

July 30, 2021

Via USPS Priority Mail

James Beyer, Chairman
Town of Bourne Board of Appeals
c/o Town Clerk
Bourne Town Hall
24 Perry Avenue, Room 203
Buzzards Bay, MA 02532

Re: Chase Estates, Comprehensive Permit No. 08-18
Notice of Small Project Change

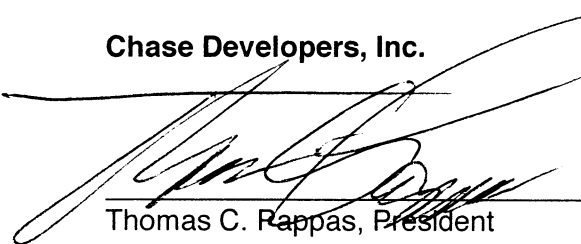
Dear Chairman Beyer,

Chase Developers, Inc. and Thomas C. Pappas, as Trustee of 230 Sandwich Road Realty Trust (collectively, "**Chase**"), holders of Comprehensive Permit No. 08-18 dated November 28, 2012 ("**Chase Estates**"), hereby submits the enclosed Notice of Small Project Change for the Board's consideration.

Chase requests that the Board begin considering this Notice of Project Change at its September 2021 meeting. Thank you for your consideration.

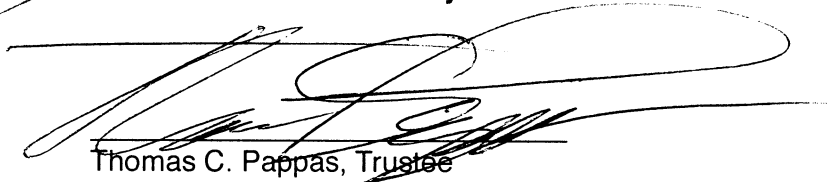
Very Truly Yours,

Chase Developers, Inc.



Thomas C. Pappas, President

230 Sandwich Road Realty Trust



Thomas C. Pappas, Trustee

Cc: Board of Appeals (10 copies hand delivered to ZBA office)

Notice of Project Change

Introduction

Chase Developers, Inc. and Thomas C. Pappas as Trustee of 230 Sandwich Road Realty Trust (collectively, the “Applicant”), are the holders of a Comprehensive Permit (No. 08-18) for development of a 16-unit residential subdivision known as “Chase Estates.” from the Town of Bourne Board of Appeals.

The Applicant wishes and intends to make the following changes to the Chase Estates project, as further described in the attached exhibits:

1. **Number and location of units.** Change the number of units from 16 to 24; the Applicant proposes to construct 24 dwelling units in 12 duplex structures, rather than the 16 units provided in the existing permit (13 detached single-family dwellings and one triplex).
2. **Subdivision vs. condominium.** Create a subdivision road and 12 building lots, rather than a condominium as currently provided. A Homeowner Association would be responsible for maintaining the road and other shared infrastructure.
3. **Road layout and conditions.** Revise the road layout, so the upper portion of the road runs through the center of the property as shown on the attached plans; eliminate the road spur from the project site to the adjacent Upper Cape Cod Regional Vocational and Technical School, and eliminate traffic-related terms and conditions in the existing permit, which were required by the Board in anticipation of an access road being built as part of the Canal-Side Commons project, which was never built and is no longer planned.
4. **Road and sidewalk width; curbs.** Reduce road width from 22 feet to 20 feet, with 4-foot sidewalk; replace granite curbs with asphalt Cape Cod berms.
5. **Wastewater Disposal and Nitrogen Loading.** Eliminate technical specifications and conditions from the existing permit that relate to wastewater disposal and nitrogen loading, and replace those conditions with a general requirement that the Applicant comply with 310 CMR 15.00 (“Title 5”), obtain required permits from the Board of Health, and submit the final approval Title 5 plans to the ZBA before construction. The project is not subject to Cape Cod Commission wastewater standards.
6. **Town Purchase of Affordable Units.** Eliminate conditions in the existing permit that would allow the Town of Bourne to purchase affordable units and rent them to low- or moderate-income tenants; town ownership of the affordable units would preclude conventional financing for the market-rate units, because Fannie Mae will not purchase mortgages for condominiums in developments where a single entity owns more than 10% of the units.
7. **Consistency with 40B regulations.** Remove or revise certain terms and conditions of the permit, to make it consistent with the procedural requirements of 760 CMR 56.00.

This Notice of Project Change is a revised iteration of the Notice of Project Change submitted by the Applicant in June 2019. The project design is substantially the same, with two main differences: First, the Applicant has revised the project (e.g. drainage design) and provided supplemental information in response to comments by the Board and by the Board's peer reviewer; Second, the Applicant is now proposing 24 units in duplexes, as opposed to the 20 detached single-family homes proposed in 2019 — a change necessitated by revisions made in response to comments by the peer reviewer, and to keep the project economically feasible.

The Board denied the 2019 Notice of Project Change, *without prejudice*, on January 4, 2021, on grounds that the Applicant had not provided certain information requested by the Board, e.g. a comprehensive response to the comments of the Board's peer review consultant. A copy of the Decision is attached as Exhibit 23. The Board indicated that the denial without prejudice was intended as "a reset and an opportunity [for the Applicant] to concentrate on assembling a substantive and comprehensive submission for the Board's consideration," at which point "the applicant is entitled to a fair hearing on the merits of this project based on a full submission." (Decision, pg. 5). Importantly, the Board stated that it "accepts that a peer review for the project has been completed, and in the case of a resubmission will not have to be redone as long as the resubmission is based on a project substantially the same as the revised project herein denied," while noting that "additional peer review may be required" as the Board deems necessary. (Id.)

Documentation of Proposed Project Changes

The following information is hereby provided for the Board's consideration, describing the proposed project changes in accordance with the list of submission requirements set forth on page 5 of the Board's January 2021 Decision; see Exhibit 23):

- i) *Existing Conditions Report showing location plan, topography, vegetation, physical structures, nearby roadways and driveways, fire hydrants, buried and overhead cables, underground piping, etc.*

An Existing Conditions plan is included as Sheet 3 of the plan set attached as Exhibit 1.

- ii) *Preliminary Subdivision Plan showing individual lots and common areas*

A Site Plan and Lotting Plan are included as Sheets 1 and 4 of the plan set attached as Exhibit 1.

- iii) *Preliminary Site Development and Utility Plans, Sections and Details showing grading and topography, stormwater management, drainage, main utility connections, culverts, retaining walls, roads, curbs, fences, site layout, roadway layout and construction, profiles, etc. (Note these exhibits should include a cross section cut through both sides of the proposed street showing all retaining walls, and identifies the leach field for each septic tank on each lot)*

The requested plans are included in the plan set attached as Exhibit 1.

- iv) *Preliminary Architectural Plans, Elevations Sections and Details showing the scope and character of the development*

Preliminary Architectural Plans are included in the plan set attached as Exhibit 1.

v) Preliminary Architectural Outline Specifications describing basic materials and design approach

The basic design approach for Chase Estates is to create a community of mid-sized homes that will be affordable to middle-income families — filling a need that is not addressed by the typical “McMansion” subdivisions or large multi-story apartment developments that dominate today’s new housing market.

The architectural drawings in the enclosed plan set represent a template that will be customized for each building lot. The drawings demonstrate the size, scale, and basic design form of the homes that will be constructed, in duplex style, on each lot. Finish materials (siding, etc.) for the homes will be selected to create a “Cape” style aesthetic.

vi) Preliminary Development Analysis showing number and type of residential units, size, area, number of bedrooms

	<u>Existing Permit</u>	<u>Proposed</u>
Number of dwelling units	16	24
Type of dwelling units	Single family detached	Duplex
Size of dwelling units	704 sf footprint; ~1770 sf living area	704 sf footprint; ~1770 sf living area (same conceptual plan, but duplex-style)
Number of bedrooms	16 3-bedroom units 48 total bedrooms	20 3-bedroom units 4 2-bedroom units 68 total bedrooms
Size of subdivision parcels	N/A - Condominium	7,822 - 13,361 sq ft

vii) Preliminary Drainage Report and Stormwater Management Report

A Preliminary Drainage and Stormwater Management Report is attached as Exhibit 2.

viii) Preliminary Traffic Impact Analysis

A Preliminary Traffic Impact Analysis is attached as Exhibit 3.

ix) List of specific Waivers required

A list of requested waivers is attached as Exhibit 4.

- x) *Preliminary List of Local Boards and Officials to be consulted, along with required letters of approval from other governmental agencies (including but not limited to Fire Department, the Water District, the Department of Transportation, the Bourne Housing Partnership, etc.)*

The Applicant has consulted with the following boards, officials and agencies:

Massachusetts Department of Transportation (“MassDOT”): The Applicant is applying for a curb cut permit, to obtain the necessary access to Sandwich Road, a state highway. MassDOT reviewed the Applicant’s initial “25% design” submittal, and the application is now at the “75% design” phase. See Exhibit 5.

Bourne Fire Department: The Applicant is currently in discussions with the Bourne Fire Department, to demonstrate and ensure that the proposed roadway layout will provide sufficient access for fire trucks and equipment. Minor changes to the intersection at Sandwich Road may be required, based on comments received to date.

Buzzards Bay Water District: The Applicant has applied for a connection to the Buzzards Bay Water District system. The District is waiting for the Board of Appeals to issue an Amended Comprehensive Permit before making a decision on the water connection application. See correspondence attached as Exhibit 6.

Other local boards and officials: Various other local boards and officials commented on the Applicant’s original June 2019 project change proposal, including the Town Planner, Health Agent, Conservation Agent, and Police Department. Copies of their comments are attached as Exhibit 7.

- xi) *Annotated Comprehensive Permit showing proposed changes to the wording of the conditions and/or content of the applicant’s existing Comprehensive Permit as well as a specific list of exhibits to be attached to the Amended Comprehensive Permit*

A draft Amended Comprehensive Permit, incorporating all of the changes proposed by the Applicant, is attached as Exhibit 8. There are no exhibits to be attached to the amended permit.

An annotated comprehensive permit, showing proposed changes to the existing permit in redline-strikeout format, is attached as Exhibit 9.

An explanation of proposed changes is attached as Exhibit 10.

A redline-strikeout comparison of the proposed Amended Permit to the previously submitted (2019) draft amended permit is attached as Exhibit 11, showing the changes made to the project after, and in response to, the peer review.¹

¹ Item (xii) on the Board’s list of submission requirements is a Project Eligibility (“PE”) letter; however, where this application is for a change to a project already permitted by the Board, a Project Eligibility letter is not required; the project, as revised, is subject to Final Approval by MassHousing (which issued the original PE letter for a development of up to 32 units) pursuant to 760 CMR 56.04(7). See generally 760 CMR 56.05(11) (procedure for reviewing changes proposed after issuance of a permit).

Response to Peer Review

Professional Services Corporation, PC (“PSC”) conducted a peer review of the Applicant’s 2019 project change proposal (as revised through October 30, 2019). To provide a record of the peer review and the Applicant’s response to it, the following documents are provided:

Project Proposal as Reviewed by Peer Reviewer

Plans and drawings reviewed by the peer reviewer are attached as Exhibit 12 and Exhibit 13. The Preliminary Drainage Report reviewed by the peer reviewer is attached as Exhibit 14. The proposed Amended Comprehensive Permit reviewed by the peer reviewer is attached as Exhibit 15, and an annotated comparison of that proposed amended permit to the original, existing permit, is attached as Exhibit 16 and Exhibit 17.

Peer Reviewer’s Comments

The peer reviewer’s comments on the proposed project changes were set forth in the following documents:

“Peer Review of First Submission of the Preliminary Site Plans and the Preliminary Drainage Report,” dated August 10, 2020. A copy of the review is attached as Exhibit 18.

Memorandum dated August 10, 2020, indicating that peer reviewer has deferred review of Traffic Impact Assessment until backup technical data underlying the report is provided. A copy of this letter is attached as Exhibit 19.

Comments by PSC on Proposed Amended Comprehensive Permit, dated August 10, 2020. These comments by PSC were provided in redline-strikeout format. A copy of PSC’s comments is attached as Exhibit 20.

Applicant Response to Peer Review

The Applicant’s response to the peer review report is attached as Exhibit 21.

The Applicant’s response to the peer reviewer’s markup of the proposed amended Comprehensive Permit is attached as Exhibit 22. See also Exhibit 11.

The technical data underlying the traffic report is included in Exhibit 3.

Proposed Review Process

The Applicant proposes a public hearing process that would take place in 8 meetings over the course of 4 months, as follows:

Meeting #1: Overview of proposed changes and review process; Identify any additional information required by the Board, including any supplemental peer review the Board may require.

Meeting #2: While any further peer review is taking place, begin discussion of proposed changes to Comprehensive Permit terms and conditions.

Meeting #3: Supplemental peer review having been completed, begin discussion of project design plans: Drainage, stormwater, Title 5.

Meeting #4: Continue discussion of project design plans: site layout, architectural, and other aspects of project.

Meeting #5: Continue discussion of proposed changes to Comprehensive Permit terms and conditions.

Meeting #6: Board presents draft Amended Comprehensive Permit decision.

Meeting #7: Applicant presents further proposed revisions to project, if any, and identifies any permit conditions proposed by the Board that would render the project uneconomic; discussion of same.

Meeting #8: Further discussion; close hearing.

Meeting #9: Board deliberation & vote.

EXHIBITS

Description of Proposed Project Change

1. Plans prepared by Outback Engineering, dated May 18, 2021:
“Index Site Plan”
“Legend and General Notes”
“Existing Conditions”
“Lotting Plan”
“Grading & Drainage Plan”
“Utility Plan & Road Profile”
“Layout & Materials Plan”
“Erosion Sedimentation and Control Plan”
“Construction Details” (2 sheets)
“Architectural Drawing & Renderings.”
2. Drainage Report, prepared by Outback Engineering, dated May 18, 2021.
3. “Traffic Impact Assessment, Proposed Chase Estates Residential Development, 230 Sandwich Road, Bourne, Massachusetts,” prepared by Vanesse & Associates, dated June 9, 2021.
4. List of Requested Waivers.
5. Correspondence with MassDOT regarding proposed Sandwich Road intersection and curb-cut permit.
6. Correspondence with Buzzards Bay Water District regarding water supply connection.
7. Comments by other town boards and officials regarding previous Notice of Project Change.
8. Draft Amended Comprehensive Permit (clean copy).
9. Draft Amended Comprehensive Permit - Annotated comparison to existing permit.
10. Explanation of Proposed Changes to Comprehensive Permit.
11. Draft Amended Comprehensive Permit - Annotated comparison to the 2019 draft reviewed by the Board’s peer reviewer.

Proposed Project Change as Reviewed by Peer Reviewer

12. Plan set with six (6) subdivision drawings prepared by Outback Engineering, titled "*Preliminary Site Plan, Chase Estates Subdivision at Sandwich Road in Bourne Massachusetts*," dated September 24, 2019, revised through October 30, 2019.
13. "*Emergency Vehicle Turning Movements*" plan prepared by Outback Engineering, dated October 28, 2019.
14. "*Preliminary Drainage Report*," prepared by Outback Engineering, dated September 24, 2019, Revised October 30, 2019.
15. "*Proposed Amended Comprehensive Permit including Supplemental Changes*"
16. "*Proposed Edits to Comprehensive Permit*" (redline-strikeout).
17. "Supplemental Proposed Edits to Comprehensive Permit" (redline-strikeout).

Peer Review

18. "*Peer Review of First Submission of the Preliminary Site Plans and the Preliminary Drainage Report*," prepared by Professional Services Corporation, PC ("PSC"), dated August 10, 2020.
19. PSC *Memorandum* dated August 10, 2020, regarding Traffic Impact Assessment.
20. *Comments by PSC* on Proposed Amended Comprehensive Permit, dated August 10, 2020.

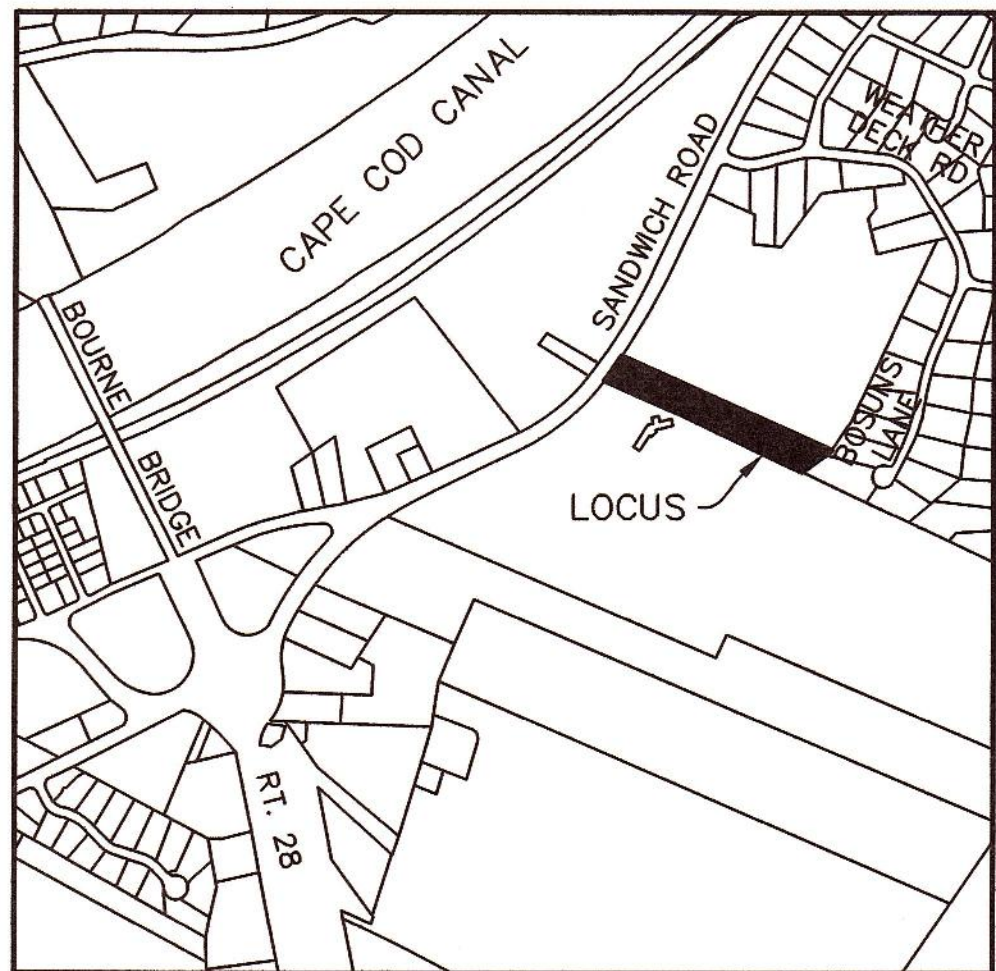
Applicant Response to Peer Review

21. Response to Peer Review Report.
22. Response to PSC Comments on Proposed Amended Comprehensive Permit.

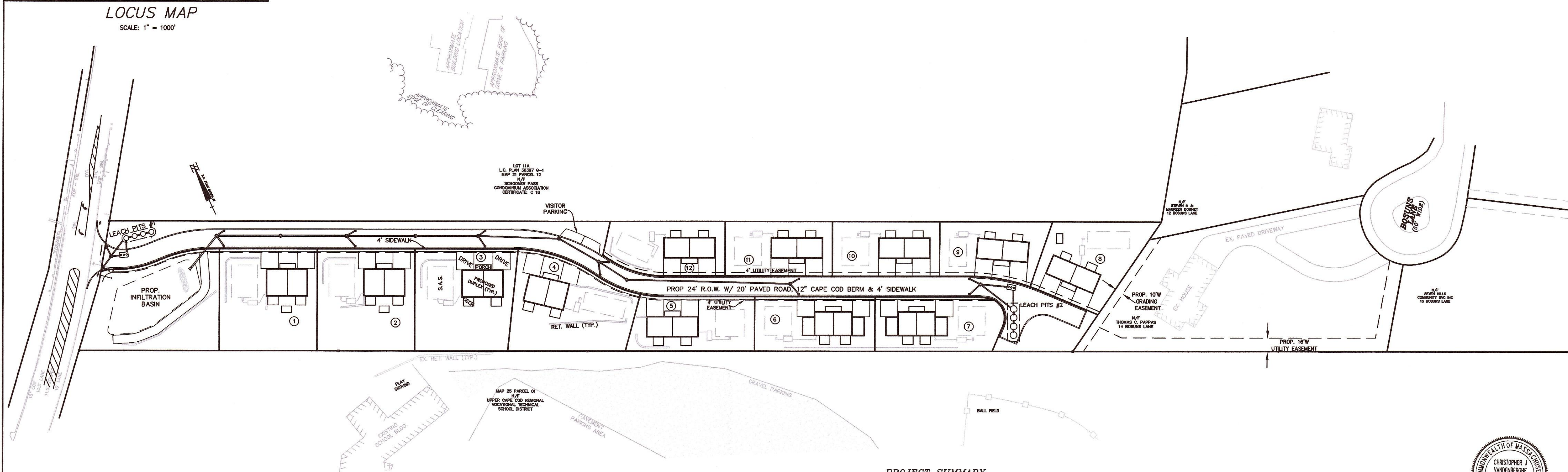
Other

23. Board of Appeals Decision, filed with Town Clerk on January 4, 2021, denying without prejudice the Applicant's previous Notice of Project Change.
24. Certified Abutter List.

" CHASE ESTATES "
A PROPOSED RESIDENTIAL SUBDIVISION
IN
BOURNE, MASSACHUSETTS



LOCUS MAP
SCALE: 1" = 1000'



PROJECT SUMMARY

PROPOSED USE: 12 LOT SUBDIVISION W/ DUPLEX HOMES, PERMITTED THROUGH MGL CH. 40B, SECTION 20-23
PARKING SUMMARY: 12 HOMES W/ 1-CAR GARAGES + 2 DRIVEWAY SPACES = 36 SPACES
12 HOMES W/ 2-CAR GARAGES + 2 DRIVEWAY SPACES = 48 SPACES
VISITOR PARKING SPACES = 2 SPACES
TOTAL PARKING PROVIDED = 86 SPACES (ALL SPACES 9'X19 MIN.)

WATER AND SEWAGE DESIGN FLOW PER TITLE 5

20 DUPLEX UNITS X 3 BEDROOMS X 110 GPD/BEDROOM = 6,600 GPD
4 DUPLEX UNITS X 2 BEDROOMS X 110 GPD/BEDROOM = 880 GPD
TOTAL=7,480 GPD

Professional Engineer Seal for Christopher Vandenberghe, No. 54807, dated 7-1-21.

Table with 3 columns: BOURNE TOWN GOVERNMENT/ UTILITY CONTACTS, listing Police Dept, Building Department, Conservation Commission, Fire Dept, Department of Public Works, Planning Board, Bourne Water District, Board of Health, and Zoning Board of Appeals with their respective addresses and phone numbers.

Table with 2 columns: SHEET and DESCRIPTION, listing the index plan, legend, existing conditions, lotting plan, grading & drainage plan, utility plan & road profile, layout & materials plan, erosion sedimentation & control plan, construction details, and architectural drawings & rendering.

FOR REGISTRY USE ONLY
I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.
Professional Land Surveyor Seal for Paul J. Babineau, No. 45915, dated 7-1-21.

APPROVED SUBJECT TO TERMS AND CONDITIONS OF A COMPREHENSIVE PERMIT PER ZONING BOARD OF APPEALS DECISION AS AUTHORIZED BY CHAPTER 40B OF THE MASSACHUSETTS GENERAL LAWS, SECTION 20-23
DATE:
BOURNE ZONING BOARD
I CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE ZONING BOARD APPROVAL, AND THAT NO APPEAL HAS BEEN FILED AT THIS OFFICE.

TOWN CLERK - TOWN OF BOURNE
REVISIONS table with columns NO., DATE, and DESCRIPTION.
OWNER: 230 SANDWICH ROAD REALTY TRUST, 14 BOSUNS LANE, BOURNE, MA
APPLICANT: CHASE DEVELOPERS INC., 14 BOSUNS LANE, BOURNE, MA

SITE PLAN
"CHASE ESTATES" SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS

Outback Engineering logo and contact information: 165 EAST GROVE STREET, MIDDLEBOROUGH, MA 02346, TEL: (508)-946-9231, FAX: (508)-947-8873, www.outback-eng.com. Includes a scale bar and project number OE-3294A.

GENERAL NOTES

PART 1 – TOPOGRAPHIC AND PROPERTY LINE INFORMATION

- A. PROPERTY LINE & TOPOGRAPHIC SURVEY REFERENCES:
1. "CHASE ESTATES 40B SITE PLAN SUBMISSION" AT 230 SANDWICH ROAD BOURNE, MA. PREPARED BY HIGHPOINT ENGINEERING INC. FOR CHASE DEVELOPERS, INC.
2. THE TOPOGRAPHY SHOWN HEREON IS DERIVED FROM REFERENCE PLAN 1.
3. VERTICAL ELEVATIONS ARE BASED ON NAVD88. HORIZONTAL DATUM IS BASED ON NAD83.
4. PROPERTY LINE AND TOPOGRAPHY: EXISTING PROPERTY LINE, UTILITY INFORMATION AND TOPOGRAPHIC INFORMATION PERFORMED BY ANDREWS SURVEY & ENGINEERING, INC.
- B. THE SITE IS LOCATED WITHIN AN AREA OF MINIMAL FLOOD HAZARD ZONE X, DEPICTED ON FIRM MAP 25001C0502J AND 25023C0237K, EFFECTIVE DATE JULY 16, 2014.
- C. SITE IS NOT LOCATED WITHIN A ZONE II OR IWPA GROUNDWATER RESOURCE PROTECTION AREA. SITE IS NOT LOCATED WITHIN A ZONE A, B, OR C SURFACE WATER PROTECTION AREA.
- D. THE SITE IS NOT LOCATED WITHIN A NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM (NHESP) PRIORITY HABITAT OF RARE SPECIES OR WITHIN AN NHESP ESTIMATED HABITAT OF RARE WILDLIFE PER THE LATEST ON-LINE MASSGIS MAPPING INFORMATION.
- E. THE SITE IS NOT LOCATED WITHIN A STATE DESIGNATED AREA OF CRITICAL ENVIRONMENTAL CONCERN.
- F. EXISTING UTILITIES DEPICTED HEREON ARE A COMPILATION OF THE FIELD SURVEY AND BEST AVAILABLE INFORMATION AND IS NOT WARRANTED TO BE CORRECT OR THAT ALL UTILITIES ARE SHOWN. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO NOTIFY ALL UTILITY COMPANIES AND AGENCIES PRIOR TO CONSTRUCTION FOR THE LOCATION OF UNDERGROUND UTILITIES. CONTRACTOR SHALL NOTIFY DIGSAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO THE ONSET OF ANY CONSTRUCTION TO HAVE ALL EXISTING UTILITIES LOCATED AND CLEARLY MARKED.
- G. THIS PLAN IS THE SUBJECT OF A COMPREHENSIVE PERMIT UNDER M.G.L. C.40B, SECTIONS 20–23.
- H. NO KNOWN PUBLIC OR COMMUNITY WATER SUPPLY WELLS ARE WITHIN 1000' OF THE SUBJECT PROPERTY.
- I. SITE HAS TOWN WATER, ELECTRIC, CABLE & GAS SERVICE AVAILABLE IN SANDWICH ROAD. ALL UTILITIES FOR THE PROJECT SHALL BE INSTALLED UNDERGROUND.

PART 2 – EXECUTION

2.1 – DEMOLITION, SEDIMENTATION, AND EROSION CONTROL

- A. THE FIRST STAGE INVOLVES ACTIVITIES NEEDED TO ADDRESS STORMWATER MANAGEMENT, EXCAVATING MATERIAL DESIGNATED FOR OFF-SITE REMOVAL, OR ON-SITE RELOCATION AND FENCING SELECTED AREAS. STAGE ONE WILL PREPARE SITE FOR CONVENTIONAL CONSTRUCTION.
- B. THE SECOND STAGE WILL CONSIST OF ROUTINE CONSTRUCTION INVOLVING BUILDING, PAVING, LANDSCAPING, AND UTILITIES.
- C. THERE ARE GENERAL PHASES OF CONSTRUCTION, IN EACH PHASE OF CONSTRUCTION, IMPLEMENT STANDARD EROSION AND SEDIMENT CONTROL PRACTICES PRIOR TO INITIATING EARTH DISTURBING ACTIVITIES, AND MAINTAIN THESE PRACTICES THROUGHOUT THE COURSE OF CONSTRUCTION.
- D. DURING DEMOLITION, EXCAVATIONS AS MUCH AS 20 FEET MAY BE REQUIRED FOR THE INSTALLATION OF FOUNDATIONS, RETAINING WALLS, AND UTILITIES. EXCAVATIONS SHALL BE CUT TO A STABLE SLOPE OR BE TEMPORARILY BRACED, DEPENDING ON THE EXCAVATION DEPTHS AND THE ENCOUNTERED SUBSURFACE CONDITIONS. THE CONTRACTOR MAY BE REQUIRED TO SUBMIT EXCAVATION AND SLOPE STABILIZATION METHODS PRIOR TO THE START OF CONSTRUCTION TO THE ENGINEER FOR REVIEW.
- E. BASED ON THE COMPOSITION OF SOILS ENCOUNTERED DURING THE EXPLORATION PROGRAM, SITE SOILS ARE GENERALLY CLASSIFIED AS TYPE A SOILS AS DEFINED BY USDA NATURAL RESOURCES CONSERVATION SERVICE (NRCS), FORMERLY SOIL CONSERVATION SURVEY (SCS). TEMPORARY CONSTRUCTION SLOPES SHOULD BE DESIGNED IN STRICT COMPLIANCE WITH THE MOST RECENT GOVERNING REGULATIONS. STOCKPILES SHOULD BE PLACED WELL AWAY FROM THE EDGE OF THE EXCAVATION AND THEIR HEIGHT SHOULD BE CONTROLLED TO PREVENT SURCHARGE TO THE SIDES OF THE EXCAVATION. SURFACE DRAINAGE SHOULD BE CONTROLLED TO AVOID FLOW OF SURFACE WATER INTO THE EXCAVATIONS.
- F. CONSTRUCTION SLOPES SHOULD BE REVIEWED FOR MASS MOVEMENT; IF POTENTIAL STABILITY PROBLEMS ARE OBSERVED, WORK SHOULD CEASE AND A GEOTECHNICAL ENGINEER SHOULD BE CONTACTED IMMEDIATELY. THE RESPONSIBILITY FOR EXCAVATION SAFETY AND STABILITY OF TEMPORARY CONSTRUCTION SLOPES SHOULD LIE SOLELY WITH THE CONTRACTOR.
- G. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF EROSION CONTROL MEASURES SHOWN ON THIS PLAN AND ANY ADDITIONAL MEASURES AS MAY BE NECESSARY OR REQUIRED THROUGHOUT CONSTRUCTION, UNTIL FINAL SURFACE FINISHES HAVE BEEN ESTABLISHED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTROL EROSION AND SEDIMENTATION. IT IS INTENDED THAT THE IMPLEMENTATION OF THE FOLLOWING MEASURES WILL MEET THIS GOAL. WHEN IT IS CLEAR TO THE DESIGNER THAT EROSION AND SEDIMENTATION HAVE BEEN ADEQUATELY CONTROLLED WITHOUT THE IMPLEMENTATION OF EVERY MEASURE, ADDITIONAL MEASURES NEED NOT BE IMPLEMENTED. ALTERNATIVELY, IF ALL OF THE FOLLOWING MEASURES HAVE BEEN IMPLEMENTED AND THE CONTROL OF EROSION AND SEDIMENTATION IS INADEQUATE, THE CONTRACTOR MUST EMPLOY SUFFICIENT SUPPLEMENTAL MEASURES BEYOND THE SCOPE OF THIS PLAN.

2.2 – TYPICAL PRACTICES TO BE APPLIED TO THE SITE INCLUDE THE FOLLOWING:

- A. PRIOR TO EARTH DISTURBANCE IN ANY WORK AREA, INSTALL EROSION CONTROL BARRIERS BETWEEN THE WORK AREA AND THE SURFACE WATER RESOURCE TO WHICH IT DRAINS, IF PRESENT, OR TO PROTECT OFF-SITE AREAS
- B. DISCHARGE WATER FROM DEWATERING OPERATIONS TO A TEMPORARY SILTATION TRAP OR SEDIMENTATION BASIN.
- C. PROVIDE TEMPORARY BERMS AND SWALES TO DIVERT SURFACE WATER AWAY FROM THE AREAS THAT WILL BE EXPOSED BY CONSTRUCTION ACTIVITY TO MINIMIZE THE AMOUNT OF SURFACE WATER COMING INTO CONTACT WITH EXPOSED SOILS. PROVIDE STABLE OUTLETS FOR THESE DEVICES, AND LINE OR VEGETATE THESE DIVERSIONS TO PROVIDE FOR THEIR STABILITY DURING CONSTRUCTION.
- D. LIMIT THE EXTENT OF EXPOSED SOILS TO AREAS THAT CAN BE WORKED AND RESTABILIZED WITHIN THE CONSTRUCTION SEASON AND DURING THE SPECIFIC CONSTRUCTION PHASE.
- E. WHEN EARTHWORK CONSTRUCTION ACTIVITY IN AN AREA IS COMPLETE, STABILIZE THE AREA WITH A SUITABLE SURFACE AS DESCRIBED BELOW.
- F. IN ADDITION TO THESE PRACTICES, FOLLOW THE SPECIAL PRACTICES DESCRIBED BELOW. COMPLY WITH THE DIRECTIONS OF THE APPLICANT'S REPRESENTATIVE TO ADDRESS EROSION AND SEDIMENTATION CONDITIONS THAT MAY ARISE ON A CASE BY CASE BASIS DURING CONSTRUCTION.
- G. THE FOLLOWING IS A DESCRIPTION OF MINIMUM CONSTRUCTION REQUIREMENTS AND DOES NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITIES WITH REGARD TO DETERMINING THE ADEQUACY OF MEANS AND METHODS OF CONSTRUCTION.

2.3 – CONSTRUCTION SEQUENCING

- A. SEQUENCING SHALL BE AS SHOWN ON THE PLAN AND AS DICTATED BY THE REQUIREMENTS OF CONSTRUCTION.
- B. THE FOLLOWING ARE GENERAL GUIDELINES FOR CONTRACTOR TO FOLLOW. REFER TO COMPREHENSIVE PERMIT FOR OTHER SPECIFIC REQUIREMENTS.
- 1.) CLEAR TREES TO LIMIT OF WORK SHOWN.
 - 2.) INSTALL EROSION CONTROL BARRIER (ECB) AROUND WORK AREA AS SHOWN.
 - CLEAR AND GRUB THE SITE.
 - INSTALL STONE ENTRANCE PAD (SEE DETAIL).
 - INSTALL STRAW WATTLES ACROSS STONE ENTRANCE PAD AT NIGHT AND PRIOR TO RAIN EVENTS.
 - INSTALL EROSION CONTROL MEASURES AND SEDIMENT TRAPS PER PLANS. PRIOR TO EARTH DISTURBANCE IN ANY WORK AREA, INSTALL ECB BETWEEN THE WORK AREA AND THE SURFACE WATER RESOURCE AREA OR DOWNGRADE/IN AREAS.
 - 3.) WHEN WORK SITE IS GRADED TOWARDS ROADWAY AND/OR PROPERTY LINES, ECB ARE TO BE PLACED AT PAVEMENT EDGE/PROPERTY LINE, AS NECESSARY DURING CONSTRUCTION.
 - MAINTAIN ALL EROSION CONTROL BARRIERS DURING CONSTRUCTION, UNTIL SOILS ARE STABILIZED.
 - 4.) CONTRACTOR TO USE STEW, STRAW OR STUMP GRINDINGS ATOP BARE SOILS AS NECESSARY TO MINIMIZE POTENTIAL EROSION, AS NECESSARY DURING CONSTRUCTION.
 - 5.) CONTRACTOR MAY UTILIZE ADDITIONAL EROSION CONTROL MEASURES AS NECESSARY, SUCH AS BUT NOT LIMITED TO HAY BALES, STRAW WATTLES, CRUSHED STONE, EARTHEN BERMS, AND SEDIMENT TRAPS TO CONTAIN SOILS ON SITE. MODIFICATIONS MAY BE IMPLEMENTED AS CONSTRUCTION PROGRESSES, AS NECESSARY DURING CONSTRUCTION.
 - 6.) CONTRACTOR TO DEMOLISH EXISTING STRUCTURES, AND CONSTRUCT ROADWAY, PARKING, UTILITIES AND OTHER INFRASTRUCTURE PER SCHEDULE BY OWNER. CONSTRUCTION OF ROADWAY SHALL FOLLOW BOURNE SUBDIVISION REGULATION 361.a–e, PERTAINING TO SCHEDULE OF WORK.
 - 7.) DEVELOPER TO CONSTRUCT DUPLEX HOMES WITH INDIVIDUAL SEPTIC SYSTEMS ON LOTS 1–12.
 - 8.) COMPLETE LOTS AND ROADWAY, FINISH GRADING AND CLEAN UP SITE AND STABILIZE ALL DISTURBED AREAS.
 - 9.) CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES DURING CONSTRUCTION UNTIL SITE IS FINISH LANDSCAPED AND SOILS ARE STABILIZED.

2.4 – MAINTENANCE

- A. DURING THE PERIOD OF CONSTRUCTION AND/OR UNTIL LONG TERM VEGETATION IS ESTABLISHED, SEEDED AREAS WILL BE FERTILIZED AND RESEDED AS NECESSARY TO INSURE VEGETATION ESTABLISHMENT.
- B. TEMPORARY SEDIMENTATION TRAPS WILL BE CHECKED AFTER EACH SIGNIFICANT RAINFALL AND CLEANED AS NEEDED TO RETAIN STORAGE CAPACITY.
- C. TEMPORARY DRAINAGE SWALES AND BERMS WILL BE CHECKED WEEKLY AND REPAIRED WHEN NECESSARY.
- D. THE EROSION CONTROL BARRIERS AND OTHER EROSION AND SEDIMENT CONTROL MEASURES/DEVICES SHALL BE INSPECTED, CLEANED, REPLACED AND/OR REPAIRED AS NECESSARY, PERIODICALLY AND AFTER EACH SIGNIFICANT RAINFALL.
- E. SWEEP ON-SITE PAVED AREAS AND OFF-SITE STREETS AS NECESSARY TO PREVENT SILT AND DEBRIS ORIGINATING ON-SITE FROM ENTERING CLOSED DRAINAGE SYSTEMS AND/OR ENVIRONMENTALLY SENSITIVE AREAS. WHEN NECESSARY UTILIZE WATER SPRAYING, SURFACE ROUGHENING AND/OR APPLY POLYMERS, SPRAY-ON TACKIFIERS, CHLORIDES AND BARRIERS FOR DUST CONTROL.
- F. THE OPERATION AND MAINTENANCE (O&M) SCHEDULE DURING THE CONSTRUCTION PHASE IS THE RESPONSIBILITY OF THE OWNER AND/OR SITE CONTRACTOR. THE OUTLINE BELOW SHALL BE ADHERED TO AS CLOSELY AS POSSIBLE TO ENSURE THE PROPER CONSTRUCTION AND FUNCTION OF THE DRAINAGE SYSTEM.
1. PRIOR TO CONSTRUCTION, EROSION CONTROL (ECB) SHALL BE INSTALLED PER THE APPROVED PLANS. ECB SHALL BE INSPECTED PRIOR TO A LARGE STORM EVENT TO ENSURE THAT THE EROSION CONTROL WILL FUNCTION AS REQUIRED AND FOLLOWING A STORM TO INSPECT FOR DAMAGE TO THE EROSION CONTROL ELEMENTS. ANY DAMAGE OR IMPROPER INSTALLATION THAT IS NOTICED PRIOR TO OR FOLLOWING A STORM EVENT SHALL BE PROMPTLY REPLACED OR REPAIRED IN A SATISFACTORY MANNER SO AS TO PREVENT SEDIMENT FROM BYPASSING THE EROSION CONTROL BARRIER.
 2. IN CONJUNCTION WITH THE SITE CONSTRUCTION, ALL DRAINAGE STRUCTURES INCLUDING CATCH BASIN, WATER QUALITY INLET SUBSURFACE INFILTRATION STRUCTURES, AND THE INFILTRATION BASIN SHALL BE CONSTRUCTED AND STABILIZED AS SOON AS POSSIBLE. CATCH BASINS SHALL BE PROTECTED WITH SILT SACKS AS SHOWN.
 3. THE CATCH BASINS AND WATER QUALITY TANK SHALL BE INSPECTED WEEKLY DURING CONSTRUCTION. ANY SEDIMENT BUILDUP OF EIGHT (8) INCH DEPTH IN ANY OF THE STRUCTURES SHALL BE PROMPTLY REMOVED BY HAND OR MECHANICAL METHODS AND ALL DEBRIS REMOVED IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.
 - PROTECT CATCH BASIN AND WATER QUALITY TANK INLETS FROM RECEIVING SEDIMENT-LADEN STORM RUNOFF THAT MAY CLOG UNDERGROUND LEACHING SYSTEMS BY GRADING GRAVEL SUBBASE AWAY FROM THESE INLETS PRIOR TO PAVING.
 4. THE SITE SHALL BE INSPECTED WEEKLY OR AFTER ALL RAINFALL EVENTS GREATER THAN 1/2 INCH, WHICHEVER OCCURS SOONER. ANY EROSION SHALL BE FILLED AND RESTABILIZED IN A MANNER TO PREVENT FUTURE EROSION.

2.5 – GENERAL

- A. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH USDA GUIDELINES AND ALL LOCAL, COUNTY AND MUNICIPAL REGULATIONS.
- B. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO THE COMMENCEMENT OF ANY SITE WORK OR EARTHWORK OPERATIONS, SHALL BE MAINTAINED DURING CONSTRUCTION, AND SHALL REMAIN IN PLACE UNTIL ALL SITE WORK IS COMPLETE AND GROUNDCOVER IS ESTABLISHED.
- C. ALL WORK SHALL BE IN ACCORDANCE WITH THE PERMITS AND APPROVALS ISSUED AND THE CONSTRUCTION SPECIFICATIONS. BLASTING IS PROHIBITED ON THE PROJECT SITE.
- D. STOCKPILES SHALL BE SURROUNDED ON THEIR PERIMETERS WITH STAKED STRAW WATTLES AND/OR SILTATION FENCES TO PREVENT AND/OR CONTROL SILTATION AND EROSION.
- E. TOPS OF STOCKPILES SHOULD BE COVERED IN SUCH A MANNER THAT STORMWATER DOES NOT INFILTRATE THE MATERIALS AND THEREBY RENDER THE SAME UNSUITABLE FOR FILL USE.
- F. ALL DISTURBED OR EXPOSED AREAS SHALL BE PERMANENTLY STABILIZED WITHIN FIVE (5) BUSINESS DAYS OF COMPLETION OF CONSTRUCTION OF A GIVEN AREA. EXPOSED AREAS WHERE NO WORK HAS OCCURRED FOR FOURTEEN (14) DAYS SHALL BE TEMPORARILY STABILIZED WITH HYDROSEED OR OTHER APPROVED METHOD.
- G. THE LOCATION OF TEMPORARY DRAINAGE SWALES AND SEDIMENTATION TRAPS ARE APPROXIMATE ONLY AND SHALL BE RELOCATED AS REQUIRED AS CONSTRUCTION PROGRESSES.
- H. HAYBALE DIKES SHALL BE CONSTRUCTED AT ALL EXISTING & PROPOSED CATCH BASINS LOCATED IN FILL AREAS & SUBJECT TO STORMWATER RUN-OFF FROM PROPOSED FILL AREAS DURING CONSTRUCTION, OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE. NO SEDIMENTS SHALL ENTER THE ON-SITE OR OFF-SITE DRAINAGE SYSTEMS AT ANY TIME.
- I. CULVERT/PIPE INLETS AND OUTFALLS SHALL BE PROTECTED BY STRAW WATTLE FILTERS UNTIL DISTURBED AREAS ARE PERMANENTLY STABILIZED.
- J. EROSION CONTROLS SHALL BE PERIODICALLY INSPECTED AND REPLACED AS REQUIRED.
- K. ALL PROPOSED NON-RIPRAP SLOPES STEEPER THAN 3:1 SHALL BE STABILIZED WITH EXCELSIOR BLANKETS OR OTHER EROSION CONTROL COVERINGS AND PROTECTED FROM EROSION.
- L. THE CONTRACTOR SHALL KEEP ON SITE AT ALL TIMES ADDITIONAL STRAW WATTLES AND EXTRA SILTATION FENCING FOR INSTALLATION AT THE DIRECTION OF THE OWNER'S REPRESENTATIVE OR LOCAL OFFICIALS TO MITIGATE ANY EMERGENCY CONDITION.
- M. DISPOSAL OF ALL DEMOLISHED MATERIALS IS THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE HAULED OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL MUNICIPAL REQUIREMENTS.
- N. THE CONTRACTOR SHALL PROTECT AND/OR CAP OFF ALL EXISTING ON-SITE UTILITY SERVICES DESIGNATED AS SUCH ON THESE DRAWINGS.
- O. THE LIMIT OF WORK LINE FOR THE AREA TO BE CLEARED AND GRUBBED SHALL BE THE SAME AS THE LIMIT OF WORK LINE NECESSARY FOR GRADING PURPOSES, (I.E., THE GRADING LIMITS AROUND THE PERIMETER OF THE PROJECT AREA).
- P. THE AREA OR AREAS OF ENTRANCE AND EXIT TO AND FROM THE SITE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY.
- Q. FOLLOWING THE ADDITION OF A BINDER COURSE, THE CONTRACTOR SHALL SWEEP ALL ON-SITE PAVEMENT, IF NECESSARY, UNTIL ALL SITE CONSTRUCTION IS COMPLETED.
- R. THE MATERIALS AND METHODS USED IN THE CONSTRUCTION OF ROADWAYS SHALL CONFORM TO THE REQUIREMENTS OF "TOWN OF BOURNE CONSTRUCTION STANDARDS AND SPECIFICATIONS", AS MAY BE WAIVED BY THE COMPREHENSIVE PERMIT. WHEN NO CITY SPECIFICATION IS PROVIDED THE MATERIALS AND METHODS USED IN THE CONSTRUCTION OF ROADWAYS SHALL CONFORM TO THE REQUIREMENTS OF "THE COMMONWEALTH OF MASSACHUSETTS, DEPARTMENT OF PUBLIC WORKS, STANDARDS & SPECIFICATIONS FOR HIGHWAYS & BRIDGES," LATEST EDITION.
- PART 3 – STORM DRAINS
- A. STORM DRAIN PIPING (INDICATED BY LETTER "D") SHALL BE CONCRETE UNLESS ADS PLASTIC PIPE PROTECTED IS APPROVED BY THE BOARD. MINIMUM COVER FOR DRAINS SHALL BE 24". PIPING WITH 24" TO 36" COVER SHALL BE REINFORCED CONCRETE
- B. ANY CATCHBASINS AND MANHOLES SHALL BE AT LEAST FOUR FEET INSIDE DIAMETER, WHERE CB'S SHALL HAVE A 4" OR GREATER SUMP BELOW PIPE INVERT. THEY SHALL BE CONSTRUCTED OF PRECAST CONCRETE UNITS, WITH A CONCRETE BASE OF AT LEAST 4" THICKNESS. PRECAST SEGMENTS OR POURED IN PLACE. ALL CATCHBASINS MUST BE HOODED. A CATCHBASIN TO MANHOLE CONFIGURATION SHALL BE USED. LEACHING CATCHBASINS WILL NOT NORMALLY BE ALLOWED. MANHOLE COVERS AND GRATES SHALL BE IN CONFORMANCE WITH MASSACHUSETTS DPW SPECIFICATIONS, DESIGNED AND PLACED SO AS TO CAUSE NO HAZARD TO BICYCLES. NO STORM SEWER SHALL HAVE LESS THAN A 12" INSIDE DIAMETER.
- C. COORDINATES OF MANHOLES REFER TO CENTERS OF STRUCTURES AND CATCH BASINS REFER TO THE CENTER BACK OF THE FRAME AND GRATE.
- E. FLARED END SECTIONS (FES) SHALL BE CORRUGATED POLYETHYLENE PIPE (HDPE) AS INDICATED, PER AASHTO M170 MANUFACTURED TO MEET ASTM C76, ADS N-12 OR APPROVED EQUAL

PART 4 – UTILITIES

4.1 – WATER DISTRIBUTION AND FIRE PROTECTION

- A. ALL WATER MAIN APPURTENANCES, MATERIALS, AND METHODS OF INSTALLATION SHALL MEET OR EXCEED ALL LOCAL MUNICIPAL REQUIREMENTS OF THE BOURNE WATER DISTRICT (BWD)
- B. GENERALLY, WATER MAIN FITTINGS IDENTIFIED ON THIS DRAWING ARE SHOWN FOR INSTALLATION LOCATION PURPOSES. THE CONTRACTOR IS ADVISED THAT NOT ALL FITTINGS AND SUPPLY LINES ARE NOTED, SHOWN, OR INDICATED.
- C. WATER MAINS 3" DIA. AND LARGER SHALL HAVE 4'-6" MINIMUM COVER AND SHALL BE EITHER PLASTIC C900 OR CEMENT LINED DUCTILE IRON (CLDI), CLASS 52 MINIMUM, CONFORMING TO AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) A21.50, A21.4, A21.10 AND A21.51. JOINTS AT FITTINGS, VALVES AND HYDRANT LATERALS SHALL BE MECHANICAL JOINT PER ANSI A21.11, WITH GASKETS. JOINTS AT OTHER LOCATIONS SHALL BE PUSH-ON TYPE WITH GASKETS PER ANSI A21.11. ALL FITTINGS, VALVES, HYDRANTS AND CAPS SHALL BE CLASS 350 PROVIDED WITH THRUST RESTRAINTS (THRUST BLOCKS AND RETAINING ROOS) IN CONFORMANCE WITH THE DETAILS.
- D. ALL HYDRANTS SHALL BE INSTALLED WITH A 6" OLDI LATERAL AND SHALL BE INSTALLED WITH A 6" GATE VALVE, BOX, AND TEE FITTING. ALL HYDRANTS SHALL MEET AND BE INSTALLED IN ACCORDANCE WITH ALL LOCAL MUNICIPAL STANDARDS.
- E. PRESSURE AND LEAKAGE TEST, DISINFECTION AND FLUSHING SHALL BE IN ACCORDANCE WITH ALL LOCAL MUNICIPAL STANDARDS AND REQUIREMENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS IN CONNECTIONS WITH UTILITY TESTS, FLUSHING, AND INSPECTIONS AS REQUIRED BY THE LOCAL MUNICIPALITY.
- F. EXISTING SERVICES SHALL BE CUT AND A WATERTIGHT PLUG SHALL BE INSTALLED. EXISTING GATE VALVES TO BE ABANDONED SHALL BE PERMANENTLY CLOSED AND CAPPED, AND WATER SERVICES SHOULD BE SHUT OFF AT THE MAIN CORPORATION.

4.2 – UTILITY SEPARATION

- A. A MINIMUM 10 FEET CLEAR HORIZONTAL DISTANCE SHALL BE MAINTAINED BETWEEN SANITARY SEWER MAINS AND WATER MAINS. WHENEVER CONDITIONS PREVENT A LATERAL SEPARATION OF 10 FEET, THE WATER MAIN SHALL BE LAID IN A SEPARATE TRENCH AND THE ELEVATION OF THE CROWN OF THE SEWER SHALL BE AT LEAST 18 INCHES BELOW THE INVERT OF THE WATER MAIN.
- B. A MINIMUM OF 18" VERTICAL CLEARANCE SHALL BE MAINTAINED WHERE WATER MAINS CROSS STORM DRAIN LINES, OR AS MAY BE APPROVED BY TOWN DPW AND BMD
- C. WHERE SANITARY SEWERS CROSS WATER MAINS, THE SEWER SHALL BE LAID AT SUCH AN ELEVATION THAT THE CROWN OF THE SEWER IS AT LEAST 18" BELOW THE INVERT OF THE WATER MAIN. IF THE ELEVATION OF THE SEWER CANNOT BE VARIED TO MEET THIS REQUIREMENT, THE CONTRACTOR SHALL DO THE FOLLOWING:
THE WATER MAIN SHALL BE RELOCATED TO PROVIDE THIS SEPARATION OR CONSTRUCTED WITH MECHANICAL-JOINT PIPE FOR A DISTANCE OF TEN FEET ON EACH SIDE OF THE SEWER. ONE FULL LENGTH OF WATER MAIN SHALL BE CENTERED OVER THE SEWER SO THAT BOTH JOINTS WILL BE AS FAR FROM THE SEWER AS POSSIBLE. IN ADDITION, THE WATER MAIN SHALL BE ENCASED IN CONCRETE.
- D. PRIMARY ELECTRICAL ENCASED CONDUIT MUST BE SEPARATED FROM GAS BY 3' MIN. AND FROM OTHER UTILITIES BY 2' MINIMUM.
- E. TELEPHONE AND FIRE ALARM WHICH SHARE THE SAME TRENCH MUST HAVE A 1' VERTICAL SEPARATION.
- F. GAS MAINS MUST BE SEPARATED FROM OTHER UTILITIES BY 2' MINIMUM.

4.3 – ELECTRIC AND COMMUNICATIONS

- A. INSTALLATION OF COMMUNICATIONS (TELEPHONE, CABLE AND FIRE ALARM) SYSTEMS SHALL BE COORDINATED AND SCHEDULED BY THE CONTRACTOR WITH THE APPROPRIATE UTILITY COMPANY SERVICING THE PROJECT SITE.
- B. COORDINATES REFER TO THE CENTER OF STRUCTURES UNLESS OTHERWISE NOTED OR DETAILED. CONTRACTOR SHALL COORDINATE LIGHT BASE LOCATIONS WITH PROPOSED CURBING AND PARKING LOT STRIPING.
- C. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ELECTRICAL SERVICE PRIOR TO ORDERING ANY EQUIPMENT.

PART 5 – PAVEMENT AND CURBING

- A. JOINTS BETWEEN NEW BITUMINOUS CONCRETE PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED WITH BITUMEN AND BACKSANDS.
- B. CURBING SHALL BE INSTALLED AS FOLLOWS:
BITUMINOUS MODIFIED CAPE COD BERM ALONG ROADWAY.
- C. DIMENSIONS REFER TO FACE OF CURB UNLESS NOTED OTHERWISE.
- D. ALL LIMITS OF PAVING SHALL BE CURBED UNLESS NOTED OR DETAILED OTHERWISE.

PART 6 – TRAFFIC CONTROL

- A. INCLUDING, BUT NOT LIMITED TO, ALL CROSSWALKS, STOP LINES AND LEGENDS.
 - LEGENDS SHALL BE PREFORMED PERMANENT PLASTIC. PAVEMENT MARKINGS SHALL BE THERMO PLASTIC (ALKYD). THE MARKINGS, LEGENDS SHALL BE INSTALLED IN ACCORDANCE WITH THE RELEVANT PORTIONS OF MASSACHUSETTS HIGHWAY DEPARTMENT (WHO) STANDARD SPECIFICATIONS, FOR REQUIREMENTS REGARDING THE AMBIENT AIR TEMPERATURE AT THE TIME OF APPLICATION.

PART 7 – QUALITY ASSURANCE

- A. COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS FROM ACCEPTABLE MANUFACTURERS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- B. CONFORM TO CONDITIONS OF APPROVAL ISSUED BY REGULATORY AGENCIES INCLUDING, BUT NOT NECESSARILY LIMITED TO, LOCAL PLANNING BOARD, CONSERVATION COMMISSION, CITY COUNCIL, BOARD OF HEALTH, PUBLIC WORKS / HIGHWAY DEPARTMENT, STATE ENVIRONMENTAL PROTECTION DEPARTMENT, AND U.S. GOVERNMENT, ENVIRONMENTAL PROTECTION AGENCY. WHERE CONDITIONS OF REGULATORY APPROVAL DIFFER FROM REQUIREMENTS CONTAINED HEREIN OR ON THE DRAWINGS, COMPLY WITH THE MORE STRINGENT REQUIREMENT.

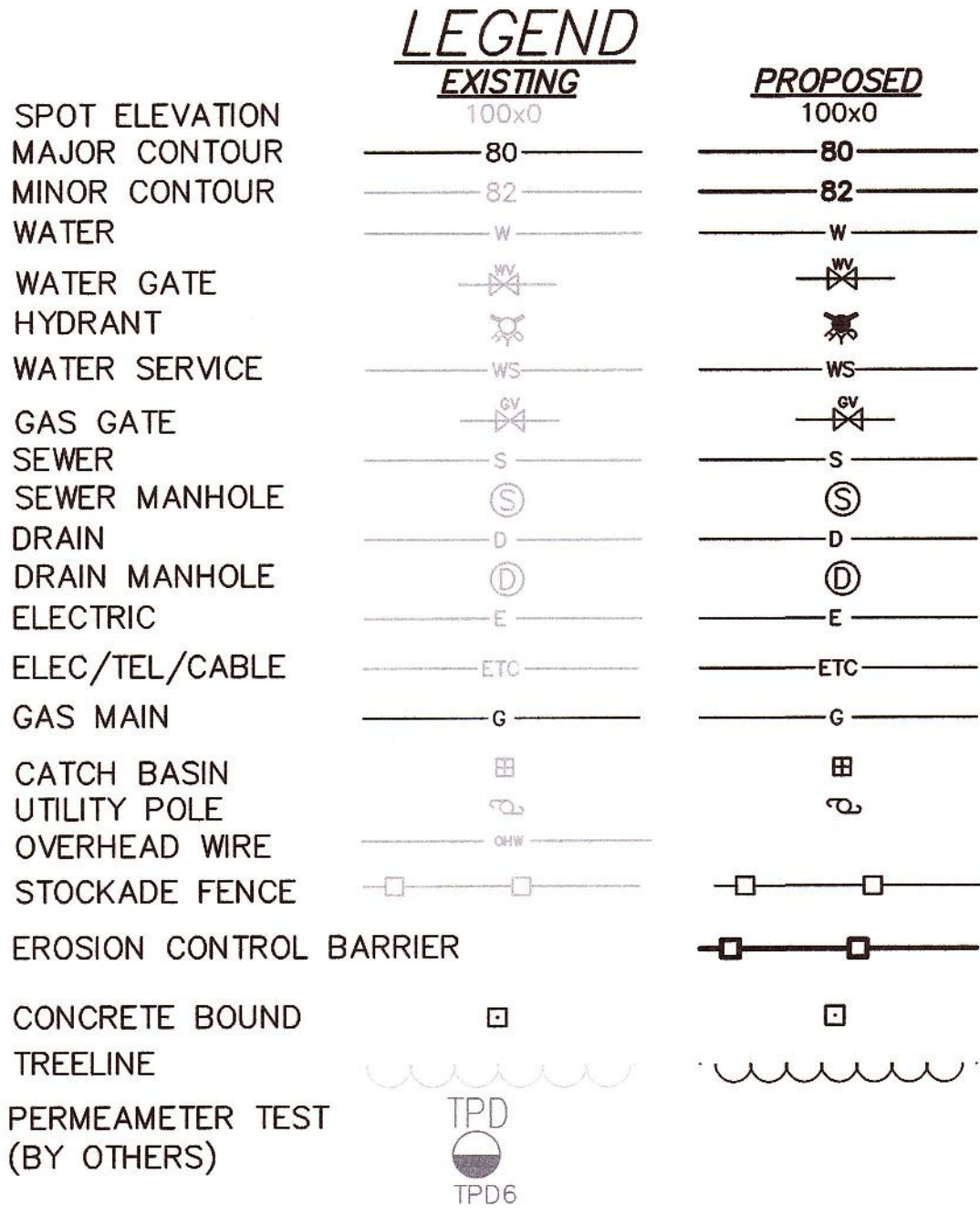
PART 8 – INSPECTION AND MAINTENANCE

BITUMINOUS CONCRETE

- A. INSPECT ALL CATCH BASINS (CB) AND MANHOLES AT LOCATIONS SHOWN ON SITE PLANS. LOOK FOR SETTLING OF PAVEMENT, REPAIR AS REQUIRED. LOOK AT LEVEL OF SAND, SILT IN SUMPS. HAVE SUMPS CLEANED IF OUTLET PIPE IS BLOCKED. VERIFY THAT ELBOW (OIL TRAP) ON PIPE OUTLET IS SECURELY IN PLACE. CLEAN ALL LEAVES, TRASH, AND PINE NEEDLES FROM CB GRATE.
- B. LOOK FOR SIGNS OF CRACKING & POTHOLES, REPAIR AS REQUIRED.

LAWN

- A. INSPECT AFTER EACH SIGNIFICANT RAINFALL (1/2" OR MORE) FOR FIRST 6 MONTHS AFTER CONSTRUCTION TO ENSURE SURFACE VEGETATION IS HEALTHY, DISCHARGE DEVICES ARE NOT BLOCKED AND BANKS ARE NOT ERODING. CHECK ALL COMPONENTS AFTER EACH MAJOR STORM (MORE THAN 2" RAINFALL IN 24 HOURS). CLEAN/REPAIR AS REQUIRED.



DRAINAGE TEST PITS (BY OTHERS)



7-1-21

PART 8 – CONTINUED

LANDSCAPING

- A. INSPECT FOR DISEASED/DYING TREES, SHRUBS, GROUND COVER, & GRASS; REPLACE AS REQUIRED.
- B. INSPECT MULCH BEDS. SUPPLEMENT AS REQUIRED TO PROVIDE THE SPECIFIED MINIMUM DEPTH (LOOSE MEASURE).
- RIP RAP (STONE) SLOPE PROTECTION
- A. INSPECT STONE SLOPE PROTECTION, CUT EMERGING YOUNG TREES GROWING IN STONES. INSPECT STONE AT PIPE OUTLETS. REMOVE DEBRIS. REPAIR AS REQUIRED.

PART 9 – POST CONSTRUCTION OPERATION AND MAINTENANCE SCHEDULE

- A. ONCE CONSTRUCTION IS COMPLETED, THE CONTRACTOR/OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE OF ROADWAYS AND UTILITY INFRASTRUCTURE UNTIL THE ROADWAY IS ACCEPTED, OR ONCE THE HOMEOWNERS ASSOCIATION (HOA) ASSUMES RESPONSIBILITY FOR MAINTENANCE. REFER TO THE LONG TERM STORMWATER OPERATION AND MAINTENANCE PLAN & POLLUTION PREVENTION PLAN PREPARED FOR THIS PROJECT FOR ADDITIONAL DETAILS.
- B. TRASH AND RECYCLING FROM HOMES SHALL BE BY PRIVATE TRASH REMOVAL COMPANY CONTRACTED BY THE HOMEOWNERS ASSOCIATION.
- C. OPERATION AND MAINTENANCE OF ON SITE SEPTIC SYSTEMS:
1. SEPTIC SYSTEMS ON LOTS 1–12 SHALL BE THE RESPONSIBILITY OF THE INDIVIDUAL HOME OWNERS.
- D. SNOW STORAGE/REMOVAL:
1. SNOW REMOVAL FROM THE ROADWAY AND BUS SHELTER PARKING SHALL BE AT THE EXPENSE OF THE HOME OWNER'S ASSOCIATION, SIMILAR TO LANDSCAPING AND OVERALL MAINTENANCE OF THE DEVELOPMENT.
 2. SNOW STORAGE AREAS SHALL BE UTILIZED AS DEPICTED ON THIS PLAN OR IN OTHER AREAS NOT WITHIN RESOURCE AREAS ON THE SITE.
 3. SIGNS SHALL BE INSTALLED ADJACENT TO THE WETLAND AREAS. SIGNS SHALL INDICATED RESOURCE AREA, NO SNOW DUMPING.

FOR REGISTRY USE ONLY

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.



7-1-21
DATE PROFESSIONAL LAND SURVEYOR

APPROVED SUBJECT TO TERMS AND CONDITIONS OF A COMPREHENSIVE PERMIT PER ZONING BOARD OF APPEALS DECISION AS AUTHORIZED BY CHAPTER 40B OF THE MASSACHUSETTS GENERAL LAWS, SECTION 20–23

DATE:

BOURNE ZONING BOARD

I CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE ZONING BOARD APPROVAL, AND THAT NO APPEAL HAS BEEN FILED AT THIS OFFICE.

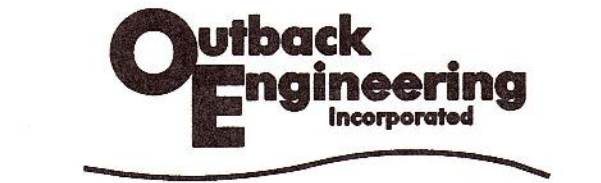
REVISIONS

NO.	DATE	DESCRIPTION

OWNER
230 SANDWICH ROAD REALTY TRUST
14 BOSUNS LANE
BOURNE, MA
APPLICANT
CHASE DEVELOPERS INC.
14 BOSUNS LANE
BOURNE, MA

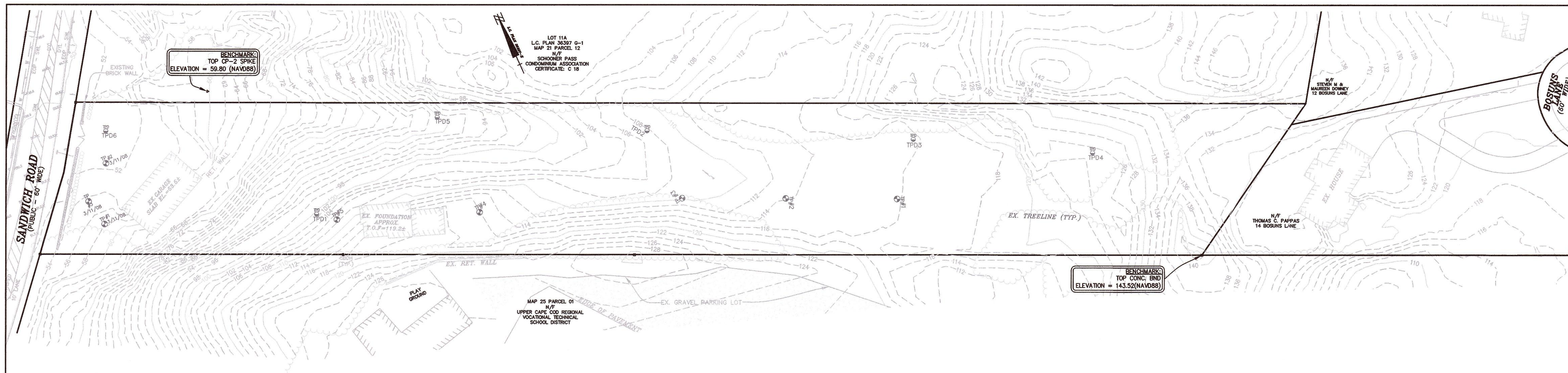
LEGEND & GENERAL NOTES

"CHASE ESTATES"
SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS



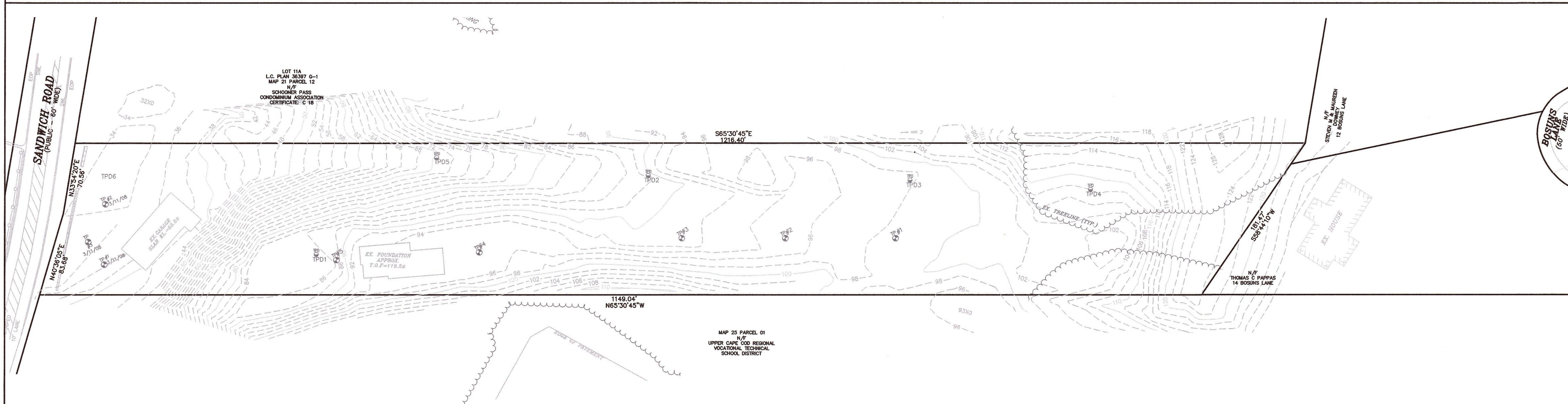
165 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508)–946–9231
FAX: (508)–947–8873
www.outback-eng.com

DATE: MAY 18, 2021
DRAWN BY: KAD CHECKED BY: JAP
SCALE: 1"=40' SHEET 2 OF 11
0' 40' 80' 120'
OE-3294A



- NOTES:**
- EXISTING CONDITIONS TOPOGRAPHY SHOWN BASED ON A SURVEY PERFORMED BY OUTBACK ENGINEERING INC. IN JANUARY 2021.
 - ELEVATIONS SHOWN ON NAVD88 DATUM.

OUTBACK ENGINEERING INC. SURVEY
(JANUARY 2021 SURVEY)



- NOTES:**
- EXISTING CONDITIONS TOPOGRAPHY SHOWN BASED ON PLANS PREPARED BY HOLMES AND McGRATH, INC. ENTITLED "SITE PLAN PREPARED FOR CHASE DEVELOPERS, INC. IN BOURNE, MA DATED JULY 30, 2007 AND LAST REVISED JANUARY 19, 2010.
 - ELEVATIONS SHOWN BASED ON AN ASSUMED DATUM.

HOLMES AND McGRATH, INC SURVEY
(JULY 2007 SURVEY)

FOR REGISTRY USE ONLY

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.



DATE 7-1-21 PROFESSIONAL LAND SURVEYOR

APPROVED SUBJECT TO TERMS AND CONDITIONS OF A COMPREHENSIVE PERMIT PER ZONING BOARD OF APPEALS DECISION AS AUTHORIZED BY CHAPTER 40B OF THE MASSACHUSETTS GENERAL LAWS, SECTION 20-23

DATE: _____

BOURNE ZONING BOARD

I CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE ZONING BOARD APPROVAL, AND THAT NO APPEAL HAS BEEN FILED AT THIS OFFICE.

TOWN CLERK - TOWN OF BOURNE

REVISIONS

NO.	DATE	DESCRIPTION

OWNER

230 SANDWICH ROAD REALTY TRUST
14 BOSUNS LANE
BOURNE, MA

APPLICANT

CHASE DEVELOPERS INC.
14 BOSUNS LANE
BOURNE, MA

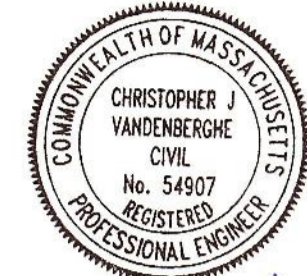
**EXISTING CONDITIONS
PLAN
"CHASE ESTATES"
SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS**



165 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508)-946-9231
www.outback-eng.com

DATE: MAY 18, 2021
DRAWN BY: KAD CHECKED BY: JAP
SCALE: 1"=50' SHEET 3 OF 11
0' 50' 100' 150'

0E-3294A



7-1-21



7-1-21

DATE PROFESSIONAL LAND SURVEYOR

APPROVED SUBJECT TO TERMS AND CONDITIONS OF A COMPREHENSIVE PERMIT PER ZONING BOARD OF APPEALS DECISION AS AUTHORIZED BY CHAPTER 40B OF THE MASSACHUSETTS GENERAL LAWS, SECTION 20-23

DATE:

BOURNE ZONING BOARD

I CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE ZONING BOARD APPROVAL, AND THAT NO APPEAL HAS BEEN FILED AT THIS OFFICE.

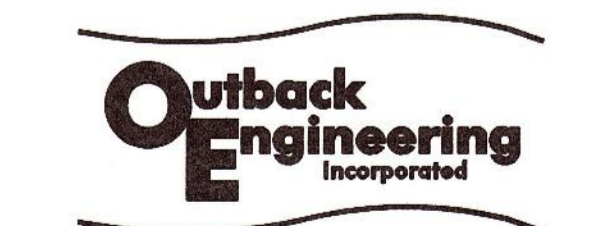
TOWN CLERK - TOWN OF BOURNE

REVISIONS

NO. DATE DESCRIPTION

OWNER
230 SANDWICH ROAD REALTY TRUST
14 BOSUNS LANE
BOURNE, MA
APPLICANT
CHASE DEVELOPERS INC.
14 BOSUNS LANE
BOURNE, MA

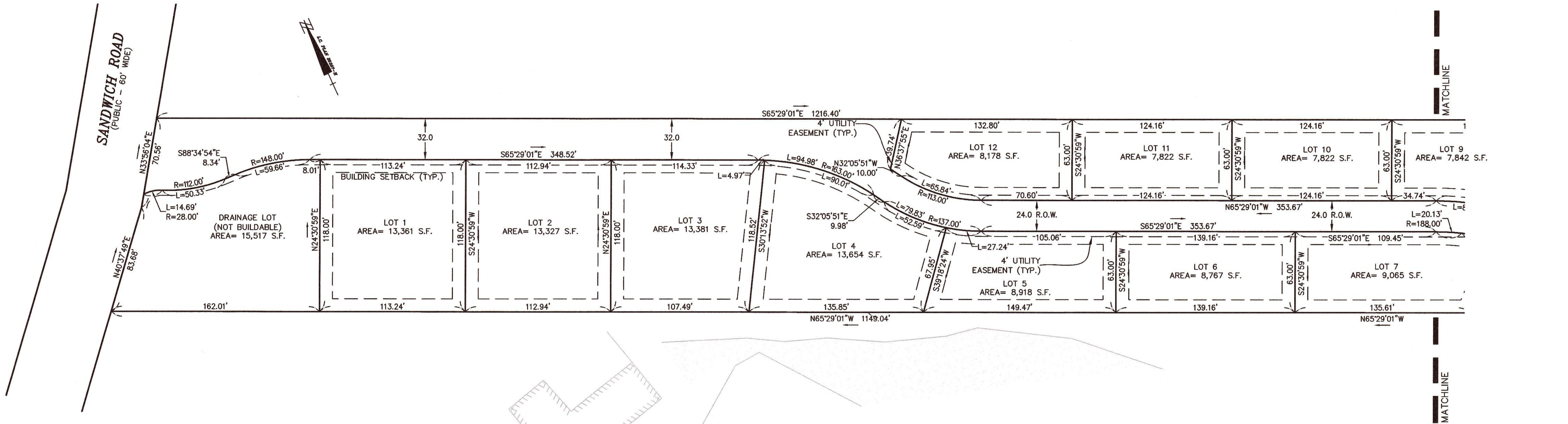
LOTING SHEET
"CHASE ESTATES"
SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS



165 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508)-946-9231
FAX: (508)-947-8873
www.outback-eng.com

DATE: MAY 18, 2021
DRAWN BY: CJV CHECKED BY: JAP
SCALE: 1"=40' SHEET 4 OF 11
0' 40' 80' 120'

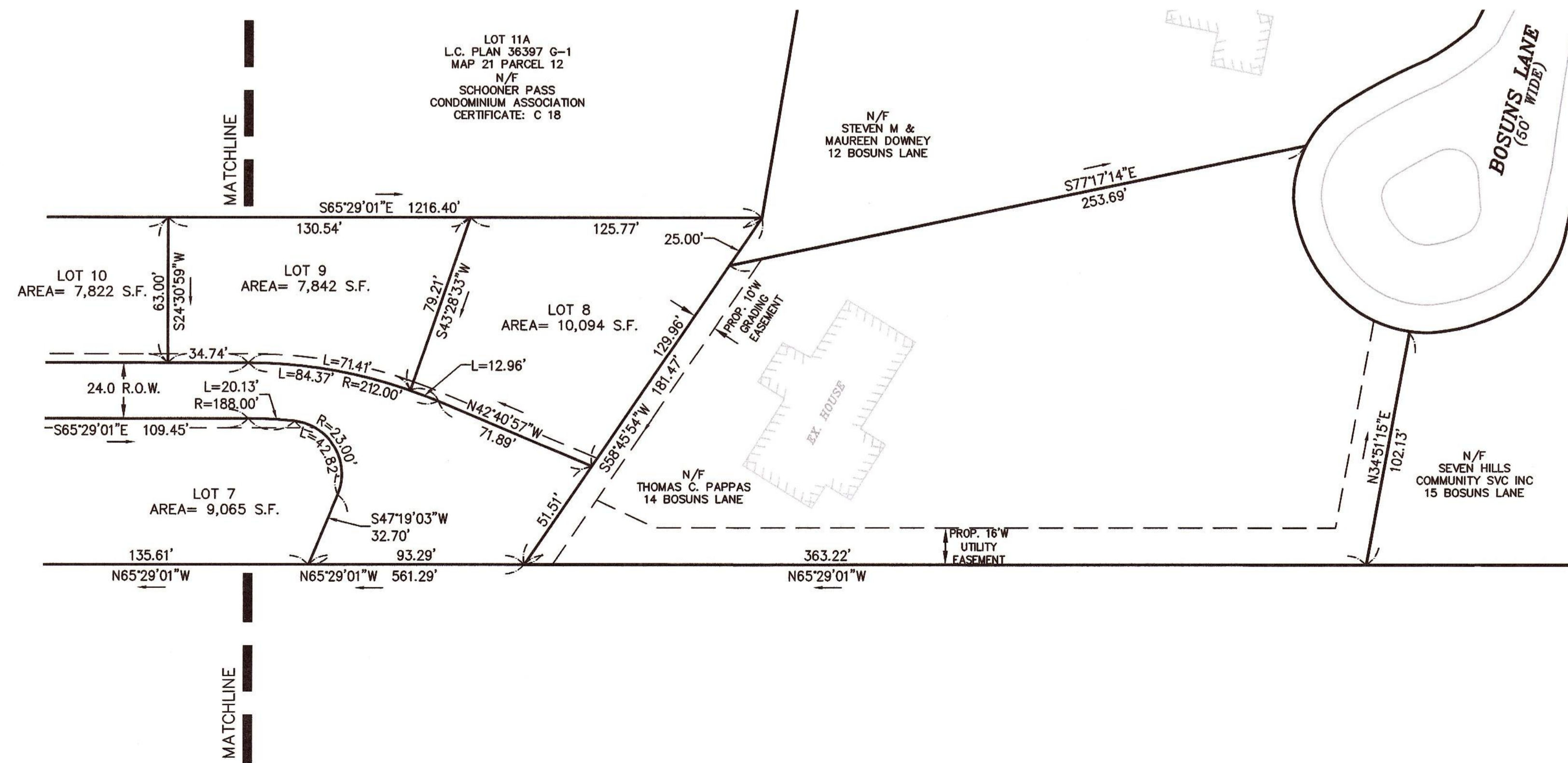
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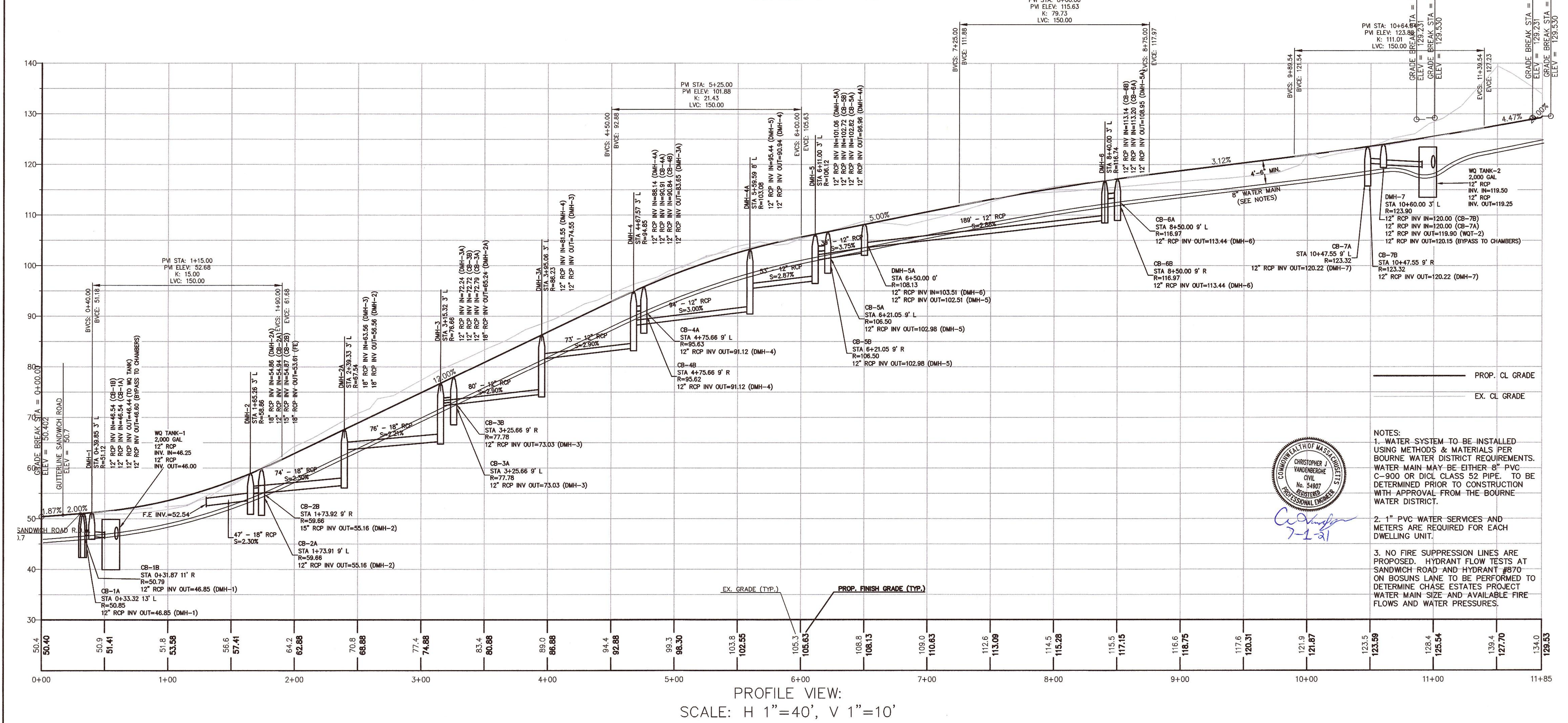
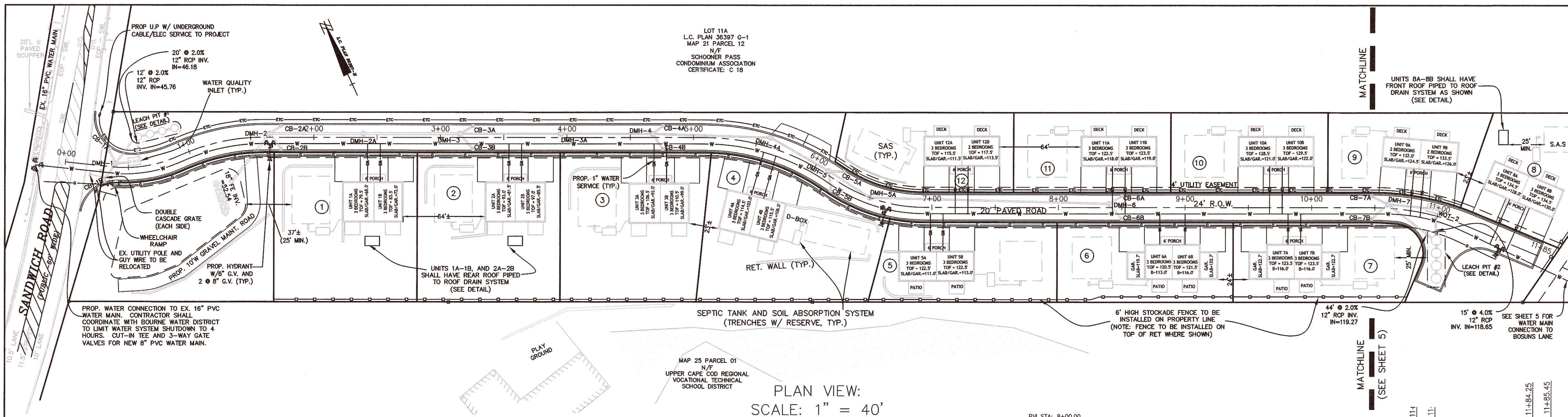
ZONING ANALYSIS TABLES - DIMENSIONAL REQUIREMENTS
RESIDENTIAL (R-40)

ZONING CRITERIA	LOT 1	LOT 2	LOT 3	LOT 4	LOT 5	LOT 6	LOT 7	LOT 8	LOT 9	LOT 10	LOT 11	LOT 12
LOT AREA REQUIRED	40,000 S.F.	40,000 S.F.	40,000 S.F.	40,000 S.F.	40,000 S.F.	40,000 S.F.	40,000 S.F.	40,000 S.F.	40,000 S.F.	40,000 S.F.	40,000 S.F.	40,000 S.F.
LOT AREA PROVIDED	13,361 S.F.	13,327 S.F.	13,381 S.F.	13,654 S.F.	8,918 S.F.	8,767 S.F.	9,065 S.F.	10,094 S.F.	7,842 S.F.	7,822 S.F.	7,822 S.F.	8,178 S.F.
LOT FRONTAGE REQUIRED	125 FT	125 FT	125 FT	125 FT	125 FT	125 FT	125 FT	125 FT	125 FT	125 FT	125 FT	125 FT
LOT FRONTAGE PROVIDED	113.24 FT	112.94 FT	119.29 FT	152.59 FT	132.30 FT	139.16 FT	205.10 FT	84.85 FT	106.15 FT	124.16 FT	124.16 FT	146.47 FT
MIN. FRONT SETBACK*	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'
MIN. SIDE SETBACK*	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'
MIN. REAR SETBACK*	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'
MAX. BLDG HEIGHT**	33'	33'	28'	26'	26'	25'	25'	25'	25'	27'	29'	25'
MAX. LOT COVERAGE**	22%	22%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
MAX. GFA: LOT AREA**	21%	21%	24%	24%	25%	25%	25%	25%	25%	24%	23%	25%
SHAPE FACTOR REQUIRED***	22	22	22	22	22	22	22	22	22	22	22	22
SHAPE FACTOR PROVIDED***	16	16	16	17	19	19	18	17	18	18	18	18

*REQUIRED MIN. FRONT YARD, SIDE YARD, AND REAR YARD SETBACK PER BOURNE ZONING BY LAW SECTION 2500 IS 30', 15' AND 15' RESPECTIVELY
**PER BOURNE ZONING BY-LAW SECTION 2456
***NO LOT SHALL BE CREATED SO AS TO BE SO IRREGULARLY SHAPED OR EXTENDED THAT THE SQUARE OF THE LOT PERIMETER EXCEEDS THIRTY (30) TIMES THE GROSS LOT AREA FOR ANY LOT IN EXCESS OF 80,000 SQUARE FEET, OR TWENTY-TWO (22) TIMES THE GROSS LOT AREA FOR ANY OTHER LOT. LOT SHAPE. NO LOT SHALL BE CREATED SO AS TO BE SO IRREGULARLY SHAPED OR EXTENDED THAT THE SQUARE OF THE LOT PERIMETER EXCEEDS THIRTY (30) TIMES THE GROSS LOT AREA FOR ANY LOT IN EXCESS OF 80,000 SQUARE FEET, OR TWENTY-TWO (22) TIMES THE GROSS LOT AREA FOR ANY OTHER LOT.



OE-3294A



FOR REGISTRY USE ONLY
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7-1-21
DATE PROFESSIONAL LAND SURVEYOR

APPROVED SUBJECT TO TERMS AND CONDITIONS OF A COMPREHENSIVE PERMIT PER ZONING BOARD OF APPEALS DECISION AS AUTHORIZED BY CHAPTER 40B OF THE MASSACHUSETTS GENERAL LAWS, SECTION 20-23

DATE: _____
BOURNE ZONING BOARD

I CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE ZONING BOARD APPROVAL, AND THAT NO APPEAL HAS BEEN FILED AT THIS OFFICE.

TOWN CLERK - TOWN OF BOURNE

REVISIONS		
NO.	DATE	DESCRIPTION

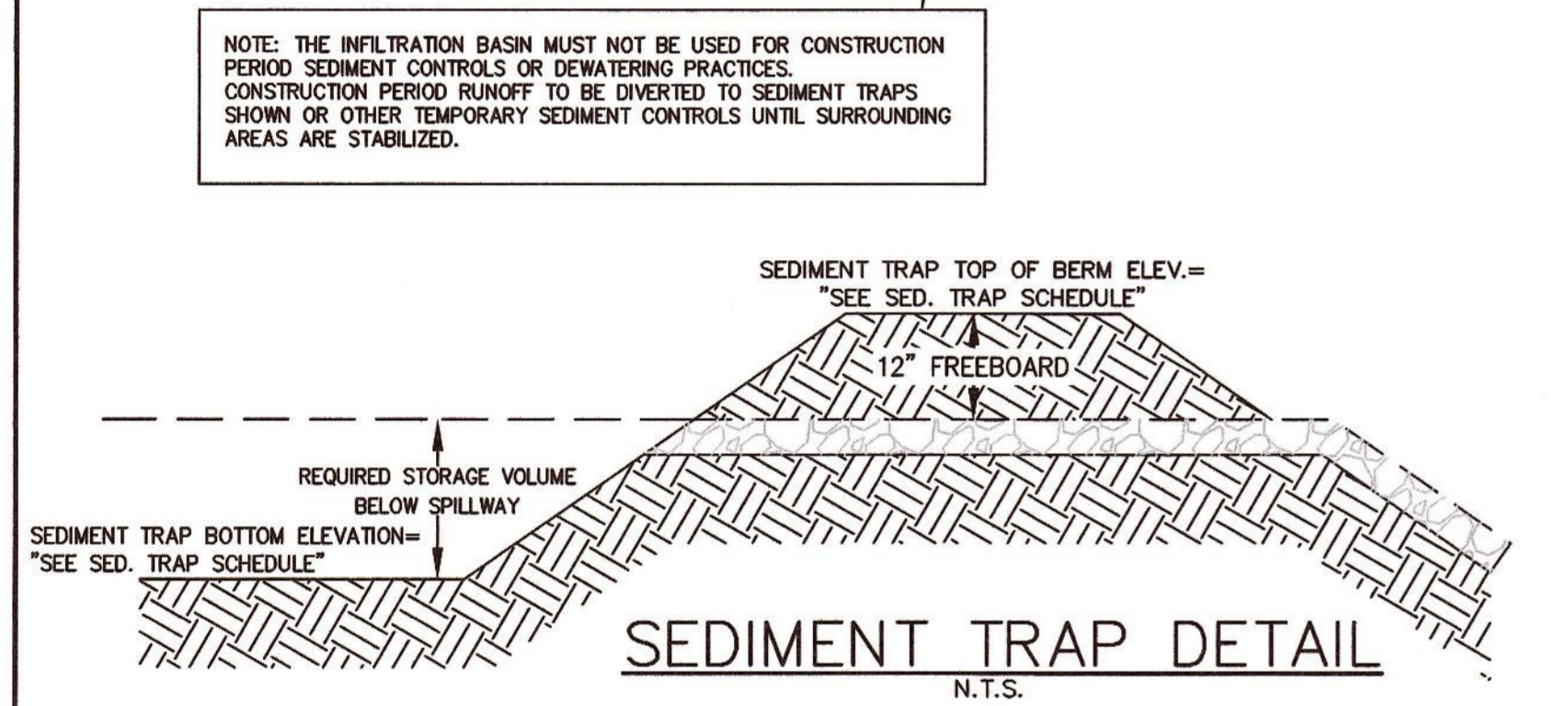
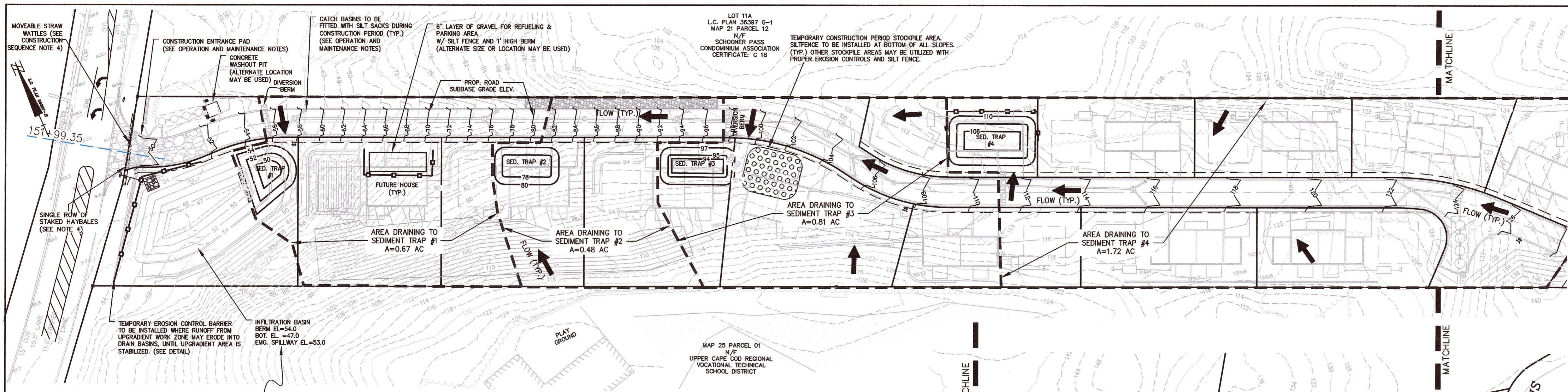
OWNER
230 SANDWICH ROAD REALTY TRUST
14 BOSUNS LANE
BOURNE, MA
APPLICANT
CHASE DEVELOPERS INC.
14 BOSUNS LANE
BOURNE, MA

UTILITY PLAN & ROAD PROFILE
"CHASE ESTATES" SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS

Outback Engineering
165 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508)-946-9231
FAX: (508)-947-8873
www.outback-eng.com

DATE: MAY 18, 2021
DRAWN BY: KAD CHECKED BY: JAP
SCALE: 1"=40' SHEET 6 OF 11
0' 40' 80' 120'
OE-3294A

OE-3294A

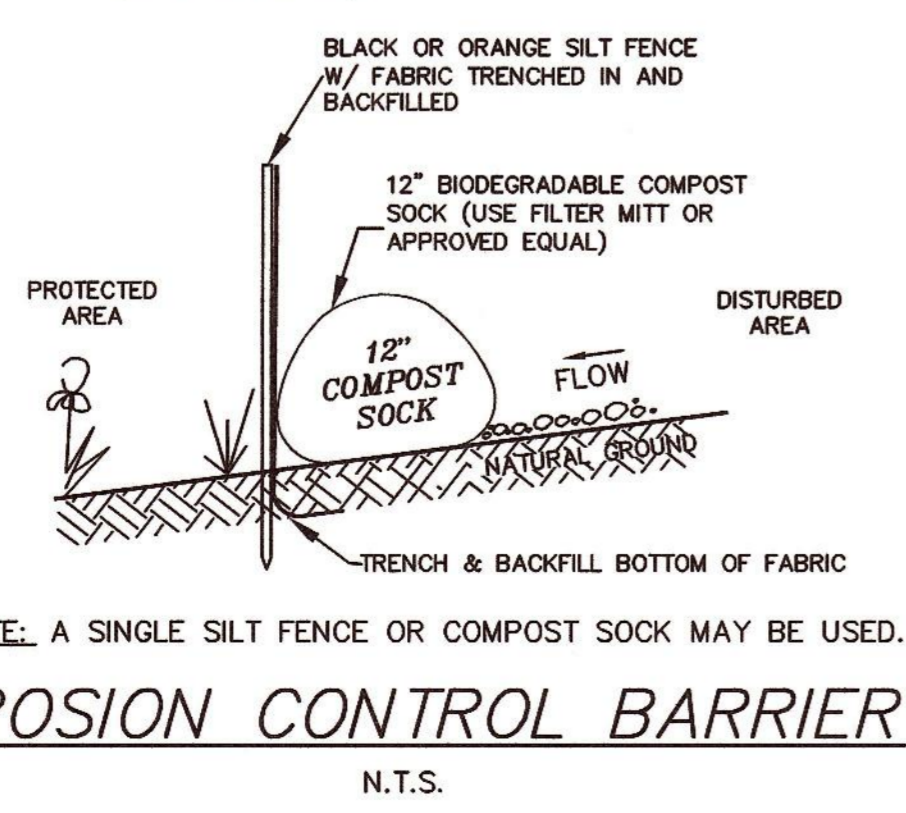
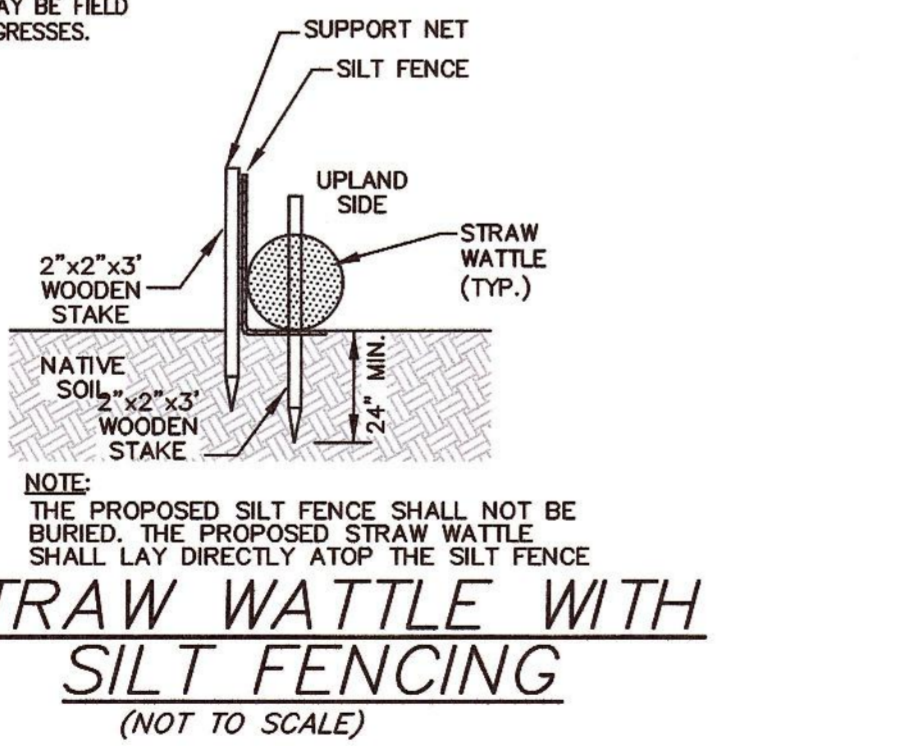
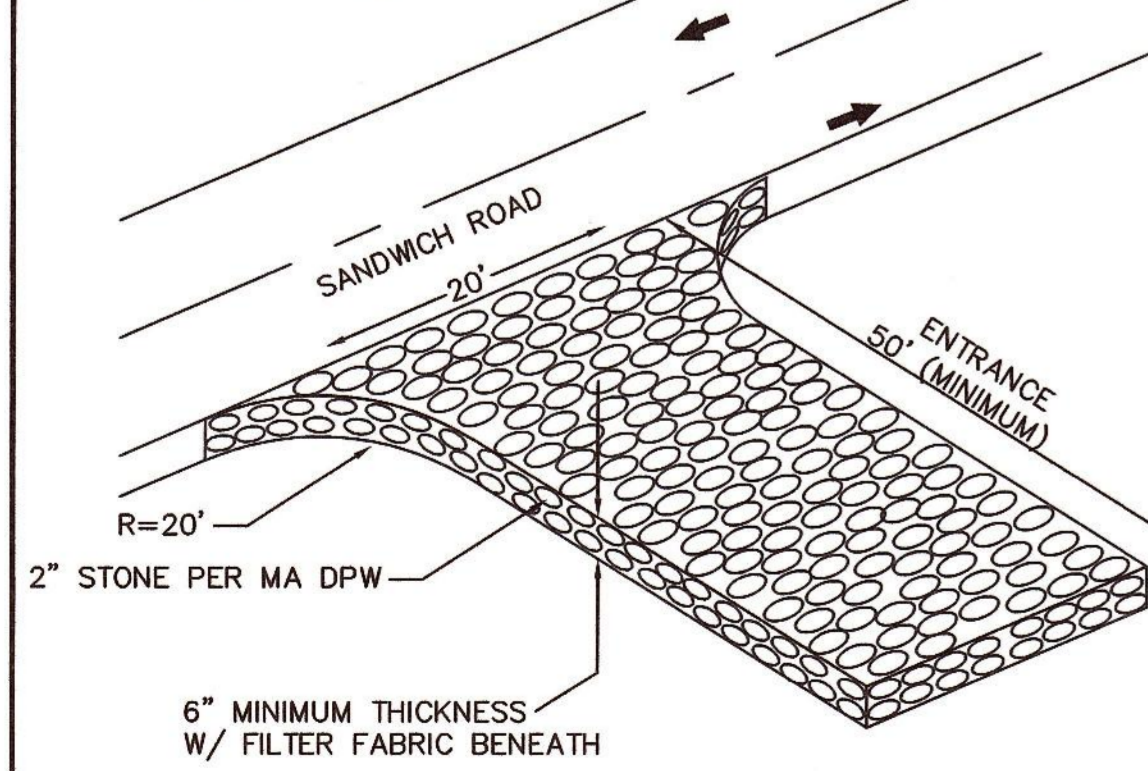
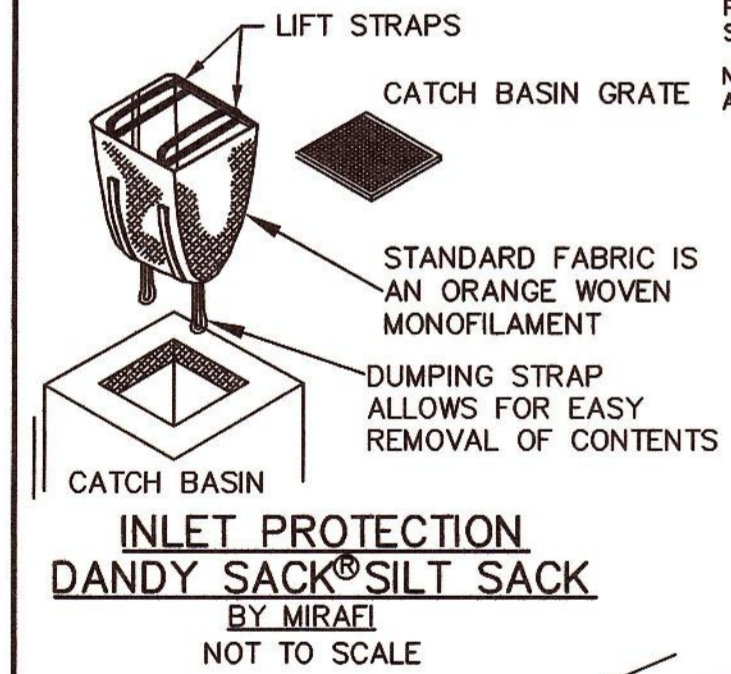


SEDIMENT TRAP SCHEDULE

TRAP #	DRAINED AREA TO TRAP (AC.)	SED. TRAP REQ. VOLUME (FT ³) ^a	BOT. EL.	BOT. AREA (S.F.)	SPILLWAY EL.	SPILLWAY AREA (S.F.)	TRAP VOLUME PROVIDED (FT ³) ^a
1	0.67	2427	50	267	54	1600	3734
2	0.48	1714	78	668	80	1433	2100
3	0.81	2907	94	464	97	1671	3203
4	1.72	6192	106	651	110	2585	6472

^aSEDIMENT TRAPS MUST BE SIZED TO PROVIDE 3,600 FT³ OF STORAGE PER ACRE DRAINED PER THE MASSACHUSETTS EROSION AND SEDIMENTATION CONTROL GUIDELINES.

NOTE: TRAP LOCATIONS AND ELEVATIONS SHOWN MAY BE FIELD ADJUSTED BY CONTRACTOR AS CONSTRUCTION PROGRESSES.



EROSION & SEDIMENT CONTROL NOTES (SEE SHEET 2 ALSO)

1. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF EROSION CONTROL MEASURES SHOWN ON THIS PLAN AND ANY ADDITIONAL MEASURES AS MAY BE NECESSARY OR REQUIRED THROUGHOUT CONSTRUCTION, UNTIL FINAL SURFACE FINISHES HAVE BEEN ESTABLISHED AND ACCEPTED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTROL EROSION AND SEDIMENTATION. IT IS INTENDED THAT THE IMPLEMENTATION OF THE FOLLOWING MEASURES WILL MEET THIS GOAL. WHEN IT IS CLEAR TO THE DESIGNER THAT EROSION AND SEDIMENTATION HAVE BEEN ADEQUATELY CONTROLLED WITHOUT THE IMPLEMENTATION OF EVERY MEASURE, ADDITIONAL MEASURES NEED NOT BE IMPLEMENTED. ALTERNATIVELY, IF ALL OF THE FOLLOWING MEASURES HAVE BEEN IMPLEMENTED AND THE CONTROL OF EROSION AND SEDIMENTATION IS INADEQUATE, THE CONTRACTOR MUST EMPLOY SUFFICIENT SUPPLEMENTAL MEASURES BEYOND THE SCOPE OF THIS PLAN.
2. ALTHOUGH NOT SHOWN HEREON, CONTRACTOR MAY UTILIZE ADDITIONAL EROSION CONTROL MEASURES SUCH AS, BUT NOT LIMITED TO SEDIMENT TRAPS AND EROSION CONTROL BLANKETS.
3. EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE STANDARDS OF THE MOST CURRENT VERSION OF THE "MASSACHUSETTS EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS," THE STANDARDS OF THE TOWN OF BOURNE, AND AS SHOWN ON THESE PLANS, WHICHEVER IS THE MOST STRINGENT.
4. EROSION CONTROLS MUST BE INSTALLED PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITIES. LIMITED CLEARING (BUT NO GRUBBING) AND SITE DISTURBANCE IS ALLOWED IN ORDER TO FACILITATE INSTALLATION OF EROSION CONTROLS.
5. WHERE SEVERAL TYPES OF EROSION CONTROL DEVICES ARE CALLED OUT ON THE PLAN, THE CONTRACTOR MAY SELECT FROM THOSE DETAILED FOR INDIVIDUAL AREAS THAT MAY BEST FIT HIS CONSTRUCTION OPERATIONS WHILE STILL MAINTAINING PROTECTIONS THAT MEET ALL CONTRACT AND REGULATORY REQUIREMENTS.
6. ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES, WHETHER INSIDE THE CONTRACT LIMIT LINE OR BEYOND, NOT COVERED BY BUILDINGS OR PAVEMENTS, SHALL BE TOP SOILED AND SEEDED AS LAWN.
7. THE CONTRACTOR SHALL MONITOR ALL NEW AND MODIFIED DRAINAGE STRUCTURE SUMPS WITHIN THE CONTRACT LIMITS AND SHALL PUMP SUMPS CLEAN OF SILT AND DEBRIS WHEN MORE THAN 1/4 FULL AND/OR IMMEDIATELY PRIOR TO FINAL ACCEPTANCE.
8. AREAS THAT ARE NOT THE LOCATION OF ACTIVE CONSTRUCTION WHICH ARE TO BE LEFT BARE FOR OVER ONE MONTH BEFORE FINISHED GRADING AND SEEDING IS ACHIEVED, SHALL BE MULCHED OR RECEIVE TEMPORARY STABILIZATION SUCH AS JUTE NETTING OR SHALL RECEIVE A TEMPORARY SEEDING OF PERENNIAL RYEGRASS APPLIED AT A RATE OF 2 LBS./1,000 SQ. FT. LIMESTONE (EQUIVALENT TO BE 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) SHALL BE APPLIED AS SEEDBED PREPARATION AT A RATE OF 90 LBS./1,000 SQ. FT. PLANTING SEASONS SHALL BE APRIL 1 TO JUNE 1 AND AUGUST 1 TO OCTOBER 1. AREAS TO BE LEFT BARE BEFORE FINISH GRADING AND SEEDING OUTSIDE OF PLANTING SEASONS SHALL RECEIVE AN AIR-DRIED WOOD CHIP MULCH, FREE OF COARSE MATTER.
9. STABILIZATION OF SLOPES IN CUT AREAS (USING MULCH OR GRASS) AND THE INSTALLATION OF CONTROL LINE (STRAWBALE CHECK OR FILTER FABRIC) AT THE TOE OF SLOPE SHALL BE INITIATED WITHIN FOURTEEN (14) DAYS OF COMPLETION.
10. SEDIMENT REMOVED FROM CONTROL STRUCTURES WILL BE DISPOSED IN A MANNER WHICH IS CONSISTENT WITH THE INTENT OF THE PLAN. ALL LINEAR EROSION CONTROLS RETAINING SEDIMENT OVER 1/2 THEIR HEIGHT SHALL HAVE THE SEDIMENT REMOVED AND ALL DAMAGED EROSION CONTROLS SHALL BE REPAIRED OR REPLACED.
11. THE CONTRACTOR WILL BE ASSIGNED THE RESPONSIBILITY FOR IMPLEMENTING THIS EROSION AND SEDIMENT CONTROL PLAN. THIS RESPONSIBILITY INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN.
12. STOCKPILES OF SOIL SHALL BE SURROUNDED BY A SEDIMENT BARRIER. SOIL STOCKPILES TO BE LEFT BARE FOR MORE THAN FOURTEEN (14) DAYS SHALL BE STABILIZED WITH TEMPORARY VEGETATION OR MULCH. IF SOIL STOCKPILES ARE TO REMAIN FOR MORE THAN SIXTY (60) DAYS, FILTER FABRIC SHALL BE USED IN PLACE OF STRAWBALES. SIDE SLOPES SHALL NOT EXCEED 2:1.
13. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST AND WIND EROSION THROUGHOUT THE LIFE OF THEIR CONTRACT. DUST CONTROL SHALL INCLUDE, BUT IS NOT LIMITED TO SPRINKLING OF WATER ON EXPOSED SOILS AND HAUL ROADS. CONTRACTOR SHALL CONTROL DUST TO PREVENT A HAZARD TO TRAFFIC.
14. IF FINAL GRADING IS TO BE DELAYED FOR MORE THAN FOURTEEN (14) DAYS AFTER LAND DISTURBANCES CEASE, TEMPORARY VEGETATION OR MULCH SHALL BE USED TO STABILIZE SOILS.

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7-1-21
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APPROVED SUBJECT TO TERMS AND CONDITIONS OF A COMPREHENSIVE PERMIT PER ZONING BOARD OF APPEALS DECISION AS AUTHORIZED BY CHAPTER 40B OF THE MASSACHUSETTS GENERAL LAWS, SECTION 20-23

DATE: _____

BOURNE ZONING BOARD

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TOWN CLERK - TOWN OF BOURNE

REVISIONS		
NO.	DATE	DESCRIPTION

OWNER
230 SANDWICH ROAD REALTY TRUST
14 BOSUNS LANE
BOURNE, MA

APPLICANT
CHASE DEVELOPERS INC.
14 BOSUNS LANE
BOURNE, MA

SEDIMENT & EROSION CONTROL PLAN
"CHASE ESTATES"
SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS



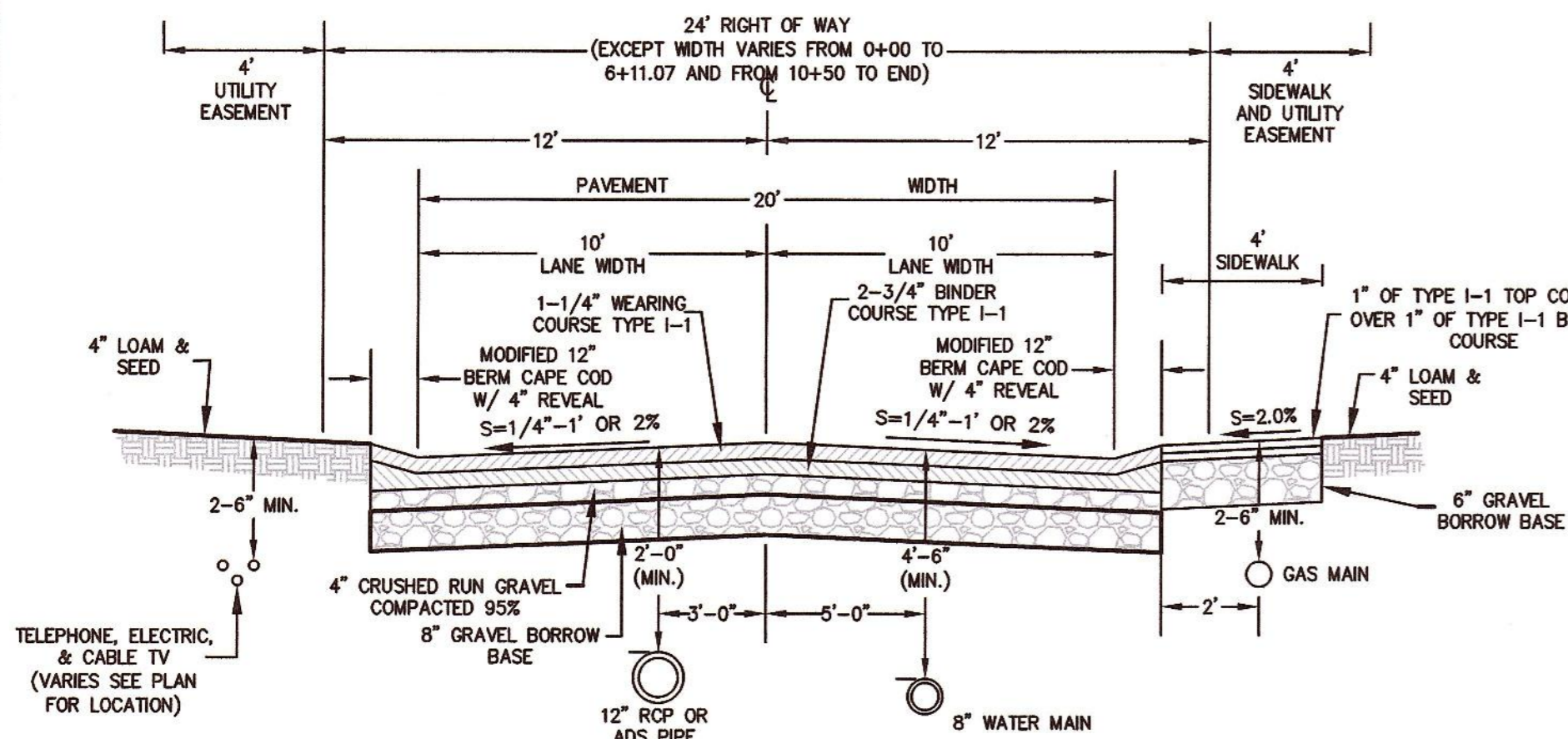
165 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508)-946-9231
FAX: (508)-947-8873
www.outback-eng.com

DATE: MAY 18, 2021

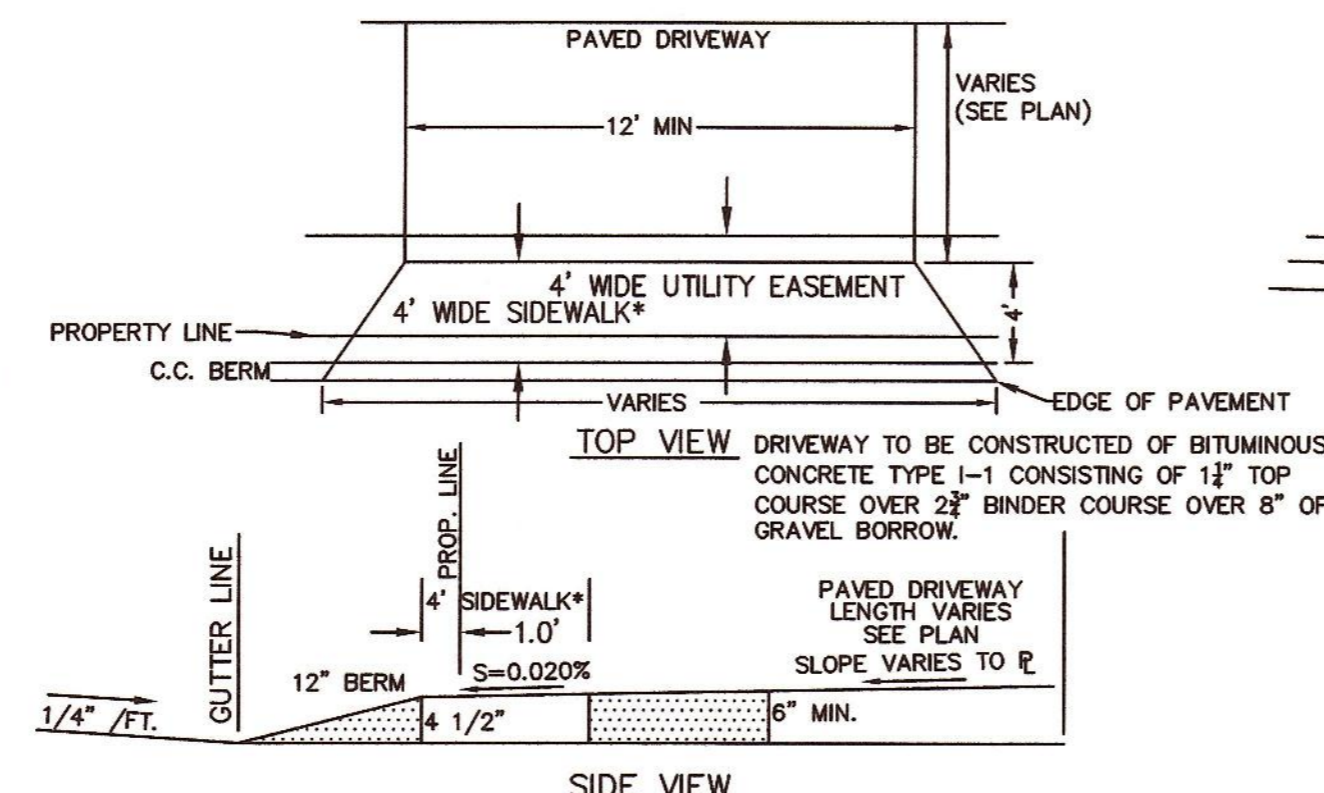
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SCALE: 1"=40' SHEET 8 OF 11

0' 40' 80' 120'

OE-3294A

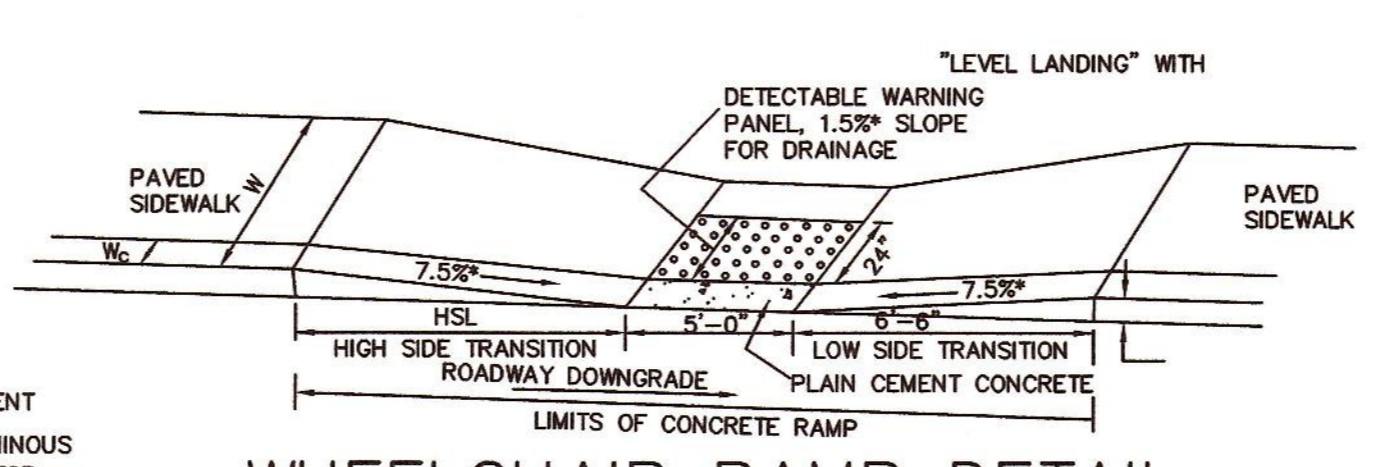


TYPICAL ROADWAY CROSS SECTION
NOT TO SCALE



TYPICAL DRIVEWAY RAMP
NOT TO SCALE

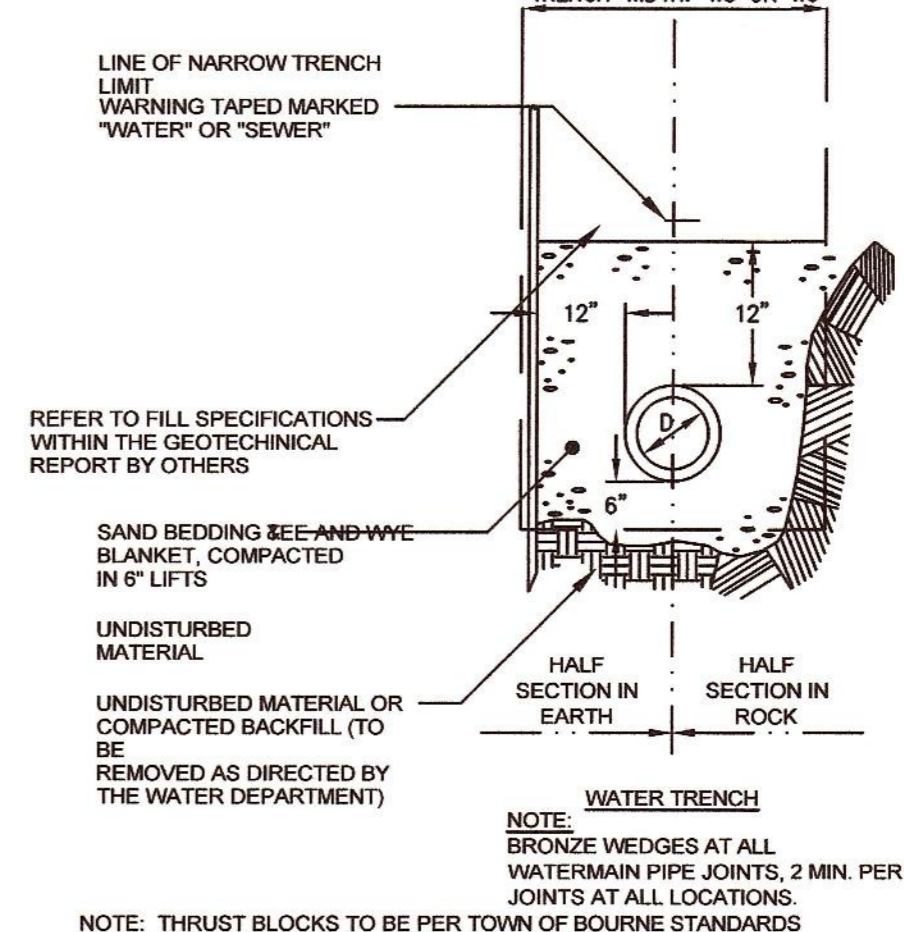
* WHERE APPLICABLE. SEE PLAN FOR SIDEWALK LOCATION



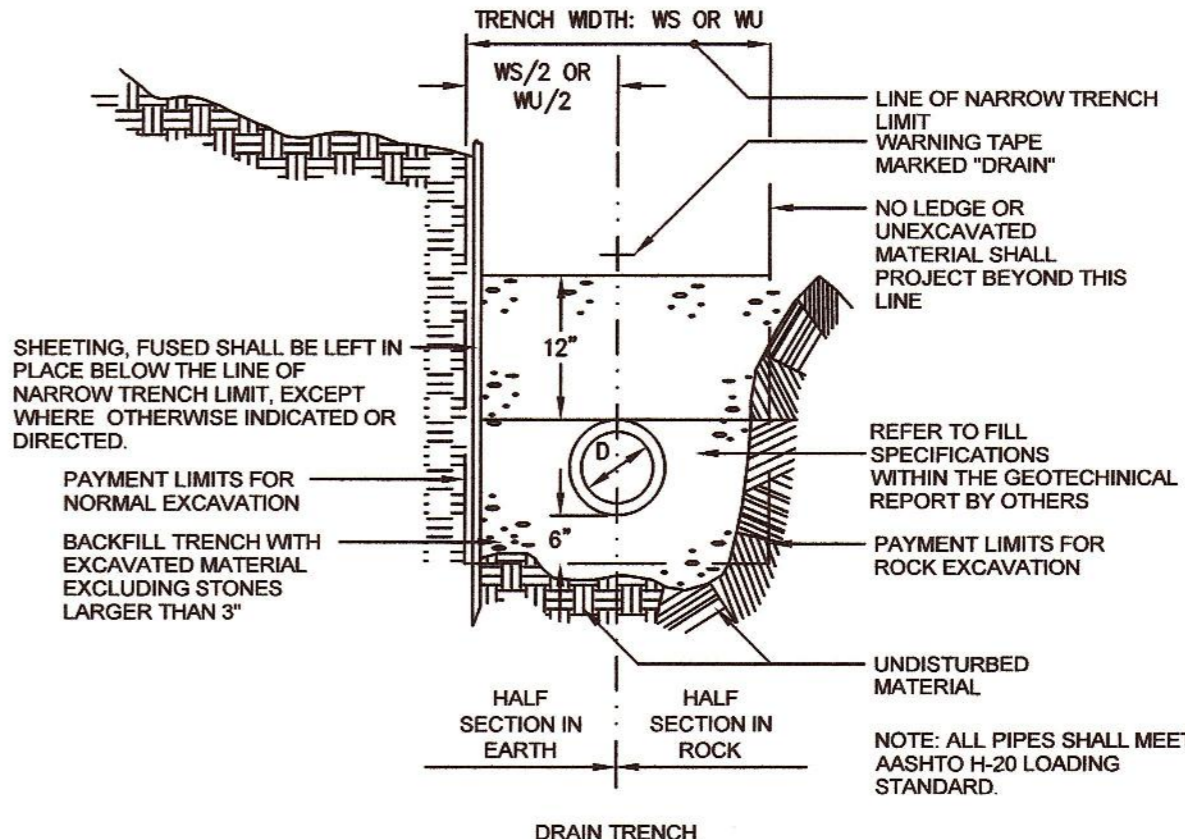
WHEELCHAIR RAMP DETAIL
NOT TO SCALE

ROADWAY PROFILE GRADE	PERCENT	TRANSITION LENGTH (FOOT)	TRANSITION LENGTH (METER)
0	0.00	6'-6"	2.0
1	0.01	7'-8"	2.4
2	0.02	9'-0"	2.7
3	0.03	11'-0"	3.4
4	0.04	14'-0"	4.3
>4	>0.04	15'-0" (MAX.)	4.6

LEGEND:
HSL=HIGH SIDE TRANSITION LENGTH (SEE M/E 107.9.0)
W=SIDEWALK LENGTH
W=CURB WIDTH
TOLERANCE FOR CONSTRUCTION $\pm 0.5\%$
USABLE SIDEWALK WIDTH PER AAB=W-W
USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0"
SEE M/E 107.6.5R FOR DETAILS OF DETECTABLE WARNING PANEL

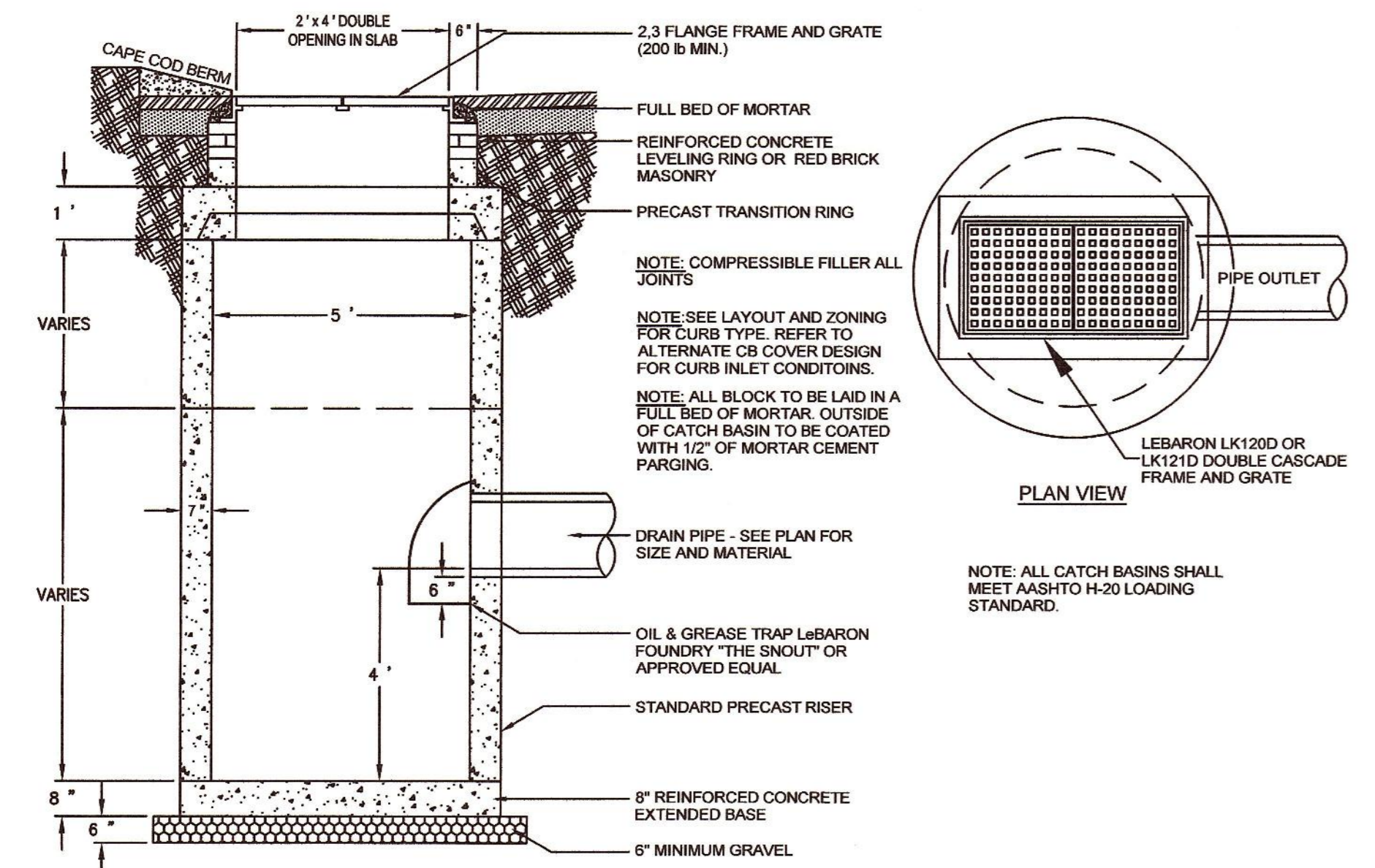


WATER TRENCH
NOT TO SCALE



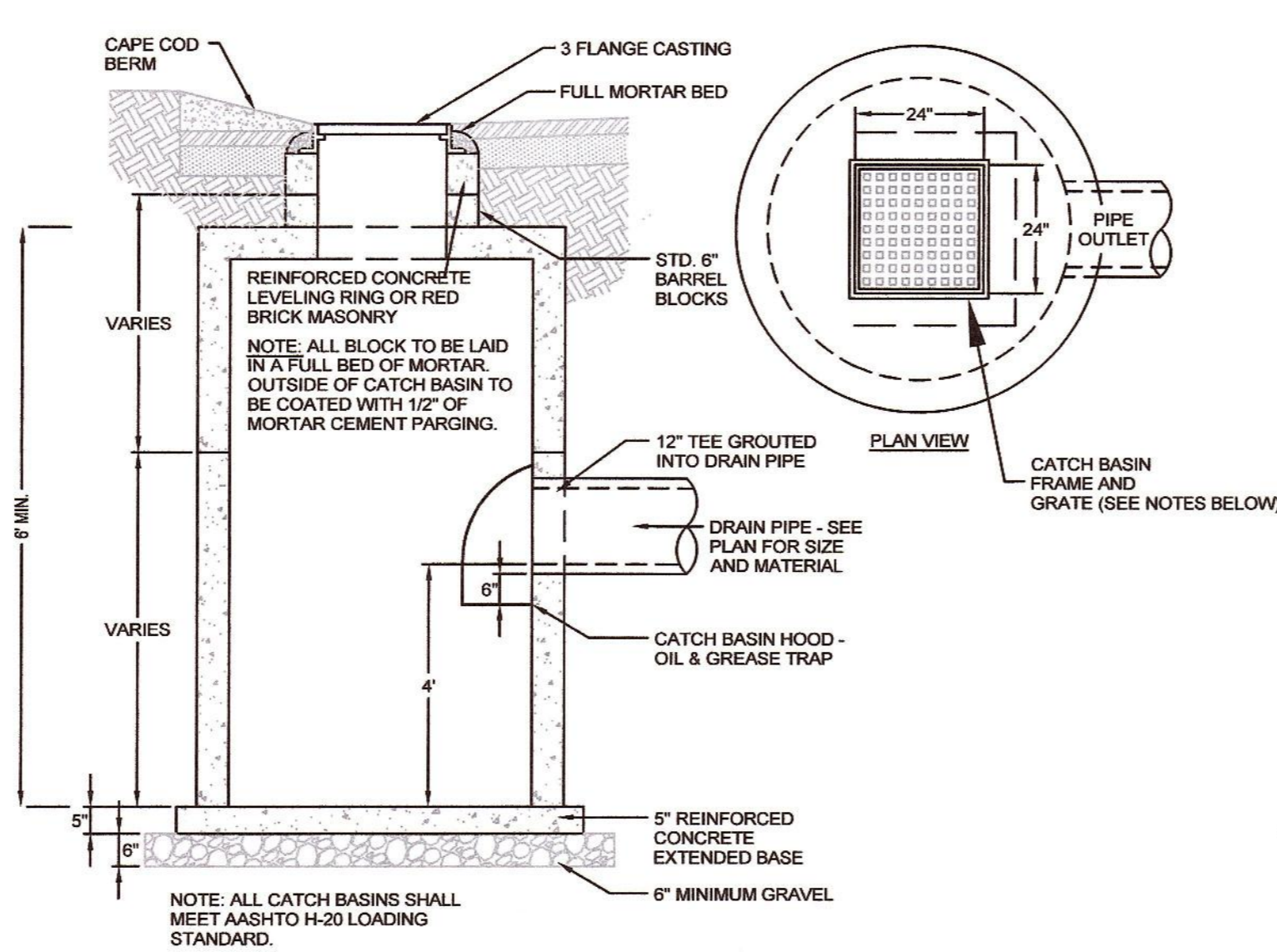
DRAINAGE TRENCH
NOT TO SCALE

DIAM. OF PIPE	TRENCH WIDTH WS OR WU	
	WU UNSHEEDED	WS SHEEDED
12" AND SMALLER	3'-0"	4'-2"
15" AND LARGER	O.D. +20"	O.D. +36"



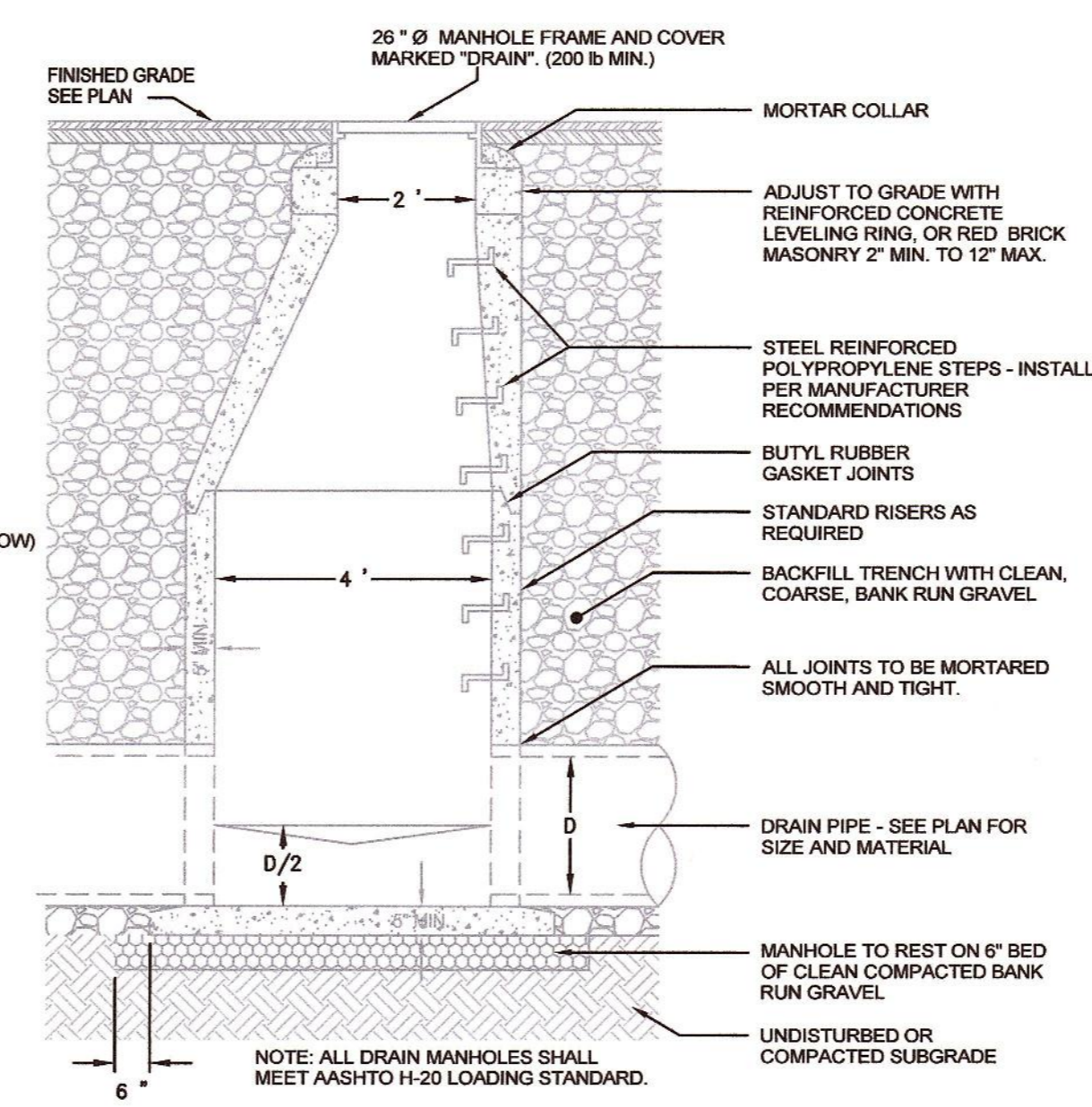
5' DIAMETER DOUBLE GRATE CATCH BASIN
NOT TO SCALE

NOTE: CB'S 1A AND 1B SHALL HAVE DOUBLE CASCADE GRATES



SINGLE GRATE CATCH BASIN
NOT TO SCALE

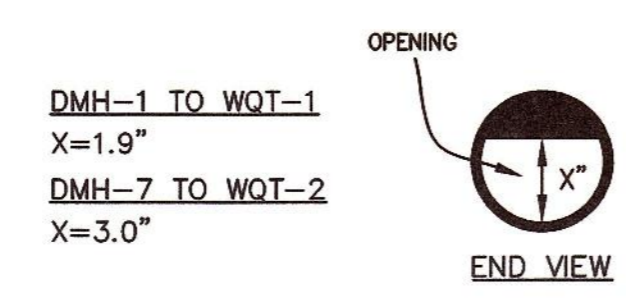
NOTES:
1. CASCADE GRATE (LEBARON LK120D OR LK121D) REQUIRED WHEN ROAD GRADES EXCEED 6%.
2. CB'S 2A, 2B, 3A, 3B, 4A AND 4B SHALL HAVE CASCADE GRATES.
CB'S 1A AND 1B SHALL HAVE DOUBLE CASCADE GRATES



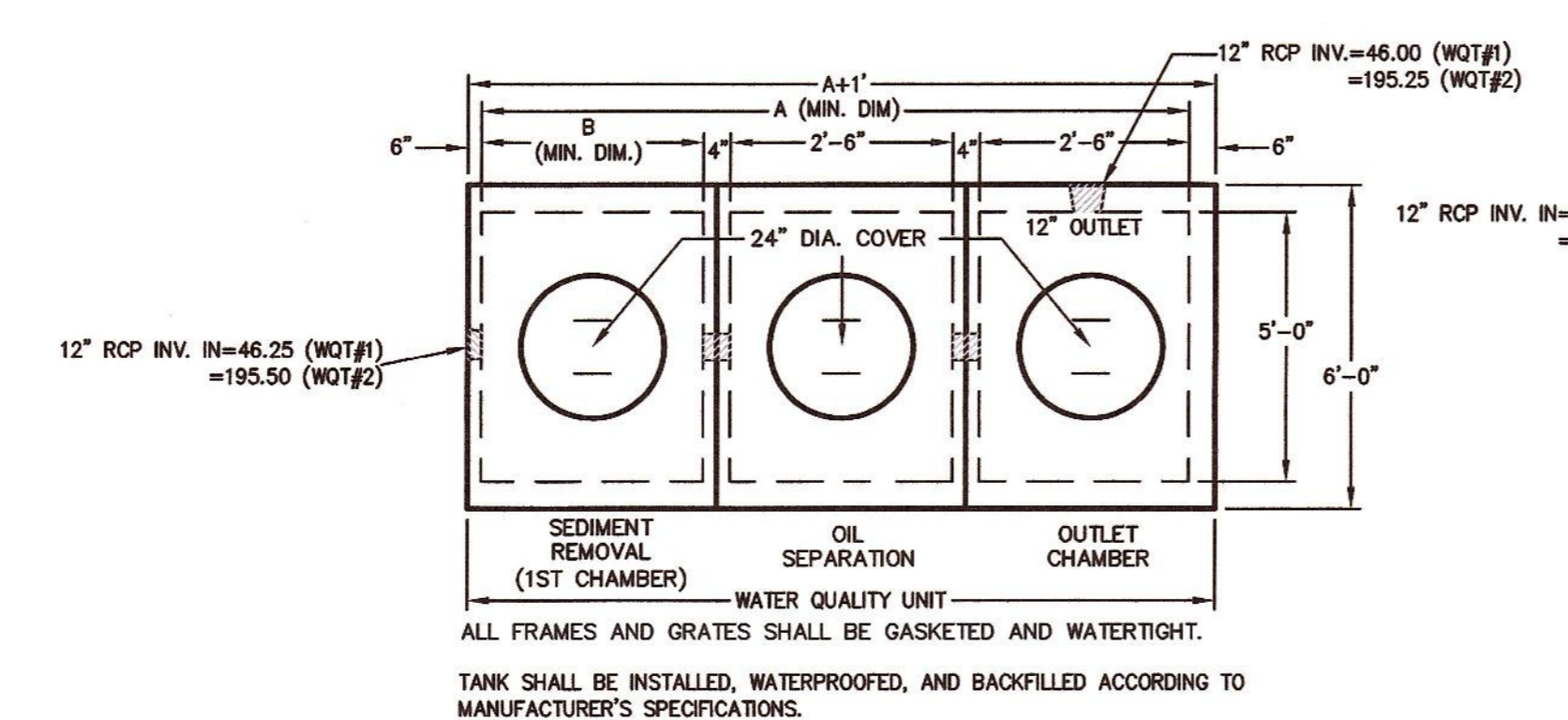
PRECAST DRAIN MANHOLE

	WQT-1	WQT-2
A (MIN. DIM.)	9'-8"	9'-8"
B (MIN. DIM.)	4'-0"	4'-0"
C	5'-6"	5'-6"
D	7'-0"	7'-0"
E	5'-0"	5'-0"
F	8'-0"	8'-0"
1ST CHAMBER GAL. REQUIRED	263	441
1ST CHAMBER GAL. PROVIDED	823	823
MIN. CAPACITY REQUIRED*	1,263 GAL.	1,441 GAL.

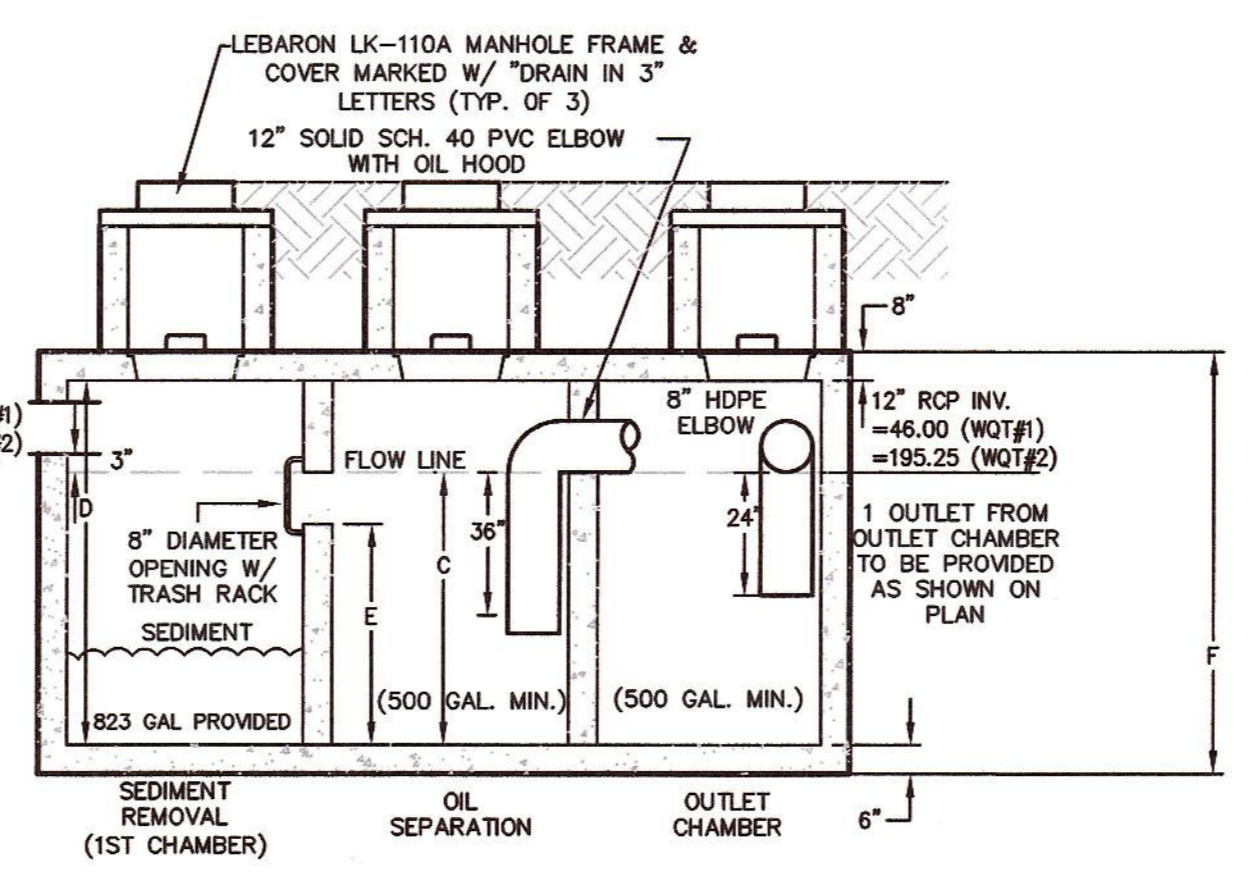
*INTERIOR VOLUME TO FLOW LINE IS SHOWN. SELECT TANK SIZE TO PROVIDE THIS MINIMUM VOLUME. USE SHEA PRECAST CONCRETE TANKS (MODIFIED AS SHOWN), OR EQUIVALENT.



OUTLET FROM DMH-1 & DMH-2 TO WATER QUALITY TANK DETAIL
N.T.S.



WATER QUALITY TANK DETAIL (H-20)
NOT TO SCALE



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DATE: 7-1-21
PROFESSIONAL LAND SURVEYOR

APPROVED SUBJECT TO TERMS AND CONDITIONS OF A COMPREHENSIVE PERMIT PER ZONING BOARD OF APPEALS DECISION AS AUTHORIZED BY CHAPTER 40B OF THE MASSACHUSETTS GENERAL LAWS, SECTION 20-23

DATE: _____
BOURNE ZONING BOARD

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TOWN CLERK - TOWN OF BOURNE

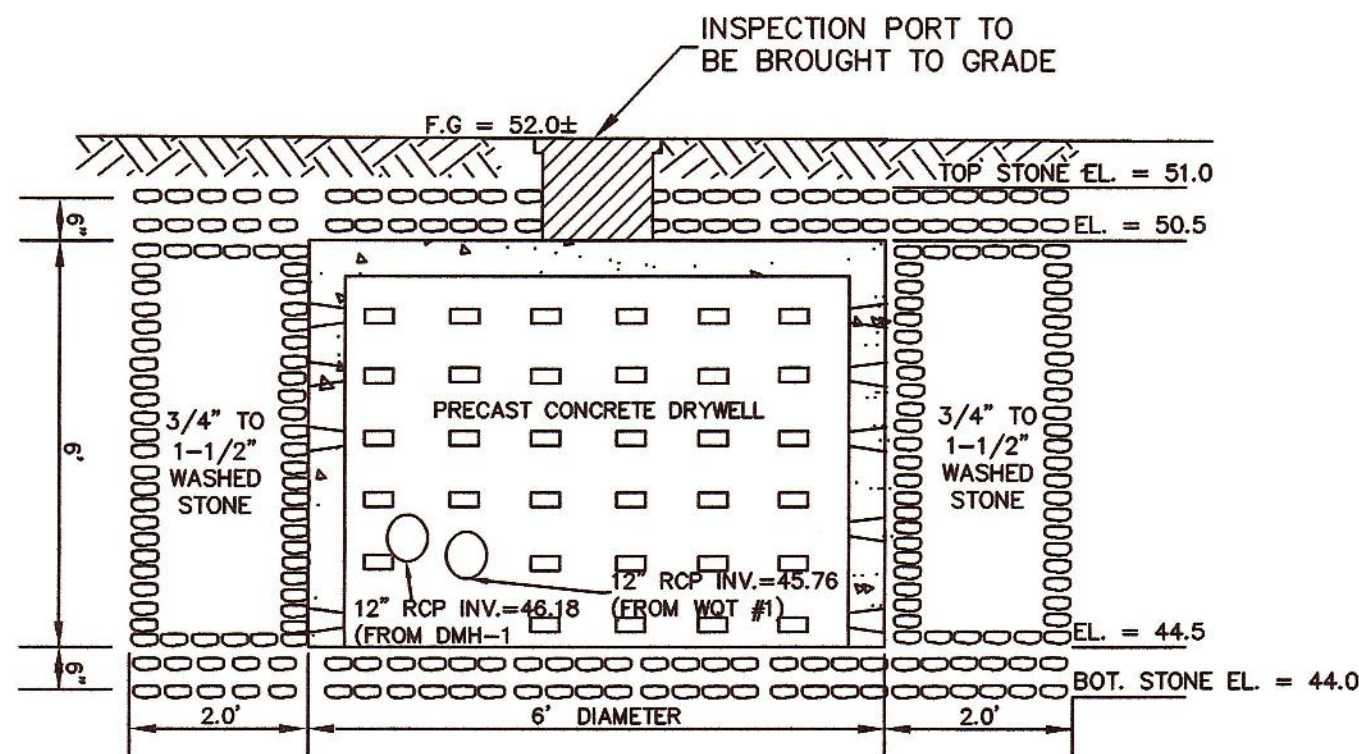
REVISIONS	
NO.	DATE

OWNER
230 SANDWICH ROAD REALTY TRUST
14 BOSUNS LANE
BOURNE, MA
APPLICANT
CHASE DEVELOPERS INC.
14 BOSUNS LANE
BOURNE, MA

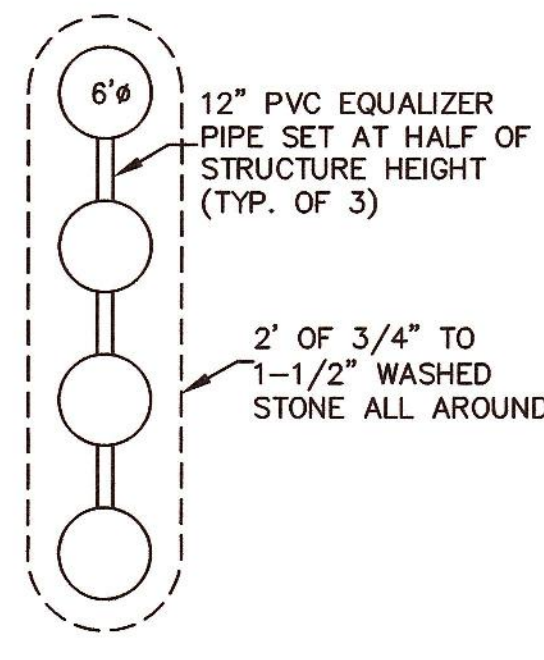
CONSTRUCTION DETAIL SHEET
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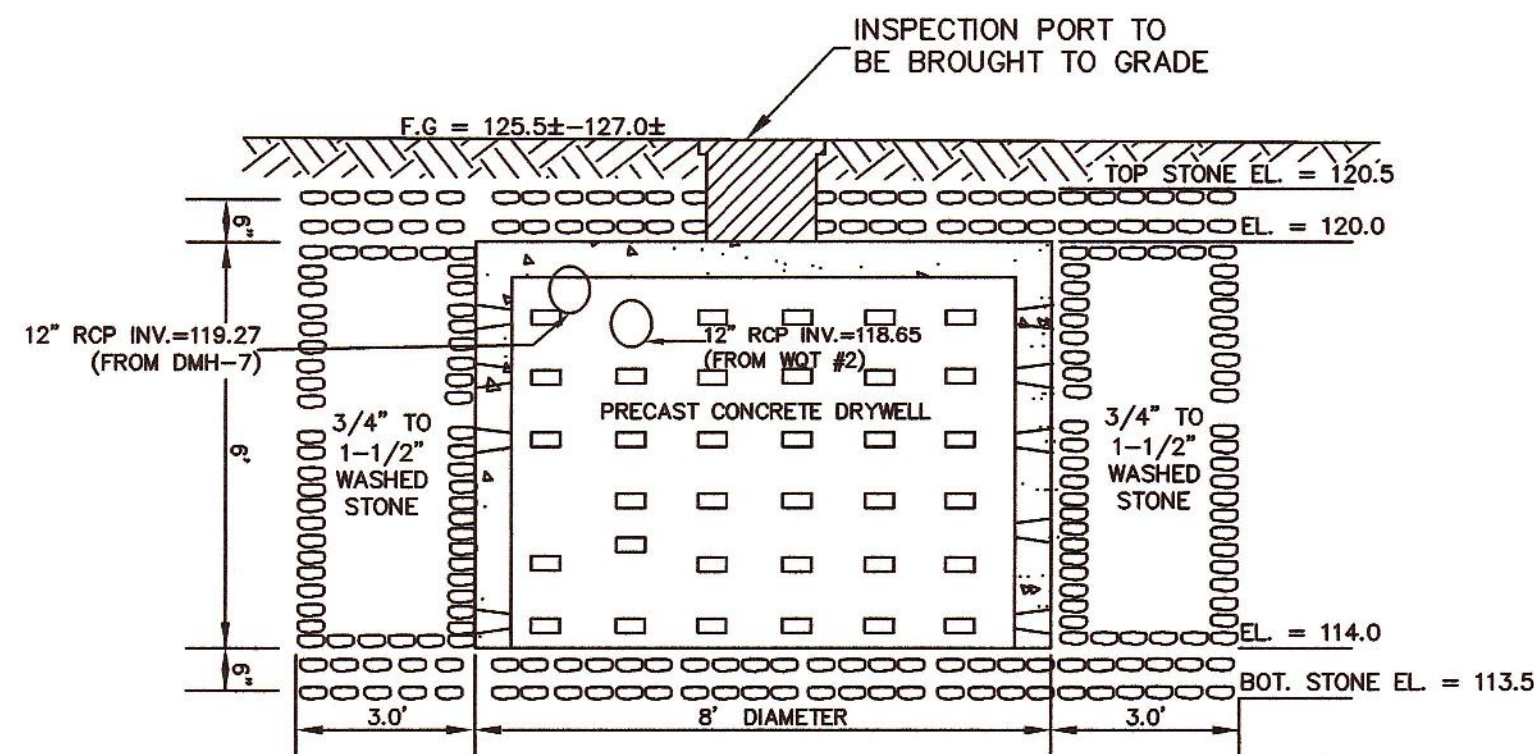
DATE: MAY 18, 2021
DRAWN BY: KAD CHECKED BY: JAP
SCALE: AS NOTED SHEET 9 OF 11
0E-3294A



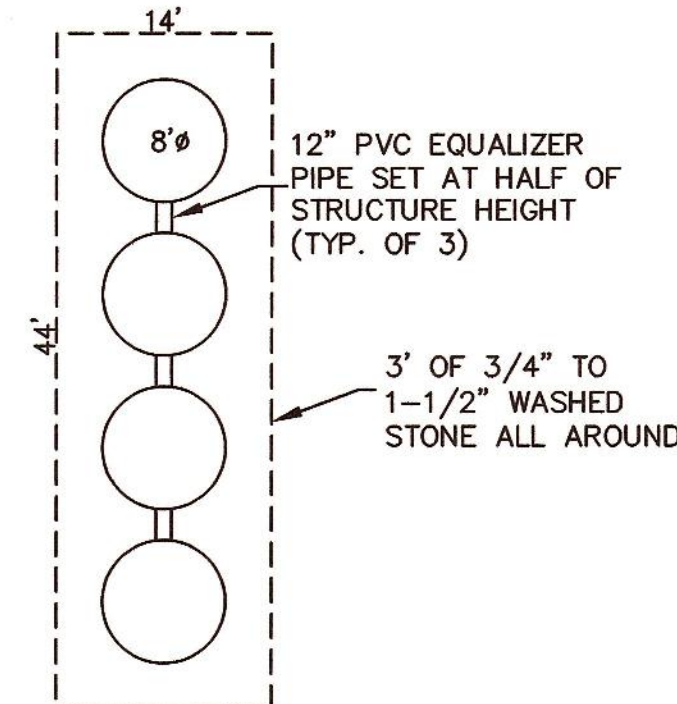
LEACHING PIT #1 DETAIL
NOT TO SCALE



LEACHING PIT #1 PLAN VIEW
NOT TO SCALE



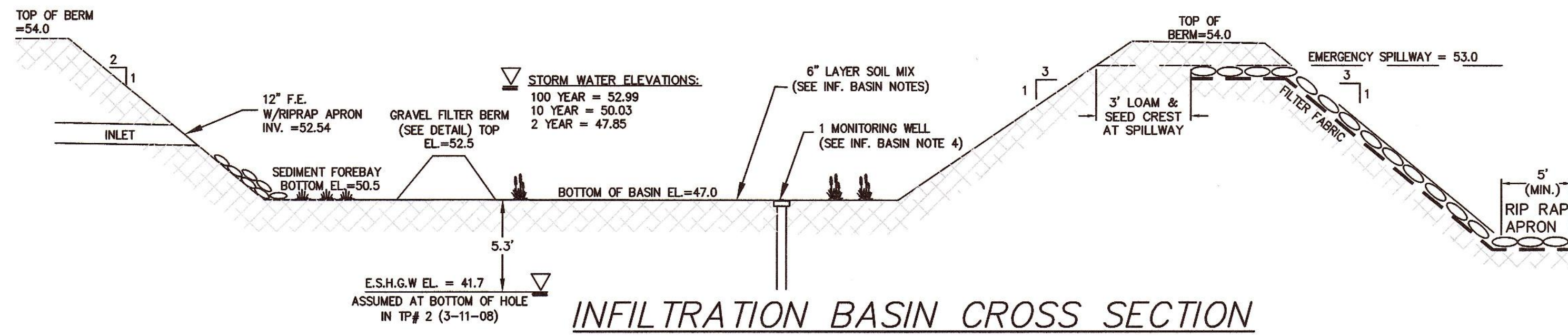
LEACHING PIT #2 DETAIL
NOT TO SCALE



LEACHING PIT #2 PLAN VIEW
NOT TO SCALE

PERMEAMETER TESTS BY
HOLMES AND McGRATH, INC

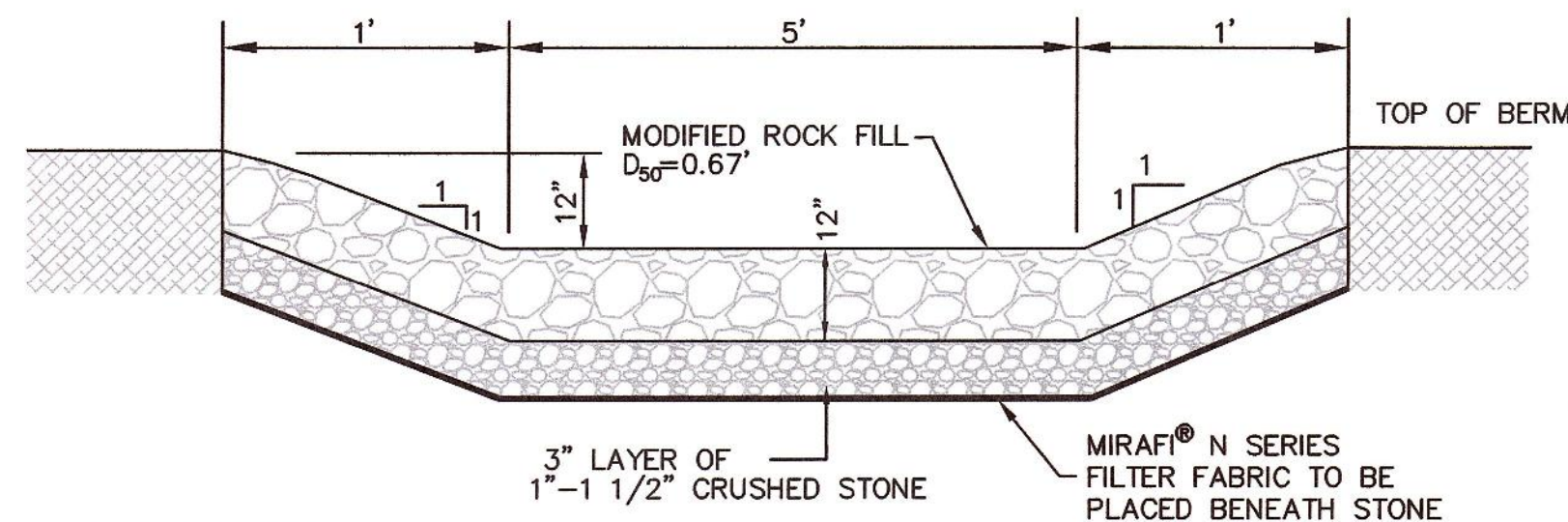
TP#	INFL. RATE (IN/HR)
TPD1	22.16
TPD2	62.24
TPD3	55.15
TPD4	22.77
TPD5	100.89
TPD6	98.34



INFILTRATION BASIN CROSS SECTION
NOT TO SCALE

INFILTRATION BASIN NOTES

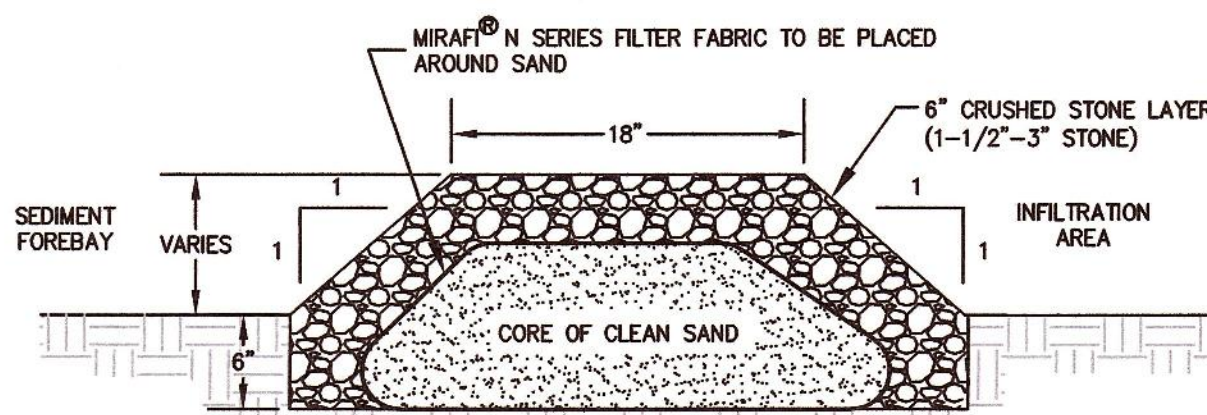
- EXISTING TOPSOIL, SUBSOIL, AND ANY UNSUITABLE SOILS BENEATH INFILTRATION BASIN (EXCLUDING SEDIMENT FOREBAY) TO BE REMOVED TO A DEPTH OF NATURALLY OCCURRING PERVIOUS SOIL. USE LIGHT EARTH-MOVING EQUIPMENT TO EXCAVATE BASIN BECAUSE HEAVY EQUIPMENT COMPACTS THE SOILS AND MAY REDUCE INFILTRATION CAPACITY. IF NECESSARY TO OBTAIN REQUIRED SUBGRADE, PLACE CLEAN WASHED SAND OR TITLE 5 SAND TO THE DEPTH REQUIRED. CONTRACTOR MUST NOTIFY DESIGN ENGINEER AND TOWN REPRESENTATIVE TO INSPECT OPEN HOLE 48 HOURS PRIOR TO PLACEMENT OF SAND AND 6" LAYER SOIL MIX.
- BASIN BOTTOM AND INTERIOR SIDE SLOPES TO RECEIVE A 6" LAYER OF PERMEABLE SOIL MIX, CONSISTING OF AGED COMPOST MIXED WITH 50/50 LOAM/SAND (OR COMPOST MIXED W/REMOVED TOPSOIL/SUBSOIL).
- SEED MIXES TO BE USED:
BOTTOM-NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES.
SIDE SLOPES: NEW ENGLAND CONSERVATION/WILDLIFE MIX.
- INSTALL 1 MONITORING WELL PER 5,000 S.F. BASIN FLOOR AREA, USING A 4" PERF. PIPE PLACED VERTICALLY DOWN INTO THE NATURALLY OCCURRING SOIL TO A DEPTH OF 10' OR LIMITING SOIL LAYER SUCH AS BEDROCK OR SILTY LOAM. THE PIPE SHALL BE WRAPPED W/MIRAFIX N-SERIES FILTER FABRIC AND CAPPED W/A SCREW TYPE CAP ACCESSIBLE AT FINISH GRADE (USE IRRIGATION VALVE BOX). INSTALLER TO CAREFULLY BACKFILL TO ENSURE PIPE REMAINS VERTICAL.



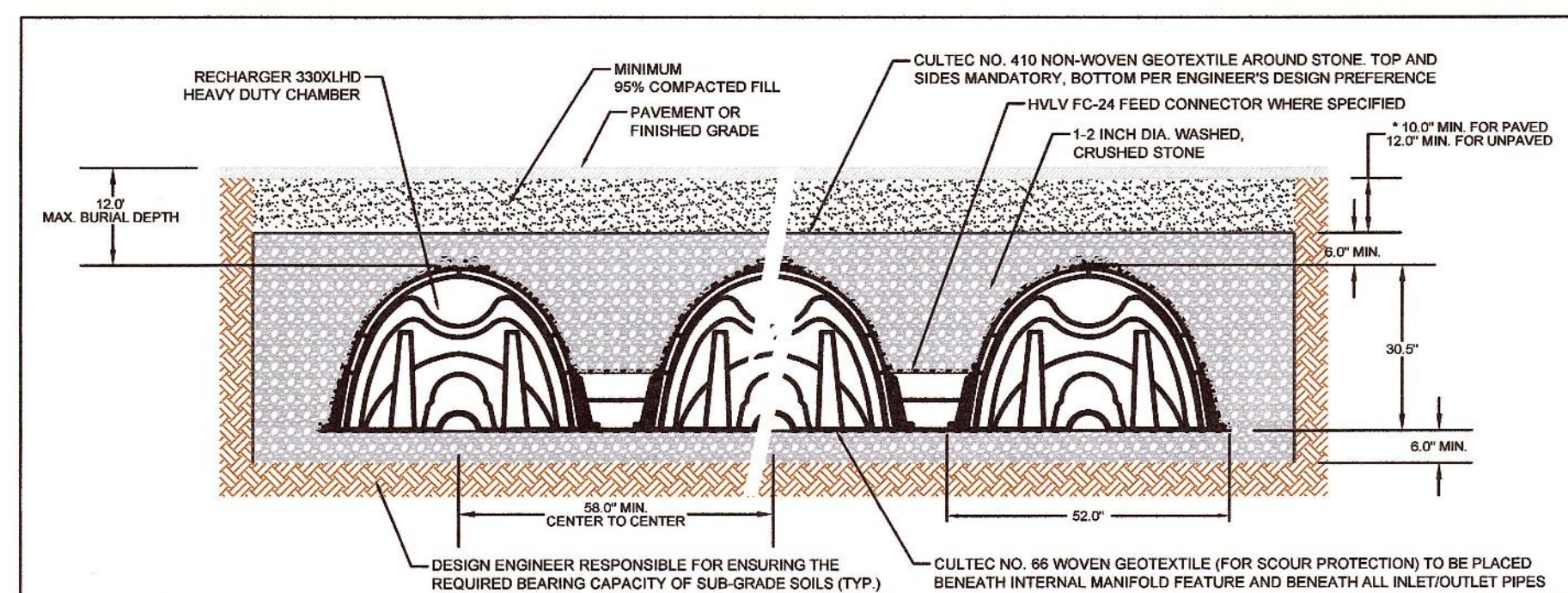
- SPILLWAY NOTES:**
- A WELL GRADED MIXTURE OF ROCK SIZES SHALL BE USED FOR THE STONE. FIFTY PERCENT BY WEIGHT OF THE STONE MIXTURE SHALL BE SMALLER THAN THE MEDIAN SIZE STONE (#50). THE LARGEST STONE SIZE IN THE MIXTURE SHALL BE 1.5 TIMES THE #50 SIZE (12").
 - STONES FOR RIP RAP SHALL BE ANGULAR OR SUBANGULAR. THE STONES SHALL BE SHAPED SO THAT THE LEAST DIMENSION OF THE STONE FRAGMENT SHALL NOT BE LESS THAN ONE-THIRD OF THE GREATEST DIMENSION OF THE FRAGMENT. FLAT ROCKS SHALL NOT BE USED FOR RIP RAP.
 - STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT DISPLACEMENT OF THE UNDERLYING MATERIALS. HAND PLACEMENT MAY BE REQUIRED TO PREVENT DAMAGE TO ANY PERMANENT STRUCTURES.
 - VOIDS IN THE ROCK RIP RAP SHOULD BE FILLED WITH SPALLS AND SMALLER ROCKS.

EMERGENCY SPILLWAY

NOT TO SCALE



GRAVEL FILTER BERM



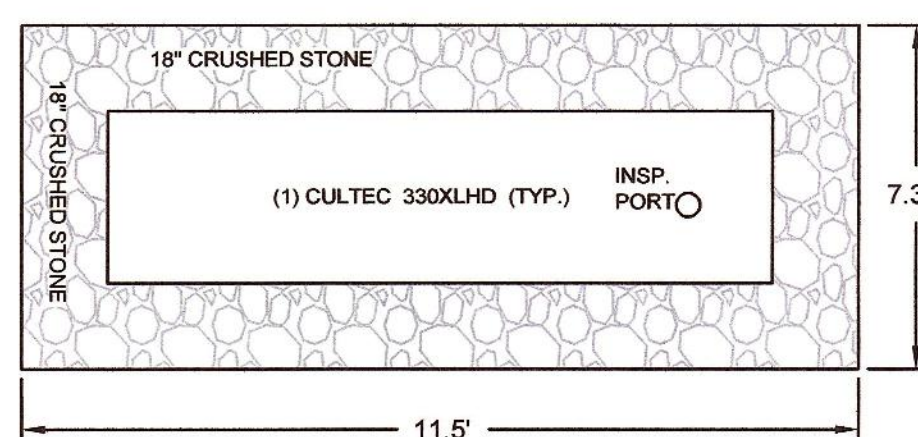
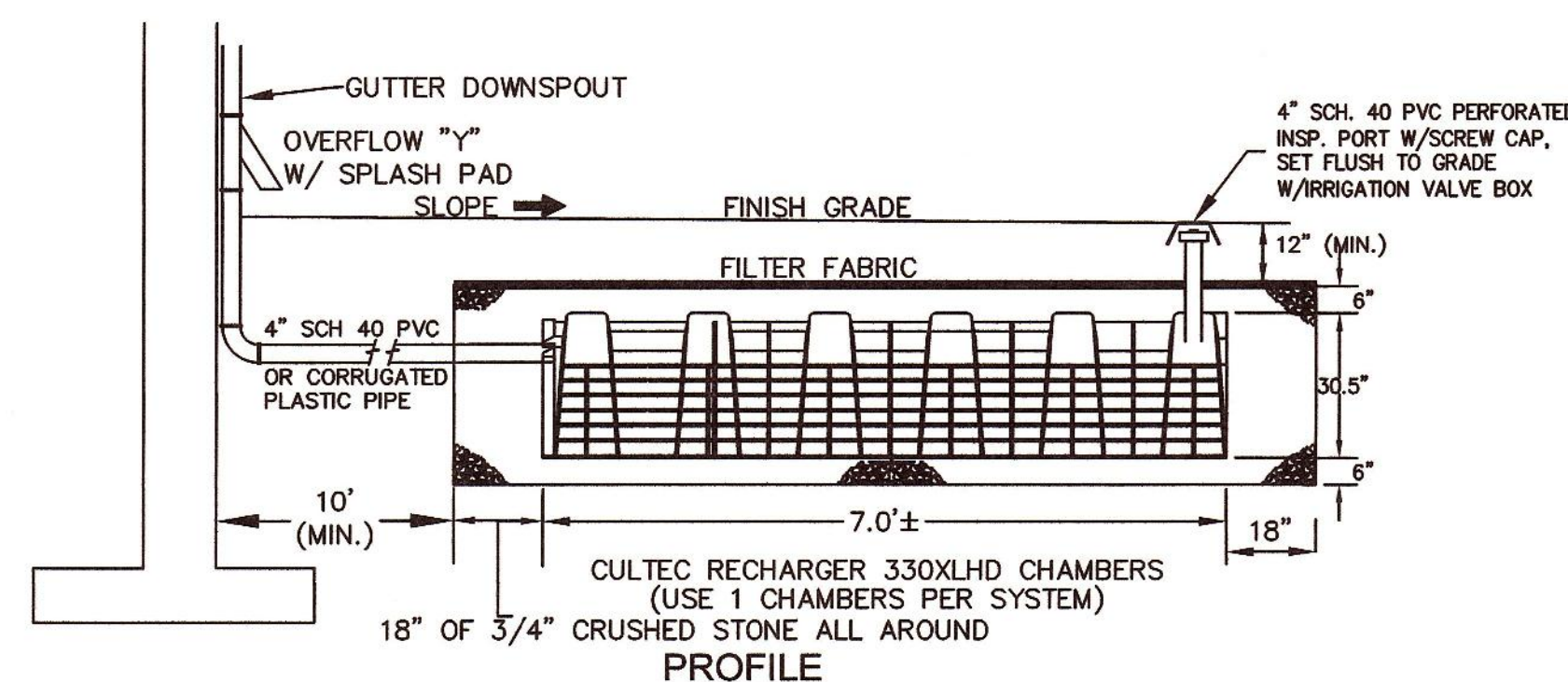
TYPICAL CROSS SECTION
N.T.S.

NOTES:

- ROOF DRAINS SHALL BE USED FOR REAR ROOF ON LOTS 1-2, AND 8
- ROOF DRAINS REQUIRE A TEST PIT TO DOCUMENT SOIL & GROUNDWATER CONDITIONS, SHALL BE SIZED FOR THE 100-YEAR STORM AND SHOWN ON SITE PLAN FOR EACH LOT PRIOR TO CONSTRUCTION. ALTERNATIVE LAYOUT MAY BE USED.
- CONTRACTOR TO REFER TO THE MANUFACTURERS RECOMMENDATIONS FOR INSTALLATION PROCEDURES.

ROOF DRAIN SYSTEM DETAILS

NOT TO SCALE



PLAN VIEW

BED CONFIGURATION
1 CHAMBER WITH 18" STONE SURROUND
OVERALL DIMENSIONS: 7.33' W X 11.5' L X 3.54' H

T.P.# 1 (7-22-08)

DEPTH	ELEV.
0	115.9
120"	105.9

PERC. RATE : OBSERVATION
DATE OF TEST : 7/22/08
WITNESSED BY : CINDY COFFIN
SOIL EVALUATOR: RAUL LIZARDI-RIVERA

T.P.# 2 (7-22-08)

DEPTH	ELEV.
0	114.0
13"	112.9
120"	104.0

PERC. RATE : <2 MPI
DATE OF TEST : 7/22/08
WITNESSED BY : CINDY COFFIN
SOIL EVALUATOR: RAUL LIZARDI-RIVERA

T.P.# 3 (7-22-08)

DEPTH	ELEV.
0	109.3
72"	103.3
120"	99.3

PERC. RATE : OBSERVATION
DATE OF TEST : 7/22/08
WITNESSED BY : CINDY COFFIN
SOIL EVALUATOR: RAUL LIZARDI-RIVERA

T.P.# 4 (7-22-08)

DEPTH	ELEV.
0	116.0
30"	113.5
66"	110.5
124"	105.7

PERC. RATE : <2 MPI
DATE OF TEST : 7/22/08
WITNESSED BY : CINDY COFFIN
SOIL EVALUATOR: RAUL LIZARDI-RIVERA

T.P.# 5 (7-22-08)

DEPTH	ELEV.
0	107.5
84"	100.5
120"	97.5

PERC. RATE : OBSERVATION
DATE OF TEST : 7/22/08
WITNESSED BY : CINDY COFFIN
SOIL EVALUATOR: RAUL LIZARDI-RIVERA

T.P.# 1 (3-11-08)

DEPTH	ELEV.
0	57.5
66"	52.0
114"	48.0

PERC. RATE : OBSERVATION
DATE OF TEST : 3/11/08
WITNESSED BY : CINDY COFFIN
SOIL EVALUATOR: RAUL LIZARDI-RIVERA

T.P.# 2 (3-11-08)

DEPTH	ELEV.
0	51.7
13"	50.6
120"	41.7

PERC. RATE : <2 MPI
DATE OF TEST : 3/11/08
WITNESSED BY : CINDY COFFIN
SOIL EVALUATOR: RAUL LIZARDI-RIVERA

T.P.# 3 (3-11-08)

DEPTH	ELEV.
0	54.5
19"	52.8
35"	51.6
114"	45.0

PERC. RATE : OBSERVATION
DATE OF TEST : 3/11/08
WITNESSED BY : CINDY COFFIN
SOIL EVALUATOR: RAUL LIZARDI-RIVERA

NOTE: ALL SOIL LOGS SHOWN WERE COMPLETED BY HOLMES AND McGRATH

TEST PIT LOGS

NOT TO SCALE



7-1-21

FOR REGISTRY USE ONLY

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.



DATE: 7-1-21
DATE: PROFESSIONAL LAND SURVEYOR

APPROVED SUBJECT TO TERMS AND CONDITIONS OF A COMPREHENSIVE PERMIT PER ZONING BOARD OF APPEALS DECISION AS AUTHORIZED BY CHAPTER 40B OF THE MASSACHUSETTS GENERAL LAWS, SECTION 20-23

DATE: _____

BOURNE ZONING BOARD

I CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE ZONING BOARD APPROVAL, AND THAT NO APPEAL HAS BEEN FILED AT THIS OFFICE.

TOWN CLERK - TOWN OF BOURNE

REVISIONS

NO.	DATE	DESCRIPTION
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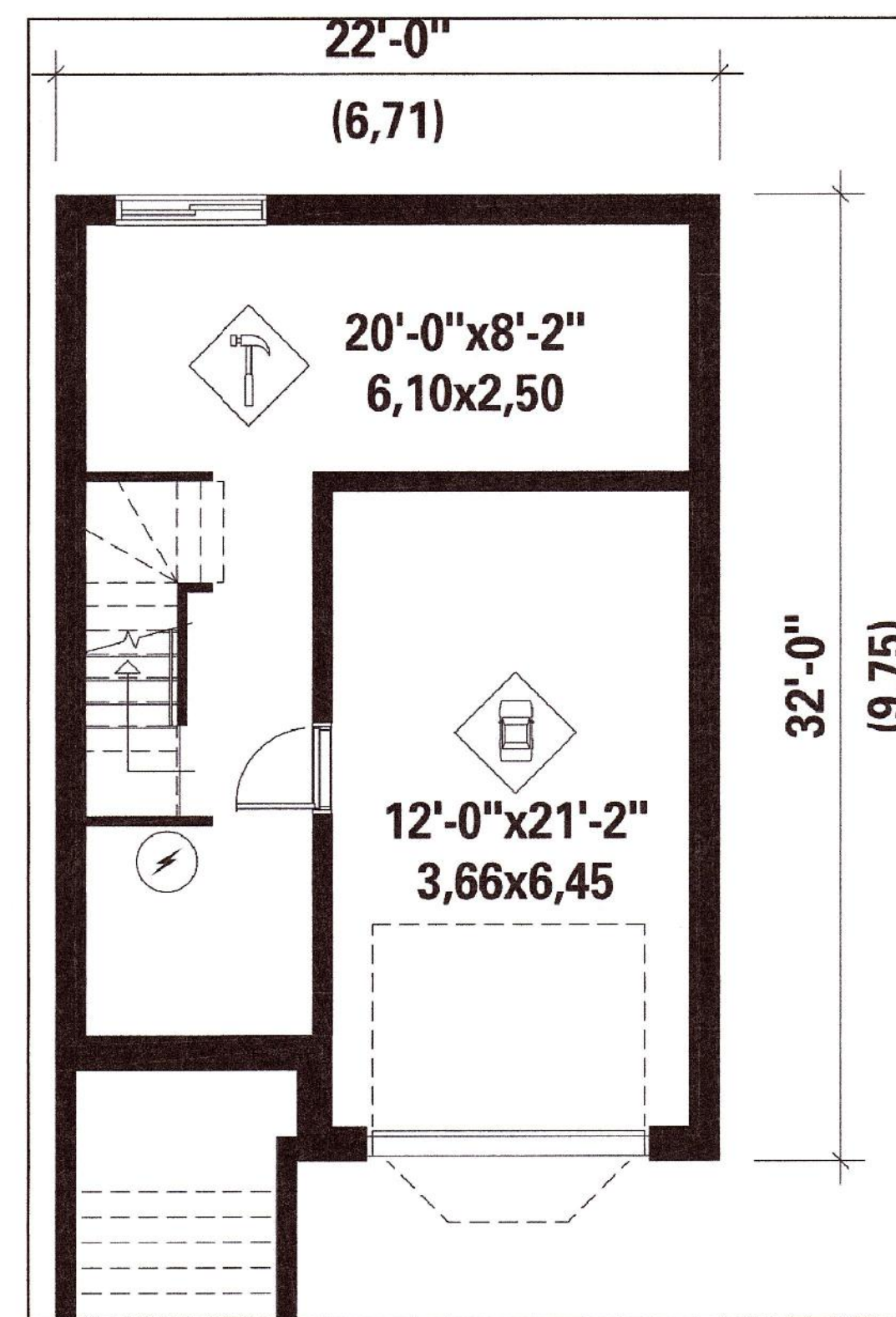
**CONSTRUCTION
DETAIL SHEET**
"CHASE ESTATES"
SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS



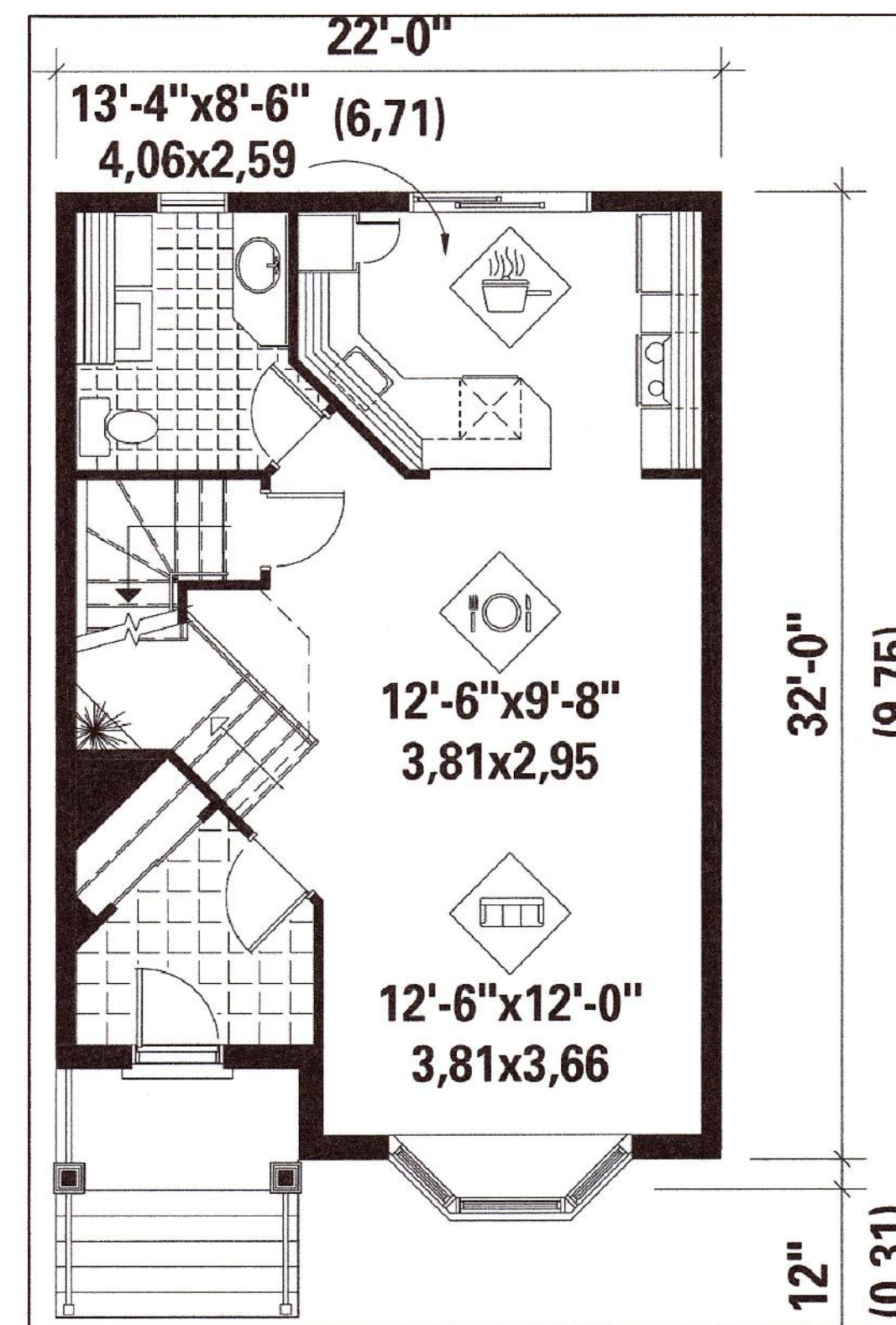
165 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508)-946-9231
FAX: (508)-947-8873
www.outback-eng.com

DATE: MAY 18, 2021
DRAWN BY: KAD CHECKED BY: JAP
SCALE: AS NOTED SHEET 10 OF 11

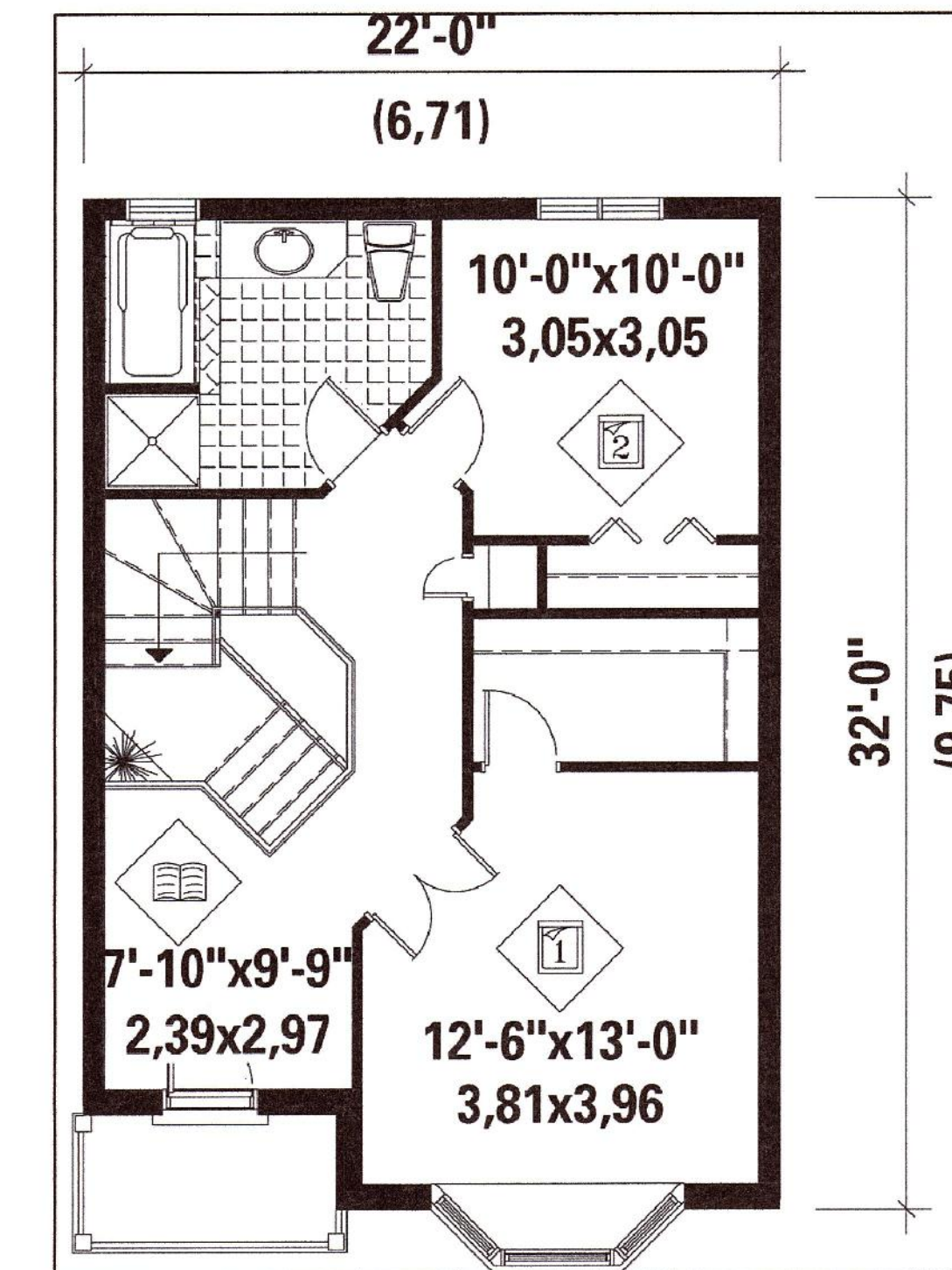
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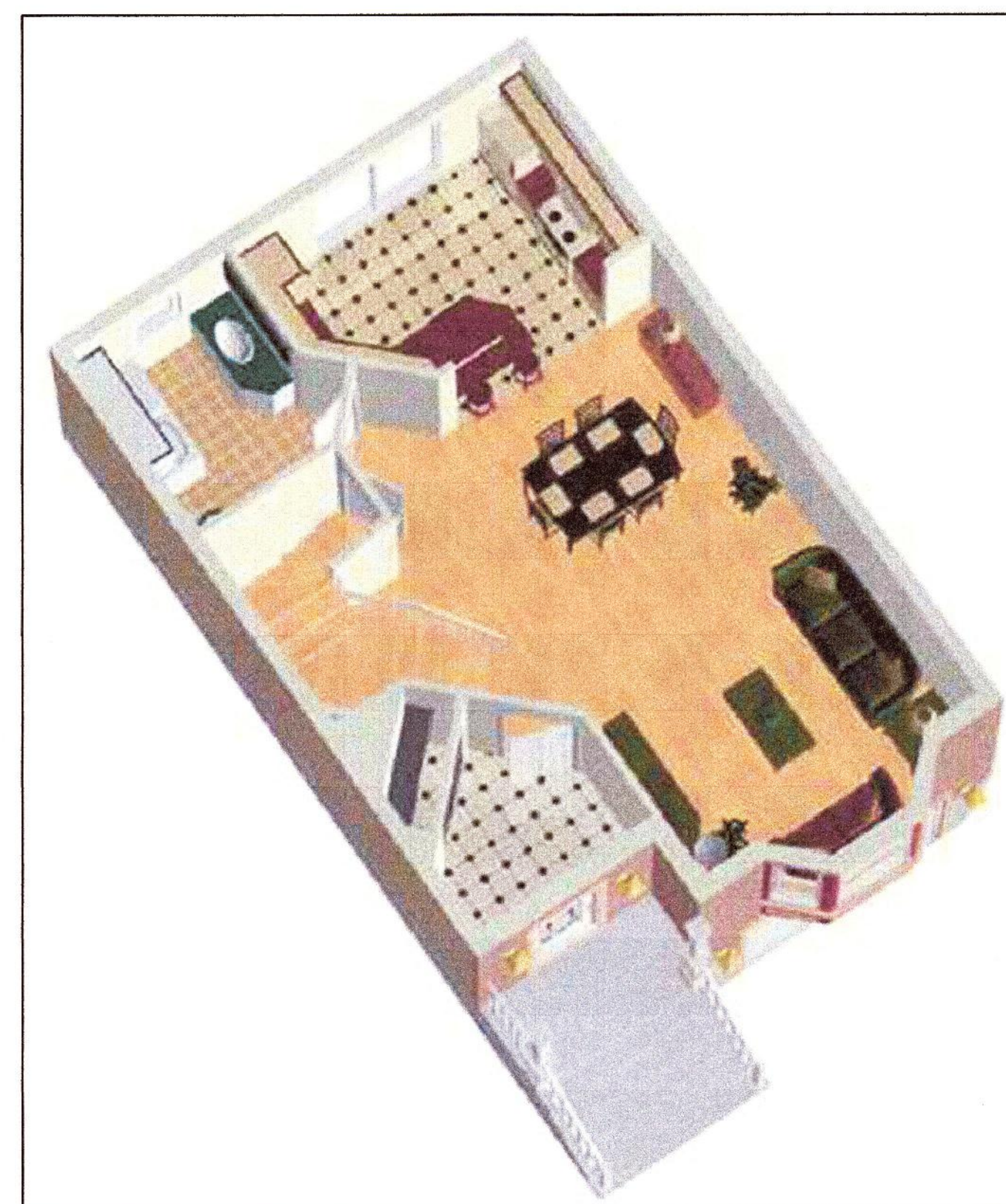
FOUNDATION PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN



FIRST FLOOR LAYOUT RENDERING



ARCHITECTURAL RENDERING



SECOND FLOOR PLAN LAYOUT RENDERING

NOTE:

ARCHITECTURAL DRAWINGS SHOWN REPRESENT TYPICAL DESIGN/ TEMPLATE AND SHALL BE CUSTOMIZED FOR EACH LOT. INDIVIDUAL DESIGNS SHALL BE INCLUDED IN FINAL PLANS.

FOR REGISTRY USE ONLY

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.



DATE 7-1-21 PROFESSIONAL LAND SURVEYOR

APPROVED SUBJECT TO TERMS AND CONDITIONS OF A COMPREHENSIVE PERMIT PER ZONING BOARD OF APPEALS DECISION AS AUTHORIZED BY CHAPTER 40B OF THE MASSACHUSETTS GENERAL LAWS, SECTION 20-23

DATE: _____

BOURNE ZONING BOARD

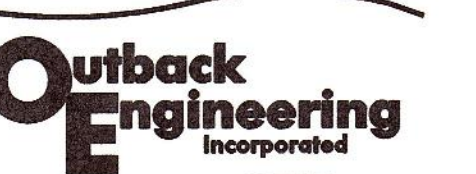
I CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE ZONING BOARD APPROVAL, AND THAT NO APPEAL HAS BEEN FILED AT THIS OFFICE.

TOWN CLERK - TOWN OF BOURNE

REVISIONS		
NO.	DATE	DESCRIPTION

OWNER
230 SANDWICH ROAD REALTY TRUST
14 BOSUNS LANE
BOURNE, MA
APPLICANT
CHASE DEVELOPERS INC.
14 BOSUNS LANE
BOURNE, MA

ARCHITECTURAL DRAWING
& RENDERINGS
"CHASE ESTATES"
SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS



165 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508)-946-9231
FAX: (508)-947-8873
www.outback-eng.com

DATE: MAY 18, 2021
DRAWN BY: KAD CHECKED BY: JAP
SCALE: NONE SHEET 11 OF 11

OE-3294A

DRAINAGE REPORT

“CHASE ESTATES” RESIDENTIAL SUBDIVISION in BOURNE, MASSACHUSETTS

May 18, 2021

Prepared for:
Chase Developers Inc.
14 Bosuns Lane
Bourne, Massachusetts

Prepared by:



**165 East Grove Street
Middleborough, MA 02346**

Tel# 508-946-9231 www.outback-eng.com Fax# 508-947-8873

DRAINAGE REPORT
“CHASE ESTATES”
BOURNE, MASSACHUSETTS

Sections

- 1.0** Introduction
- 2.0** Existing Conditions
- 3.0** Proposed Development
- 4.0** Drainage Design Methodology
- 5.0** Summary of Results
- 6.0** Compliance with DEP Stormwater Management Standards

Figures

- 1** USGS Locus Map
- 2** Flood Insurance Rate Map
- 3** Natural Heritage Endangered Species Program (NHESP) Map
- 4** Critical Areas Map

Appendices

- A** NRCS Soil characteristics for on-site soils
- B** DEP Checklist for Stormwater Report
- C** Maximum Discharge Velocities (Standard #1)
- D-1** Existing Hydrology Calculations (Standard #2)
- D-2** Post-Development Hydrology Calculations (Standard #2)
- E** Groundwater Recharge and Basin Drawdown Calculations (Standard #3)
- F-1** Water Quality Volume Calculations (Standard #4)
- F-2** TSS Removal Calculations (Standard #4)
- F-3** Sediment Forebay Calculations (Standard #4)
- F-4** Water Quality Inlet Calculations (Standard #4)
- G** Illicit Discharge Statement (Standard #10)
- H** Pipe Calculations
- I** Gutter Flow Calculations
- J** Long-Term Stormwater O&M Plan and Pollution Prevention Plan (Standards 4 & 9)
- K** Pre- and Post-Development Drainage Maps

**DRAINAGE REPORT
"CHASE ESTATES"
BOURNE, MASSACHUSETTS**

Section 1.0: Introduction

Chase Estates is a proposed 18-lot, residential subdivision permitted under a Comprehensive Permit per MGL Ch. 40B. The project was previously permitted as a 16-unit condominium, and is being modified as a 12 lot subdivision with a 1185-ft. long road. The road is proposed as 20-ft. wide with Cape Cod berms and a 4' sidewalk on one side, with town water, gas, underground cable utilities, and individual onsite Title 5 septic systems. The Final plans show proposed drainage facilities to control stormwater runoff, and the calculations herein document that stormwater runoff for the 100-year design storm can be contained in the proposed infiltration basin leaching pits #1 at the entrance and leaching pits #2 at the rear of the site.

Appendix D-2 contains the hydrology calculations based on watersheds flowing to catch basins in the roads that are piped to precast concrete leaching pits surrounded by crushed stone to infiltrate the runoff.

Appendix K shows the watersheds flowing to these drainage systems.

Section 2.0: Existing Conditions

The Chase Estates site is located on the east side of Sandwich Road, with residential homesites to the east of the sites and the upper Cape Cod Regional Technical Highschool to the south. The site is mostly cleared with about 1 acres of trees still on-site. The property currently has an existing building on site that the developer built a number of years ago as well as an existing foundation that will be demolished as part of this project. The site has very hilly terrain characteristic of two drumlins (glacial formations). There are no wetlands on-site. The property is generally long-narrow shaped, with topography ranging from elevation 50 ft. at Sandwich Road, rising eastward up to elevation 140 ft. to the top of a hill at the Southeast corner of the site.(see Figure 1, USGS Locus Map). The majority of the site slopes towards Sandwich Road, with a small portions flowing off-site to the school and a small portion flowing off-site to N/F Pappas.

Soils on-site have been identified by the NRCS as primarily Plymouth loamy coarse sand soils consisting of loamy coarse sand with a small portion of the site within pits, sand and gravel; all soil types fall within Hydrologic Soil Group A Refer to Appendix A for NRCS soils map information. Test pits were previously done by Holmes and McGrath in 2008 as shown on the Final plan set. Additional soil test pits will be needed to document soil conditions at the 2 leach pits (refer to the subdivision plans for test pit locations and soil logs). Soils in these test pits consisted of medium sand. Groundwater was not identified in any of these test pits.

The site location is not within any mapped environmentally sensitive areas based on review of MassGIS data, with no vernal pools, no endangered species habitat, and no areas prone to flooding (refer to Figures 2 and 3). The site is also not located within any state-designated Outstanding Resource Waters, Zone II of public water supply wells, or Zone A of public water supplies (see Figure 4).

For drainage design purposes, the site was delineated into 3 sub-catchment areas based on field investigations and review of the topography, and runoff conditions were calculated at 3 design discharge points, representing stormwater runoff flow to the following areas (please refer to Appendix

D-1 for Existing Hydrology Calculations representing pre-development conditions, and Appendix K for the Pre-Development Drainage Map):

- DP1: Runoff to Sandwich road
- DP2: Flow to Depression off-site on school property
- DP3: Flow off-site to N/F pappas

Section 3.0: Proposed Development

Chase Estates is a subdivision with 12 lots, each with duplex units for a total of 24 homes. The site is designed to mitigate impacts on the abutters and offsite stormwater runoff conditions. As shown on the cover sheet of the Final Plans, the site contains a number of retaining walls due to the severe grade changes that are present on-site. All retaining walls are less than 4' in height. A 6' high stockade fence is proposed along the southern property line and the eastern property line to screen the site from abutters. The subdivision roadway will include a town water main, underground electric/cable utilities and natural gas; each lot will have Title 5 septic systems.

The site design and stormwater management system features sustainable development techniques to minimize the impact on the environment. It utilizes several low impact development techniques and best management practices (BMPs) as outlined in DEP's Stormwater Management Handbook:

- Narrower roadways, small lots and short driveways to reduce impervious area.
- One stormwater infiltration basin and two (2) underground leaching pits are proposed with pretreatment systems to capture runoff from the roadway and the rest of the site, recharge the runoff to groundwater, and completely contain all runoff on site for the 100-year storm.
- Roof drains are planned for 2 duplex units to recharge groundwater and reduce runoff rates.

These BMPS are sited at appropriate locations based on the soils, grades of the roadway and setbacks required from the on-site septic systems, and were sized to completely contain the 100-year design storm within the BMP. Per the Comprehensive Permit, it is anticipated that the subdivision roadway will ultimately become owned and maintained by the town, while a homeowners association will be responsible for the maintenance of the stormwater basin and the 2 leaching pits. Refer to Appendix D-2 for the post-development hydrology calculations and Appendix K for the watershed map.

Section 4.0: Drainage Design Methodology

To determine changes in stormwater runoff for the proposed project, the HydroCAD Stormwater Modeling System software was used. This software closely approximates the USDA Soil Conservation Service (SCS) TR-20 methodology for calculating runoff. The calculations determined the change in the existing and post-development runoff rates to each drainage design point for each of the 2, 10, and 100-year storm events. All storm events analyzed comply with Technical Paper-40 (*Rainfall Frequency Atlas of the United States*) Rainfall Data. Infiltration rates used to size the recharge BMPs are based on the soil types found in test pits and Rawl's rates per DEP.

The stormwater design complies with the DEP Stormwater Management Regulations, incorporating a number three BMPs for water quality, recharge and runoff control (refer to Section 6 and Appendix B for the DEP Stormwater Checklist). The calculations herein document compliance with rate and volume control, sizing of the detention and infiltration systems, as well as pretreatment, water quality and recharge volumes, and discharge velocities. To ensure long-term viability of these drainage systems and to prevent pollution and degradation of the environment, the Long-Term Stormwater Operation & Maintenance Plan and Pollution Prevention Plan in Appendix J was prepared. Please note that this project is NOT subject to a NPDES General Construction Permit and a Storm Water Pollution

Prevention Plan (SWPPP) as required when a project involves construction covering over 1 acre with discharges to the waters of the U.S. Construction-period erosion and sediment control guidelines are generally shown on the Erosion and Sedimentation Control plans (Sheet 8 of the Final plans).

Section 5.0: Summary of Results

In accordance with DEP requirements, the storm water design controls runoff for the 2, 10, and 100-year storm events below existing conditions. There are 3 design points analyzed with a summary of runoff rates and volumes as follows.

Comparison of Pre- & Post-Development Runoff Rates

Design Point 1P -Runoff to Sandwich Road

	<u>Pre development</u>	<u>Post development</u>
	Rate/Volume	Rate/Volume
<u>2 Year Storm (3.50")</u>		
• To Design Point DP1	0.01 cfs 0.006 af	0.00 cfs 0.000 af
<u>10 Year Storm (4.85")</u>		
• To Design Point DP1	0.18 cfs 0.080 af	0.00 cfs 0.000 af
<u>100 Year Storm (7.10")</u>		
• To Design Point DP1	2.35 cfs 0.348 af	0.00 cfs 0.00 af

Design Point 2 – Flow to Depression off-site on school property

	<u>Pre development</u>	<u>Post development</u>
	Rate	Rate
<u>2 Year Storm (3.50")</u>		
• To Design Point DP2	0.00 cfs 0.00 af	0.00 cfs 0.00 af
<u>10 Year Storm (4.85")</u>		
• To Design Point DP2	0.00 cfs 0.000 af	0.00 cfs 0.00 af
<u>100 Year Storm (7.10")</u>		
• To Design Point DP2	0.01 cfs 0.003 af	0.00 cfs 0.00 af

Design Point 3 – Flow off-site to N/F Pappas

	<u>Pre development</u>	<u>Post development</u>
	Rate	Rate
<u>2 Year Storm (3.50")</u>		
• To Design Point DP3	0.00 cfs 0.00 af	0.00 cfs 0.00 af
<u>10 Year Storm (4.85")</u>		
• To Design Point DP3	0.00 cfs 0.00 af	0.00 cfs 0.001 af
<u>100 Year Storm (7.10")</u>		
• To Design Point DP3	0.01 cfs 0.003 af	0.04 cfs 0.008 af

Section 6.0: Compliance with DEP Stormwater Management Standards

This section documents how the project design complies with DEP's 10 Stormwater Management Standards, as summarized below. Refer to Appendix B for the DEP Checklist for Stormwater Report.

1. *No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

The proposed stormwater conveyances do not discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth by using appropriate BMPs with pretreatment, and riprap aprons and other measures to prevent erosion (see Appendix C for maximum discharge velocities).

2. *Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.*

To prevent storm damage and downstream and off-site flooding, Standard 2 requires that the post-development peak discharge rate is equal to or less than the pre-development rate from the 2-year and the 10-year 24-hour storms. BMPs that slow runoff rates through storage and gradual release, such as LID techniques, extended dry detention basins, and wet basins, must be provided to meet Standard 2. Where an area is within the 100-year coastal flood plain or land subject to coastal storm flowage, the control of peak discharge rates is usually unnecessary and may be waived.

For projects subject to jurisdiction under the Wetlands Protection Act, the issuing authority relies on TR-20 and TR-55 which are guides for estimating the effects of land use changes on runoff volume and peak rates of discharge published by Natural Resource Conservation Service (NRCS). Applicants must calculate runoff rates from pre-existing and post-development conditions. Measurement of peak discharge rates is calculated at a design point, typically the lowest point of discharge at the downgradient property boundary. The topography of the site may require evaluation at more than one design point, if flow leaves the property in more than one direction. An applicant may demonstrate that a feature beyond the property boundary (e.g. culvert) is more appropriate as a design point.

Proponents must also evaluate the impact of peak discharges from the 100-year 24-hour storm. If this evaluation shows that increased off-site flooding will result from peak discharges from the 100-year 24-hour storms, BMPs must also be provided to attenuate these discharges.

One infiltration basin, and 2 leach pits have been incorporated into the stormwater design to control runoff rates for the 2 and 10-year storm events as required by DEP; runoff volumes were also evaluated for each design point for the 100-year storm to ensure there will be no risk of increased off-site flooding. 3 design points have been analyzed:

- DP-1: Runoff to Sandwich Road
- DP-2: Flow to Depression off-site on school property
- DP-3 Flow off-site to N/F Pappas

Peak flow rates have been reduced in all cases from pre to post-development in the 2 and 10-year storm as required by DEP, however there is an increase in post runoff rates and volume in the 100-year to Design point #3. Per Standard 2, *"Proponents must also evaluate the impact of peak*

discharges from the 100-year 24-hour storm. If this evaluation shows that increased off-site flooding will result from peak discharges from the 100-year 24-hour storms, BMPs must also be provided to attenuate these discharges. Although there is an increase in rate and volume in the 100-year storm we feel that the increase is negligible and will not increase off-site flooding. We have incorporated all that we can into this subcatchment to control runoff, including adding a roof drain. Since the flow to this design point is the developers actual house lot, we resolved that this would not be an issue. There is an increase in volume in the 10 year storm, however the increase only amounts to 44 ft³ and since HydroCAD merely only models potential future conditions, actual proposed area may not actually be built as such. We feel this marginal increase is negligible and not a concern. See summary of results in Section 5, as well as the HydroCAD calculations in Appendices D-1 and D-2.

3. *Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.*

The Infiltration basin and the Leach Pits have been designed to recharge more than eight (8) times the required recharge volume of storm water for the site. The required recharge volume has been calculated using the simple dynamic method. Infiltration systems are sited at all locations with at least 4-ft. separation to the water table based on groundwater conditions observed in test pits. These calculations as well as drawdown calculations for all infiltration BMPs have been provided in Appendix E.

4. *Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:*
 - a. *Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;*
 - b. *Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and*
 - c. *Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*

The storm water management system for this project has been designed to remove a minimum of 80% of the average annual post construction load of total suspended solids in accordance with this standard. This standard has been met as noted below.

- (a) *Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan (see Appendix J).*
 - (b) *The structural BMP treatment trains utilized will capture the required water quality volume determined per the Massachusetts Stormwater Handbook (see Appendix F-1).*
 - (c) *Pretreatment is provided in accordance with the Handbook using deep sump catch basins, sediment forebay, and water quality tanks which is used for the 2 Leach Pits. (see Appendices F-2 to F-4).*
5. *For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant*

loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

The site is not a source of higher pollutant loads. This standard is not applicable.

6. *Stormwater discharges within the Zone II or Interim Wellhead Protection Area (IWPA) of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.*

The site is not located within or near any Zone I or II, IWPA, ORW/SRW or other critical area as defined in the Handbook. This standard is not applicable.

7. *A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

The site is not a redevelopment project. This standard is not applicable.

8. *A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.*

General construction sequencing and erosion control requirements are shown on the plans, and additional erosion and sediment controls and other pollutant source controls during construction are provided and shown on the Erosion and Sedimentation Control plan (ESC); the ESC plan references the detailed Erosion and Sediment Controls and identifies responsible parties to maintain the controls. Temporary sediment basins have been sized according to DEP Guidance on Erosion Controls. This standard has been met.

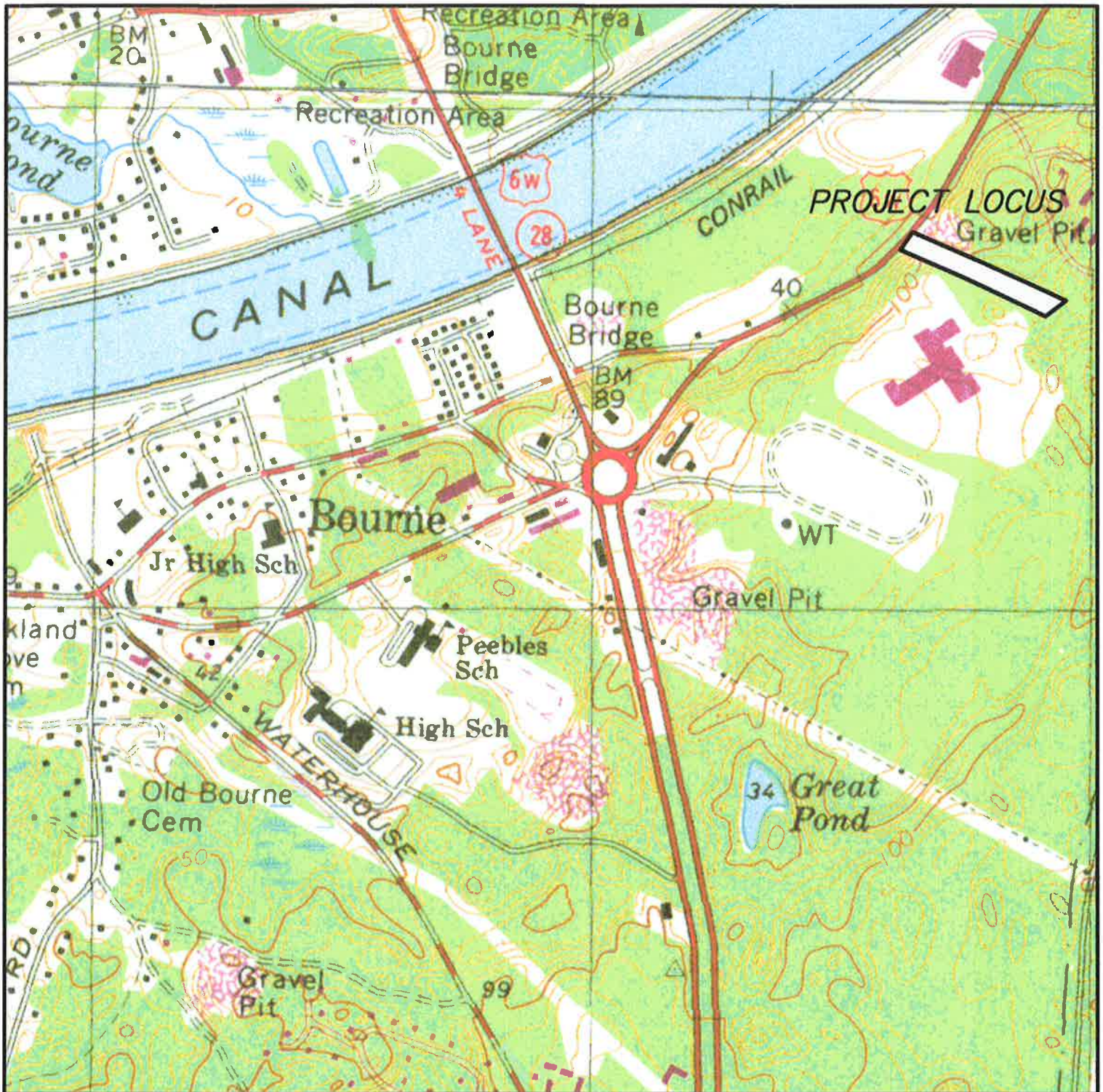
9. *A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

Long-term O&M requirements for the stormwater system are incorporated into the "Long-Term Stormwater O&M Plan and Pollution Prevention Plan" in Appendix J. This document describes inspection and maintenance schedules for each drainage BMP with an O&M Log Sheet (it also

provides good housekeeping guidelines to prevent pollution of the environment per Standard #4). Standard #9 has been met.

10. All illicit discharges to the stormwater management system are prohibited.

Appendix G contains a PE-signed Illicit Discharge Statement. This standard has been met.



USGS LOCUS MAP
 "230 SANDWICH ROAD"
 SANDWICH, MASS.
 SOURCE: USGS MAP

0 1000 2000 3000
 FEET
 SCALE: 1"=1000'



Outback
Engineering
 Incorporated

165 EAST GROVE STREET
 MIDDLEBOROUGH, MASS. 02346
 TEL 508-946-9231



LEGEND

- SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD
The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.
- ZONE A No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- FLOODWAY AREAS IN ZONE AE
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
- OTHER FLOOD AREAS
ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- OTHER AREAS
ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.



**165 EAST GROVE STREET
MIDDLEBOROUGH, MASS. 02346
TEL 508-946-9231**

**FLOOD MAP
"230 SANDWICH ROAD"
SANDWICH, MASS.
SOURCE: FEMA**

N F I P
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0502J

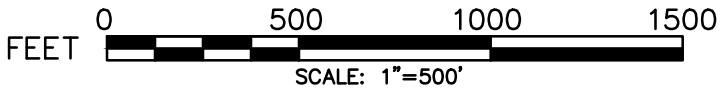
FIRM
FLOOD INSURANCE RATE MAP
BARNSTABLE COUNTY,
MASSACHUSETTS
(ALL JURISDICTIONS)

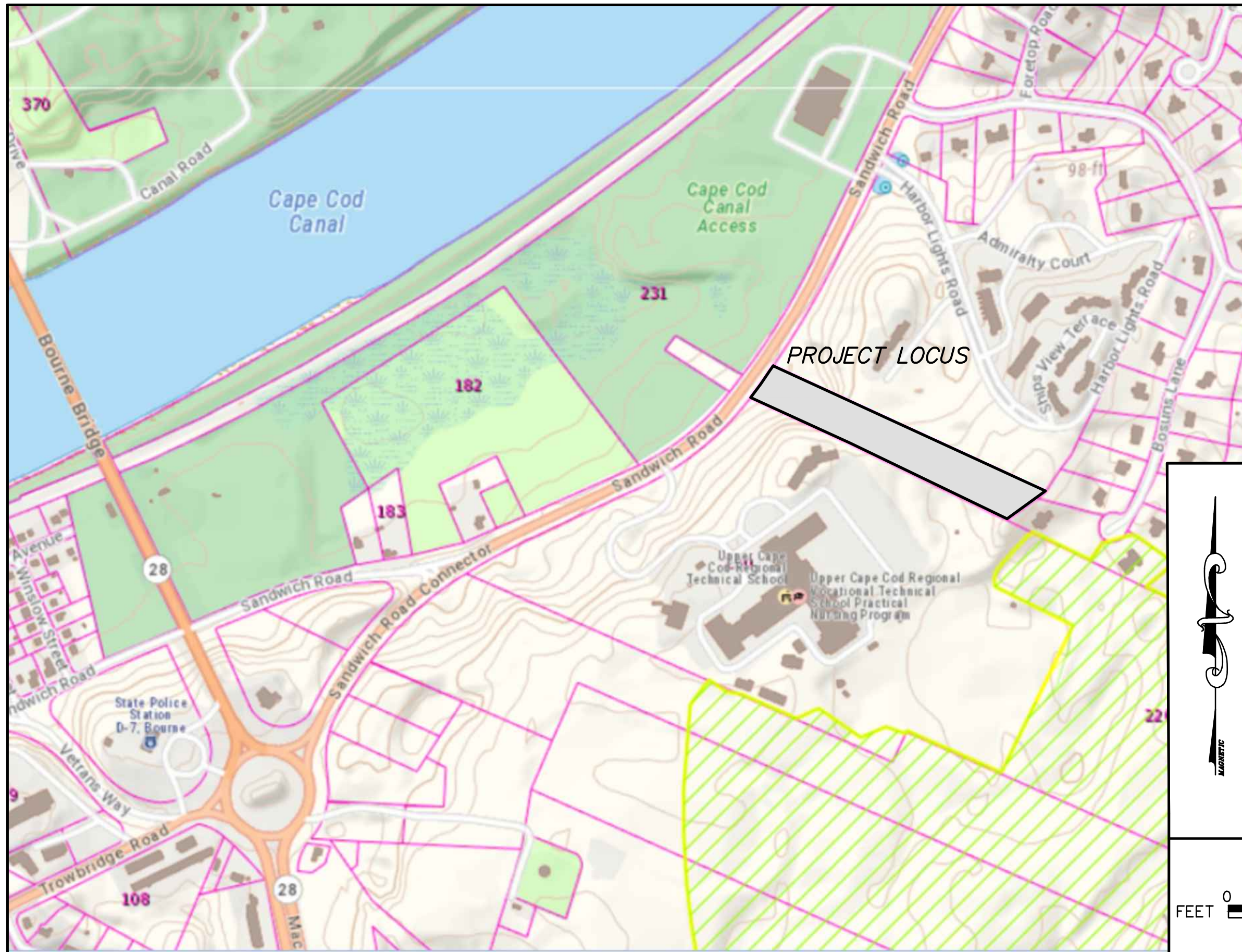
PANEL 502 OF 875
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:
COMMUNITY BOURNE, TOWN OF
NUMBER 255210
PANEL 0502
SUFFIX J

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25001C0502J
EFFECTIVE DATE
JULY 16, 2014
Federal Emergency Management Agency





LEGEND

NHESP Estimated Habitats of Rare Wildlife



NHESP Priority Habitats of Rare Species



Potential Vernal Pools



NHESP Certified Vernal Pools

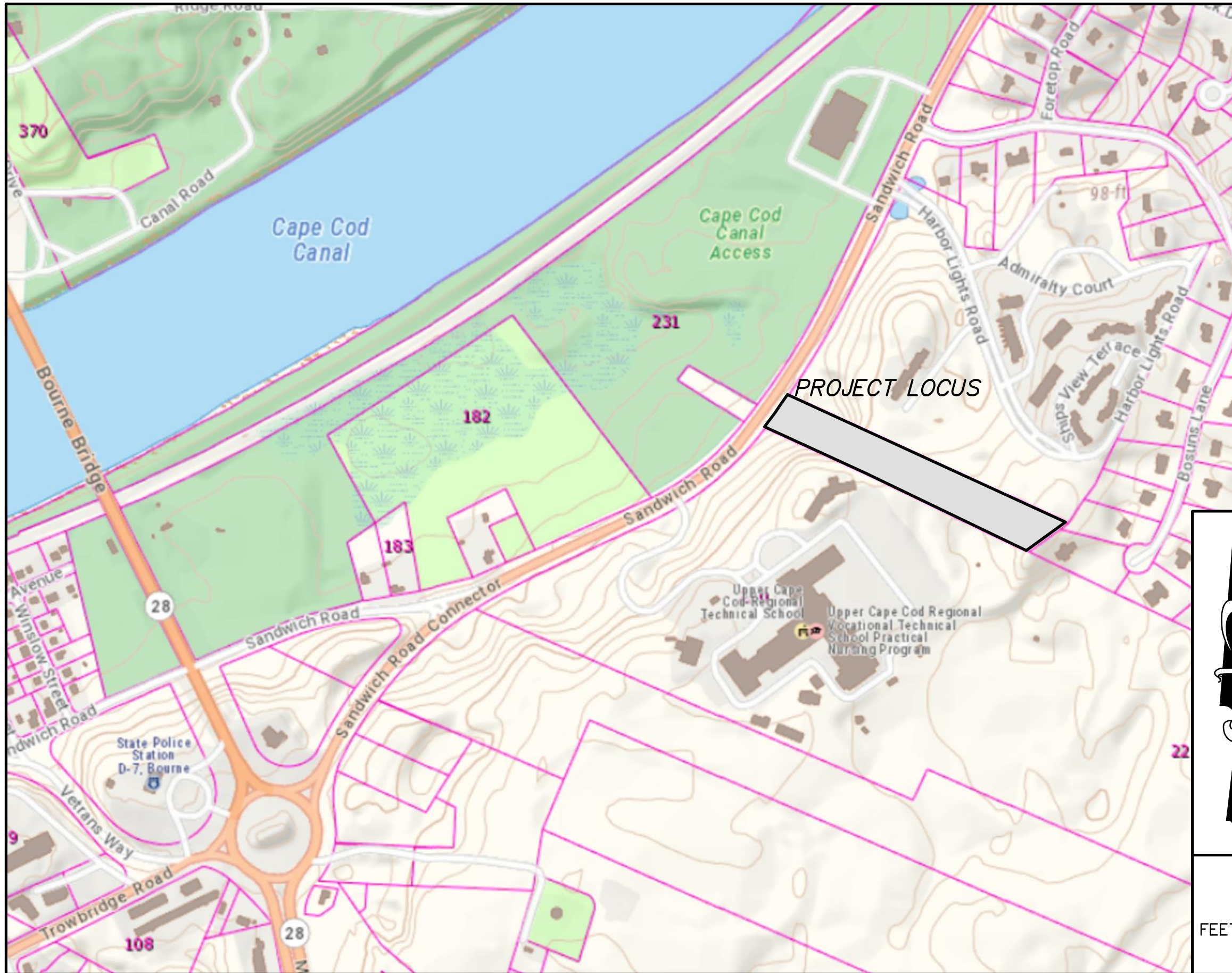


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MIDDLEBOROUGH, MASS. 02346
TEL 508-946-9231

NATURAL HERITAGE MAP
"LAKE LAND HILLS"
SANDWICH, MASS.
SOURCE: 2008 MAPPING BY
NHESP OF THE
MASSACHUSETTS DIVISIONS
OF FISHERIES AND WILDLIFE

0 400 800 1200
FEET
SCALE: 1"=400'



LEGEND

Outstanding Resource Waters

- ACEC
- Cape Cod National Seashore
- Protected Shoreline
- Public Water Supply Watershed
- Retired Public Water Supply
- Scenic/Protected River
- Wildlife Refuge

Zone Is



Zone IIs

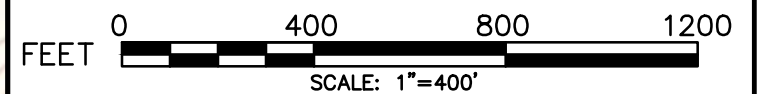


Tax Parcels for Query

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CRITICAL AREAS MAP
"230 SANDWICH ROAD"
SANDWICH, MASS.
SOURCE: MASSGIS



Appendix A
NRCS Soil characteristics for on-site soils



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Barnstable County, Massachusetts**



January 26, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

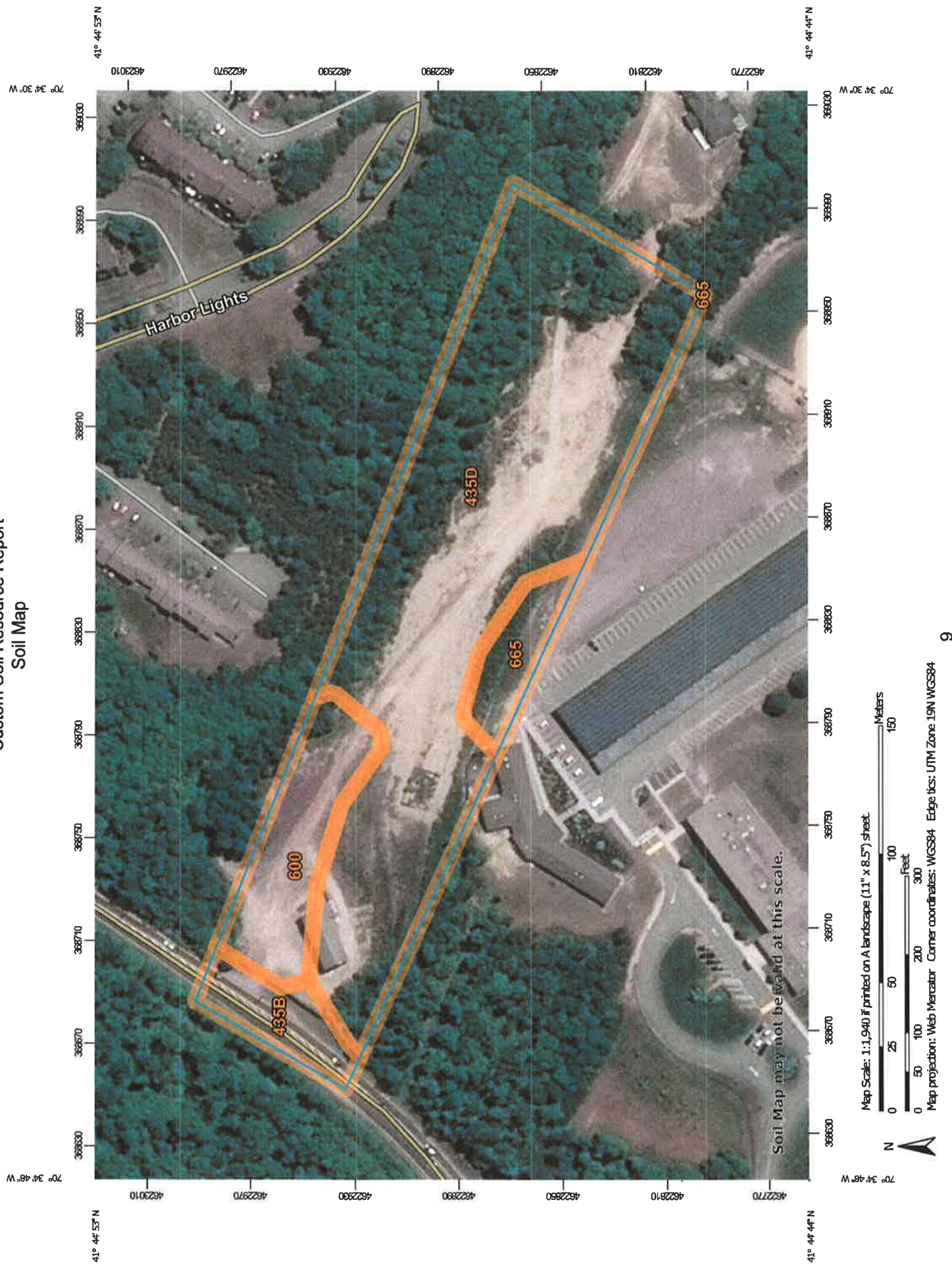
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.































Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



MAP LEGEND

Area of Interest (AOI)		Water Features	
	Area of Interest (AOI)		Streams and Canals
Soils		Transportation	
	Soil Map Unit Polygons		Rails
	Soil Map Unit Lines		Interstate Highways
	Soil Map Unit Points		US Routes
Special Point Features			Major Roads
	Blowout		Local Roads
	Borrow Pit	Background	
	Clay Spot		Aerial Photography
	Closed Depression		
	Gravel Pit		
	Gravelly Spot		
	Landfill		
	Lava Flow		
	Marsh or swamp		
	Mine or Quarry		
	Miscellaneous Water		
	Perennial Water		
	Rock Outcrop		
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Barnstable County, Massachusetts
Survey Area Data: Version 17, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2018—Nov 17, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
435B	Plymouth loamy coarse sand, 3 to 8 percent slopes	0.4	5.7%
435D	Plymouth loamy coarse sand, 15 to 35 percent slopes	4.9	76.6%
600	Pits, sand and gravel	0.8	12.2%
665	Udipsamments, smoothed	0.3	5.4%
Totals for Area of Interest		6.4	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

Custom Soil Resource Report

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Barnstable County, Massachusetts

435B—Plymouth loamy coarse sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 98rs
Elevation: 0 to 1,000 feet
Mean annual precipitation: 35 to 50 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Plymouth and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plymouth

Setting

Landform: Outwash plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loose sandy glaciofluvial deposits and/or loose sandy ablation till;
loose sandy ablation till and/or loose sandy glaciofluvial deposits; loose sandy
ablation till and/or loose sandy glaciofluvial deposits

Typical profile

H1 - 0 to 3 inches: loamy coarse sand
H2 - 3 to 29 inches: gravelly loamy coarse sand
H3 - 29 to 64 inches: gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00
to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F149BY005MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hinckley

Percent of map unit: 8 percent

Hydric soil rating: No

Carver

Percent of map unit: 8 percent

Hydric soil rating: No

Barnstable

Percent of map unit: 6 percent

Hydric soil rating: No

Nantucket

Percent of map unit: 6 percent

Hydric soil rating: No

Merrimac

Percent of map unit: 2 percent

Hydric soil rating: No

435D—Plymouth loamy coarse sand, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: 98rv

Elevation: 0 to 1,000 feet

Mean annual precipitation: 35 to 50 inches

Mean annual air temperature: 45 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Plymouth and similar soils: 65 percent

Minor components: 35 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plymouth

Setting

Landform: Ice-contact slopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Riser

Down-slope shape: Linear

Across-slope shape: Convex

*Parent material: Loose sandy glaciofluvial deposits and/or loose sandy ablation till;
loose sandy glaciofluvial deposits and/or loose sandy ablation till*

Typical profile

H1 - 0 to 3 inches: loamy coarse sand

H2 - 3 to 29 inches: gravelly loamy coarse sand

Custom Soil Resource Report

H3 - 29 to 64 inches: gravelly coarse sand

Properties and qualities

Slope: 15 to 35 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water capacity: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A

Ecological site: F149BY005MA - Dry Outwash

Hydric soil rating: No

Minor Components

Carver

Percent of map unit: 15 percent

Hydric soil rating: No

Hinckley

Percent of map unit: 10 percent

Hydric soil rating: No

Barnstable

Percent of map unit: 5 percent

Hydric soil rating: No

Nantucket

Percent of map unit: 5 percent

Hydric soil rating: No

600—Pits, sand and gravel

Map Unit Setting

National map unit symbol: 98rq

Frost-free period: 120 to 220 days

Farmland classification: Not prime farmland

Map Unit Composition

Pits: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Setting

Parent material: Loose sandy and gravelly glaciofluvial deposits

665—Udipsamments, smoothed

Map Unit Setting

National map unit symbol: 98s6

Elevation: 0 to 230 feet

Mean annual precipitation: 41 to 48 inches

Mean annual air temperature: 50 to 54 degrees F

Frost-free period: 160 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Udipsamments and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udipsamments

Setting

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy excavated or filled land

Properties and qualities

Depth to restrictive feature: More than 80 inches

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

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Appendix B
DEP Checklist for Stormwater Report



Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- ☒ New development
- ☐ Redevelopment
- ☐ Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☒ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
 - ☐ Credit 1
 - ☐ Credit 2
 - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☒ Other (describe): Leaching Drywells

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- ☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- ☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- ☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- ☒ Soil Analysis provided.
- ☒ Required Recharge Volume calculation provided.
- ☐ Required Recharge volume reduced through use of the LID site Design Credits.
- ☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - ☐ Static
 - ☒ Simple Dynamic
 - ☐ Dynamic Field¹
- ☒ Runoff from all impervious areas at the site discharging to the infiltration BMP.
- ☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- ☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- ☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
 - ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
 - ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- ☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- ☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- ☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- ☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- ☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - ☒ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - ☐ is within the Zone II or Interim Wellhead Protection Area
 - ☐ is near or to other critical areas
 - ☒ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - ☐ involves runoff from land uses with higher potential pollutant loads.
 - ☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - ☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- ☒ The BMP is sized (and calculations provided) based on:
 - ☒ The ½" or 1" Water Quality Volume or
 - ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- ☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- ☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- ☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- ☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- ☐ The NPDES Multi-Sector General Permit does **not** cover the land use.
- ☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- ☐ All exposure has been eliminated.
- ☐ All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- ☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- ☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- ☐ Critical areas and BMPs are identified in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- ☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - ☐ Limited Project
 - ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - ☐ Bike Path and/or Foot Path
 - ☐ Redevelopment Project
 - ☐ Redevelopment portion of mix of new and redevelopment.
- ☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- ☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- ☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- ☐ The project is **not** covered by a NPDES Construction General Permit.
- ☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- ☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- ☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - ☒ Name of the stormwater management system owners;
 - ☒ Party responsible for operation and maintenance;
 - ☒ Schedule for implementation of routine and non-routine maintenance tasks;
 - ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
 - ☒ Description and delineation of public safety features;
 - ☒ Estimated operation and maintenance budget; and
 - ☒ Operation and Maintenance Log Form.
- ☐ The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- ☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- ☒ An Illicit Discharge Compliance Statement is attached;
- ☐ NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

Appendix C
Maximum Discharge Velocities (Standard #1)



165 East Grove Street
Middleborough, MA 02346

Tel: 508-946-9231

Fax: 508-947-8873

www.outback-eng.com

JOB #: OE-3294
JOB NAME: 230 Sandwich Road
TOWN: Bourne

CALC BY: CJV **DATE:** 1/22/21
CHECK BY: J.A.P **DATE:** 1/22/21

STANDARD 1: NO UNTREATED DISCHARGE OR EROSION TO WETLANDS

No new untreated discharge:

Computations required to demonstrate compliance with Standards 4 through 6 may be used to demonstrate that all new discharges are adequately treated.

Maximum Discharge Velocity & Ability of Ground Surface to Resist Erosion:

<u>Discharge Outlet</u>	<u>Max. Discharge Velocity (ft/s)*</u>	<u>Receiving Groundcover</u>	<u>Receiving Slope</u>	<u>Permissible Velocity (ft/s)**</u>	<u>Suitability</u>
Broad-crested weir Infil. Basin	0	Lawn	3%	5	O.K.

* Maximum discharge velocity obtained from post-development hydrology calculation (see Appendix D-2)

Appendix D-1
Existing Hydrology Calculations (Standard #2)



Runoff to Sandwich
Road



Flow off site to N/F
Pappas



Flow to depression
off-site on school
property



Routing Diagram for PRE Hydrocad 4-7-21

Prepared by Microsoft, Printed 5/4/2021

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Summary for Subcatchment EDA 1: Runoff to Sandwich Road

Runoff = 0.01 cfs @ 21.42 hrs, Volume= 0.006 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.50"

Area (sf)	CN	Description
* 3,023	98	Existing Garage,, & Brick Walls, HSG A
134,203	30	Woods, Good, HSG A
56,008	49	50-75% Grass cover, Fair, HSG A
13,159	96	Gravel surface, HSG A
206,393	40	Weighted Average
203,370		98.54% Pervious Area
3,023		1.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1120	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
4.6	1,206	0.0740	4.38		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.5	1,256	Total			

Summary for Subcatchment EDA2: Flow to depression off-site on school property

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.50"

Area (sf)	CN	Description
2,261	30	Woods, Good, HSG A
687	49	50-75% Grass cover, Fair, HSG A
2,948	34	Weighted Average
2,948		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment EDA3: Flow off site to N/F Pappas

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.50"

PRE Hydrocad 4-7-21*Type III 24-hr 2 Year Rainfall=3.50"*

Prepared by Microsoft

Printed 5/4/2021

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Area (sf)	CN	Description
7,668	30	Woods, Good, HSG A
7,668		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment EDA 1: Runoff to Sandwich Road

Runoff = 0.18 cfs @ 12.54 hrs, Volume= 0.080 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.85"

Area (sf)	CN	Description
* 3,023	98	Existing Garage,, & Brick Walls, HSG A
134,203	30	Woods, Good, HSG A
56,008	49	50-75% Grass cover, Fair, HSG A
13,159	96	Gravel surface, HSG A
206,393	40	Weighted Average
203,370		98.54% Pervious Area
3,023		1.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1120	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
4.6	1,206	0.0740	4.38		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.5	1,256	Total			

Summary for Subcatchment EDA2: Flow to depression off-site on school property

Runoff = 0.00 cfs @ 16.72 hrs, Volume= 0.000 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.85"

Area (sf)	CN	Description
2,261	30	Woods, Good, HSG A
687	49	50-75% Grass cover, Fair, HSG A
2,948	34	Weighted Average
2,948		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment EDA3: Flow off site to N/F Pappas

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.85"

PRE Hydrocad 4-7-21*Type III 24-hr 10 Year Rainfall=4.85"*

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Area (sf)	CN	Description
7,668	30	Woods, Good, HSG A
7,668		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment EDA 1: Runoff to Sandwich Road

Runoff = 2.31 cfs @ 12.23 hrs, Volume= 0.348 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

Area (sf)	CN	Description
* 3,023	98	Existing Garage,, & Brick Walls, HSG A
134,203	30	Woods, Good, HSG A
56,008	49	50-75% Grass cover, Fair, HSG A
13,159	96	Gravel surface, HSG A
206,393	40	Weighted Average
203,370		98.54% Pervious Area
3,023		1.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1120	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
4.6	1,206	0.0740	4.38		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.5	1,256	Total			

Summary for Subcatchment EDA2: Flow to depression off-site on school property

Runoff = 0.01 cfs @ 12.37 hrs, Volume= 0.003 af, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

Area (sf)	CN	Description
2,261	30	Woods, Good, HSG A
687	49	50-75% Grass cover, Fair, HSG A
2,948	34	Weighted Average
2,948		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment EDA3: Flow off site to N/F Pappas

Runoff = 0.01 cfs @ 13.71 hrs, Volume= 0.003 af, Depth= 0.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

PRE Hydrocad 4-7-21*Type III 24-hr 100 Year Rainfall=7.10"*

Prepared by Microsoft

Printed 5/4/2021

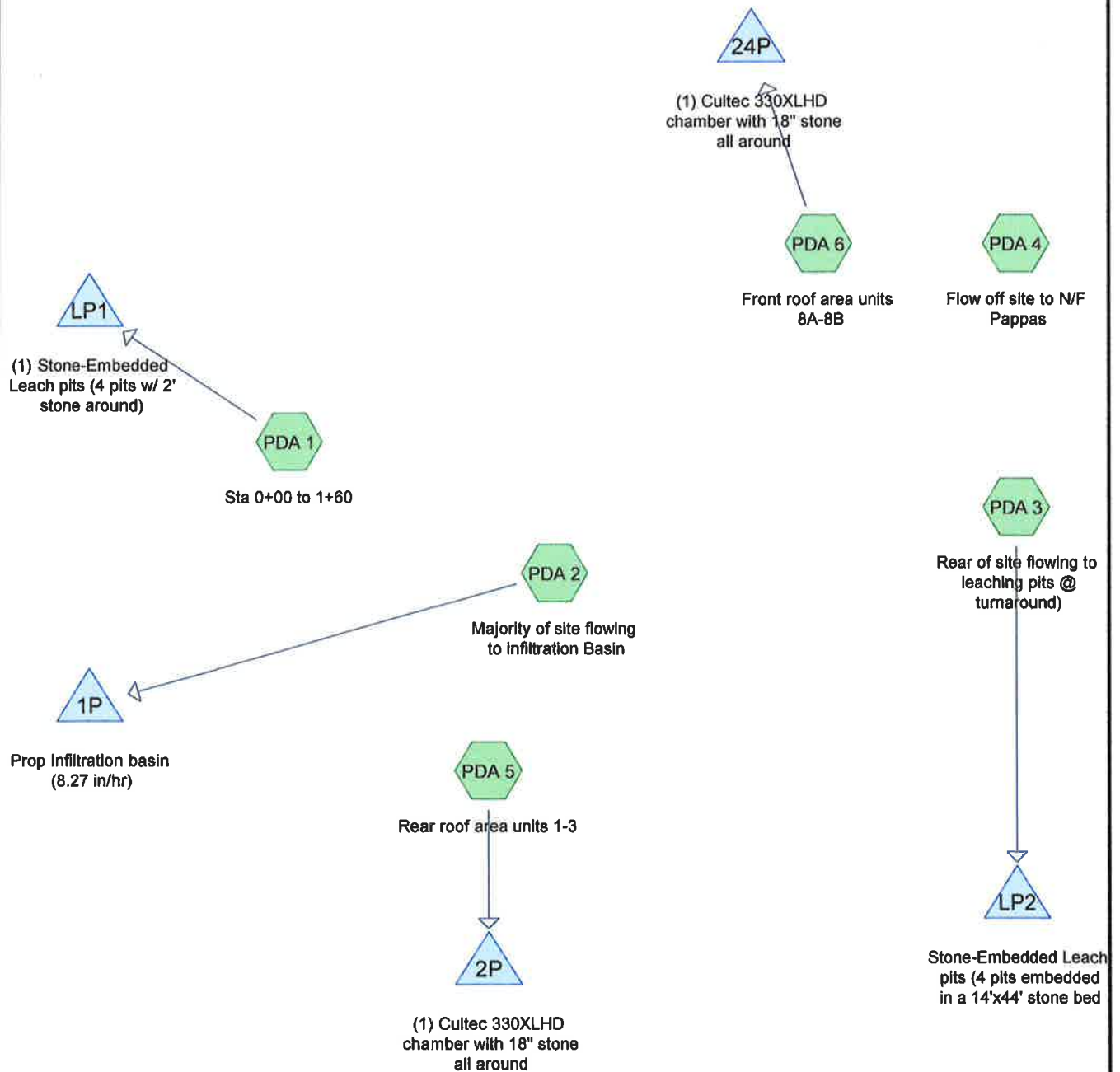
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Area (sf)	CN	Description
7,668	30	Woods, Good, HSG A
7,668		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Appendix D-2
Post-Development Hydrology Calculations (Standard #2)



Routing Diagram for HydroCAD - 4-7-21

Prepared by Microsoft, Printed 6/3/2021

HydroCAD® 10.10-5a s/n 01105 © 2020 HydroCAD Software Solutions LLC

Summary for Subcatchment PDA 1: Sta 0+00 to 1+60

Runoff = 0.16 cfs @ 12.10 hrs, Volume= 0.013 af, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.50"

Area (sf)	CN	Description
3,595	39	>75% Grass cover, Good, HSG A
3,824	98	Unconnected pavement, HSG A
236	30	Woods, Good, HSG A
7,655	68	Weighted Average
3,831		50.05% Pervious Area
3,824		49.95% Impervious Area
3,824		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PDA 2: Majority of site flowing to infiltration Basin

Runoff = 0.50 cfs @ 12.33 hrs, Volume= 0.098 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.50"

Area (sf)	CN	Description
* 8,891	98	driveways, HSG A
* 14,784	98	roof area, HSG A
* 22,522	98	road/ sidewalk, HSG A
109,247	39	>75% Grass cover, Good, HSG A
25,341	30	Woods, Good, HSG A
* 2,000	98	Unconnected roofs, HSG A (porches)
182,785	53	Weighted Average
134,588		73.63% Pervious Area
48,197		26.37% Impervious Area
2,000		4.15% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.1300	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.4	196	0.3000	8.82		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
6.0	246	Total			

Summary for Subcatchment PDA 3: Rear of site flowing to leaching pits @ turnaround)

Runoff = 0.14 cfs @ 12.16 hrs, Volume= 0.019 af, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.50"

	Area (sf)	CN	Description
*	1,843	98	driveways, HSG A
*	1,477	98	roof area, HSG A
*	4,308	98	road/ sidewalk, HSG A
	8,816	39	>75% Grass cover, Good, HSG A
	1,700	30	Woods, Good, HSG A
*	200	98	Unconnected roofs, HSG A Porches
	4,493	39	>75% Grass cover, Good, HSG A
	1,469	30	Woods, Good, HSG A
	24,306	57	Weighted Average
	16,478		67.79% Pervious Area
	7,828		32.21% Impervious Area
	200		2.55% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1000	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.3	105	0.1500	6.24		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	65	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
6.8	220	Total			

Summary for Subcatchment PDA 4: Flow off site to N/F Pappas

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.50"

	Area (sf)	CN	Description
	1,469	30	Woods, Good, HSG A
	4,493	39	>75% Grass cover, Good, HSG A
	5,962	37	Weighted Average
	5,962		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

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Type III 24-hr 2 Year Rainfall=3.50"

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Summary for Subcatchment PDA 5: Rear roof area units 1-3

Runoff = 0.12 cfs @ 12.09 hrs, Volume= 0.010 af, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.50"

	Area (sf)	CN	Description
*	1,536	98	roof area, HSG A
	1,536		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PDA 6: Front roof area units 8A-8B

Runoff = 0.05 cfs @ 12.09 hrs, Volume= 0.004 af, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.50"

	Area (sf)	CN	Description
*	720	98	roof area, HSG A
	720		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Pond 1P: Prop Infiltration basin (8.27 in/hr)

Inflow Area = 4.196 ac, 26.37% Impervious, Inflow Depth = 0.28" for 2 Year event
 Inflow = 0.50 cfs @ 12.33 hrs, Volume= 0.098 af
 Outflow = 0.17 cfs @ 13.48 hrs, Volume= 0.098 af, Atten= 65%, Lag= 69.1 min
 Discarded = 0.17 cfs @ 13.48 hrs, Volume= 0.098 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 47.85' @ 13.48 hrs Surf.Area= 902 sf Storage= 601 cf

Plug-Flow detention time= 33.6 min calculated for 0.098 af (100% of inflow)
 Center-of-Mass det. time= 33.5 min (987.0 - 953.5)

Volume	Invert	Avail.Storage	Storage Description
#1	47.00'	17,690 cf	Custom Stage Data (Irregular) Listed below (Recalc)

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Type III 24-hr 2 Year Rainfall=3.50"

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
47.00	528	142.0	0	0	528
48.00	979	163.0	742	742	1,060
49.00	1,478	183.0	1,220	1,962	1,637
50.00	2,026	203.0	1,745	3,707	2,281
51.00	2,621	223.0	2,317	6,024	2,992
52.00	3,266	243.0	2,938	8,961	3,769
53.00	4,452	283.0	3,844	12,805	5,464
54.00	5,330	302.0	4,884	17,690	6,396

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.00'	8.270 in/hr Exfiltration over Surface area
#2	Primary	53.00'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.17 cfs @ 13.48 hrs HW=47.85' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.00' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 2P: (1) Cultec 330XLHD chamber with 18" stone all around

Inflow Area = 0.035 ac, 100.00% Impervious, Inflow Depth = 3.27" for 2 Year event
 Inflow = 0.12 cfs @ 12.09 hrs, Volume= 0.010 af
 Outflow = 0.03 cfs @ 11.80 hrs, Volume= 0.010 af, Atten= 72%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.80 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 0.88' @ 12.43 hrs Surf.Area= 0.004 ac Storage= 0.002 af

Plug-Flow detention time= 10.7 min calculated for 0.010 af (100% of inflow)
 Center-of-Mass det. time= 10.7 min (765.2 - 754.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	0.002 af	7.33'W x 11.50'L x 3.54'H Field A 0.007 af Overall - 0.001 af Embedded = 0.005 af x 40.0% Voids
#2A	0.50'	0.001 af	Cultec R-330XLHD Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
		0.004 af	x 2.00 = 0.007 af Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.03 cfs @ 11.80 hrs HW=0.04' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Summary for Pond 24P: (1) Cultec 330XLHD chamber with 18" stone all around

Inflow Area = 0.017 ac, 100.00% Impervious, Inflow Depth = 3.27" for 2 Year event
 Inflow = 0.05 cfs @ 12.09 hrs, Volume= 0.004 af
 Outflow = 0.02 cfs @ 11.80 hrs, Volume= 0.004 af, Atten= 71%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.80 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 0.79' @ 12.41 hrs Surf.Area= 0.002 ac Storage= 0.001 af

Plug-Flow detention time= 9.2 min calculated for 0.004 af (100% of inflow)
 Center-of-Mass det. time= 9.2 min (763.8 - 754.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	0.002 af	7.33'W x 11.50'L x 3.54'H Field A 0.007 af Overall - 0.001 af Embedded = 0.005 af x 40.0% Voids
#2A	0.50'	0.001 af	Cultec R-330XLHD Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
			0.004 af Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.02 cfs @ 11.80 hrs HW=0.04' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.02 cfs)

Summary for Pond LP1: (1) Stone-Embedded Leach pits (4 pits w/ 2' stone around)

Inflow Area = 0.176 ac, 49.95% Impervious, Inflow Depth = 0.90" for 2 Year event
 Inflow = 0.16 cfs @ 12.10 hrs, Volume= 0.013 af
 Outflow = 0.06 cfs @ 12.05 hrs, Volume= 0.013 af, Atten= 63%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 12.05 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 44.62' @ 12.46 hrs Surf.Area= 0.007 ac Storage= 0.002 af

Plug-Flow detention time= 8.0 min calculated for 0.013 af (100% of inflow)
 Center-of-Mass det. time= 8.0 min (884.0 - 876.0)

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Type III 24-hr 2 Year Rainfall=3.50"

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Volume	Invert	Avail.Storage	Storage Description
#1	44.50'	0.016 af	6.00'D x 6.00'H Vertical Cone/Cylinder x 4 Inside #2 0.021 af Overall - 6.0" Wall Thickness = 0.016 af
#2	44.00'	0.012 af	10.00'D x 7.00'H Crushed Stone x 4 0.050 af Overall - 0.021 af Embedded = 0.029 af x 40.0% Voids
		0.027 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.06 cfs @ 12.05 hrs HW=44.13' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.06 cfs)**Summary for Pond LP2: Stone-Embedded Leach pits (4 pits embedded in a 14'x44' stone bed**

Inflow Area = 0.558 ac, 32.21% Impervious, Inflow Depth = 0.42" for 2 Year event
 Inflow = 0.14 cfs @ 12.16 hrs, Volume= 0.019 af
 Outflow = 0.12 cfs @ 12.20 hrs, Volume= 0.019 af, Atten= 15%, Lag= 2.2 min
 Discarded = 0.12 cfs @ 12.20 hrs, Volume= 0.019 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 113.59' @ 12.32 hrs Surf.Area= 0.014 ac Storage= 0.001 af

Plug-Flow detention time= 2.5 min calculated for 0.019 af (100% of inflow)

Center-of-Mass det. time= 2.5 min (928.5 - 926.0)

Volume	Invert	Avail.Storage	Storage Description
#1	114.00'	0.028 af	8.00'D x 6.00'H Vertical Cone/Cylinder x 4 Inside #2 0.035 af Overall - 6.0" Wall Thickness = 0.028 af
#2	113.50'	0.026 af	14.00'W x 44.00'L x 7.00'H Prismatoid 0.099 af Overall - 0.035 af Embedded = 0.064 af x 40.0% Voids
		0.053 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	113.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.12 cfs @ 12.20 hrs HW=113.58' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Summary for Subcatchment PDA 1: Sta 0+00 to 1+60

Runoff = 0.35 cfs @ 12.10 hrs, Volume= 0.026 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.85"

Area (sf)	CN	Description
3,595	39	>75% Grass cover, Good, HSG A
3,824	98	Unconnected pavement, HSG A
236	30	Woods, Good, HSG A
7,655	68	Weighted Average
3,831		50.05% Pervious Area
3,824		49.95% Impervious Area
3,824		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PDA 2: Majority of site flowing to infiltration Basin

Runoff = 2.76 cfs @ 12.12 hrs, Volume= 0.277 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.85"

Area (sf)	CN	Description
* 8,891	98	driveways, HSG A
* 14,784	98	roof area, HSG A
* 22,522	98	road/ sidewalk, HSG A
109,247	39	>75% Grass cover, Good, HSG A
25,341	30	Woods, Good, HSG A
* 2,000	98	Unconnected roofs, HSG A (porches)
182,785	53	Weighted Average
134,588		73.63% Pervious Area
48,197		26.37% Impervious Area
2,000		4.15% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.1300	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.4	196	0.3000	8.82		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
6.0	246	Total			

Summary for Subcatchment PDA 3: Rear of site flowing to leaching pits @ turnaround)

Runoff = 0.53 cfs @ 12.12 hrs, Volume= 0.048 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.85"

Area (sf)	CN	Description
* 1,843	98	driveways, HSG A
* 1,477	98	roof area, HSG A
* 4,308	98	road/ sidewalk, HSG A
8,816	39	>75% Grass cover, Good, HSG A
1,700	30	Woods, Good, HSG A
* 200	98	Unconnected roofs, HSG A Porches
4,493	39	>75% Grass cover, Good, HSG A
1,469	30	Woods, Good, HSG A
24,306	57	Weighted Average
16,478		67.79% Pervious Area
7,828		32.21% Impervious Area
200		2.55% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1000	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.3	105	0.1500	6.24		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	65	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
6.8	220	Total			

Summary for Subcatchment PDA 4: Flow off site to N/F Pappas

Runoff = 0.00 cfs @ 14.77 hrs, Volume= 0.001 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.85"

Area (sf)	CN	Description
1,469	30	Woods, Good, HSG A
4,493	39	>75% Grass cover, Good, HSG A
5,962	37	Weighted Average
5,962		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PDA 5: Rear roof area units 1-3

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af, Depth= 4.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.85"

	Area (sf)	CN	Description
*	1,536	98	roof area, HSG A
	1,536		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PDA 6: Front roof area units 8A-8B

Runoff = 0.08 cfs @ 12.09 hrs, Volume= 0.006 af, Depth= 4.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.85"

	Area (sf)	CN	Description
*	720	98	roof area, HSG A
	720		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Pond 1P: Prop Infiltration basin (8.27 in/hr)

Inflow Area = 4.196 ac, 26.37% Impervious, Inflow Depth = 0.79" for 10 Year event
Inflow = 2.76 cfs @ 12.12 hrs, Volume= 0.277 af
Outflow = 0.39 cfs @ 13.84 hrs, Volume= 0.277 af, Atten= 86%, Lag= 103.3 min
Discarded = 0.39 cfs @ 13.84 hrs, Volume= 0.277 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 50.03' @ 13.84 hrs Surf.Area= 2,041 sf Storage= 3,760 cf

Plug-Flow detention time= 120.2 min calculated for 0.277 af (100% of inflow)
Center-of-Mass det. time= 120.1 min (1,024.2 - 904.1)

Volume	Invert	Avail.Storage	Storage Description
#1	47.00'	17,690 cf	Custom Stage Data (Irregular) Listed below (Recalc)

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Type III 24-hr 10 Year Rainfall=4.85"

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
47.00	528	142.0	0	0	528
48.00	979	163.0	742	742	1,060
49.00	1,478	183.0	1,220	1,962	1,637
50.00	2,026	203.0	1,745	3,707	2,281
51.00	2,621	223.0	2,317	6,024	2,992
52.00	3,266	243.0	2,938	8,961	3,769
53.00	4,452	283.0	3,844	12,805	5,464
54.00	5,330	302.0	4,884	17,690	6,396

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.00'	8.270 in/hr Exfiltration over Surface area
#2	Primary	53.00'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.39 cfs @ 13.84 hrs HW=50.03' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.39 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.00' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 2P: (1) Cultec 330XLHD chamber with 18" stone all around

Inflow Area = 0.035 ac, 100.00% Impervious, Inflow Depth = 4.61" for 10 Year event
 Inflow = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af
 Outflow = 0.03 cfs @ 11.70 hrs, Volume= 0.014 af, Atten= 80%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.70 hrs, Volume= 0.014 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 1.47' @ 12.52 hrs Surf.Area= 0.004 ac Storage= 0.003 af

Plug-Flow detention time= 21.5 min calculated for 0.014 af (100% of inflow)

Center-of-Mass det. time= 21.5 min (770.0 - 748.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	0.002 af	7.33'W x 11.50'L x 3.54'H Field A 0.007 af Overall - 0.001 af Embedded = 0.005 af x 40.0% Voids
#2A	0.50'	0.001 af	Cultec R-330XLHD Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
		0.004 af	x 2.00 = 0.007 af Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.03 cfs @ 11.70 hrs HW=0.04' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Summary for Pond 24P: (1) Cultec 330XLHD chamber with 18" stone all around

Inflow Area = 0.017 ac, 100.00% Impervious, Inflow Depth = 4.61" for 10 Year event
 Inflow = 0.08 cfs @ 12.09 hrs, Volume= 0.006 af
 Outflow = 0.02 cfs @ 11.75 hrs, Volume= 0.006 af, Atten= 79%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.75 hrs, Volume= 0.006 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 1.33' @ 12.50 hrs Surf.Area= 0.002 ac Storage= 0.001 af

Plug-Flow detention time= 18.8 min calculated for 0.006 af (100% of inflow)
 Center-of-Mass det. time= 18.8 min (767.3 - 748.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	0.002 af	7.33'W x 11.50'L x 3.54'H Field A 0.007 af Overall - 0.001 af Embedded = 0.005 af x 40.0% Voids
#2A	0.50'	0.001 af	Cultec R-330XLHD Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
		0.004 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.02 cfs @ 11.75 hrs HW=0.05' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.02 cfs)

Summary for Pond LP1: (1) Stone-Embedded Leach pits (4 pits w/ 2' stone around)

Inflow Area = 0.176 ac, 49.95% Impervious, Inflow Depth = 1.77" for 10 Year event
 Inflow = 0.35 cfs @ 12.10 hrs, Volume= 0.026 af
 Outflow = 0.06 cfs @ 11.85 hrs, Volume= 0.026 af, Atten= 83%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 11.85 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 45.92' @ 12.63 hrs Surf.Area= 0.007 ac Storage= 0.007 af

Plug-Flow detention time= 36.8 min calculated for 0.026 af (100% of inflow)
 Center-of-Mass det. time= 36.7 min (891.3 - 854.6)

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Type III 24-hr 10 Year Rainfall=4.85"

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Volume	Invert	Avail.Storage	Storage Description
#1	44.50'	0.016 af	6.00'D x 6.00'H Vertical Cone/Cylinder x 4 Inside #2 0.021 af Overall - 6.0" Wall Thickness = 0.016 af
#2	44.00'	0.012 af	10.00'D x 7.00'H Crushed Stone x 4 0.050 af Overall - 0.021 af Embedded = 0.029 af x 40.0% Voids
		0.027 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.06 cfs @ 11.85 hrs HW=44.09' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.06 cfs)**Summary for Pond LP2: Stone-Embedded Leach pits (4 pits embedded in a 14'x44' stone bed**

Inflow Area = 0.558 ac, 32.21% Impervious, Inflow Depth = 1.03" for 10 Year event
 Inflow = 0.53 cfs @ 12.12 hrs, Volume= 0.048 af
 Outflow = 0.12 cfs @ 12.00 hrs, Volume= 0.048 af, Atten= 78%, Lag= 0.0 min
 Discarded = 0.12 cfs @ 12.00 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 114.99' @ 12.67 hrs Surf.Area= 0.014 ac Storage= 0.011 af

Plug-Flow detention time= 26.7 min calculated for 0.048 af (100% of inflow)
 Center-of-Mass det. time= 26.7 min (915.4 - 888.7)

Volume	Invert	Avail.Storage	Storage Description
#1	114.00'	0.028 af	8.00'D x 6.00'H Vertical Cone/Cylinder x 4 Inside #2 0.035 af Overall - 6.0" Wall Thickness = 0.028 af
#2	113.50'	0.026 af	14.00'W x 44.00'L x 7.00'H Prismaoid 0.099 af Overall - 0.035 af Embedded = 0.064 af x 40.0% Voids
		0.053 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	113.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.12 cfs @ 12.00 hrs HW=113.60' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Summary for Subcatchment PDA 1: Sta 0+00 to 1+60

Runoff = 0.70 cfs @ 12.09 hrs, Volume= 0.051 af, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

Area (sf)	CN	Description
3,595	39	>75% Grass cover, Good, HSG A
3,824	98	Unconnected pavement, HSG A
236	30	Woods, Good, HSG A
7,655	68	Weighted Average
3,831		50.05% Pervious Area
3,824		49.95% Impervious Area
3,824		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PDA 2: Majority of site flowing to infiltration Basin

Runoff = 8.88 cfs @ 12.10 hrs, Volume= 0.699 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

Area (sf)	CN	Description
* 8,891	98	driveways, HSG A
* 14,784	98	roof area, HSG A
* 22,522	98	road/ sidewalk, HSG A
109,247	39	>75% Grass cover, Good, HSG A
25,341	30	Woods, Good, HSG A
* 2,000	98	Unconnected roofs, HSG A (porches)
182,785	53	Weighted Average
134,588		73.63% Pervious Area
48,197		26.37% Impervious Area
2,000		4.15% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.1300	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.4	196	0.3000	8.82		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
6.0	246	Total			

Summary for Subcatchment PDA 3: Rear of site flowing to leaching pits @ turnaround)

Runoff = 1.43 cfs @ 12.11 hrs, Volume= 0.111 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

Area (sf)	CN	Description
* 1,843	98	driveways, HSG A
* 1,477	98	roof area, HSG A
* 4,308	98	road/ sidewalk, HSG A
8,816	39	>75% Grass cover, Good, HSG A
1,700	30	Woods, Good, HSG A
* 200	98	Unconnected roofs, HSG A Porches
4,493	39	>75% Grass cover, Good, HSG A
1,469	30	Woods, Good, HSG A
24,306	57	Weighted Average
16,478		67.79% Pervious Area
7,828		32.21% Impervious Area
200		2.55% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1000	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.3	105	0.1500	6.24		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	65	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
6.8	220	Total			

Summary for Subcatchment PDA 4: Flow off site to N/F Pappas

Runoff = 0.04 cfs @ 12.29 hrs, Volume= 0.008 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

Area (sf)	CN	Description
1,469	30	Woods, Good, HSG A
4,493	39	>75% Grass cover, Good, HSG A
5,962	37	Weighted Average
5,962		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PDA 5: Rear roof area units 1-3

Runoff = 0.24 cfs @ 12.09 hrs, Volume= 0.020 af, Depth= 6.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

Area (sf)	CN	Description
* 1,536	98	roof area, HSG A
1,536		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PDA 6: Front roof area units 8A-8B

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 6.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

Area (sf)	CN	Description
* 720	98	roof area, HSG A
720		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Pond 1P: Prop Infiltration basin (8.27 in/hr)

Inflow Area = 4.196 ac, 26.37% Impervious, Inflow Depth = 2.00" for 100 Year event
 Inflow = 8.88 cfs @ 12.10 hrs, Volume= 0.699 af
 Outflow = 0.85 cfs @ 13.86 hrs, Volume= 0.699 af, Atten= 90%, Lag= 105.4 min
 Discarded = 0.85 cfs @ 13.86 hrs, Volume= 0.699 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 52.99' @ 13.86 hrs Surf.Area= 4,433 sf Storage= 12,740 cf

Plug-Flow detention time= 210.7 min calculated for 0.698 af (100% of inflow)
 Center-of-Mass det. time= 210.8 min (1,081.4 - 870.7)

Volume	Invert	Avail.Storage	Storage Description
#1	47.00'	17,690 cf	Custom Stage Data (Irregular) Listed below (Recalc)

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Type III 24-hr 100 Year Rainfall=7.10"

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
47.00	528	142.0	0	0	528
48.00	979	163.0	742	742	1,060
49.00	1,478	183.0	1,220	1,962	1,637
50.00	2,026	203.0	1,745	3,707	2,281
51.00	2,621	223.0	2,317	6,024	2,992
52.00	3,266	243.0	2,938	8,961	3,769
53.00	4,452	283.0	3,844	12,805	5,464
54.00	5,330	302.0	4,884	17,690	6,396

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.00'	8.270 in/hr Exfiltration over Surface area
#2	Primary	53.00'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.85 cfs @ 13.86 hrs HW=52.99' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.85 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.00' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 2P: (1) Cultec 330XLHD chamber with 18" stone all around

Inflow Area = 0.035 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100 Year event
 Inflow = 0.24 cfs @ 12.09 hrs, Volume= 0.020 af
 Outflow = 0.03 cfs @ 11.65 hrs, Volume= 0.020 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.65 hrs, Volume= 0.020 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 2.64' @ 12.61 hrs Surf.Area= 0.004 ac Storage= 0.006 af

Plug-Flow detention time= 45.2 min calculated for 0.020 af (100% of inflow)
 Center-of-Mass det. time= 45.1 min (787.9 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	0.002 af	7.33'W x 11.50'L x 3.54'H Field A 0.007 af Overall - 0.001 af Embedded = 0.005 af x 40.0% Voids
#2A	0.50'	0.001 af	Cultec R-330XLHD Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
			0.004 af x 2.00 = 0.007 af Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.03 cfs @ 11.65 hrs HW=0.05' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Summary for Pond 24P: (1) Cultec 330XLHD chamber with 18" stone all around

Inflow Area = 0.017 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100 Year event
 Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
 Outflow = 0.02 cfs @ 11.65 hrs, Volume= 0.009 af, Atten= 86%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.65 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 2.39' @ 12.59 hrs Surf.Area= 0.002 ac Storage= 0.003 af

Plug-Flow detention time= 40.0 min calculated for 0.009 af (100% of inflow)
 Center-of-Mass det. time= 40.0 min (782.7 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	0.002 af	7.33'W x 11.50'L x 3.54'H Field A 0.007 af Overall - 0.001 af Embedded = 0.005 af x 40.0% Voids
#2A	0.50'	0.001 af	Cultec R-330XLHD Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
		0.004 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.02 cfs @ 11.65 hrs HW=0.05' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.02 cfs)

Summary for Pond LP1: (1) Stone-Embedded Leach pits (4 pits w/ 2' stone around)

Inflow Area = 0.176 ac, 49.95% Impervious, Inflow Depth = 3.49" for 100 Year event
 Inflow = 0.70 cfs @ 12.09 hrs, Volume= 0.051 af
 Outflow = 0.06 cfs @ 11.65 hrs, Volume= 0.051 af, Atten= 91%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 11.65 hrs, Volume= 0.051 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 49.15' @ 13.45 hrs Surf.Area= 0.007 ac Storage= 0.020 af

Plug-Flow detention time= 133.8 min calculated for 0.051 af (100% of inflow)
 Center-of-Mass det. time= 133.6 min (968.2 - 834.6)

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Type III 24-hr 100 Year Rainfall=7.10"

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Volume	Invert	Avail.Storage	Storage Description
#1	44.50'	0.016 af	6.00'D x 6.00'H Vertical Cone/Cylinder x 4 Inside #2 0.021 af Overall - 6.0" Wall Thickness = 0.016 af
#2	44.00'	0.012 af	10.00'D x 7.00'H Crushed Stone x 4 0.050 af Overall - 0.021 af Embedded = 0.029 af x 40.0% Voids
		0.027 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.06 cfs @ 11.65 hrs HW=44.08' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.06 cfs)

Summary for Pond LP2: Stone-Embedded Leach pits (4 pits embedded in a 14'x44' stone bed

Inflow Area = 0.558 ac, 32.21% Impervious, Inflow Depth = 2.38" for 100 Year event
 Inflow = 1.43 cfs @ 12.11 hrs, Volume= 0.111 af
 Outflow = 0.12 cfs @ 11.75 hrs, Volume= 0.111 af, Atten= 92%, Lag= 0.0 min
 Discarded = 0.12 cfs @ 11.75 hrs, Volume= 0.111 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 119.33' @ 14.07 hrs Surf.Area= 0.014 ac Storage= 0.045 af

Plug-Flow detention time= 167.3 min calculated for 0.110 af (100% of inflow)
 Center-of-Mass det. time= 167.0 min (1,027.8 - 860.8)

Volume	Invert	Avail.Storage	Storage Description
#1	114.00'	0.028 af	8.00'D x 6.00'H Vertical Cone/Cylinder x 4 Inside #2 0.035 af Overall - 6.0" Wall Thickness = 0.028 af
#2	113.50'	0.026 af	14.00'W x 44.00'L x 7.00'H Prismatic 0.099 af Overall - 0.035 af Embedded = 0.064 af x 40.0% Voids
		0.053 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	113.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.12 cfs @ 11.75 hrs HW=113.60' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.12 cfs)

Flow to infil. Basin @
24in/hr



Prop Infiltration basin
(24 in/hr)

Majority of site flowing
to infiltration Basin



Routing Diagram for Hydrocad - 4-7-21
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Summary for Subcatchment PDA2(C): Majority of site flowing to infiltration Basin

Runoff = 8.88 cfs @ 12.10 hrs, Volume= 0.699 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

	Area (sf)	CN	Description
*	8,891	98	driveways, HSG A
*	14,784	98	roof area, HSG A
*	22,522	98	road/ sidewalk, HSG A
	109,247	39	>75% Grass cover, Good, HSG A
	25,341	30	Woods, Good, HSG A
*	2,000	98	Unconnected roofs, HSG A (porches)
	182,785	53	Weighted Average
	134,588		73.63% Pervious Area
	48,197		26.37% Impervious Area
	2,000		4.15% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Pond 1P(C): Prop Infiltration basin (24 in/hr)

Inflow Area = 4.196 ac, 26.37% Impervious, Inflow Depth = 2.00" for 100 Year event
 Inflow = 8.88 cfs @ 12.10 hrs, Volume= 0.699 af
 Outflow = 1.81 cfs @ 12.61 hrs, Volume= 0.699 af, Atten= 80%, Lag= 30.3 min
 Discarded = 1.81 cfs @ 12.61 hrs, Volume= 0.699 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 52.00' @ 12.61 hrs Surf.Area= 3,264 sf Storage= 8,951 cf

Plug-Flow detention time= 50.4 min calculated for 0.698 af (100% of inflow)
 Center-of-Mass det. time= 50.3 min (921.0 - 870.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	47.00'	17,690 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
47.00	528	142.0	0	0	528
48.00	979	163.0	742	742	1,060
49.00	1,478	183.0	1,220	1,962	1,637
50.00	2,026	203.0	1,745	3,707	2,281
51.00	2,621	223.0	2,317	6,024	2,992
52.00	3,266	243.0	2,938	8,961	3,769
53.00	4,452	283.0	3,844	12,805	5,464
54.00	5,330	302.0	4,884	17,690	6,396

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.00'	24.000 in/hr Exfiltration over Surface area
#2	Primary	53.00'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=1.81 cfs @ 12.61 hrs HW=52.00' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 1.81 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.00' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Appendix E

Groundwater Recharge and Basin Drawdown Calculations (Standard #3)

DRAWDOWN WITHIN 72 HOURS

DRAWDOWN TIME = $(Rv)(1/IR)(12 \text{ inches/ 1 foot})(1/BA)$

WHERE,

Rv = RECHARGE VOLUME IN CUBIC FEET

IR = DESIGN INFILTRATION RATE IN INCHES PER HOUR

BA = BOTTOM AREA IN SQUARE FEET

INFILTRATION BASIN

$$\text{DRAWDOWN TIME} = 12,805 \times \frac{1}{8.27} \times \frac{12}{1} \times \frac{1}{528} = 35.19 \text{ Hours}$$

Leaching Pits @ entrance (cum. of 4)

$$\text{DRAWDOWN TIME} = 1,176 \times \frac{1}{8.27} \times \frac{12}{1} \times \frac{1}{378} = 4.51 \text{ Hours}$$

Leaching Pits @ Turnaround (cum. of 4)

$$\text{DRAWDOWN TIME} = 1,698 \times \frac{1}{8.27} \times \frac{12}{1} \times \frac{1}{504} = 4.89 \text{ Hours}$$



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JOB #: OE-3284
JOB NAME: 230 Sandwich Road
TOWN: Bourne

CALC BY: CJV **DATE:** 1/22/21
CHECK BY: J.A.P. **DATE:** 1/22/21

STANDARD 3: GROUNDWATER RECHARGE CALCULATIONS

Required Recharge Volume

$R_v = F \times \text{impervious area}$ (including green roofs & porous pavement)
where F = Target Depth Factor

Total Impervious Area* = 62,105 S.F. = 1.43 ACRES

	HSG A	HSG B	HSG C	HSG D
Impervious Area (sf)	62,105	0	0	0
Target Depth Factor (in.)	0.6	0.35	0.25	1
Annual Recharge Volume (cf)	3105	0	0	0

Total required volume to recharge = 3,105 c.f.

CAPTURE AREA ADJUSTMENT:

Total Site Impervious Area	=	1.43	ACRES		
Total Impervious Area Directed to Infiltration BMPs	=	1.43	ACRES		
Adjustment Ratio	=	1.43	/	1.43	= 1.00
Adjusted Required Recharge Volume	=	3,105	x	1.00	= 3,105 c.f.
	=	3,105	/	43,560	= 0.071 a.f.

SIMPLE DYNAMIC METHOD:

Recharge Provided through exfiltration In Infiltration Basin, Leaching Pits at entrance and Leaching Pits at turnaround @

1.29" rainfall event required to produce *adjusted* required recharge volume

*Storm start time of 11 hours and end time of 13 hours (see attached hydrograph and drain summary)

Required Storage Volume, assuming exfiltration rate of 8.27 in/hr = 1,500 cf

Volume provided in Infiltration Basin (below lowest outlet at 53.0):
 Cumulative Vol. at 53.00 = 12,805 c.f.

Volume provided in Leaching Pits @ entrance (cum. Of 4)
 Cumulative Vol. at 51.00 = 1,176 c.f.

Volume provided in Leaching Pits @ turnaround (cum. Of 4)
 Cumulative Vol. at 124.00 = 1,698 c.f.

STORAGE VOLUME PROVIDED

Infiltration BMP	TOTAL VOLUME (C.F.)	BOTTOM AREA (S.F.)
Infiltration basin	12,805	528
Leaching Pits at entrance (4)	1,176	378
Leaching Pits @ turnaround (4)	1,698	504
TOTAL	13,981	1,410



Impervious Area

Recharge Volume



Appendix E - Groundwater Recharge

Type III 24-hr Recharge Rainfall=1.29"

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Summary for Subcatchment S: Impervious Area

Runoff = 1.65 cfs @ 12.09 hrs, Volume= 0.071 af, Depth> 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 11.00-13.00 hrs, dt= 0.05 hrs
Type III 24-hr Recharge Rainfall=1.29"

	Area (sf)	CN	Description
*	62,105	98	Impervious
	62,105		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 Minimum

Summary for Pond P: Recharge Volume

Inflow Area = 1.426 ac, 100.00% Impervious, Inflow Depth > 0.60" for Recharge event
 Inflow = 1.65 cfs @ 12.09 hrs, Volume= 0.071 af
 Outflow = 0.29 cfs @ 11.75 hrs, Volume= 0.041 af, Atten= 83%, Lag= 0.0 min
 Discarded = 0.29 cfs @ 11.75 hrs, Volume= 0.041 af

Routing by Dyn-Stor-Ind method, Time Span= 11.00-13.00 hrs, dt= 0.05 hrs
 Peak Elev= 100.99' @ 12.55 hrs Surf.Area= 1,500 sf Storage= 1,478 cf

Plug-Flow detention time= 17.7 min calculated for 0.041 af (58% of inflow)
 Center-of-Mass det. time= 3.3 min (728.2 - 724.9)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	1,500 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	1,500	0	0
101.00	1,500	1,500	1,500

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.29 cfs @ 11.75 hrs HW=100.02' (Free Discharge)

↑ 1=Exfiltration (Exfiltration Controls 0.29 cfs)

Appendix F-1
Water Quality Volume Calculations (Standard #4)



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JOB NAME: 230 Sandwich Road
TOWN: Bourne

CALC BY: CJV
CHECK BY: JAP
DATE: 1/22/21
DATE: 1/22/21

STANDARD 4: WATER QUALITY

WATER QUALITY VOLUME:

$V(WQ) = D(WQ) \times (12 \text{ IN.} / \text{FT}) \times A(\text{IMP})$

WHERE,

$V(WQ)$ = REQUIRED WATER QUALITY TREATMENT VOLUME IN CUBIC FEET

$D(WQ)$ = WATER QUALITY DEPTH (0.5 INCH OR 1 INCH)

$A(\text{IMP})$ = IMPERVIOUS AREA IN S.F.

WATER QUALITY VOLUME AT INFILTRATION BASIN

CONTRIBUTING IMPERVIOUS AREA = 48,197 S.F.

$V(WQ) = 1 \text{ IN.} \times 1 \text{ FT} / 12 \text{ IN.} \times 48,197 \text{ S.F.} = 4,016 \text{ C.F.}$

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS

$(3.14 \times (2\text{ft})^2 \times 4\text{ft}) \times 10 \text{ CATCH BASINS} = 503 \text{ C.F.}$

VOLUME PROVIDED FROM SEDIMENT FOREBAY

(See Sediment Forebay Calculations) = 433 C.F.

VOLUME PROVIDED AT BASIN (BELOW LOWEST OUTLET)

(See Groundwater Recharge Calculations) = 12,805 C.F.

TOTAL = 13,741 C.F.

WATER QUALITY VOLUME AT LEACHING PITS #1

CONTRIBUTING IMPERVIOUS AREA = 3,824 S.F.

$V(WQ) = 1 \text{ IN.} \times 1 \text{ FT} / 12 \text{ IN.} \times 3,824 \text{ S.F.} = 319 \text{ C.F.}$

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS

$(3.14 \times (2\text{ft})^2 \times 4\text{ft}) \times 2 \text{ CATCH BASINS} = 101 \text{ C.F.}$

VOLUME PROVIDED FROM WATER QUALITY TANK= 110 ft³

(See Water Quality Tank Sizing Calcs) = 110 C.F.

VOLUME PROVIDED IN DRYWELLS (BELOW LOWEST OUTLET)

(See Groundwater Recharge Calculations) = 1,178 C.F.

TOTAL = 1,387 C.F.

WATER QUALITY VOLUME AT LEACHING PITS #2

CONTRIBUTING IMPERVIOUS AREA = 7,828 S.F.

$V(WQ) = 1 \text{ IN.} \times 1 \text{ FT} / 12 \text{ IN.} \times 7,828 \text{ S.F.} = 652 \text{ C.F.}$

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS

$(3.14 \times (2\text{ft})^2 \times 4\text{ft}) \times 2 \text{ CATCH BASINS} = 101 \text{ C.F.}$

VOLUME PROVIDED FROM WATER QUALITY TANK= 110 ft³

(See Water Quality Tank Sizing Calcs) = 110 C.F.

VOLUME PROVIDED IN DRYWELLS (BELOW LOWEST OUTLET)

(See Groundwater Recharge Calculations) = 1,698 C.F.

TOTAL = 1,909 C.F.

Appendix F-2
TSS Removal Calculations (Standard #4)



165 East Grove Street
Middleborough, MA 02346

Tel: 508-946-9231

www.outback-eng.com

Fax: 508-947-8873

JOB #: OE-3294
JOB NAME: 230 Sandwich Road
TOWN: Bourne

CALC BY: CJV DATE: 1/22/21
CHECK BY: JAP DATE: 1/22/21

PRETREATMENT TSS REMOVAL CALCULATIONS FOR INFILTRATION BASINS WITH RAPID INFILTRATION

INFILTRATION BASIN

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Sediment Forebay	25%	0.75	0.19	0.56
Total TSS Removal=			0.44	

LEACHING PITS @ ENTRANCE

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Water Quality tank	25%	0.75	0.19	0.56
Total TSS Removal=			0.44	

LEACHING PITS @ TURNAROUND

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Water Quality tank	25%	0.75	0.19	0.56
Total TSS Removal=			0.44	

TSS REMOVALS FOR EACH DISCHARGE

TREATMENT OF INFILTRATION BASIN

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Infiltration Basin (with Sediment Forebay)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	



165 East Grove Street
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Fax: 508-947-8873

JOB #: OE-3294
JOB NAME: 230 Sandwich Road
TOWN: Bourne

CALC BY: CJV DATE: 1/22/21
CHECK BY: JAP DATE: 1/22/21

TREATMENT OF LEACHING PITS @ ENTRANCE

<u>A</u> BMP	<u>B</u> TSS Removal Rate	<u>C</u> Starting TSS Load*	<u>D</u> Amount Removed (BXC)	<u>E</u> Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Leaching Chambers (with Pre-Treatment WQ tank)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	

TREATMENT OF LEACHING PITS @ TURNAROUND

<u>A</u> BMP	<u>B</u> TSS Removal Rate	<u>C</u> Starting TSS Load*	<u>D</u> Amount Removed (BXC)	<u>E</u> Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Leaching Chambers (with Pre-Treatment WQ tank)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	

Appendix F-3
Sediment Forebay Calculations (Standard #4)



165 East Grove Street
Middleborough, MA 02346

Tel: 508-946-9231

Fax: 508-947-8873

www.outback-eng.com

JOB #: OE-3294
JOB NAME: Sandwich Road
TOWN: Bourne

CALC BY:
CHECK BY:

K.A.D. DATE: 12/03/20
J.A.P. DATE: 12/03/20

SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #1

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 48,197 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = 0.1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 48,197 S.F.
= 402 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 50.50 AREA = 72 S.F.
FOREBAY BERM EL. = 52.50 AREA = 348 S.F.

VOLUME PROVIDED = 420 C.F.

Appendix F-4
Water Quality Inlet Calculations



165 East Grove Street
Middleborough, MA 02346

Tel: 508-946-9231

Fax: 508-947-8873

JOB #: OE-3294
JOB NAME: 230 Sandwich Road

CALC BY: CJV
CHECK BY: J.A.P.

DATE: 1/21/21
DATE: 1/21/21

WATER QUALITY INLET CALCULATIONS (Flow to Leaching pits @ entrance)

Contributing Impervious Area = 3,824 s.f.

$$\begin{aligned} \text{First Chamber (400 c.f. / contributing impervious acre)} \\ &= \frac{3,824 \text{ s.f.}}{43,560 \text{ s.f.}} \times \frac{1 \text{ Acre}}{1} = 0.09 \text{ Acres} \\ &= \frac{400 \text{ c.f.}}{\text{acre}} \times 0.09 \text{ Acres} = 35 \text{ c.f.} \\ &= \frac{7.48 \text{ gal}}{\text{c.f.}} \times 35 \text{ c.f.} = 263 \text{ Gallons (Min.)} \end{aligned}$$

Second Chamber
= 500 Gallons (Min.)

Third Chamber
= 500 Gallons (Min)

Use a 2000 Gallon Tank

WATER QUALITY INLET CALCULATIONS (Flow to Leaching pits @ Turnaround)

Contributing Impervious Area = 6,423 s.f.

$$\begin{aligned} \text{First Chamber (400 c.f. / contributing impervious acre)} \\ &= \frac{6,423 \text{ s.f.}}{43,560 \text{ s.f.}} \times \frac{1 \text{ Acre}}{1} = 0.15 \text{ Acres} \\ &= \frac{400 \text{ c.f.}}{\text{acre}} \times 0.15 \text{ Acres} = 59 \text{ c.f.} \\ &= \frac{7.48 \text{ gal}}{\text{c.f.}} \times 59 \text{ c.f.} = 441 \text{ Gallons (Min.)} \end{aligned}$$

Second Chamber
= 500 Gallons (Min.)

Third Chamber
= 500 Gallons (Min)

Use a 2000 Gallon Tank



165 East Grove Street
Middleborough, MA 02346

Tel: 508-946-9231

Fax: 508-947-8873

JOB #: OE-3294
JOB NAME: 230 Sandwich Road
TOWN: Bourne
Des. Storm: 2 year

CALC BY: CJV **DATE:** 1/21/21
CHECK BY: J.A.P. **DATE:** 1/21/21

WATER QUALITY TANK BYPASS CALCULATION

Per the Stormwater Management Regulations, water quality tanks must be designed offline, pass the 2-year 24-hour storm without interference, and must have a bypass for larger storms to prevent resuspension of solids. This calculation provides the required elevation difference between the two outlets in the required flow splitter drain manhole (highlighted in yellow). The bypass pipe must be set at this relative height above the outlet to the water quality tank. Also see detail for flow limiter on sheet C-8.4 of the Final Plans.

WATER QUALITY TANK 1

(DMH-1 acts as the flow splitter manhole for WQ Tank-1)

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.=0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	1	CB-1A	DMH-1	0.13	0.04	0.09	0.48	0.06	10	0.06	10.06	3.2	0.19
2	1	CB-1B	DMH-1	0.05	0.05	0.00	0.90	0.05	10	0.09	10.09	3.2	0.14
3	1	DMH-1	WQT-1	0.18	0.09	0.09	0.60	0.11	10	0.04	10.04	3.2	0.34

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.02	11	6.95	5.46	3.16	0.19	0.04	0.1	1.4	
2	12	0.012	0.02	16	6.95	5.46	2.87	0.14	0.03	0.1	1.2	
3	12	0.012	0.02	10	6.95	5.46	3.85	0.34	0.06	0.2	1.9	

WATER QUALITY TANK 2

(DMH-7 acts as the flow splitter manhole for WQ Tank-2)

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.=0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	1	CB-7A	DMH-7	0.30	0.12	0.18	0.53	0.16	10	0.07	10.07	3.2	0.51
2	1	CB-7B	DMH-7	0.13	0.07	0.06	0.61	0.08	10	0.09	10.09	3.2	0.24
3	1	DMH-7	WQT-2	0.42	0.18	0.24	0.56	0.23	10	0.09	10.09	3.2	0.75

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.02	19	6.95	5.46	4.44	0.51	0.09	0.2	2.4	
2	12	0.012	0.02	18	6.95	5.46	3.44	0.24	0.04	0.1	1.6	
3	12	0.012	0.02	26	6.95	5.46	5.04	0.75	0.14	0.3	3.0	

PIPE CHARACTERISTICS

	Vel	Q	n	DIA	DIA FT	A	Pw	R
1	49.1	38.6	0.012	12	1	0.785	3.1416	0.25
2	49.1	38.6	0.012	12	1	0.785	3.1416	0.25
3	49.1	38.6	0.012	12	1	0.785	3.1416	0.25

	Vel	Q	n	DIA	DIA FT	A	Pw	R
1	49.1	38.6	0.012	12	1	0.785	3.1416	0.25
2	49.1	38.6	0.012	12	1	0.785	3.1416	0.25
3	49.1	38.6	0.012	12	1	0.785	3.1416	0.25

Appendix G
Illicit Discharge Statement (Standard #10)

The project does not have any illicit discharges to any of the stormwater management facilities as shown on the Final Plans.

James A. Pavlik, P.E.
Project Manager

Appendix H

Pipe Calculations

Tel: 508-946-9231

Fax: 508-947-8873

JOB #: OE-3294
JOB NAME: 230 Sandwich Road
TOWN: Bourne
Des. Storm: 25 year

CALC BY: C.J.V **DATE:** 1/25/21
CHECK BY: J.A.P. **DATE:** 1/25/21

PIPE CAPACITY CALCULATIONS**MIN VELOCITY:** 2 ft./sec.**MAX VELOCITY:** 10 ft./sec.**PIPE NETWORK TO INFILTRATION BASIN**

LENGTH #	PIPE DESCRIPTION			DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CAI (cfs)
	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	1	CB-6A	DMH-6	0.47	0.10	0.38	0.42	0.20	10	0.04	10.04	5	0.99
2	1	CB-6B	DMH-6	0.35	0.16	0.19	0.57	0.20	10	0.05	10.05	5	1.00
3	1	DMH-6	DMH-5A	0.82	0.25	0.57	0.49	0.40	10	0.42	10.42	5	1.99
4	1	DMH-5A	DMH-5	0.82	0.25	0.57	0.49	0.40	10	0.08	10.08	5	1.99
5	1	CB-5A	DMH-5	0.38	0.13	0.25	0.51	0.19	10	0.04	10.04	5	0.97
6	1	CB-5B	DMH-5	0.54	0.11	0.43	0.42	0.22	10	0.05	10.05	5	1.12
7	1	DMH-5	DMH-4A	1.74	0.49	1.25	0.47	0.82	10	0.10	10.10	5	4.08
8	1	DMH-4A	DMH-4	1.74	0.49	1.25	0.47	0.82	10	0.17	10.17	5	4.08
9	1	CB-4A	DMH-4	0.13	0.05	0.08	0.52	0.07	10	0.17	10.17	5	0.34
10	1	CB-4B	DMH-4	0.33	0.12	0.21	0.51	0.17	10	0.04	10.04	5	0.84
11	1	DMH-4	DMH-3A	2.20	0.66	1.54	0.48	1.05	10	0.05	10.05	5	5.26
12	1	DMH-3A	DMH-3	2.20	0.66	1.54	0.48	1.05	10	0.13	10.13	5	5.26
13	1	CB-3A	DMH-3	0.14	0.04	0.10	0.46	0.07	10	0.14	10.14	5	0.33
14	1	CB-3B	DMH-3	0.43	0.14	0.29	0.49	0.21	10	0.05	10.05	5	1.05
15	1	DMH-3	DMH-2A	2.76	0.83	1.93	0.48	1.33	10	0.05	10.05	5	6.64
16	1	DMH-2A	DMH-2	2.76	0.83	1.93	0.48	1.33	10	0.14	10.14	5	6.64
17	1	CB-2A	DMH-2	0.13	0.04	0.09	0.48	0.06	10	0.13	10.13	5	0.30
18	1	CB-2B	DMH-2	0.47	0.09	0.38	0.41	0.19	10	0.05	10.05	5	0.96
19	1	DMH-2	FE	3.36	0.96	2.40	0.47	1.58	10	0.05	10.05	5	7.90

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft.)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in.)	
1	12	0.012	0.02	12	6.95	5.46	5.46	0.99	0.18	0.3	3.5	OK!
2	12	0.012	0.02	16	6.95	5.46	5.46	1.00	0.18	0.3	3.5	OK!
3	12	0.012	0.0288	189	8.34	6.55	7.48	1.99	0.30	0.4	4.4	OK!
4	12	0.012	0.0375	39	9.52	7.47	8.25	1.99	0.27	0.3	4.2	OK!
5	12	0.012	0.0141	12	5.84	4.58	4.77	0.97	0.21	0.3	3.7	OK!
6	12	0.012	0.0163	16	6.27	4.93	5.23	1.12	0.23	0.3	3.9	OK!
7	12	0.012	0.0287	53	8.33	6.54	9.01	4.08	0.62	0.6	6.8	OK!
8	12	0.012	0.03	93	8.51	6.69	9.16	4.08	0.61	0.6	6.7	OK!
9	12	0.012	0.0206	10	7.05	5.54	3.91	0.34	0.06	0.2	1.9	OK!
10	12	0.012	0.0195	14	6.86	5.39	5.16	0.84	0.16	0.3	3.2	OK!
11	12	0.012	0.029	72	8.37	6.57	9.50	5.26	0.80	0.7	7.9	OK!
12	12	0.012	0.029	79	8.37	6.57	9.50	5.26	0.80	0.7	7.9	OK!
13	12	0.012	0.02	12	6.95	5.46	3.81	0.33	0.06	0.2	1.9	OK!
14	12	0.012	0.02	16	6.95	5.46	5.54	1.05	0.19	0.3	3.6	OK!
15	18	0.012	0.022	76	9.55	16.88	9.16	6.64	0.39	0.4	7.6	OK!
16	18	0.012	0.023	74	9.77	17.26	9.31	6.64	0.38	0.4	7.5	OK!
17	12	0.012	0.0205	12	7.04	5.53	3.75	0.30	0.06	0.2	1.8	OK!
18	12	0.012	0.0196	15	6.88	5.40	5.37	0.96	0.18	0.3	3.4	OK!
19	18	0.012	0.023	47	9.77	17.26	9.76	7.90	0.46	0.5	8.3	OK!

NOTE: Refer to Appendix F-4 for pipe calcs associated with CB's 1A,1B, 7A, and 7B.

Appendix I

Gutter Flow Calculations

The following calculations were prepared in accordance with Bourne Subdivision Regulations section 352.A.4 and 352.A.5 (Road Drainage) and in response to comment 22 from the December 11, 2020 comment letter from Drew Hoyt.

Gutter Flow calculation methodology

The equation below was used to calculate the top width of flow into the travel lane

$$T = \frac{(1.79Qn)^{3/8}}{S_x^{5/8}S^{3/16}}$$

Where Q= Flow rate in gutter (ft³/s)

N=manning's n

S_x= road cross slope, ft/ft

S= Longitudinal (Direction of flow) slope, ft/ft

T- Spread, top width flow (ft)

From this calculation the height of flow was calculated knowing the roadway cross slope and using simple triangle formulas. With the width and height of flow now known the velocity (ft/s) was calculated using the simply formula of V=Q/A, where A=cross sectional area of flow over catch basins.



165 East Grove Street
Middleborough, MA 02346

Tel: 508-946-9231

Fax: 508-947-8873

JOB #: OE-3294
JOB NAME: 230 Sandwich Road
TOWN: Bourne

CALC BY: C.J.V **DATE:** 1/25/21
CHECK BY: J.A.P. **DATE:** 1/25/21

GUTTER FLOW CALCULATIONS

GUTTER FLOW CALCS					
Flow to	Q (cfs)*	Impedence into roadway (feet)	height of flow (ft)	Velocity (ft/s)	Velocity check (See Note)
CB-6A	0.99	5.42	0.11	3.38	OK
CB-6B	1.00	5.42	0.11	3.39	OK
CB-5A	0.97	5.36	0.11	3.36	OK
CB-5B	1.12	5.36	0.11	3.90	OK
CB-4A	0.34	2.80	0.06	4.36	OK
CB-4B	0.84	3.93	0.08	5.46	OK
CB-3A	0.33	2.75	0.06	4.31	OK
CB-3B	1.05	4.27	0.09	5.77	OK
CB-2A	0.30	2.68	0.05	4.23	OK
CB-2B	0.96	4.13	0.08	5.64	OK

*Flow rates taken from Pipe calcs from Appendix H

Note: Per Bourne Subdivision Regulations Section 362.A.6, water velocities shall be between 2 and 10 ft/s in pipes and gutters

Appendix J
Long-Term Stormwater Operation & Maintenance Plan and Pollution Prevention Plan
(Standards #4 & #9)

**Long-Term
Stormwater Operation & Maintenance Plan
&
Pollution Prevention Plan**

***Chase Estates
Bourne, Massachusetts***

May 18, 2021

Prepared for:
Chase Developers Inc.
14 Bosuns Lane
Bourne, Massachusetts

Prepared by:



**165 East Grove Street
Middleborough, MA 02346**

Tel # 508-946-9231

www.outback-eng.com

Fax # 508-947-8873

**Long-Term Stormwater Operation & Maintenance Plan & Pollution Prevention Plan
Chase Estates
Bourne, Massachusetts**

Sections

- 1.0** Introduction & Responsible Parties
- 2.0** Operation & Maintenance Schedule – Stormwater System
 - 2.1** O&M for Roadway Infrastructure
 - 2.2** O&M for Infiltration Basin & Leaching Pits #1 and #2
- 3.0** Post-Development Operation & Maintenance Budget
- 4.0** Pollution Prevention Plan w/ Snow Management

Appendices

- A** Operation and Maintenance Log Forms
- B** Stormwater Infrastructure Plans

Section 1.0: Introduction & Responsible Parties

This operation and maintenance plan has been prepared for the Chase Estates subdivision in compliance with the Massachusetts Department of Environmental Protection (DEP) Stormwater Management Regulations, Standards #4 and #9, to ensure long-term functioning of the drainage systems, and to provide suitable practices for source control and pollution prevention, including a snow management program. Chase Estates is a proposed 18-lot, residential subdivision permitted under a Comprehensive Permit per MGL Ch. 40B. The project was previously permitted as a 16-unit condominium, and is being modified as a 12 lot subdivision with a 1167-ft. long road. The road is proposed as 20-ft. wide with Cape Cod berms and a 4' sidewalk on one side, with town water, gas, underground cable utilities, and individual onsite Title 5 septic systems.

This O&M plan identifies the responsible party to perform maintenance tasks on the stormwater systems after construction is completed, as was intended per the design and as required by the Comprehensive Permit; good housekeeping practices are also outlined to prevent pollution and degradation of the environment. Initially, all maintenance tasks on the roadway and common areas will be undertaken by the HOA to be established by the developer as homes are built and sold, except the individual homeowners and/or condominium associations shall be responsible for maintaining their roof drains and individual lots as outlined herein. When the road is accepted by the town of Bourne, then maintenance tasks for the roadway only shall be transferred to the town, whereas the infiltration basin and leaching drywells shall continue to be maintained by the HOA and/or condominium associations.

Developer/Owner: 230 Sandwich Road Realty Trust
14 Bosuns Lane
Bourne, Massachusetts

Responsible Party for maintenance of stormwater infrastructure within the roadway layout:
HOA, or Town of Bourne if road is accepted and deeded to town.

Section 2.0: Operation & Maintenance Schedule - Stormwater System

The Chase Estates drainage systems for the site are generally shown on the “Stormwater Infrastructure Plan” (see attached); also reference the approved Final Plans showing the subdivision and the Drainage Report for detailed information on the overall site design and stormwater management system description and calculations.

2.1 O&M for Roadway Infrastructure

The drainage system is generally shown on the “Stormwater Infrastructure Plan” (see Appendix B). For additional details for the individual system components and a description of the drainage system, refer to the approved subdivision plans and drainage report. Once construction is completed, the following tasks shall be the responsibility of the Homeowners Association until the town accepts the roadway and receives a deed (refer to O&M Log Form in Appendix A). It is anticipated that the town will be responsible for all roadway infrastructure within the road layout, and including the pipes draining to the infiltration basin and Leaching Pit #1 at sta 0+80 and Leaching Pit #2 at sta 11+00, while the HOA will be responsible for the sediment forebay.

1. Inspect or clean catch basins quarterly, and at the end of the foliage (Autumn) and snow removal (Spring) seasons. Sediments must be removed four times per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the basin. Cleaning may be done by either clamshell bucket or vacuum truck. All sediment and hydrocarbons should be properly handled and disposed of in accordance with local, state, and federal guidelines and regulations.
2. Inspect the water quality tanks, tanks with 3 chambers at roadway station 0+55 and 10+95, after every major storm for the first year, and clean at least two times per year thereafter. Cleaning includes removing grease and oil floating on top of the water, as well as sediment that settles at the bottom of the tank, using a vacuum truck or other catch basin cleaning device. This tank is designed to prevent sediment from entering into the underground leaching chamber system and causing the chamber bed to clog, as well as preventing oil/grease from entering and causing pollution of soil and groundwater.

2.2 O&M for Infiltration Basin & Leaching Pits #1 and #2

The off-road drainage systems for this project are generally shown on the “Stormwater Infrastructure Plan” (see Appendix B). Where the catch basins and other pipes within the road layout and leading into the infiltration structure will be maintained potentially by the town upon acceptance according to Section 2.1, the following tasks shall be the sole responsibility of the Homeowners Association (refer to O&M Log Form in Appendix A).

1. An underground stone-embedded drywell system (leach pit #1) north side of road at station 0+80. This stone-embedded drywell receives stormwater runoff from the entrance roadway, with its catch basins and water quality tank piped to it. It is designed to infiltrate the stormwater runoff, and dry out in 72 hours following a rain event.

Maintenance: Leach pit #1 shall be inspected after every major storm during the first few months after construction to ensure proper stabilization and function. Thereafter, inspections are required once yearly. The water depth should be measured in the observation well at 24

and 48 hours after a storm. The clearance rate can be calculated based on the drop in depth divided by the elapsed time. If the clearance rate has been significantly reduced, or if water is found to be ponding within the chamber bed for much longer than 72 hours, repair or replacement may be necessary. The exterior of the stone bed can be checked by excavating a section and replacing stone with filter fabric as needed. The overflow pipe and its outlet rip rap should also be inspected yearly to check for scour; the overflow will only be required in the event of extremely large storm events or multiple storms that occur back to back in a short time period of 2 or 3 days. Maintenance of the water quality tank (see Section 2.1, #2) is important to keep sediment from entering the chamber bed and clogging the system.

2. An underground stone-embedded drywell system (leach pit #2) under pavement at emergency turnaround at sta 11+00. This stone-embedded drywell receives stormwater runoff from sta 10+48 to 11+85, with its catch basins and water quality tank piped to it. It is designed to infiltrate the stormwater runoff, and dry out in 72 hours following a rain event.

Maintenance: Leach pit #2 shall be inspected after every major storm during the first few months after construction to ensure proper stabilization and function. Thereafter, inspections are required once yearly. The water depth should be measured in the observation well at 24 and 48 hours after a storm. The clearance rate can be calculated based on the drop in depth divided by the elapsed time. If the clearance rate has been significantly reduced, or if water is found to be ponding within the chamber bed for much longer than 72 hours, repair or replacement may be necessary. The exterior of the stone bed can be checked by excavating a section and replacing stone with filter fabric as needed. The overflow pipe and its outlet rip rap should also be inspected yearly to check for scour; the overflow will only be required in the event of extremely large storm events or multiple storms that occur back to back in a short time period of 2 or 3 days. Maintenance of the water quality tank (see Section 2.1, #2) is important to keep sediment from entering the chamber bed and clogging the system.

3. The infiltration basin receives stormwater runoff from the roadway and the catch basins that are piped to them. The infiltration basin is designed to fully capture and recharge the 100-year storm through the underlying soils at the bottom of the basin. The basin will have a sediment forebay that require maintenance, and emergency overflow structures that should rarely if ever require maintenance except in the event of the basin clogging/failure that may lead to runoff spilling out and causing erosion.

Maintenance: The infiltration basin should be inspected after every major storm for the first three months after construction and twice per year thereafter. If the infiltration rate has been significantly reduced such that standing water persists for more than 3 days, the infiltrative capacity of the soil should be restored by scarifying the bottom of the basin, or removing and replacing the bottom soil layer with fresh loam/sand mix and reseeding as necessary.

Mow the buffer area, side slopes, and bottom area twice per year. Remove grass clippings and accumulated organic matter.

Inspect sediment forebay after every major storm during the first few months after construction to ensure proper stabilization and function. Cleaning of sediments should take place four times per year thereafter. After cleaning, damaged vegetation should be restored using loam as necessary and reseeding or using sod.

Inspect and clean basin emergency overflow outlet structures and rip rap aprons at least twice per year. Check for scour and repair eroded areas immediately upon discovery with additional riprap and/or loam and seed as necessary.

Section 3.0: Post-development Operation and Maintenance Budget

The following is an estimated annual budget for Operation & Maintenance of the different drainage systems (in parentheses is the responsible party):

- Catch Basin cleaning: 14 catch basins x 4 times per year @ \$50 each = \$2800 (HOA or town upon acceptance).
- Sediment Forebay cleaning: 1 forebays x 4 times per year @ \$50 each = \$200 (HOA).
- Water Quality Inlet tank cleaning: 2 tanks x 2 time per year @ \$100 each = \$400 (HOA or town upon acceptance).
- Stone-Embedded Drywells: 8 structures x 2 times per year x \$50 each = \$800 (HOA).
- Infiltration Basin cleaning and mowing: 1 basin x 2 times per year @ \$60 each = \$120(HOA).

Total Estimated Annual Stormwater System O&M Budget: \$4,320

Section 4.0: Pollution Prevention Plan w/ Snow Management

1. **Good housekeeping measures** shall be used in the day-to-day operation of the development site. This includes keeping the homesites and bus shelter/mail station area in a neat and orderly state, limiting use of fertilizers and pesticides, and using professional companies to maintain common areas and to dispose of waste materials.

2. **Snow Management Guidelines:**

General:

Calcium chloride and/or sand should be used sparingly for deicing purposes. During and following snowstorms, snow shall be plowed from the paved roadway, sidewalk. The homeowners association shall have snow plowed from driveways and visitor parking by its contractor(s). Once accepted and deeded to the town, the town's DPW will be responsible for plowing the roadway and sidewalk only; private driveways, and visitor parking areas shall continue to be plowed by the homeowners association contractor. Snow plow trucks will perform this snow removal by furrowing snow along the edges of the road and driveways. It is anticipated that most smaller snowstorms will not generate enough snow requiring removal. In the event of an extremely large snowfall, heavy equipment, such as front end loaders, may be required to remove snow from the roadway; this snow may be

disposed in the areas shown on the Stormwater Infrastructure Plan. These potentially larger snowfalls that result in large accumulations across the site shall be disposed per the guidelines below.

Site Selection:

The snow stockpile areas shall be utilized (or snow may be trucked offsite by contractors). These onsite areas were selected because of their location on pervious surfaces in upland areas away from wetlands. Note: snow will be compacted and reduced in volume when stockpiled.

The following areas must be avoided for snow disposal (refer to Stormwater Infrastructure Plan for signage associated with prohibited dumping areas):

*Avoid dumping of snow in infiltration basin or leaching pits. Snow combined with sand and debris may block a storm drainage system, causing localized flooding. A high volume of sand, sediment, and litter released from melting snow also may be quickly transported through the system into surface water.

Site Preparation and Maintenance:

The following maintenance measures should be undertaken for the snow disposal site:

- * Snow disposal sites are to be in areas with stabilized groundcover such as lawn or mulched areas.
- * A siltfence should be placed securely on the downgradient side of the snow disposal site.
- * Debris should be cleared from the site prior to using the site for snow disposal each winter season.
- * At the end of the snow season, debris and accumulated sediment should be cleared from the site and properly disposed of no later than May 15.

3. Mosquito Control Guidelines:

The stormwater basins do not rely on a standing pool of water, and are designed to dewater within 72 hours after precipitation. If evidence of mosquitos is found in any of the sediment forebays and/or basins, larvicide (i.e. Bacillus sphaericus (Bs)) may be applied by a licensed pesticide applicator in compliance with all pesticide label requirements (Bs is to be hand-broadcast).

4. Pet Waste Management:

Pet waste management involves using a combination of pet waste collection programs, pet awareness and education, to alert residents to the proper disposal techniques for pet droppings. The homeowners association and condominium associations will establish rules requiring individual home owners to properly collect and dispose of pet waste.

5. Spill Prevention: The homeowners association shall be aware of, educate home owners, and enforce the following spill prevention measures:

Good Housekeeping

The following good housekeeping practices will be followed by individual homeowners:

- An effort will be made to store only enough product required to do the job.
- All materials stored on-site will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other structure.

- Products will be kept in their original containers with the original manufacturer's label.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used up before disposing of the container.
- Manufacturer's recommendations for proper use and disposal will be followed.

Hazardous Products

These practices are used to reduce the risks associated with hazardous materials:

- Exterior storage of deicing chemicals, fertilizers, herbicides, pesticides, or other hazardous materials shall be prohibited.
- Products will be kept in original containers unless they are not resealable.
- Original labels and material safety data will be retained.
- If surplus product must be disposed of, manufacturer's or local/State recommended methods will be followed.

Petroleum Products

All vehicles should be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Small quantities of petroleum products for individual homeowners use may be stored in tightly sealed containers which are clearly labeled.

Pesticides, Herbicides, Fungicides and Fertilizers

Pesticides, fungicides and herbicides shall be used sparingly or not at all within jurisdictional areas. Regular use of fertilizers within jurisdictional areas is also not recommended by the Conservation Commission. If used, fertilizers will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. Storage will be in a covered enclosure. The contents of any partially used bags will be transferred to a sealable plastic bin to avoid spills.

Paints

All containers will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm sewer system but will be properly disposed of according to manufacturers' instructions or State and local regulations.

Spill Control Practices

In addition to the management practices listed above the following practices will be followed for spill prevention and cleanup:

- Manufacturers' recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area on-site. Equipment and materials will include but not be limited to brooms, dustpans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate State or local government agency, protective clothing, regardless of the size.

- The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included.

Accidental Spill and Emergency Response Plan

In the event of an accident within the boundaries of the site, where significant gasoline or other petroleum products or other hazardous materials are released, the following procedure shall be followed in the order noted.

- As quickly as possible, attempt to block the nearest stormwater catch basins if on a roadway, or if in proximity to wetlands, create a berm of soil downslope of the spill.
- Immediately, and while the containment measures are implemented as described above, notify the following government entities and inform them of the type of spill that occurred:
 - Bourne Fire Department at 911 (emergencies). Regular business calls: 508-759-4412
 - Bourne Board of Health at 508-759-0615
 - Bourne Conservation Commission at 508-759-0615
 - Mass. Department of Environmental Protection (DEP) Central Region at 508-792-7650
 - National Response Center (NRC) at 800-424-8802 (for spills that require such notification pursuant to 40 CFR Part 110, 40 CFR Part 117, and 40 CFR Part 302)
- Once the various emergency response teams have arrived at the site and if the spill occurs on a lot, the owner shall follow the instructions of the various government entities, which may include the following:
 - A clean up firm may need to be immediately contacted.
 - If the hazardous materials have entered the stormwater system, portions of it may need to be cleaned and restored per the DEP.

Appendix A
Long-Term Stormwater Operation & Maintenance Log Forms

Stormwater Operation & Maintenance Log Form
Chase Estates- Roadway
Page 1 of 1

PRETREATMENT STRUCTURAL CONTROLS

CONTROL	DATE INSPECTED	SEDIMENT BUILDUP (YES/NO)	IF SEDIMENT BUILDUP, DATE CLEANED
CB-1A			
CB-1B			
Water Quality Tank #1			
Water Quality Tank #2			
CB-2A			
CB-2B			
CB-3A			
CB-3B			
CB-4A			
CB-4B			
CB-5A			
CB-5B			
CB-6A			
CB-6B			
CB-7A			
CB-7B			

Note: Sediment to be removed from catch basins & Water Quality Inlet tanks when depth reaches 24". Water Quality Inlet tanks and the other three compartments in the WQT are to be inspected and cleaned annually.

REQUIRED MAINTENANCE NOTES:

TO BE PERFORMED BY: _____ ON OR BEFORE: _____

NOTE: This log form to be used by HOA, until roadway is accepted by town of Bourne.

Stormwater Operation & Maintenance Log Form
Chase Estates– Infiltration Basin, Leaching Drywells
Page 1 of 1

SEDIMENT/PRETREATMENT STRUCTURAL CONTROLS

CONTROL	DATE INSPECTED	SEDIMENT BUILDUP (YES/NO)	STATEMENT OF GENERAL CONDITION, REQUIRED MAINT., DATE OF SEDIMENT REMOVAL
Sed. Forebay to Infil. Basin			

RUNOFF STRUCTURAL CONTROLS

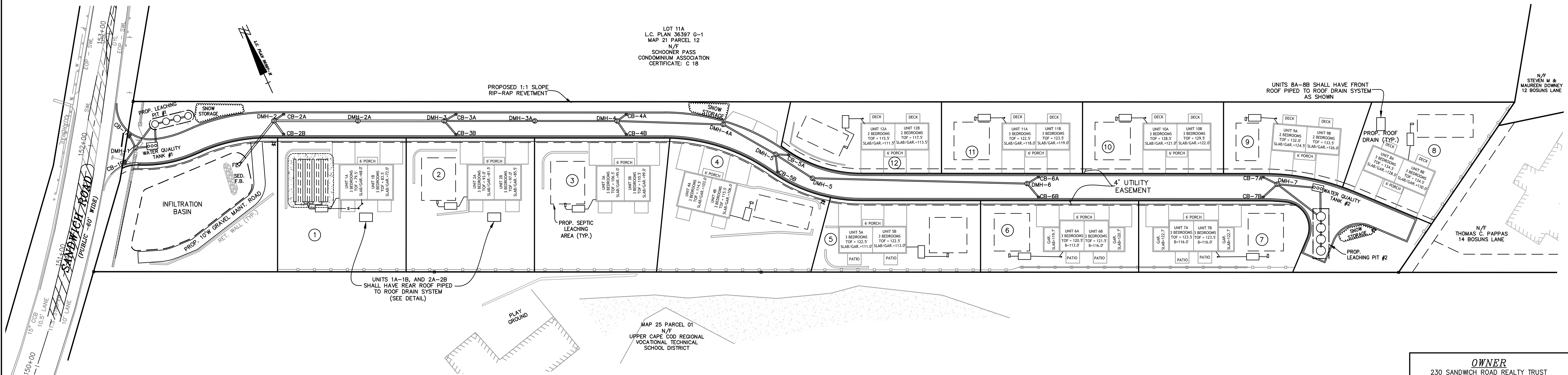
CONTROL	DATE INSPECTED	STATEMENT OF GENERAL CONDITION & REQUIRED MAINTENANCE IF ANY
Infiltration Basin		
Leach Pits #1 @ sta 0+80		
Leach Pits #2 @ sta 11+00		

REQUIRED MAINTENANCE:

TO BE PERFORMED BY: _____ ON OR
BEFORE: _____

NOTE: This log form to be used by HOA.

Appendix B
Stormwater Infrastructure Plans



OWNER
230 SANDWICH ROAD REALTY TRUST
14 BOSUNS LANE
BOURNE MA

**STORMWATER
INFRASTRUCTURE PLAN
"CHASE ESTATES"
SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS**

**Outback
Engineering
Incorporated**

165 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508)-946-9231
FAX: (508)-947-8873
www.outback-eng.com

DATE: MAY 18, 2021
DRAWN BY: CJV CHECKED BY: JAP

SCALE: 1"=40'
0' 40' 80' 120'

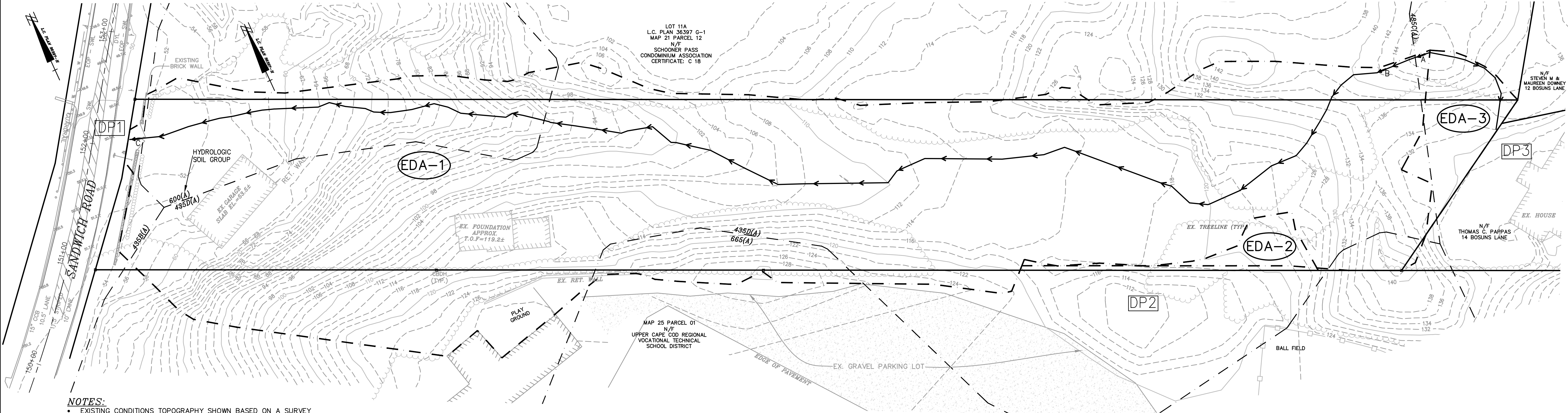
OE-3294

SNOW DISPOSAL NOTES
• REFER TO OPERATION AND MAINTENANCE PLAN
FOR FULL SNOW DISPOSAL REQUIREMENTS
• FURROW SNOW ALONG ROAD SHOULDERS
• AVOID DUMPING SNOW ON/IN CATCH BASINS,
FOREBAY, INFILTRATION BASIN, LEACHING PITS

ROOF DRAIN NOTE
• HOMEOWNERS TO BE RESPONSIBLE FOR
THEIR ROOF DRAIN MAINTENANCE

Appendix K
Pre- and Post-Development Drainage Maps

LEGEND	
DESCRIPTION	SYMBOL
POST DRAIN BOUNDARY	---
POST Tc FLOW PATH	→
POST DRAIN AREA	EDA-2
SOIL BOUNDARY	435D(A)
DESIGN POINT	DP1



- NOTES:
- EXISTING CONDITIONS TOPOGRAPHY SHOWN BASED ON A SURVEY PERFORMED BY OUTBACK ENGINEERING INC, IN JANUARY 2021.
 - ELEVATIONS SHOWN ON NAVD88 DATUM.

- NOTES:
- EDA-1 FLOWS SANDWICH ROAD
 - EDA-2 FLOWS TO DEPRESSION OFF-SITE ON N/F UPPER CAPE COD REGIONAL VOCATIONAL TECHNICAL SCHOOL DISTRICT
 - EDA-3 FLOWS OFF-SITE TO N/F PAPPAS

REVISIONS		
NO.	DATE	DESCRIPTION

OWNER
230 SANDWICH ROAD REALTY TRUST
14 BOSUNS LANE
BOURNE, MA

APPLICANT
CHASE DEVELOPERS INC.

PRE DRAINAGE MAP
"CHASE ESTATES"
SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS

Outback Engineering
Incorporated

165 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508)-946-9231
www.outback-eng.com

DATE: MAY 18, 2021	
DRAWN BY: KAD	CHECKED BY: JAP
SCALE: 1"=40'	SHEET 3 OF 10

0' 40' 80' 120'

OE-3294A

MEMORANDUM

TO: Mr. Thomas Pappas
Cape Cod Builders
10 Foretop Road
Bourne, MA 02532

FROM: Mr. Shaun P. Kelly *SPK*
Associate
Vanasse & Associates, Inc.
35 New England Business Center Drive
Suite 140
Andover, MA 01810

DATE: June 9, 2021

RE: 8430

SUBJECT: Traffic Impact Assessment
Proposed Chase Estates Residential Development
230 Sandwich Road
Bourne, Massachusetts

INTRODUCTION

Vanasse & Associates, Inc. (VAI) has prepared this Traffic Impact Assessment (TIA) in order to identify the anticipated traffic impacts associated with the development of a proposed 24-unit residential subdivision, to be located at 230 Sandwich Road (Route 6A) in Bourne, Massachusetts. To allow for a conservative assessment of project impacts, this assessment evaluates a larger 32-unit project, which represents the maximum number of potential units contemplated for the site. In completing our assessment, VAI visited the study area, collected daily and peak hour traffic volumes to identify current traffic flow patterns along the Sandwich Road corridor, collected vehicle speeds over an extended time period to determine prevailing travel speeds, identified projected daily and peak-hour traffic increases associated with the project, and assessed the impact of project-related traffic increases to traffic operations at the site driveway intersection with Sandwich Road.

As documented in this assessment, project-related traffic increases are expected to amount to minor increases to traffic volumes within the study area and can be adequately accommodated within the surrounding transportation infrastructure. It is recommended that the applicant work with the Massachusetts Department of Transportation (MassDOT) towards the development of a site access plan, including modifications to the existing pavement striping along Sandwich Road to accommodate a left-turn lane for traffic entering the site, if deemed appropriate by MassDOT.

PROJECT DESCRIPTION

The project involves the development of a 24-unit residential subdivision off the southern side of Sandwich Road. Access to the site is currently provided via an unpaved gated driveway onto Sandwich Road, approximately 500 feet east of the access drive to the Upper Cape Cod Regional Vocational High School. The proposed subdivision roadway will be approximately 1,090 feet in length, with individual driveways provided for each residential unit. The corridor will provide a total width of 20-feet of travel way, accommodating a single 10-foot wide lane in each direction. The location of the project site, relative to the surrounding transportation network is displayed in Figure 1.





Figure 1 – Site Location Map

EXISTING CONDITIONS

The following provides a description of the existing transportation infrastructure serving the project site.

Sandwich Road (Route 6A)

Sandwich Road, in the vicinity of the project site, is a two-lane roadway under MassDOT jurisdiction. In the vicinity of the site access, Sandwich Road provides an approximate 11-foot wide general purpose travel lane in each direction with an approximate 1-foot shoulder along either side of the corridor. An approximate 11-foot wide painted gore island is also provided along the site frontage, which transitions southbound traffic towards an exclusive left-turn lane into the Upper Cape Cod Regional Vocational School immediately west of the project site. The posted speed limit along Sandwich Road is 40 miles per hour (mph) which increases to 45 mph immediately east of the project site. Land use along the Sandwich Road corridor, in the vicinity of the site consists primarily of residential and institutional uses, as well as areas of wooded and open space.

EXISTING TRAFFIC VOLUMES

In order to identify existing traffic conditions within the study area, an automatic traffic recorder (ATR) count was conducted along Sandwich Road, in the vicinity of the project site. Traffic volumes were collected over a 48-hour period in order to identify traffic conditions over an extended period. Based on the collected data, Sandwich Road, in the vicinity of the project site accommodates approximately 24,671 vehicles per day (vpd). Between the weekday morning (7:00 to 9:00 AM) and weekday evening (4:00 to 6:00 PM) commuter peak periods the corridor was found to accommodate 1,866 vehicles per hour (vph) during the weekday morning peak hour and 2,115 vph during the weekday evening peak hour. The weekday



morning peak hour generally occurs between 8:00 and 9:00 AM, with the weekday evening peak hour generally occurring between 4:45 and 5:45 PM. Table 1 presents a summary of the existing traffic volumes along the corridor.

Table 1
EXISTING ROADWAY TRAFFIC-VOLUME SUMMARY

Location	Daily Volume (vpd) ^a	Weekday Morning Peak Hour (8:00 – 9:00 AM)			Weekday Afternoon Peak Hour (4:45 – 5:45 PM)		
		Volume (vph) ^b	Percent of Daily Traffic ^c	Predominant Flow	Volume (vph)	Percent of Daily Traffic	Predominant Flow
Cranberry Highway, east of Upper Cape Cod Regional Technical High School	24,671	1,866	7.6	52% WB	2,115	8.6	57% WB

^aTwo-way daily traffic expressed in vehicles per day; from ATR Counts October 2019.

^b Manual turning movement counts conducted in October 2019.

^cThe percent of daily traffic that occurs during the peak hour.

EB = eastbound, WB = westbound

SAFETY ANALYSIS

In order to identify any safety deficiencies along the Sandwich Road corridor, in the vicinity of the site access and to ensure the proposed site driveway will allow for safe access and egress to and from the site a safety analysis was conducted. Specifically, motor vehicle crash records published by MassDOT were reviewed for the section of Sandwich Road adjacent to the site and a sight distance analysis was conducted for the proposed driveway location, including a speed study along Sandwich Road. The following summarizes the methodology and findings of the safety analysis.

Motor Vehicle Crash Data

Motor vehicle crash information for the study area intersections was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent five-year period available (2014 through 2018 inclusive) in order to examine motor vehicle crash trends occurring within the study area. Based on a review of this data, a total of 21 motor vehicle collisions were reported along Sandwich Road, in the vicinity of the site access over the last 5 years of available data. The majority of reported collisions (16 out of 21) resulted in property damage only, with no reported fatalities over the five-year review period. The majority of collisions at this location involve either rear-end (10 out of 21) or single-vehicle collisions with a fixed object (7 out of 21). The motor vehicle crash rate for this location falls below MassDOT's average crash rate for unsignalized intersections in this MassDOT District.

Vehicle Speed Study

Vehicle speed measurements were taken along Sandwich Road, in the vicinity of the proposed site drive in conjunction with the ATR count in order to determine prevailing travel speeds along the corridor. The posted speed limit on Sandwich Road, in the vicinity of the project site is 40 mph and increases to 45 mph immediately east of the project site access.

Based on the collected data, the average travel speed in the eastbound and westbound directions were determined to be 42 mph and 41 mph, respectively. The 85th percentile operating speed, which is often utilized determining speed limits and design, was observed to be approximately 48 mph in the eastbound direction and 47 mph in the westbound direction. Table 2 summarizes the observed travel speeds along the



Sandwich Road corridor.

Table 2
OBSERVED VEHICLE SPEEDS (MPH^a)

Roadway	Direction	Median Speed	85 th Percentile Speed ^b	Speed Limit
Sandwich Road	Eastbound	42	48	40
	Westbound	41	47	40

^aMiles per hour.

^bThe 85th percentile speed is the speed at or below which 85 percent of motorists are traveling. It is commonly used for posting speed limits.

Sight Distance Analysis

Sight distances were collected at the proposed site driveway location to determine whether adequate sight distance is available at this location. Available sight distance, as recorded in the field is compared to minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO).¹ The stopping sight distance (SSD) is a function of the perception/reaction time of an approaching motorist and the required braking distance, which is a function of vehicular speed. As previously indicated, the 85th percentile travel speed was measured at approximately 48 mph and 47 mph in the eastbound and westbound directions, respectively. Observed sight distances from the site driveway location, and the minimum required distance for travel speeds ranging from 45 to 60 mph are displayed in Table 3.

Table 3
SIGHT DISTANCE SUMMARY

Location	Direction	Stopping Sight Distance	AASHTO ^a Requirement			
			45 mph	50 mph	55 mph	60 mph
Sandwich Road at Site Driveway	Eastbound	>600 Feet	360	425	495	570
	Westbound	>600 Feet	360	425	495	570

^aBased on AASHTO *A Policy on Geometric Design Sight Distance Requirements*.

As summarized in Table 2, the available sight distance at the proposed site driveway location meets or exceeds the required sight distance for the 85th percentile travel speeds along the corridor. The available sight distance exceeds the requirements for a 60 mph travel speed, well above the posted 40 mph speed limit at the site access.

¹A Policy on Geometric Design of Highways and Streets; American Association of State Highway and Transportation Officials (AASHTO); 2011.



PROJECT-RELATED TRAFFIC IMPACTS

In order to identify the anticipated impact of project-related traffic volumes along the surrounding roadway network, existing traffic volumes were projected to a future condition to account for growth in traffic both independent of the project and due to the project. The following summarizes the framework to develop the future year traffic conditions.

No-Build Traffic Volumes

Consistent with MassDOT traffic assessment guidelines, Existing 2019 traffic volumes were projected to the year 2026 in order to account for anticipated increases in traffic, independent of the project. Based on a review of MassDOT traffic count data, traffic growth along this section of roadway is estimated at 1 percent annually. A compounded 1 percent per year background traffic growth rate was applied to collected peak hour traffic volumes in order to develop the year 2026 No-Build traffic volumes.

Project-Generated Traffic

The proposed development, as currently proposed, will entail the construction of 24 residential homes, however for the purpose of this assessment a larger 32-unit development was assumed to represent a more conservative scenario. Trip-generation estimates for the proposed development were derived based on trip generation rates published by the Institute of Transportation Engineers (ITE) *Trip Generation* manual² for Land Use Codes (LUC) 210 – Single-Family Detached Housing, the most appropriate category for this development. Project-related trip generation is summarized in Table 4.

**Table 4
TRIP-GENERATION SUMMARY**

	<u>Total New Trips^a</u>
<i>Weekday Morning Peak Hour:</i>	
Entering	6
<u>Exiting</u>	<u>18</u>
Total	24
<i>Weekday Evening Peak Hour:</i>	
Entering	20
<u>Exiting</u>	<u>12</u>
Total	32
Weekday Daily	302

Source: ITE *Trip Generation* manual, Tenth Edition, 2017.

^aITE LUC 210 trip rate applied to 32 units.

As summarized in Table 3, the proposed development at the maximum anticipated 32 units, is expected to generate 24 new vehicle trips (6 entering and 18 exiting) during the weekday morning peak hour and 32

²*Trip Generation*, Eighth Edition; Institute of Transportation Engineers; Washington, DC; 2008.



new vehicle trips (20 entering and 12 exiting) during the weekday evening peak hour. On a daily basis, the proposed development is projected to generate 302 new trips (151 entering and 151 exiting) on a typical weekday.

Trip Distribution Patterns

Existing traffic patterns along the Sandwich Road corridor were reviewed in order to determine the anticipated trip distribution patterns for the project. During peak hours of commuter activity, approximately 52 to 57 percent of corridor traffic is oriented in the westbound direction. As such, project-related traffic increases were distributed 55 percent to the west and 45 percent towards the east.

Traffic Volume Increases

Additional traffic increases associated with the project were distributed along the local roadway network in accordance with the aforementioned trip distribution patterns. Table 5 provides a summary of the peak hour traffic volumes on Sandwich Road under 2019 Existing, 2026 No-Build and 2026 Build conditions.

Table 5
PEAK HOUR TRAFFIC-VOLUME INCREASES

Location/Peak Hour	2019 Existing	2026 No-Build	2026 Build	Increase Over No-Build	Percent Increase Over No-Build
<i>Sandwich Road, east of site:</i>					
Weekday Morning	1,866	2,001	2,012	11	0.5
Weekday Evening	2,115	2,268	2,282	14	0.6
<i>Sandwich Road, west of site:</i>					
Weekday Morning	1,866	2,001	2,014	13	0.6
Weekday Evening	2,115	2,268	2,286	18	0.8

As summarized in Table 5, in comparison to future 2026 No-Build conditions, project-related traffic increases are projected to range between 11 to 18 additional vehicles per hour on segments of Sandwich Road east and west of the project site. This level of increase amounts to an approximate 0.5 to 0.8 percent change in traffic as compared to No-Build conditions.

Traffic Operations Analysis

Measuring existing and future traffic volumes quantifies traffic flow within the study area. To assess quality of flow, roadway capacity and vehicle queue analyses were conducted under future Build traffic volume conditions. Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed upon them, with vehicle queue analyses providing a secondary measure of the operational characteristics of an intersection or section of roadway under study.

A primary result of capacity analyses is the assignment of level of service to traffic facilities under various traffic-flow conditions.³ The concept of level of service is defined as a qualitative measure describing

³The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity*



operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with level-of-service (LOS) A representing the best operating conditions and LOS F representing congested or constrained operating conditions.

Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

Unsignalized Intersections

The six levels of service for unsignalized intersections may be described as follows:

- *LOS A* represents a condition with little or no control delay to minor street traffic.
- *LOS B* represents a condition with short control delays to minor street traffic.
- *LOS C* represents a condition with average control delays to minor street traffic.
- *LOS D* represents a condition with long control delays to minor street traffic.
- *LOS E* represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
- *LOS F* represents a condition where minor street demand volume exceeds capacity of an approach lane, with extreme control delays resulting.

The levels of service of unsignalized intersections are determined by application of a procedure described in the 2010 *Highway Capacity Manual*.⁴ Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the 2010 *Highway Capacity Manual*. Table 6 summarizes the relationship between level of service and average control delay for two way stop controlled and all-way stop controlled intersections.

Manual; Transportation Research Board; Washington, DC; 2010.

⁴*Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010.



Table 6
LEVEL-OF-SERVICE CRITERIA FOR
UNSIGNALIZED INTERSECTIONS^a

Level-Of-Service by Volume-to-Capacity Ratio		Average Control Delay (Seconds Per Vehicle)
v/c ≤ 1.0	v/c > 1.0	
A	F	≤ 0.0
B	F	10.1 to 15.0
C	F	15.1 to 25.0
D	F	25.1 to 35.0
E	F	35.1 to 50.0
F	F	> 50.0

^aSource: *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010; page 19-2.

Analysis Results

The results of the unsignalized intersection analysis indicate that under 2026 Build conditions, mainline traffic volumes along Sandwich Road, at its intersection with the proposed site access will operate at LOS A during both the weekday morning and weekday evening peak hours. Additionally, westbound left-turns are projected to operate at LOS B, with minimal queuing projected in the left-turn lane serving vehicles entering the project site. While exiting traffic will experience moderate delays, typical of unsignalized intersections along the Sandwich Road corridor, queuing on the subdivision approach to Sandwich Road is projected to be minimal, amounting to less than one vehicle on average during peak commuter hours.

CONCLUSIONS AND RECOMMENDATIONS

As documented in this assessment, project-related traffic increases associated with the development of a 24-unit residential subdivision are not expected to result in a notable change to traffic volumes or operations along the Sandwich Road corridor. Based on a review of a more conservative 32-unit project, project-related traffic increases are not expected to result in a notable impact to traffic operations along the Sandwich Road corridor. In order to ensure safe and efficient access to the project, the following recommendations are provided.

- The proposed subdivision roadway should be a minimum of 20-feet in width or as required to accommodate the turning and maneuvering requirements of anticipated delivery vehicles and the largest anticipated responding emergency vehicle as defined by the Town of Bourne Fire Department.
- All signs and pavement markings to be installed within the project site shall conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).⁵
- Signs and landscaping to be installed as a part of the project and located within intersection sight triangle areas should be designed and maintained so as not to restrict lines of sight along Sandwich Road.

⁵*Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.



- Snow windrows along the project site frontage on Sandwich Road, within the sight triangle areas of the project site driveway shall be promptly removed where such accumulations would inhibit sight lines.
- The applicant should work with MassDOT towards the development of a modified striping plan for the Sandwich Road corridor that provides an exclusive left-turn lane in the westbound direction for vehicles entering the site. This would involve restriping the existing painted gore island along the site frontage. It is recommended that storage for two vehicles be provided for traffic turning left into the site.

With implementation of these measures, safe and efficient access and egress to the development be provided, and the development can be safely completed with minimal impact to the surrounding transportation system.



APPENDIX

AUTOMATIC TRAFFIC RECORDER COUNTS
MOTOR VEHICLE CRASH DATA
TRIP GENERATION
CAPACITY ANALYSIS

AUTOMATIC TRAFFIC RECORDER COUNTS

Accurate Counts
978-664-2565

Page 1

Location : Sandwich Road
Location : at #230
City/State: Bourne, MA

8430VOL1

Start Time	10/16/201 Wed	WB		Hour Totals		EB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		29	207			17	165				
12:15		15	229			11	166				
12:30		20	257			3	142				
12:45		16	220	80	913	7	217	38	690	118	1603
01:00		15	230			7	160				
01:15		19	202			3	174				
01:30		7	234			4	189				
01:45		7	203	48	869	4	181	18	704	66	1573
02:00		7	197			8	178				
02:15		8	180			1	158				
02:30		3	273			0	179				
02:45		6	285	24	935	3	174	12	689	36	1624
03:00		10	244			2	204				
03:15		13	299			4	201				
03:30		19	265			3	220				
03:45		11	265	53	1073	2	222	11	847	64	1920
04:00		9	275			2	218				
04:15		26	330			16	240				
04:30		34	289			13	220				
04:45		43	288	112	1182	23	233	54	911	166	2093
05:00		61	287			23	227				
05:15		80	322			36	234				
05:30		106	308			37	216				
05:45		133	283	380	1200	43	206	139	883	519	2083
06:00		155	230			77	186				
06:15		167	225			97	146				
06:30		205	204			135	124				
06:45		202	176	729	835	158	122	467	578	1196	1413
07:00		196	134			185	90				
07:15		177	142			265	78				
07:30		234	165			290	74				
07:45		202	139	809	580	242	67	982	309	1791	889
08:00		202	140			205	80				
08:15		258	118			199	102				
08:30		266	99			244	59				
08:45		270	81	996	438	222	69	870	310	1866	748
09:00		262	84			179	44				
09:15		226	66			130	49				
09:30		233	53			160	42				
09:45		216	41	937	244	191	37	660	172	1597	416
10:00		239	40			140	52				
10:15		236	41			189	22				
10:30		203	42			135	36				
10:45		205	44	883	167	189	51	653	161	1536	328
11:00		221	29			147	40				
11:15		211	31			156	34				
11:30		221	39			175	55				
11:45		228	23	881	122	167	39	645	168	1526	290
Total		5932	8558			4549	6422			10481	14980
Percent		40.9%	59.1%			41.5%	58.5%			41.2%	58.8%

Accurate Counts
978-664-2565

Page 2

Location : Sandwich Road
Location : at #230
City/State: Bourne, MA

8430VOL1

Start Time	10/17/201 Thu	WB		Hour Totals		EB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		15	204			40	162				
12:15		18	209			60	140				
12:30		12	181			63	159				
12:45		6	193	51	787	46	154	209	615	260	1402
01:00		4	225			54	127				
01:15		7	207			68	152				
01:30		5	229			43	152				
01:45		27	210	43	871	18	163	183	594	226	1465
02:00		11	209			13	159				
02:15		9	244			14	156				
02:30		7	276			2	191				
02:45		8	244	35	973	3	189	32	695	67	1668
03:00		10	288			4	183				
03:15		11	266			8	158				
03:30		19	277			1	170				
03:45		14	295	54	1126	4	209	17	720	71	1846
04:00		18	283			7	189				
04:15		16	283			5	173				
04:30		30	267			8	197				
04:45		36	258	100	1091	10	219	30	778	130	1869
05:00		50	210			14	207				
05:15		72	251			28	211				
05:30		99	260			38	201				
05:45		122	276	343	997	33	165	113	784	456	1781
06:00		144	207			60	148				
06:15		149	174			71	126				
06:30		179	217			132	127				
06:45		186	173	658	771	172	101	435	502	1093	1273
07:00		181	140			170	106				
07:15		161	172			244	85				
07:30		206	139			219	88				
07:45		202	140	750	591	210	65	843	344	1593	935
08:00		223	147			178	65				
08:15		203	129			195	82				
08:30		237	134			195	76				
08:45		225	89	888	499	165	57	733	280	1621	779
09:00		211	72			141	62				
09:15		208	91			155	48				
09:30		210	71			156	30				
09:45		211	62	840	296	125	45	577	185	1417	481
10:00		228	64			149	31				
10:15		222	56			147	21				
10:30		236	43			140	33				
10:45		189	64	875	227	129	25	565	110	1440	337
11:00		176	33			131	18				
11:15		223	51			143	23				
11:30		228	33			168	8				
11:45		222	22	849	139	164	25	606	74	1455	213
Total		5486	8368			4343	5681			9829	14049
Percent		39.6%	60.4%			43.3%	56.7%			41.2%	58.8%
Grand Total		11418	16926			8892	12103			20310	29029
Percent		40.3%	59.7%			42.4%	57.6%			41.2%	58.8%
ADT	ADT 24,670		AADT 24,670								

Accurate Counts
978-664-2565

Page 1

Location : Sandwich Road
Location : at #230
City/State: Bourne, MA

8430VOL1

Start	10/14/2019		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 AM	*	*	*	*	80	38	51	209	*	*	*	*	*	*	66	124
01:00	*	*	*	*	48	18	43	183	*	*	*	*	*	*	46	100
02:00	*	*	*	*	24	12	35	32	*	*	*	*	*	*	30	22
03:00	*	*	*	*	53	11	54	17	*	*	*	*	*	*	54	14
04:00	*	*	*	*	112	54	100	30	*	*	*	*	*	*	106	42
05:00	*	*	*	*	380	139	343	113	*	*	*	*	*	*	362	126
06:00	*	*	*	*	729	467	658	435	*	*	*	*	*	*	694	451
07:00	*	*	*	*	809	982	750	843	*	*	*	*	*	*	780	912
08:00	*	*	*	*	996	870	888	733	*	*	*	*	*	*	942	802
09:00	*	*	*	*	937	660	840	577	*	*	*	*	*	*	888	618
10:00	*	*	*	*	883	653	875	565	*	*	*	*	*	*	879	609
11:00	*	*	*	*	881	645	849	606	*	*	*	*	*	*	865	626
12:00 PM	*	*	*	*	913	690	787	615	*	*	*	*	*	*	850	652
01:00	*	*	*	*	869	704	871	594	*	*	*	*	*	*	870	649
02:00	*	*	*	*	935	689	973	695	*	*	*	*	*	*	954	692
03:00	*	*	*	*	1073	847	1126	720	*	*	*	*	*	*	1100	784
04:00	*	*	*	*	1182	911	1091	778	*	*	*	*	*	*	1136	844
05:00	*	*	*	*	1200	883	997	784	*	*	*	*	*	*	1098	834
06:00	*	*	*	*	835	578	771	502	*	*	*	*	*	*	803	540
07:00	*	*	*	*	580	309	591	344	*	*	*	*	*	*	586	326
08:00	*	*	*	*	438	310	499	280	*	*	*	*	*	*	468	295
09:00	*	*	*	*	244	172	296	185	*	*	*	*	*	*	270	178
10:00	*	*	*	*	167	161	227	110	*	*	*	*	*	*	197	136
11:00	*	*	*	*	122	168	139	74	*	*	*	*	*	*	130	121
Lane	0	0	0	0	14490	10971	13854	10024	0	0	0	0	0	0	14174	10497
Day	0		0		25461		23878		0		0		0		24671	
AM Peak	-	-	-	-	08:00	07:00	08:00	07:00	-	-	-	-	-	-	08:00	07:00
Vol.	-	-	-	-	996	982	888	843	-	-	-	-	-	-	942	912
PM Peak	-	-	-	-	17:00	16:00	15:00	17:00	-	-	-	-	-	-	16:00	16:00
Vol.	-	-	-	-	1200	911	1126	784	-	-	-	-	-	-	1136	844

Comb. Total	0	0	25461	23878	0	0	0	24671
ADT	ADT 24,670	AADT 24,670						

Accurate Counts
978-664-2565

Page 1

Location : Sandwich Road
Location : at #230
City/State: Bourne, MA

WB

8430SPD1

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
10/16/19	0	0	0	1	3	2	23	29	16	5	1	0	0	0	80
01:00	0	1	0	0	2	5	11	19	7	1	1	1	0	0	48
02:00	0	0	0	0	2	1	11	6	0	3	0	1	0	0	24
03:00	0	0	1	0	0	2	16	20	12	2	0	0	0	0	53
04:00	0	0	0	0	0	3	33	38	27	9	2	0	0	0	112
05:00	0	0	1	7	17	43	142	120	45	5	0	0	0	0	380
06:00	1	2	5	7	28	133	308	189	50	4	2	0	0	0	729
07:00	4	3	9	16	70	227	299	141	36	3	0	0	1	0	809
08:00	23	29	60	72	81	217	352	148	11	3	0	0	0	0	996
09:00	1	3	7	19	79	210	388	189	35	6	0	0	0	0	937
10:00	8	9	33	36	40	219	329	173	32	2	1	1	0	0	883
11:00	0	6	14	19	49	212	339	193	42	7	0	0	0	0	881
12 PM	12	34	26	54	71	176	330	172	37	1	0	0	0	0	913
13:00	0	2	2	41	64	214	355	168	21	2	0	0	0	0	869
14:00	42	42	116	82	107	189	253	91	10	1	2	0	0	0	935
15:00	27	27	57	120	103	258	345	115	20	1	0	0	0	0	1073
16:00	7	29	72	98	152	267	382	150	22	3	0	0	0	0	1182
17:00	18	44	96	152	232	304	244	93	17	0	0	0	0	0	1200
18:00	5	17	34	44	89	218	282	132	13	1	0	0	0	0	835
19:00	2	7	23	27	24	106	196	145	44	3	1	1	1	0	580
20:00	0	0	2	6	33	65	178	125	26	3	0	0	0	0	438
21:00	0	0	0	3	13	48	115	56	7	2	0	0	0	0	244
22:00	0	1	1	6	10	50	63	29	6	1	0	0	0	0	167
23:00	0	4	8	3	15	32	42	13	5	0	0	0	0	0	122
Total	150	260	567	813	1284	3201	5036	2554	541	68	10	4	2	0	14490

Daily

15th Percentile : 31 MPH
50th Percentile : 40 MPH
85th Percentile : 46 MPH
95th Percentile : 49 MPH

Mean Speed(Average) : 40 MPH
10 MPH Pace Speed : 36-45 MPH
Number in Pace : 8237
Percent in Pace : 56.8%
Number of Vehicles > 45 MPH : 3179
Percent of Vehicles > 45 MPH : 21.9%

Location : Sandwich Road
Location : at #230
City/State: Bourne, MA

8430SPD1

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
10/17/19	1	0	4	0	13	15	12	4	2	0	0	0	0	0	51
01:00	3	1	1	1	16	11	7	1	2	0	0	0	0	0	43
02:00	0	0	1	1	4	14	8	5	2	0	0	0	0	0	35
03:00	0	1	0	1	0	5	17	19	10	0	1	0	0	0	54
04:00	0	1	1	1	0	13	35	35	11	3	0	0	0	0	100
05:00	0	0	3	1	4	50	151	97	34	3	0	0	0	0	343
06:00	2	2	9	3	28	143	272	162	33	4	0	0	0	0	658
07:00	0	0	1	14	40	154	275	201	54	11	0	0	0	0	750
08:00	25	40	39	33	37	111	341	199	53	9	1	0	0	0	888
09:00	3	4	4	11	40	122	306	293	50	7	0	0	0	0	840
10:00	0	1	4	9	38	223	330	214	48	8	0	0	0	0	875
11:00	0	1	2	9	30	152	350	231	66	8	0	0	0	0	849
12 PM	0	0	3	12	30	137	288	259	51	5	2	0	0	0	787
13:00	0	0	6	5	49	188	345	236	37	5	0	0	0	0	871
14:00	7	24	19	10	103	249	353	173	29	5	1	0	0	0	973
15:00	38	95	135	236	240	206	149	23	4	0	0	0	0	0	1126
16:00	58	105	169	145	104	244	200	57	8	1	0	0	0	0	1091
17:00	9	24	30	38	89	317	346	120	19	5	0	0	0	0	997
18:00	23	50	38	52	142	227	178	55	5	1	0	0	0	0	771
19:00	8	8	19	26	75	189	188	68	10	0	0	0	0	0	591
20:00	2	9	21	23	47	111	177	86	18	3	2	0	0	0	499
21:00	0	0	4	16	9	27	90	108	33	9	0	0	0	0	296
22:00	0	1	6	2	6	28	77	76	28	3	0	0	0	0	227
23:00	0	0	6	7	3	10	42	41	21	7	1	0	0	1	139
Total	179	367	525	656	1147	2946	4537	2763	628	97	8	0	0	1	13854

Daily

15th Percentile : 31 MPH
50th Percentile : 41 MPH
85th Percentile : 47 MPH
95th Percentile : 50 MPH

Mean Speed(Average) : 40 MPH
10 MPH Pace Speed : 36-45 MPH
Number in Pace : 7483
Percent in Pace : 54.0%
Number of Vehicles > 45 MPH : 3497
Percent of Vehicles > 45 MPH : 25.2%

Grand Total	329	627	1092	1469	2431	6147	9573	5317	1169	165	18	4	2	1	28344
-------------	-----	-----	------	------	------	------	------	------	------	-----	----	---	---	---	-------

Overall

15th Percentile : 31 MPH
50th Percentile : 41 MPH
85th Percentile : 47 MPH
95th Percentile : 49 MPH

Mean Speed(Average) : 40 MPH
10 MPH Pace Speed : 36-45 MPH
Number in Pace : 15720
Percent in Pace : 55.5%
Number of Vehicles > 45 MPH : 6676
Percent of Vehicles > 45 MPH : 23.6%

Accurate Counts
978-664-2565

Page 3

Location : Sandwich Road
Location : at #230
City/State: Bourne, MA

EB

8430SPD1

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
10/16/19	0	0	2	2	1	6	11	9	3	2	0	1	1	0	38
01:00	0	0	0	0	1	0	7	5	5	0	0	0	0	0	18
02:00	0	0	0	1	0	0	4	3	2	1	1	0	0	0	12
03:00	0	0	0	0	0	0	2	5	3	1	0	0	0	0	11
04:00	0	0	0	0	2	2	11	24	9	6	0	0	0	0	54
05:00	0	0	0	1	3	8	43	52	25	6	1	0	0	0	139
06:00	0	0	2	2	19	51	201	146	45	1	0	0	0	0	467
07:00	0	0	1	25	115	249	355	208	28	1	0	0	0	0	982
08:00	0	1	7	20	71	228	363	169	10	1	0	0	0	0	870
09:00	0	0	0	4	25	116	269	200	42	4	0	0	0	0	660
10:00	0	5	1	7	27	137	280	168	27	1	0	0	0	0	653
11:00	0	0	0	7	29	104	265	214	24	2	0	0	0	0	645
12 PM	10	16	25	59	80	87	234	154	24	1	0	0	0	0	690
13:00	0	1	6	6	61	154	276	171	26	3	0	0	0	0	704
14:00	28	23	20	54	102	151	201	97	13	0	0	0	0	0	689
15:00	0	0	1	37	101	207	337	145	18	1	0	0	0	0	847
16:00	0	0	0	8	60	211	413	184	34	1	0	0	0	0	911
17:00	0	0	0	51	196	241	282	98	14	1	0	0	0	0	883
18:00	0	0	2	15	64	160	207	108	22	0	0	0	0	0	578
19:00	0	0	4	3	16	45	111	99	27	4	0	0	0	0	309
20:00	0	0	0	4	19	48	102	107	23	6	1	0	0	0	310
21:00	1	0	1	2	6	31	69	45	14	2	1	0	0	0	172
22:00	40	4	0	1	7	26	49	19	10	3	2	0	0	0	161
23:00	95	6	5	12	2	13	15	14	6	0	0	0	0	0	168
Total	174	56	77	321	1007	2275	4107	2444	454	48	6	1	1	0	10971

Daily

15th Percentile : 35 MPH
50th Percentile : 41 MPH
85th Percentile : 47 MPH
95th Percentile : 49 MPH

Mean Speed(Average) : 41 MPH
10 MPH Pace Speed : 41-50 MPH
Number in Pace : 6551
Percent in Pace : 59.7%
Number of Vehicles > 45 MPH : 2954
Percent of Vehicles > 45 MPH : 26.9%

Location : Sandwich Road
Location : at #230
City/State: Bourne, MA

8430SPD1

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
10/17/19	177	9	6	3	0	3	9	1	1	0	0	0	0	0	209
01:00	140	16	4	3	4	4	8	3	1	0	0	0	0	0	183
02:00	2	2	0	0	0	4	13	8	1	0	1	1	0	0	32
03:00	0	0	0	0	0	2	6	5	1	1	2	0	0	0	17
04:00	0	0	0	0	4	1	9	6	8	2	0	0	0	0	30
05:00	0	0	0	4	4	3	47	36	15	4	0	0	0	0	113
06:00	0	0	0	4	14	80	179	127	26	5	0	0	0	0	435
07:00	0	0	0	2	38	134	372	259	35	3	0	0	0	0	843
08:00	0	0	2	31	62	110	253	240	32	3	0	0	0	0	733
09:00	0	0	0	2	21	66	230	195	60	3	0	0	0	0	577
10:00	0	0	0	6	22	66	233	187	46	4	1	0	0	0	565
11:00	0	0	0	5	19	66	251	216	46	2	1	0	0	0	606
12 PM	0	0	0	6	29	85	267	192	31	4	0	0	1	0	615
13:00	0	0	0	7	36	108	246	158	35	4	0	0	0	0	594
14:00	0	0	7	30	41	131	282	177	22	5	0	0	0	0	695
15:00	0	0	2	36	111	168	231	149	23	0	0	0	0	0	720
16:00	0	0	1	17	84	208	316	143	9	0	0	0	0	0	778
17:00	0	0	0	14	80	201	307	162	20	0	0	0	0	0	784
18:00	0	0	0	8	59	123	185	108	19	0	0	0	0	0	502
19:00	0	0	0	3	37	69	116	99	18	2	0	0	0	0	344
20:00	0	0	0	0	20	34	99	98	23	6	0	0	0	0	280
21:00	0	0	0	0	4	32	49	72	22	6	0	0	0	0	185
22:00	0	0	0	1	2	6	25	52	22	2	0	0	0	0	110
23:00	0	0	0	3	2	6	23	25	12	1	2	0	0	0	74
Total	319	27	22	185	693	1710	3756	2718	528	57	7	1	1	0	10024

Daily

15th Percentile : 35 MPH
50th Percentile : 42 MPH
85th Percentile : 48 MPH
95th Percentile : 50 MPH

Mean Speed(Average) : 42 MPH
10 MPH Pace Speed : 41-50 MPH
Number in Pace : 6474
Percent in Pace : 64.6%
Number of Vehicles > 45 MPH : 3312
Percent of Vehicles > 45 MPH : 33.0%

Grand Total	493	83	99	506	1700	3985	7863	5162	982	105	13	2	2	0	20995
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Overall

15th Percentile : 35 MPH
50th Percentile : 42 MPH
85th Percentile : 48 MPH
95th Percentile : 50 MPH

Mean Speed(Average) : 42 MPH
10 MPH Pace Speed : 41-50 MPH
Number in Pace : 13025
Percent in Pace : 62.0%
Number of Vehicles > 45 MPH : 6266
Percent of Vehicles > 45 MPH : 29.8%

Accurate Counts
978-664-2565

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Location : Sandwich Road
Location : at #230
City/State: Bourne, MA

8430SPD1

WB, EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
10/16/19	0	0	2	3	4	8	34	38	19	7	1	1	1	0	118
01:00	0	1	0	0	3	5	18	24	12	1	1	1	0	0	66
02:00	0	0	0	1	2	1	15	9	2	4	1	1	0	0	36
03:00	0	0	1	0	0	2	18	25	15	3	0	0	0	0	64
04:00	0	0	0	0	2	5	44	62	36	15	2	0	0	0	166
05:00	0	0	1	8	20	51	185	172	70	11	1	0	0	0	519
06:00	1	2	7	9	47	184	509	335	95	5	2	0	0	0	1196
07:00	4	3	10	41	185	476	654	349	64	4	0	0	1	0	1791
08:00	23	30	67	92	152	445	715	317	21	4	0	0	0	0	1866
09:00	1	3	7	23	104	326	657	389	77	10	0	0	0	0	1597
10:00	8	14	34	43	67	356	609	341	59	3	1	1	0	0	1536
11:00	0	6	14	26	78	316	604	407	66	9	0	0	0	0	1526
12 PM	22	50	51	113	151	263	564	326	61	2	0	0	0	0	1603
13:00	0	3	8	47	125	368	631	339	47	5	0	0	0	0	1573
14:00	70	65	136	138	209	340	454	188	23	1	2	0	0	0	1624
15:00	27	27	58	157	204	465	682	260	38	2	0	0	0	0	1920
16:00	7	29	72	108	212	478	795	334	56	4	0	0	0	0	2093
17:00	18	44	96	203	428	545	526	191	31	1	0	0	0	0	2083
18:00	5	17	36	59	153	378	489	240	35	1	0	0	0	0	1413
19:00	2	7	27	30	40	151	307	244	71	7	1	1	1	0	889
20:00	0	0	2	10	52	113	280	232	49	9	1	0	0	0	748
21:00	1	0	1	5	19	79	184	101	21	4	1	0	0	0	416
22:00	40	5	1	7	17	76	112	48	16	4	2	0	0	0	328
23:00	95	10	13	15	17	45	57	27	11	0	0	0	0	0	290
Total	324	316	644	1134	2291	5476	9143	4998	995	116	16	5	3	0	25461

Daily

15th Percentile : 33 MPH
50th Percentile : 41 MPH
85th Percentile : 47 MPH
95th Percentile : 49 MPH

Mean Speed(Average) : 41 MPH
10 MPH Pace Speed : 36-45 MPH
Number in Pace : 14619
Percent in Pace : 57.4%
Number of Vehicles > 45 MPH : 6133
Percent of Vehicles > 45 MPH : 24.1%

Accurate Counts
978-664-2565

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Location : Sandwich Road
Location : at #230
City/State: Bourne, MA

8430SPD1

WB, EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
10/17/19	178	9	10	3	13	18	21	5	3	0	0	0	0	0	260
01:00	143	17	5	4	20	15	15	4	3	0	0	0	0	0	226
02:00	2	2	1	1	4	18	21	13	3	0	1	1	0	0	67
03:00	0	1	0	1	0	7	23	24	11	1	3	0	0	0	71
04:00	0	1	1	1	4	14	44	41	19	5	0	0	0	0	130
05:00	0	0	3	5	8	53	198	133	49	7	0	0	0	0	456
06:00	2	2	9	7	42	223	451	289	59	9	0	0	0	0	1093
07:00	0	0	1	16	78	288	647	460	89	14	0	0	0	0	1593
08:00	25	40	41	64	99	221	594	439	85	12	1	0	0	0	1621
09:00	3	4	4	13	61	188	536	488	110	10	0	0	0	0	1417
10:00	0	1	4	15	60	289	563	401	94	12	1	0	0	0	1440
11:00	0	1	2	14	49	218	601	447	112	10	1	0	0	0	1455
12 PM	0	0	3	18	59	222	555	451	82	9	2	0	1	0	1402
13:00	0	0	6	12	85	296	591	394	72	9	0	0	0	0	1465
14:00	7	24	26	40	144	380	635	350	51	10	1	0	0	0	1668
15:00	38	95	137	272	351	374	380	172	27	0	0	0	0	0	1846
16:00	58	105	170	162	188	452	516	200	17	1	0	0	0	0	1869
17:00	9	24	30	52	169	518	653	282	39	5	0	0	0	0	1781
18:00	23	50	38	60	201	350	363	163	24	1	0	0	0	0	1273
19:00	8	8	19	29	112	258	304	167	28	2	0	0	0	0	935
20:00	2	9	21	23	67	145	276	184	41	9	2	0	0	0	779
21:00	0	0	4	16	13	59	139	180	55	15	0	0	0	0	481
22:00	0	1	6	3	8	34	102	128	50	5	0	0	0	0	337
23:00	0	0	6	10	5	16	65	66	33	8	3	0	0	1	213
Total	498	394	547	841	1840	4656	8293	5481	1156	154	15	1	1	1	23878

Daily
15th Percentile : 33 MPH
50th Percentile : 41 MPH
85th Percentile : 47 MPH
95th Percentile : 50 MPH

Mean Speed(Average) : 41 MPH
10 MPH Pace Speed : 41-50 MPH
Number in Pace : 13774
Percent in Pace : 57.7%
Number of Vehicles > 45 MPH : 6809
Percent of Vehicles > 45 MPH : 28.5%

Grand Total	822	710	1191	1975	4131	10132	17436	10479	2151	270	31	6	4	1	49339
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Overall
15th Percentile : 33 MPH
50th Percentile : 41 MPH
85th Percentile : 47 MPH
95th Percentile : 49 MPH

Mean Speed(Average) : 41 MPH
10 MPH Pace Speed : 41-50 MPH
Number in Pace : 27915
Percent in Pace : 56.6%
Number of Vehicles > 45 MPH : 12942
Percent of Vehicles > 45 MPH : 26.2%

MOTOR VEHICLE CRASH DATA

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Time	First Harmful Event	Light Conditions	Manner of Collision	Weather Conditions
3738699	BOURNE	02/11/2014	Property damage only (none injured)	10:55 AM	Collision with tree	Daylight	Single vehicle crash	Clear
3794098	BOURNE	04/17/2014	Property damage only (none injured)	9:10 AM	Collision with motor vehicle in traffic	Daylight	Sideswipe, opposite direction	Clear
3910709	BOURNE	08/17/2014	Non-fatal injury	2:05 AM	Collision with utility pole	Dark - roadway not lighted	Single vehicle crash	Clear
4016007	BOURNE	02/28/2015	Property damage only (none injured)	6:06 PM	Collision with motor vehicle in traffic	Dark - roadway not lighted	Rear-end	Clear
4070207	BOURNE	08/03/2015	Property damage only (none injured)	4:17 PM	Collision with unknown fixed object	Daylight	Single vehicle crash	Clear
4130663	BOURNE	12/20/2015	Non-fatal injury	12:16 PM	Collision with motor vehicle in traffic	Daylight	Rear-end	Clear
4146698	BOURNE	02/04/2016	Property damage only (none injured)	5:00 PM	Collision with motor vehicle in traffic	Daylight	Rear-end	Clear
4150280	BOURNE	09/13/2015	Property damage only (none injured)	12:26 AM	Collision with unknown fixed object	Dark - lighted roadway	Single vehicle crash	Clear
4156273	BOURNE	02/23/2016	Property damage only (none injured)	6:27 PM	Collision with motor vehicle in traffic	Dark - roadway not lighted	Rear-end	Clear
4198650	BOURNE	06/01/2016	Property damage only (none injured)	12:51 AM	Collision with unknown fixed object	Dark - lighted roadway	Single vehicle crash	Clear
4218222	BOURNE	07/16/2016	Property damage only (none injured)	8:59 PM	Collision with animal - deer	Dark - lighted roadway	Single vehicle crash	Clear
4231979	BOURNE	08/12/2016	Non-fatal injury	9:35 PM	Collision with motor vehicle in traffic	Dark - roadway not lighted	Rear-end	Rain
4253697	BOURNE	09/22/2016	Property damage only (none injured)	8:45 AM	Collision with motor vehicle in traffic	Daylight	Rear-end	Clear
4255087	BOURNE	09/22/2016	Property damage only (none injured)	11:00 PM	Collision with motor vehicle in traffic	Dark - roadway not lighted	Sideswipe, same direction	Not Reported
4328072	BOURNE	02/15/2017	Property damage only (none injured)	3:41 PM	Collision with motor vehicle in traffic	Daylight	Rear-end	Rain
4397475	BOURNE	06/29/2017	Non-fatal injury	4:45 AM	Collision with motor vehicle in traffic	Dawn	Rear-end	Clear
4473184	BOURNE	12/25/2017	Property damage only (none injured)	2:36 AM	Collision with guardrail	Dark - roadway not lighted	Single vehicle crash	Rain
4559801	BOURNE	07/01/2018	Property damage only (none injured)	10:04 AM	Collision with motor vehicle in traffic	Daylight	Rear-end	Clear
4574648	BOURNE	07/29/2018	Non-fatal injury	9:27 PM	Collision with motor vehicle in traffic	Dark - roadway not lighted	Head-on	Clear
4582813	BOURNE	08/16/2018	Property damage only (none injured)	3:56 PM	Collision with motor vehicle in traffic	Daylight	Angle	Clear
4611609	BOURNE	10/15/2018	Property damage only (none injured)	6:40 AM	Collision with motor vehicle in traffic	Dawn	Rear-end	Clear

TRIP GENERATION

Institute of Transportation Engineers (ITE)
Trip Generation, 10th Edition
Land Use Code (LUC) 210 - Single-Family Detached Housing

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 32

AVERAGE WEEKDAY DAILY

$T = 9.44 * (X)$
 $T = 9.44 * 32$
 $T = 302.08$
 $T = 302.00$
 $T = 302$ vehicle trips
with 50% (151 vpd) entering and 50% (151 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 0.74 * (X)$
 $T = 0.74 * 32$
 $T = 23.68$
 $T = 24$ vehicle trips
with 25% (6 vph) entering and 75% (18 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 0.99 * (X)$
 $T = 0.99 * 32$
 $T = 31.68$
 $T = 32.00$
 $T = 32$ vehicle trips
with 63% (20 vph) entering and 37% (12 vph) exiting.

AVERAGE SATURDAY

$T = 9.54 * (X)$
 $T = 9.54 * 32$
 $T = 305.28$
 $T = 306.00$
 $T = 306$ vehicle trips
with 50% (153 vpd) entering and 50% (153 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$T = 0.93 * (X)$
 $T = 0.93 * 32$
 $T = 29.76$
 $T = 30$ vehicle trips
with 54% (16 vph) entering and 46% (14 vph) exiting.

Intersection

Int Delay, s/veh 0.6

Movement EBT EBR WBL WBT NBL NBR

Lane Configurations	↑		↑	↑	↑	↑
Traffic Vol, veh/h	933	3	3	1068	10	8
Future Vol, veh/h	933	3	3	1068	10	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	1014	3	3	1161	11	9

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	1017	0	2183
Stage 1	-	-	-	-	1016
Stage 2	-	-	-	-	1167
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	690	-	51
Stage 1	-	-	-	-	353
Stage 2	-	-	-	-	299
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	690	-	51
Mov Cap-2 Maneuver	-	-	-	-	51
Stage 1	-	-	-	-	353
Stage 2	-	-	-	-	298

Approach	EB	WB	NB
HCM Control Delay, s	0	0	63.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	81	-	-	690	-
HCM Lane V/C Ratio	0.242	-	-	0.005	-
HCM Control Delay (s)	63.1	-	-	10.2	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	0.9	-	-	0	-

Intersection

Int Delay, s/veh 0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	↔
Traffic Vol, veh/h	976	11	9	1292	7	5
Future Vol, veh/h	976	11	9	1292	7	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	1061	12	10	1404	8	5

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	1073
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.2
Pot Cap-1 Maneuver	-	-	657
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	657
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

	EB	WB	NB
HCM Control Delay, s	0	0.1	96
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	52	-	-	657	-
HCM Lane V/C Ratio	0.251	-	-	0.015	-
HCM Control Delay (s)	96	-	-	10.6	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	0.9	-	-	0	-

Chase Estates
Town of Bourne Comprehensive Permit #08-10
Notice of Project Change

Chase Developers, Inc.

Requested Waivers

The Applicant requests waivers of the following local bylaws and regulations:

Bourne Zoning Bylaw

Section 1230-1244. Site Plan - Special Permit Approval.

40B comprehensive permit process supersedes Site Plan - Special Permit process.

Section 2500. Intensity of Use Schedule (R40)

Minimum lot area: 40,000 sf required; 7,822 - 13,654 sf proposed.

Minimum lot frontage: 125 feet required; 84.85 - 146.47 feet proposed.

Minimum front yard: 30 feet required; 10 feet proposed.

Minimum rear and side yard: 15 feet required; 10 feet proposed.

Maximum lot coverage: 20% specified by bylaw; 22-25% proposed.

Section 2640. Development Scheduling.

Applicant seeks waiver of 120 building permits per year limit, if necessary.

Section 2660. Development Scheduling.

Applicant seeks waiver of 3 building permits per month limit, and 10-day waiting period between building permit applications.

Section 3491 - Stormwater Regulations

(E)(4) - Bylaw requires stormwater permit issued by Planning Board; in 40B context, comprehensive permit issued by Zoning Board of Appeals serves as stormwater permit

Section 3492 - Stormwater Regulations

(C) - Stormwater management plan is not formatted as prescribed and does not include evaluation of Low Impact Development Techniques

Section 3493 - Stormwater Management Standards for Local Stormwater Permits

(G)(1)(b)(ii) - Bylaw requires 90% TSS removal; MA Stormwater Handbook requires 80%, and proposed BMPs will achieve 80% TSS removal.

Section 3496. Inspection and Site Supervision (Stormwater)

Compliance monitoring and inspection procedure shall be as provided in Amended Comprehensive Permit.

Section 3498. Performance Bond (Stormwater)

Bonding and financial assurance mechanisms shall be as provided in Amended Comprehensive Permit.

Section 4400. Earth Removal.

Project construction may result in removal of more than 50 yards of material (e.g., spoils, rocks).

Bourne Subdivision Regulations

Section 223-Standards of access

Min. right-of-way width: 50 feet required; 24 feet proposed

Surface width: 24 feet required; 20 feet proposed

Maximum grade: Regulation specifies 10% maximum; 12% proposed

Section 261-Application Procedure

In the 40B context, an application for a comprehensive permit is filed with the Zoning Board of Appeals, in lieu of a subdivision application to the Planning Board. The Final Plans to be submitted by the Applicant, and recorded at the Registry of Deeds, will conform in substance and form to the requirements of a Definitive Subdivision Plan.

Section 264-Environmental Information Report

In the 40B context, an application for a comprehensive permit is filed with the Zoning Board of Appeals, in lieu of a subdivision application to the Planning Board. An Environmental Information Report (alternatives analysis) is not required in this context.

Section 265 - Plan Processing

In the 40B context, plans and applications are reviewed & approved by ZBA, not by Planning Board as specified in the subdivision regulation.

Section 266 - Performance Guaranty

The performance guaranty and financial assurance mechanisms specified in existing and proposed comprehensive permit are applicable, in lieu of those specified in the subdivision regulation.

Section 267(c) - Ownership of Ways and Easements (15% security retainer)

The performance guaranty and financial assurance mechanisms specified in existing and proposed comprehensive permit are applicable, in lieu of those specified in the subdivision regulation.

Section 268 - Rescission

Plans approved by the ZBA pursuant to Chapter 40B are not subject to the automatic rescission specified in the subdivision regulation.

Section 312 - Required Cross Section

Regulation (Appendix) requires 4-foot shoulders on both sides; proposed road includes a 1-foot shoulder on left side, and a 4-foot sidewalk (no shoulder) on the right side.

Section 322 - Widths

- (a) Right of Way: 50 feet required; 24 feet proposed;
- (b) Pavement: 24 feet required; 20 feet proposed.

Section 323-Grade

- (a) Regulation specifies 10% maximum; 12% proposed.

(f) Regulation specifies maximum 3:1 slope from fill and 2:1 slope from cut; Proposal would exceed those slopes in certain areas (e.g. STA 5+00)

Section 325-Dead End streets

Regulation specifies 500 foot maximum; 1185 feet proposed.

Section 326 - Preparation and Surfacing of Roadway

Regulation requires submittals to Planning Board; in 40B context, the Zoning Board of Appeals is the reviewing / monitoring authority.

Section 327 - Curbs

(b) Regulation provides for granite or concrete curb inlets at catch basins when required by Board; Cape Cod Berm proposed.

Section 331-Sidewalk location

Regulation requires 5-foot sidewalks; 4'-foot sidewalks proposed

Section 332 - Preparation and Surfacing of Sidewalks

Regulation requires 3/8-inch-per-foot slope toward curb; 1/4-inch-per-foot proposed

Section 341-Easement

Regulation requires 24-foot utility easement width; 4-foot easement width proposed

Section 365 - Spoil Lots

Regulation requires spoil lot; applicant will dispose of spoils off-site

Section 366-Reflective markers

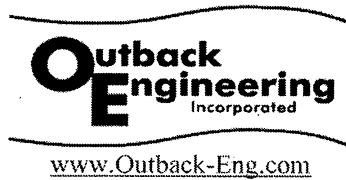
Regulation requires 30" reflective markers; markers not proposed (road will remain private and will be privately plowed).

Section 372 - Inspections

Regulation specifies Planning Board inspection procedure; in 40B context, the Zoning Board of Appeals is the reviewing / monitoring authority.

Section 374 - Compliance

Regulation specifies Planning Board compliance review procedure; in 40B context, the Zoning Board of Appeals is the reviewing / monitoring authority.



April 16, 2021

MassDOT Highway Division – District Five
Attn: Ms. Nicole Berthiaume, Permits Engineer
1000 County Street
Taunton, MA 02780

Re: Revised Plans per "Bourne-Route 6 -#230 Sandwich Road- 25% Review comments for Permit application #5-2017-0156 for Access for a proposed Residential Development"

Dear Ms. Berthiaume,

On behalf of the applicant, 230 Sandwich Road Realty Trust, c/o Thomas Pappas, we are submitting a revised site layout and Access Permit Plan as a follow up to MassDOT's 25% review comments for permit application #5-2017-0156 dated May 10, 2017. This submittal reflects changes to the project since that time, where 12 lots are now proposed with duplex homes for a total of 24 dwelling units as shown on the attached Site Layout Plan for Chase Estates. Please note also that the revised entry onto the state layout is based on discussions from a meeting with MassDOT personnel including Aidee Cira and others about a year ago.

Please see below for MassDOT's original 25% review comments and our responses to each.

Comment: *"Submit a copy of the Order of Conditions or Determination of Applicability issued by the Bourne Conservation Commission (if applicable)."*

Response: Not applicable as there are no wetlands on site.

Comment: *"Submit a full-size site development plan for the proposed project."*

Response: Refer to the preliminary Site Layout Plan attached, showing the proposed development which is to be submitted to the town of Bourne for approvals. We are seeking MassDOT's input now to facilitate further reviews by the town.

Comment: *"On the revised plan, show how the painted cross-hatched median island will be modified."*

Response: The attached 25% Access Permit Plan shows proposed pavement striping changes, to add a left turn lane for southbound traffic on Sandwich Road, per the meeting with MassDOT.

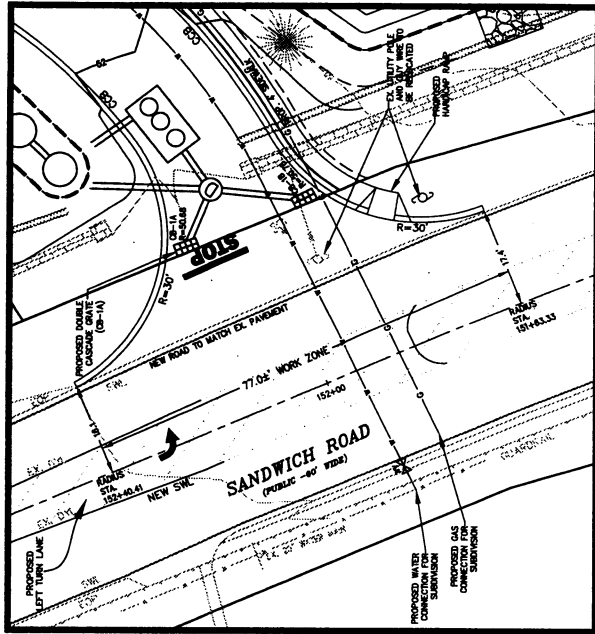
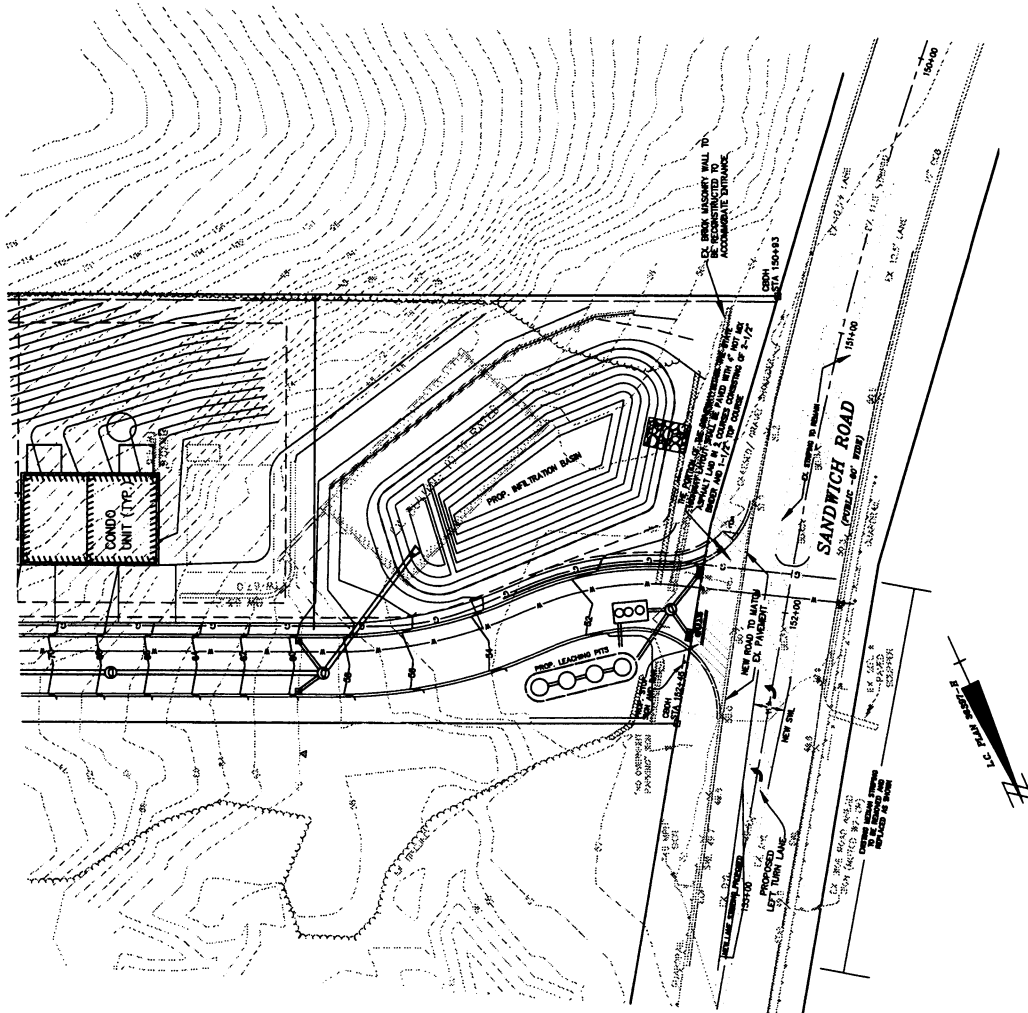
Comment: *"Submit drainage plans and associated stormwater analysis reports, including the drainage calculations."*

Response: Development plans for the site are preliminary, and the proposed stormwater system will contain all runoff on site in infiltration basins and leaching pits. More detailed plans and a stormwater report shall be provided with future plan submittals.

Comment: *Please clarify where the existing utility pole, located within the proposed driveway apron, will be relocated to. Also, clarify what is intended for the existing handhole adjacent to this utility pole*

Response: The Access Permit Plan shows the proposed relocation of the utility pole, and further changes shall be made in consultation with the utility company as the plans evolve.

- NOTES:**
1. PRELIMINARY SITE PLAN CHASE ESTATES SUBDIVISION AT 230 SANDWICH ROAD DATED 11-18-03. THIS PLAN IS FOR INFORMATION ONLY. ANY CHANGES TO THIS PLAN SHALL BE MADE BY THE ENGINEER.
 2. LOCATION OF UTILITIES IS APPROXIMATE AND CONDUITS SHALL NOT BE INSTALLED UNTIL AT LEAST 72 HOURS PRIOR TO THE ONSET OF CONSTRUCTION TO HAVE SUFFICIENT TIME TO LOCATE UTILITIES AND AVOID THEM.
 3. SEE SHEET 10 OF THE SITE PLAN REFERENCED ABOVE FOR CONSTRUCTION PERIOD SEDIMENTATION AND EROSION CONTROL MEASURES.



SITE ENTRANCE DETAIL
SCALE: 1" = 10'

REVISIONS NO. DATE DESCRIPTION 1 01/18/04 230 SANDWICH ROAD REALTY TRUST 14 BODINE LANE BOURNE, MA		25% ACCESS PERMIT PLAN "CHASE ESTATES" SUBDIVISION AT 230 SANDWICH ROAD IN BOURNE MASSACHUSETTS	Outback Engineering Incorporated 185 EAST GROVE STREET MIDDLEBOROUGH, MA 02346 (508) 947-7000 FAX: (508) 947-8873 www.outback-eng.com	DATE: APRIL 18, 2003 DRAWN BY: JMD CHECKED BY: JMD SCALE: 1" = 20' SHEET 1 OF 1 03-3284
-----------------------------------------------------------------------------------------------------------------------	--	-------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------

NOTE: PROPOSED DRIVEWAY SHALL MATCH EXISTING DRIVEWAY. EXISTING DRIVEWAY SHALL BE MAINTAINED AND NOT REMOVED. EXISTING DRIVEWAY SHALL BE MAINTAINED AND NOT REMOVED. EXISTING DRIVEWAY SHALL BE MAINTAINED AND NOT REMOVED. EXISTING DRIVEWAY SHALL BE MAINTAINED AND NOT REMOVED.

Comment and Resolution Form

PERMIT #: 5-2017-0156
 PERMIT TYPE: Driveway
 LOCATION: BOURNE, M, 230 Sandwich Road
 APPLICANT: Legacy Permit AGENT: Kyle Devenish
 SUBMITTAL: 75/100%
 SUBMITTED BY: Cindy McConarty



DATE: May 28, 2021

NO.	SHEET OR ITEM	COMMENT	DOCUMENT UPLOADED?	INITIAL ACTION	RESPONSE	QC REVIEW INITIAL	FINAL ACTION VERIFIED
COMPLETED BY REVIEWER			COMPLETED BY DESIGNER				
HIGHWAY OPERATIONS (Aidee Ciraj) Submission Type/# 1 - One							
1		The proposed sidewalk along the southerly side of the driveway needs to be outside the State Highway Layout (SHLO) and within the private property.					
2		Submit a stormwater report for the site demonstrating that all stormwater runoff is contained/treated within the property owner's site/parcel. The report needs to include a watershed plan and routing diagram for pre/post development conditions. Include a summary table (with the various design year storms, including the 100-year storm) with the volume of runoff to be infiltrated within the property.					
3		Specify on the plan if curb or HMA berm is proposed along the edge of the driveway. Any existing hot mix asphalt berm or curbing/edging that exists within the proposed driveway must be sawcut and removed. The new pavement must tie into, and not overlap, the edge of the hardened surface of the roadway. All abutting edges of the existing pavement shall be coated with a hot poured joint sealer immediately prior to the placement of the permanent bituminous concrete.					
4		Review the possibility to relocate the existing pole within the proposed driveway closer to the property line and a minimum of 2' (feet) from the edge of the driveway (right turn).					
5		Plans show modification to the striped median pavement markings to add a left turn lane. Clarify how the existing markings will be removed without causing deterioration of the pavement surface.					
PERMITS (Florcie St. Fleur-Jerome) Submission Type/# 1 - One							
1		Submit copies of all local approvals once available.					
2		Tie the driveway radii to the State Highway Layout Baseline.					
3		Label the width of the driveway apron.					
PROJECTS (Richard Oliveira) Submission Type/# 1 - One							
1	Proposed Pedestrian Access Ramp	If the sidewalk from the site will terminate within the SHLO with an ADA/AAB-compliant WCR, a reciprocal ramp to pair it with is required on the opposite side of the driveway.					

COLUMN "NO." PREFIX FOR COMMENT NO'S - PLANS =P, SPEC. PROVS=S, EST.=E, CALC BOOK=C, BRIDGE CALCS=D, OTHER = O
 "ACTION" A=WILL INCORPORATE, B=WILL EVALUATE, C=N/A

Comment and Resolution Form

PERMIT #: 5-2017-0156

PERMIT TYPE: Driveway

LOCATION: BOURNE, M, 230 Sandwich Road

APPLICANT: Legacy Permit AGENT: Kyle Devenish

SUBMITTAL: 75/100%

SUBMITTED BY: Cindy McConarty



DATE: May 28, 2021

9	Proposed Driveway	Provide a cross section through the center of the driveway, depicting the slope/profile from the Sandwich Road gutter line through the SHLO line and a short distance into the site. The required HMA Driveway materials can be depicted in the section.					
10	General	If there are any questions related to these comments, contact the D5 Permits Engineer in order to facilitate a meeting.					
		TRAFFIC (Bianca Marshall) Submission Type/# 1 - One					
1	General	The left turn lane shall be designed with the appropriate length and taper for the speed of the roadway and the width shall be consistent throughout. To achieve this, while maintaining the lane widths for the thru movements, roadway widening may be required.					
2	General	Traffic Management Plans are required for work impacting traffic on a public road.					

COLUMN "NO." PREFIX FOR COMMENT NO'S - PLANS =P, SPEC. PROVS=S, EST.=E, CALC BOOK=C, BRIDGE CALCS=D, OTHER = O
"ACTION" A=WILL INCORPORATE, B=WILL EVALUATE, C=N/A



165 East Grove Street
Middleborough, MA 02346

Tel # 508-946-9231 www.outback-eng.com Fax # 508-947-8873

Civil Engineers ★ Land Surveyors ★ Environmental Consultants ★ Soil Testing Services

May 5, 2021

Bourne Water District
Mr. Robert Prophet, Superintendent
211 Barlow's Landing Road
Pocasset, MA 02559

Re: Request for Water Connection
Chase Estates, 40B subdivision at 230 Sandwich Road

Dear Mr. Prophet,

On behalf of 230 Sandwich Road Realty Trust (c/o Tom Pappas), we are submitting the enclosed preliminary Utility Plan & Road Profile, Grading Plan and Road Cross Section detail for the Chase Estates subdivision proposed at 230 Sandwich Road (plans with dates of April 16, 2021) as a followup to your letter to Mr. Pappas dated February 26, 2020. The project will be submitted to the Bourne Zoning Board for a modification of the Comprehensive Permit issued under MGL Ch. 40B, and at this time we are seeking BWD's approval to authorize the water connection/extension, and input on the water system and general site layout to ensure there is adequate water pressure and fire flow capacities. The proposed development includes 24 duplex homes (12 buildings) on a 20' wide road ... no fire suppression system for the homes is proposed. At a maximum of 3 bedrooms each, there would be a total of 72 bedrooms, and the estimated water demand would 7,920 gallons per day based on Title 5 sewage design flows.

As requested in your letter, we are proposing:

- 8" water main (either PVC C-900 or DICT, to be determined following hydrant flow tests and prior to construction) to be connected to BWD's 16" water main on the west side of Sandwich Road with 3 gates, and to the existing 8" PVC main at the end of Bosun's Lane (existing hydrant to be relocated as shown).
- Three hydrants are proposed along the 1,154 ft. long roadway, at intervals of 500 ft. max. w/3 gate clusters.
- Each home would have a 1" PVC water service and meter as shown.
- The developer will commit to using all materials normally required by the Bourne Water District.

Please note a MassDOT Access Permit has been filed for the roadway, and we are awaiting reply; will also likely need to file a separate application for the water main on behalf of BWD if main is owned by the town.

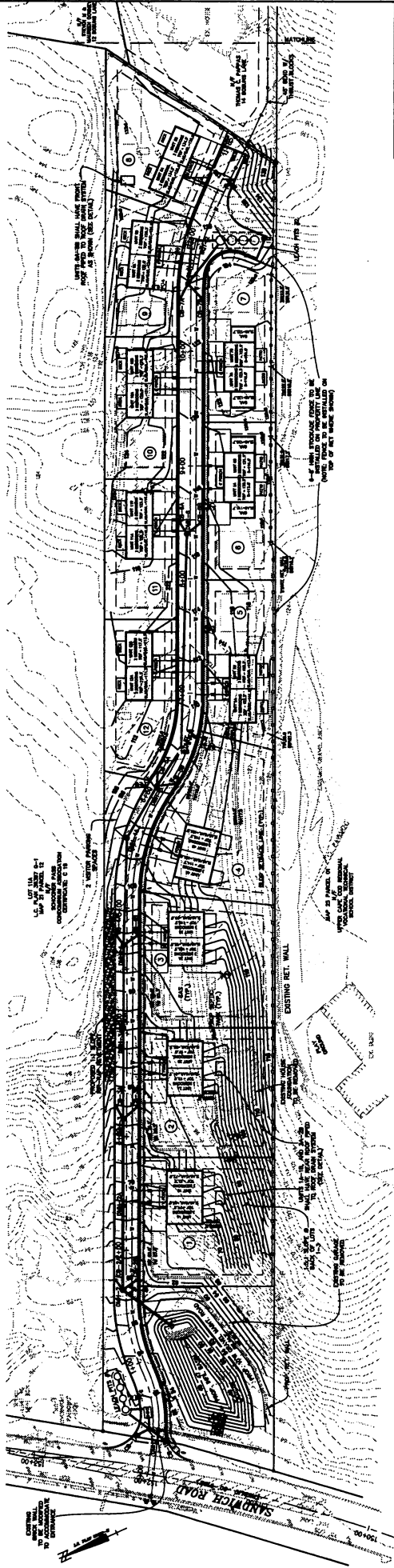
We appreciate your consideration of this matter and look forward to your review and approvals. If you have any comments or require additional information, please feel free to call (508) 946-9231 or email me at jpavlik@outback-eng.com.

Sincerely,
OUTBACK ENGINEERING, INC.

James A. Pavlik
James A. Pavlik, P.E.
Principal, Project Manager

Attachments

cc: Tom Pappas
Drew Hoyt



REVISIONS	
NO.	DATE
1	01/27/20

OWNER
230 SANDWICH ROAD
BOURNE, MA 01939

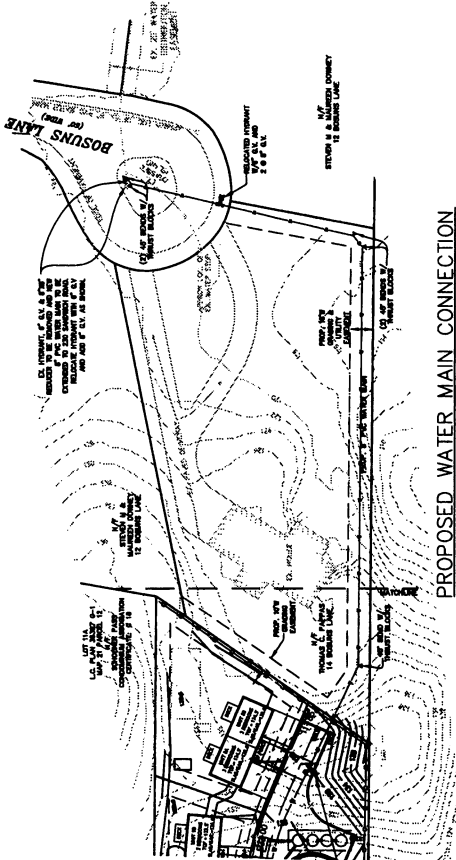
GRADING & DRAINAGE
PLAN
"CHASE ESTATES"
SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS

Outback Engineering
165 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508) 446-8231
FAX: (508) 446-8233
www.outback-eng.com

DRAWN BY: JLD
CHECKED BY: JLD
SCALE: 1"=40'
SHEET 7 OF 10

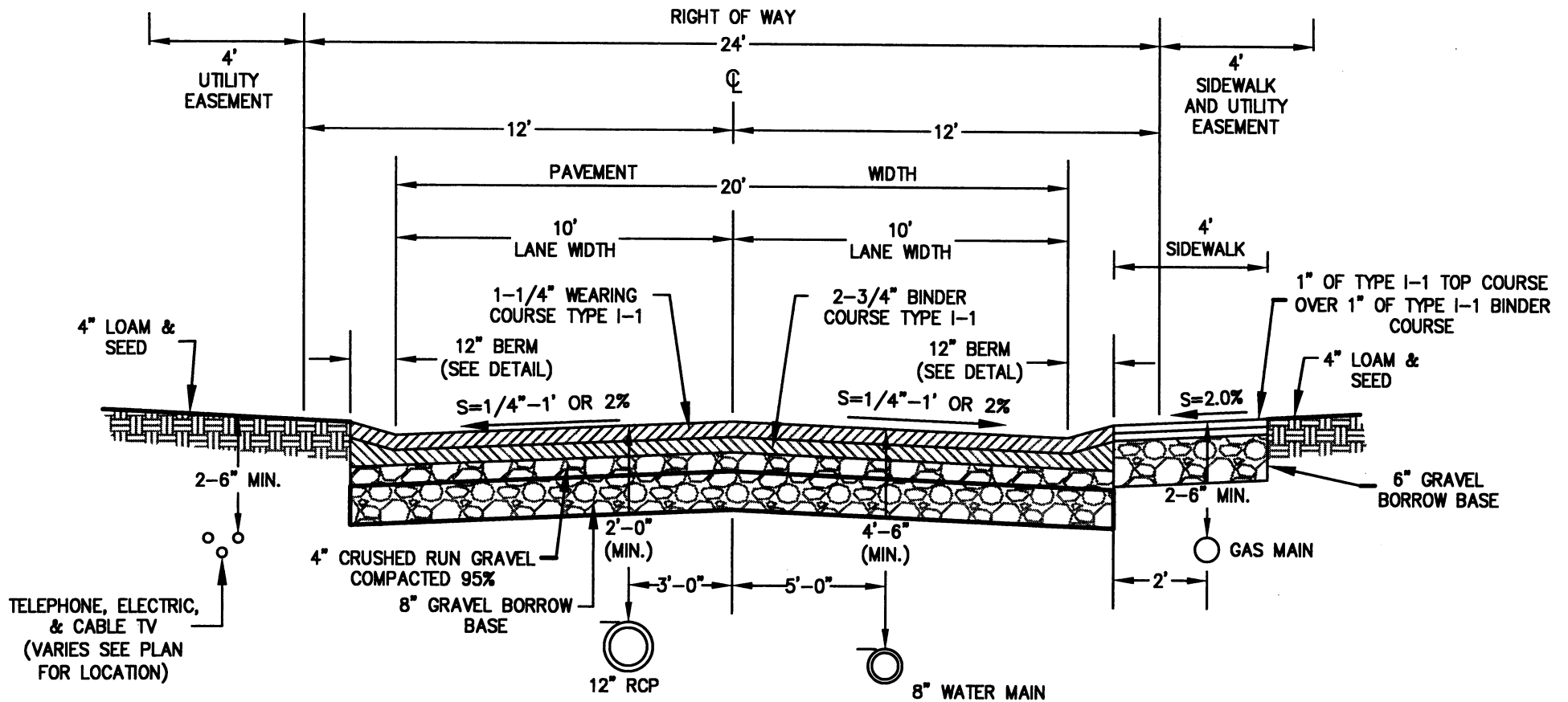
DATE: 01/27/20
PROJECT: 08-3284

NOTE: EXISTING WATER SYSTEM LANE TAKEN FROM SECTION PLAN ATTACHED TO THE BOURNE WATER DISTRICT DATED FEBRUARY 26, 2020.



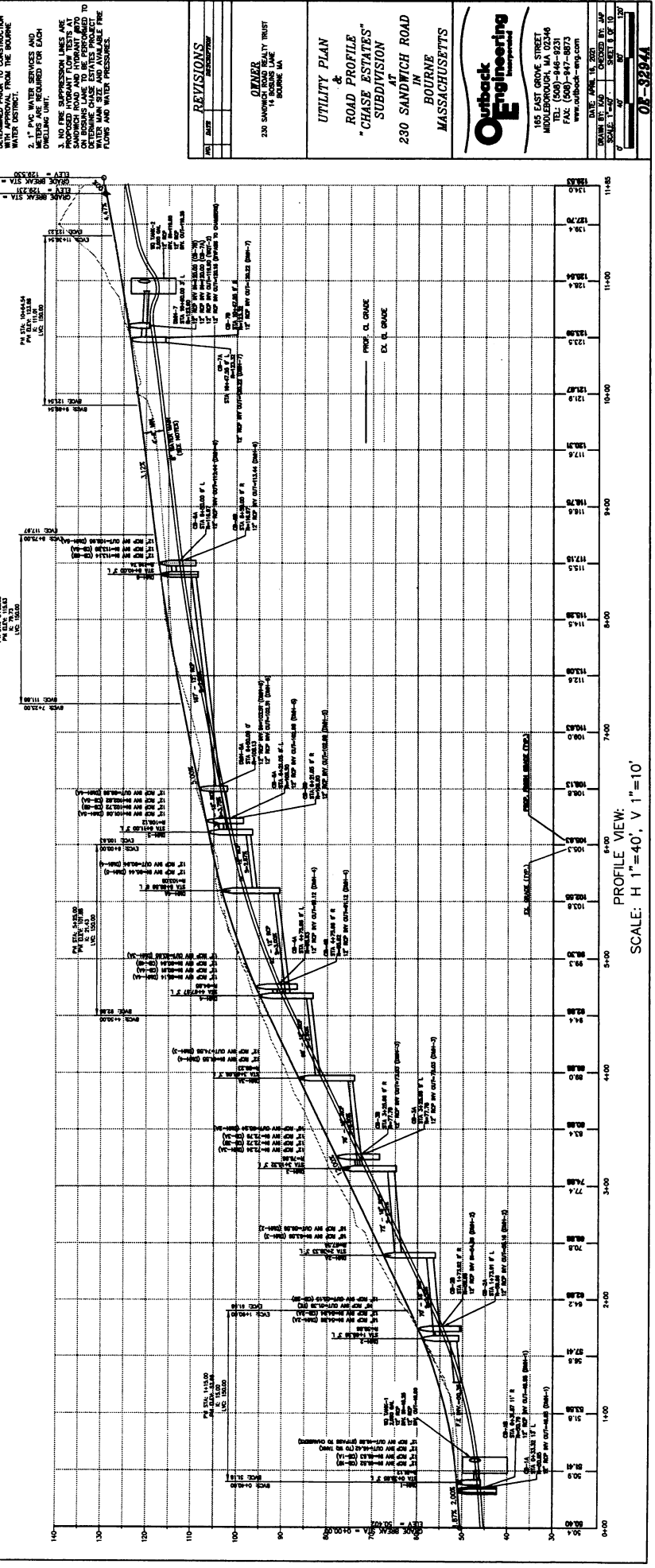
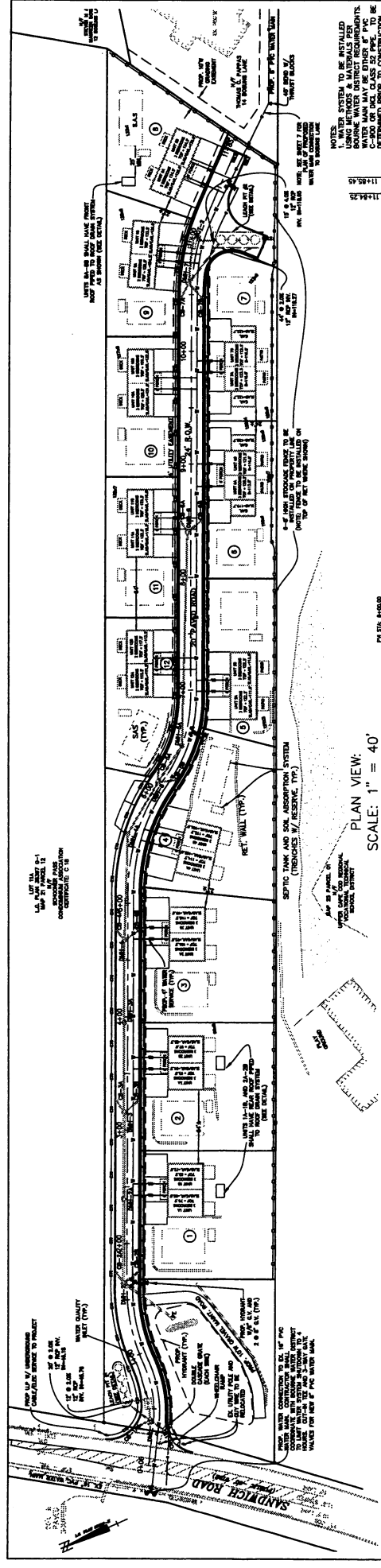
GENERAL NOTES

1. PROPOSED HOUSE, SEPTIC SYSTEMS, AND DRIVEWAYS SHOWN ARE PRELIMINARY. HOMES, GRADING, AND OTHER FEATURES ARE SUBJECT TO FINAL APPROVALS FROM TOWN BOARD OF HEALTH AND BUILDING DEPARTMENT.
2. REFER TO SHEET 6 FOR WATER SYSTEM & UTILITY LAYOUT.



TYPICAL ROADWAY CROSS SECTION

NOT TO SCALE



REVISIONS	
NO.	DESCRIPTION
1	OWNER
2	230 SANDWICH ROAD
3	14 BORDEN LANE
4	BOURNE
5	MASSACHUSETTS

UTILITY PLAN & ROAD PROFILE
"CHASE ESTATES"
SUBDIVISION
230 SANDWICH ROAD
BOURNE
MASSACHUSETTS

Outback Engineering
185 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508) 940-8231
FAX: (508) 940-8232
WWW.OUTBACK-ENG.COM

DATE: 10/15/2003
DRAWN BY: JAM
CHECKED BY: JAM
SCALE: 1" = 40' SHEET 5 OF 7
PROJECT: 03-3294

From: Bob Prophett rprophett@bournewaterdistrict.com
Subject: Re: Chase Estates (230 Sandwich Road) - submittal for water connection
Date: May 6, 2021 at 4:26 PM
To: Jim Pavlik jpavlik@outback-eng.com
Cc: Thomas Pappas capecodbuilders@hotmail.com, Drew Hoyt dhoyt.hoytlaw@gmail.com

BP

I will go over it with them as a discussion not really sure how they are going to feel about voting on it yet but I will get in touch with you as soon as the meeting is done and move forward from there. Has the town approved any of the plans or movement on this project?

Thanks
Bob
Sent from my iPhone

On May 6, 2021, at 4:21 PM, Jim Pavlik <jpavlik@outback-eng.com> wrote:

Hello Robert,
Understood water main size is still to be determined, and these plans are essentially a preliminary layout I believe Note 3 on Sheet 6 Utility Plan & Road Profile addresses the need for hydrant flow tests to determine the proper water main size. Hoping you can condition your approval accordingly, but if you need revised plans or letter ahead of the May 11 meeting, let me know.

Thank you.

Jim Pavlik, P.E.

<image002.jpg>

Principal
jpavlik@outback-eng.com
Phone: (508) 946-9231 x203
Cell: (508) 369-5358

www.outback-eng.com
165 East Grove Street
Middleborough, MA 02346

From: Robert Prophett <rprophett@bournewaterdistrict.com>
Sent: Thursday, May 06, 2021 4:04 PM
To: Jim Pavlik <jpavlik@outback-eng.com>
Cc: 'Thomas Pappas' <capecodbuilders@hotmail.com>; 'Drew Hoyt' <dhoyt.hoytlaw@gmail.com>
Subject: RE: Chase Estates (230 Sandwich Road) - submittal for water connection

Hello Jim, I received the package today and under "as requested in your letter" asks for an 8" water main that size was never mentioned in the letter to Mr. Pappas because that would have to be an engineered size based upon a fire flow test conducted by owner/Contractor so I would remove the language about size until that is known.

Thanks

Robert Prophett, Superintendent
Bourne Water District

From: Jim Pavlik [<mailto:jpavlik@outback-eng.com>]
Sent: Wednesday, May 5, 2021 4:05 PM
To: Robert Prophett <rprophett@bournewaterdistrict.com>

Cc: Thomas Pappas <capecodbuilders@hotmail.com>; Drew Hoyt <dhoyt.hoytlaw@gmail.com>

Subject: RE: Chase Estates (230 Sandwich Road) - submittal for water connection

Hi Bob,

As discussed here's the submittal for proposed water connection and system layout, please refer to the cover letter for more information. Look forward to getting the Board's feedback. Tom will drop off 2 copies tomorrow to assist with your review with the Board on May 11.

Thanks,

Jim Pavlik, P.E.

<image003.jpg>

www.outback-eng.com

Principal

jpavlik@outback-eng.com

Phone: (508) 946-9231 x203

Cell: (508) 369-5358

Outback Engineering, Inc. • 165 East Grove Street • Middleborough, MA 02346
Civil Engineers, Land Surveyors, Landscape Architects, Soil/Asphalt/Conc. Testing

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From: Robert Prophett <rprophett@bournewaterdistrict.com>

Sent: Tuesday, April 27, 2021 2:02 PM

To: Jim Pavlik <jpavlik@outback-eng.com>

Subject: Chase estates

Hello Jim, As I said in the phone message last week this was a request from the Bourne Water District as far as the plan that was submitted a year ago. I do not have anything to do with the Fire Departments requirments, Board of Health, and or any permits issued by the Town of Bourne for building any of the structures and or roadways that would all be separate. The attachments are my estimate of what would have to be met as far as water and without a flow test I have no recommendation of size or material of the mains. If you have any questions let me know.

Thanks

Robert Prophett, Superintendent
Bourne Water District

Comment: *Submit a Traffic Management Plan (T.M.P.) in compliance with the provisions of part VI of the Manual on Uniform Traffic Control Devices (M.U.T.C.D.) (Latest Edition).*

Response: This shall be done after further review of the new plans by MassDOT.

Comment: *"Submit copies of all local approvals (Planning Board, Zoning Board, etc.)."*

Response: The development plans are to be further reviewed by the town, and local approvals shall be provided at a later date.

Comment: *"The proposed northerly driveway radius is encroaching on the adjacent parcel, therefore you must complete and return to this office the attached Access Sign-off Form, which is to be signed, and notarized by the northerly abutter. If access sign-off cannot be obtained, the proposed drive must be shifted southerly to avoid crossing along the abutter's frontage."*

Response: The roadway layout was shifted to the south to provide a 30' curb radius to avoid encroachment on the adjacent parcel.

Comment: *The respective utility companies must apply for any utilities needed for this property under a separate permit application."*

Response: Utility companies will apply for their own permit as required.

Comment: *If applicable, replace any missing or damaged MassDOT, Highway Division Bounds (MHB's) within the proposed work location (submit separate list for bound replacements).*

Response: This shall be done as may be required.

We look forward to your review of these revised plans. Should you have any questions or need additional information, please let us know.

Sincerely,
Outback Engineering, Inc.

James Pavlik, P.E.
Principal, Project Manager

cc: Tom Pappas



COREEN V. MOORE
TOWN PLANNER

TOWN OF BOURNE
Office of the Town Planner

TOWN HALL
24 PERRY AVE.

BUZZARDS BAY, MA 02532

PHONE: 508-759-0600 ext. #1346

Email: cmoore@townofbourne.com



MEMORANDUM

To: Amy Kullar, Chairwoman of the Zoning Board of Appeals

From: Coreen V. Moore, Town Planner

Date: October 30, 2019

Re: Project Change Comprehensive Permit #08-10
Chase Estates (Chase Developer's) 230 Sandwich Rd
Map 25 Parcels 9 & 36

I have reviewed the above-mention project and offer the following comments:

1. The project that is currently before the Board is substantially different than the one proposed previously and that was presented to the Bourne Affordable housing partnership meeting on June 12, 2019.
2. The previous project was a one lot condominium project. One option presented; a 32 unit with 14 duplexes and one four-plex including 5 community septic systems. The second option was single lot with 3 multifamily buildings with a total of sixteen units.
3. The initial submittal to the ZBA on June 21, 2019 had a single lot with 20 single family condo units, a community building and pool with a shared septic system.
4. The current proposal before the Board is a 20 lot subdivision with 20 single family homes with 20 separate septic systems. The community building and pool have been removed.
5. The project as it stands today should be reviewed as a subdivision under subdivision regulations along with zoning bylaw.
6. The waivers requested do not include any waivers from the subdivision regulations and several of the waivers requested are not valid.
7. The Applicant must identify waivers of all local regulations needed to build the proposed project.
8. Waiver request should be reasonably specific and clear, i.e., no "umbrella" waivers.
9. If the applicant feels the project will be made uneconomic because the ZBA denies a waiver request or asks for significant changes, the ZBA may seek a pro forma review by independent peer review consultant (at applicant's expense)

10. The lot sizes proposed range from 12,627 square feet to 5,321 square feet. It is a major concern that the grading and placement of septic systems will be quite difficult due to the existing topography. Each lot would be permitted and designed separately, presenting major hardships for the owners of the lots.
11. A spreadsheet should be provided with proposed buildings including the number of bedrooms, floor area and type (ownership or rental); sample architectural drawings showing massing and exterior building materials, and how the proposed buildings relate to adjacent properties also should be provided.
12. The site plan should include basic site development calculations, e.g., impervious coverage, approximate open areas, number of parking spaces
13. The project proposes higher density but with detached single-family units, without utilizing a compact or cluster design.
14. The project fails to preserve or enhance the environment, no usable open space is provided, nor has any active or passive recreation areas been provided.

DENSITY:

The rule of thumb for affordable developments in Bourne is about four (4) units per acre, which is approximately 10,800 square feet per unit. There are a few developments in Town that exceed that rule such as Waterhill condos, Hunters Brook condos, Old Colony Condos, New Aptuxet Condos and the newest condo complex Canal Crossing, however all of those developments are attached multi-family developments unlike Chase Estates a free standing single family development proposing a density of approximately 8800 square feet per unit.

SITE DESIGN:

The site is long and narrow with extremely sloping terrain. The site has been previously graded creating a steep temporary "roadway" to the rear of the property. Steep sloping sites are less forgiving of construction errors, which may cause disastrous consequences.

It has been noted that single-family development is typically the most disruptive housing type on steep slopes; attached multi-family in an open space or clustered development is more appropriate. Cuts and fills should be minimized and vegetated as quickly as possible to prevent erosion and slope stability problems. The existing site has been exposed for sometime without vegetation and without measures to control erosion, which has caused significant hazards for Sandwich Road. It is recommended that an erosion plan be submitted to minimize erosion and sedimentation during and after site development.

RETAINING WALLS:

The applicant proposes multiple retaining walls with ranging heights. Retaining walls should follow the natural character of the site and not dominate or appear fortress-like. Retaining walls with a 30-inch drop in height should include fencing.

ROADWAY & ACCESS:

1. The proposed roadway exceeds slope requirements of the Bourne Subdivision Regulations. The maximum slope for a minor street (*a street serving 11-49 units*) is 10%. In addition only lanes can be dead-ended, a minor street can be dead-ended if not

potentially hazardous. If dead-ended the roadway must contain a cul-de-sac with an outside diameter of 100 feet and accommodate a 30-foot wheelbase.

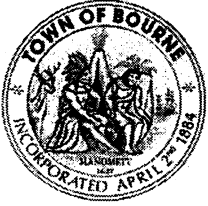
2. The site currently has a Mass Highway curb cut permit for a single-family residence; the applicant must reapply for new or amended driveway permit.

MISC:

1. Please confirm the prior response from the Department of Public Works that the Town will not provide plowing or trash pickup. Therefore it is highly recommended that neighborhood dumpsters be provided.
2. The locations of the affordable units should be shown on the site plan.

LIGHTING:

The project has not provided street lighting, it is recommended that minimum street lighting be supplied either maintained by the condo association or a pole fixture at the end of each driveway.



Terri A. Guarino
Health Agent

TOWN OF BOURNE BOARD OF HEALTH

24 Perry Avenue
Buzzards Bay, MA 02532
www.townofbourne.com/health
Phone (508) 759-0600 ext. 1513
Fax (508) 759-0679



To: Zoning Board of Appeals
From: Terri Guarino, Health Agent
cc: Inspections Department, Office of the Town Planner, & Applicant
Date: October 18, 2019
Re: Chase Estates

This letter is written as additional comment for the proposed amendments and supplemental changes to the comprehensive permit for Chase Estates. The former Health Agent provided a series of recommendations for the modification of the preceding project. The scope of the project change does not conform to the recommendations of the Board of Health and does not provide sufficient information to demonstrate compliance with public health laws, rules, and regulations enacted to ensure sanitary conditions. Please consider the following:

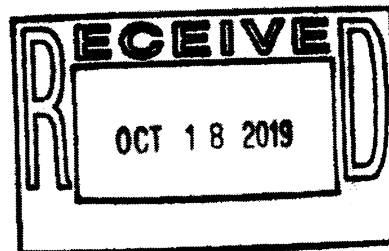
- Verification from the Bourne Water District should be provided to stipulate that they can deliver potable water in a sufficient quantity and pressure to the residential development.
- A waiver from Bourne Board of Health Regulations is not supported. Within the Town of Bourne, the term "bedroom" as it relates to the design flow of on-site sewage disposal systems, is determined in accordance with the Bourne Board of Health Bedroom Definition Regulation dated effective April 24, 1992.
- All wells in the area should be delineated on the site plan(s) with appropriate setbacks for protection zones.
- The plans provided do not adequately demonstrate that the project can comply with Title 5 of the State Environmental Code, 310 CMR 15.000, and Bourne Board of Health Regulations relative to sewage disposal.
 - Whether or not there are suitable areas to site septic system components and both primary and reserve soil absorption systems within the borders of each lot that meet setback and design requirements for new construction
 - Not enough percolation tests and deep observation holes were conducted in the past and more will be required prior to any issuance of building or sewage disposal permits
 - More detail is needed on the existing and proposed grading to the lots to ensure there is no issue of breakout where the soil absorption systems are sited
 - Whether or not the proposed drainage map meets setback distances within 310 CMR 15.211 and if it will be sufficient as to not cause excessive runoff.
- More information is needed to determine whether the semi-public swimming pool and appurtenances thereto meet the standards set forth in 105 CMR 435.000. Board of Health plan review and approval will be required prior to any construction permits.

Please do not hesitate to contact the Board of Health Office at 508-759-0600 ext. 1513 with any questions you may have.

Respectfully Submitted,

T. Guarino

Terri Guarino, RS, CHO
Health Agent



Chase Estates

Town of Bourne Comprehensive Permit #08-10
Notice of Project Change

Chase Developers, Inc.

**Proposed Amended Comprehensive Permit
(July 2021)**

DECISION UPON APPLICATION OF CHASE DEVELOPERS, INC.

FOR A COMPREHENSIVE PERMIT UNDER MASSACHUSETTS GENERAL LAWS CHAPTER 40B, s.20-23

I. APPLICANT AND PUBLIC HEARING

[RECITE PROCEDURAL HISTORY OF REQUEST FOR AMENDED PERMIT]

The total Project shall include no more than twenty (20) dwelling units with no more than three (3) bedrooms each (including five affordable 3-bedroom units) and four (4) dwelling units with no more than two (2) bedrooms each (including one affordable 2-bedroom unit). A total of six (6) of the units, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be affordable to qualified purchasers, in perpetuity.

The minutes and exhibits from the public hearing are available for public inspection in the office of the Town Clerk. A list of the exhibits is contained in the record and is appended hereto by reference.

II. NATURE OF APPLICATION; PROCEDURE REQUIRED BY STATUTE

In conducting its hearings in this matter, the ZBA is guided by G.L. c.40B, s.20-23 and applicable regulations.

III. GOVERNING LAW

The law governing this case is The Low and Moderate Income Housing Act, Massachusetts General Laws, Chapter 40B, §§ 20-23 (the “Act”), and the regulations promulgated by the Department of Housing and Community Development (“DHCD”) Housing Appeals Committee, 760 CMR 56.00 (the “Regulations”).

SUMMARY OF DECISION

The ZBA hereby approves with the conditions set forth below, a comprehensive permit for Chase Developer’s Inc. for the Project depicted on the plans and materials identified in the record, specifically including twenty-four (24) dwelling units and consisting of six (6) units of low or moderate income housing pursuant to the terms, conditions and obligations imposed by G.L. 40B, s.20-23.

IV. THE RECORD BEFORE THE BOARD UPON WHICH THIS DECISION IS BASED.

1. Index Site Plan, dated May 18, 2021, prepared by Outback Engineering
2. Legend and General Notes, dated May 18, 2021, prepared by Outback Engineering

3. Existing Conditions, dated May 18, 2021, prepared by Outback Engineering
4. Lotting Plan, dated May 18, 2021, prepared by Outback Engineering
5. Grading & Drainage Plan, dated May 18, 2021, prepared by Outback Engineering
6. Utility Plan & Road Profile, dated May 18, 2021, prepared by Outback Engineering
7. Layout & Materials Plan, dated May 18, 2021, prepared by Outback Engineering
8. Erosion Sedimentation and Control Plan, dated May 18, 2021, prepared by Outback Engineering
9. Construction Details (2 sheets), dated May 18, 2021, prepared by Outback Engineering
10. Architectural Drawing & Renderings, dated May 18, 2021, prepared by Outback Engineering
11. [Other documents entered into the record]

V. GENERAL CONDITIONS

1. The plans referenced above are the “Approved Plans.”

The Applicant or its agents shall maintain a copy of the Approved Plans and this Decision at the Site during construction.

2. This Decision shall be noted on the Approved Plans and both this Decision and the initial site plan sheet of the Approved Plans shall be recorded at the Barnstable County Registry of Deeds. Proof of recording shall be forwarded to the Building Inspector prior to construction.
3. The Applicant shall comply with all local bylaws, rules and regulations of the Town of Bourne and its boards and commissions in effect as of the date of this decision unless expressly waived herein or as otherwise addressed in these conditions.
4. The Applicant shall pay all fees of the Town of Bourne imposed generally with respect to construction projects and for the purposes of monitoring compliance of the construction and occupancy of the Project in accordance with this Comprehensive Permit, unless otherwise waived in this Decision.

5. The Applicant shall copy the ZBA on all material submissions made by or on behalf of the Applicant for permits or approvals from any federal, state, county, or Town official, board or commission that concerns the design and/or conditions set forth in this Decision, including but not limited to all testing results, official filings and other permits issued for the Project.
6. The Applicant shall comply in all respects with the State Building Code and any local published regulations or published schedule of fees of the Building Inspector. The Applicant shall pay all required fees for all such building permits including any fees customarily charged for inspections and permits unless otherwise waived in this Decision.
7. Prior to the commencement of construction, site development, or clearing, the Applicant shall post with the Town Treasurer security for Site Stabilization and Restoration. Prior to issuance of a Building Permit, vehicle access, emergency vehicle access, and utility service shall be provided to the site of each building for which a building permit is sought in accordance with a phasing plan approved by the Board. Prior to issuance of any Certificate of Occupancy, the Core Site Improvements required to provide vital access and utility service to all dwelling units, or those dwelling units contained within a particular phase of the Project as shown on a Phasing Plan approved by the Board, shall be complete as determined by the Board. Prior to issuance of any Certificate of Occupancy the applicant shall post the Minimum Required Security with the Town Treasurer for the overall project or for a particular phase of the Project as shown on a Phasing Plan approved by the Board. Once posted, security shall remain in full force and effect until the work secured thereby is satisfactorily completed as determined by the Board. However, the instrument serving as security may be changed by the Applicant from time to time with the agreement of the Board as set forth hereinafter. Failure to maintain the Minimum Required Security in full force and effect shall constitute due cause for the Building Inspector to revoke Building Permits. The Board may increase the Minimum Required Security to be posted by the Applicant if the Board determines that the actual construction cost plus contingency to complete the Site Improvements is ten percent (10%) more than the posted security value. The Applicant shall post additional security within forty-five days following receipt of notice from the Board. Upon completion of the work or portions thereof for which security has been provided, the Applicant may petition in writing with a copy to the Town Clerk for reduction or release of the posted security pertaining to the work completed satisfactorily as determined by the Board. If the work has been completed to its satisfaction, the Board will reduce the Minimum Required Security. If the work has not been completed to its satisfaction, the Board will inform the Applicant of the nature of the deficiencies in the work and will forgo or limit the amount of security authorized for release. The Board's decision with respect to release of security will be rendered within 45 days following receipt of the petition. The instrument serving as security may consist of cash, a bankbook, a performance bond, or a trilateral agreement between a bank having a first mortgage on

the property, the property owner, and the Town. The form of security shall be acceptable to the Board only if the language of the security agreement is acceptable to Town Counsel, both as to form, substance, and as to the financial stability of the bonding company or the bank that is party to any Trilateral Agreement. As used in this Decision, the term “Minimum Required Security” shall mean an amount established by the Board that is based upon the anticipated cost to be incurred by the Town in the event the Town completes all remaining work in accordance with applicable public procurement practices plus a construction cost contingency of fifteen percent (15%), except that the amount of security required shall never fall below ten percent (10%) of the amount first posted until final acceptance of all work, and security for plant materials shall not be released until one year has passed following initial planting. The term “Site Improvements” shall mean all required clearing, earthwork, paving, utilities, storm-drain including water quality measures and retention or detention facilities, paving, curbing, walkways, lighting, site entrance, retaining walls, septic systems, landscaping, testing, erosion controls, cleanup, and as-built drawings and data in compliance with the approved plans and Conditions of Approval. For the purposes of determining the Minimum Required Security, site improvements shall not include residential structures or site improvements within 10 feet of residential structures being submitted for a Certificate of Occupancy. The term “Core Site Improvements” shall mean “Site Improvements” as defined above but excludes the top course of the sidewalk and main access roadway pavement and tree and shrub planting. The term “Site Stabilization and Restoration” shall mean stabilization of disturbed areas and shall include grading, placement of a 2 inch thick layer of “plantable soil borrow,” hydroseeding or other acceptable erosion control measures and establishment of ground cover consisting of a “woody mix” of grass, wildflower, shrub, and tree seeds.

8. Nothing in this Decision shall be interpreted as relieving the Applicant of its burden to obtain easements, licenses or written permission from any abutting property owner if, during the course of construction, it becomes necessary to enter upon abutting land for construction or planting purposes.
9. Each condition in this Decision shall run with the land and shall, in accordance with its terms, be applicable to and binding on the Applicant and the Applicant’s successors and assigns; and reference to this Decision shall be incorporated in every deed recorded for the Project and for any dwelling unit in the Project.
10. This Decision permits the construction, use, and occupancy of twenty (20) three (3)-bedroom housing units and four (4) two (2)-bedroom housing units on the Site. The construction and use of the Site shall be in conformity with the Plans as modified by the Approved Plans, and there shall be no creation of additional housing units or any other structures or infrastructure or any increase in the number of bedrooms, except that which

is shown on the Approved Plan, without further approval of the ZBA in the form of amendment to this Decision.

11. Prior to the commencement of construction on the Site, the Applicant shall have obtained all necessary permits and approvals for access to Sandwich Road (Route 6A) from state or county agencies.
12. The Project shall consist of no greater than twenty (20) three (3)-bedroom dwelling units, and four (4) two (2)-bedroom dwelling units, of which five (5) three (3)-bedroom units and one (1) two (2)-bedroom unit shall be affordable to low or moderate-income purchasers, in perpetuity, to households at or below 80% of area median income.
13. The development and dwelling units shall comply with any applicable laws or regulations regarding handicap access.
14. Twenty (20) dwelling units shall contain more than three (3) bedrooms, and four (4) units shall contain no more than two (2) bedrooms, as the term “bedroom” is defined in 310 CMR 15.000 (Title 5 regulations).
15. No internal roadways within the Project shall have a traveled way width of less than twenty (20) feet in width exclusive of berms and curbs.
16. The number and location of the fire hydrants installed within the Project shall be as directed by the Fire Chief, and shall comply fully with applicable laws, codes, and requirements including without limitation NFPA and Bourne Water District requirements to be depicted on the Final Site Plans (as defined in Paragraph VIII.1).
17. Four (4)-foot wide sidewalks, exclusive of the Cape Cod berm separating the sidewalk from the road, shall be constructed along the entire road “going up the hill”, and the width shall be increased in the area of any signs or other obstructions in order that there is at least a continuous 4 foot wide walking area throughout the entire sidewalk.
18. This Comprehensive Permit is conditioned upon the applicant obtaining an expanded Access Permit from Mass Highway for access to the Project approved herein, regardless of whether or not obtaining said expanded permit triggers the Massachusetts Environmental Policy Act or other state or regional regulatory requirements. The Access Permit from MassDOT shall be obtained and recorded in the Barnstable Registry of Deeds prior to construction.

VI. AFFORDABLE HOUSING

1. Five (5) 3-bedroom dwelling units, and one (1) 2-bedroom dwelling unit, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be sold to low or moderate income qualified purchasers. These dwelling units shall be located on an Affordable Units Location Plan. These dwelling units shall remain affordable pursuant to the terms and conditions of this Decision, in perpetuity or for the longest period allowed by law.
2. Phasing-in of Affordable Units: No more than three certificates of occupancy shall be issued by the Building Inspector for units designated for sale at fair market prices (the "Market Rate Units") until at least one certificate of occupancy is issued for an Affordable Unit. The proportion of Market Rate Unit certificates of occupancy issued to Affordable Unit certificates of occupancy issued shall at no time exceed 3:1. The last unit sold shall be a Market Rate Unit. The Affordable Units shall be reasonably interspersed within the Project and shall be shown on the site plans prior to Decision.
3. The affordable units shall be sold to qualified households whose gross annual income is no greater than eighty percent (80%) of the median family income for Barnstable County, as published annually by the U.S. Department of Housing and Urban Development, adjusted for household size, and whose assets do not exceed the then current DHCD guidelines. The maximum sale price for the affordable units shall be the maximum purchase price affordable for a household with an income that does not exceed seventy percent (70%) of the median family income for Barnstable County, as published annually by the U.S. Department of Housing and Urban Development.
4. Each conveyance of an affordable unit shall include a Deed Rider or Affordable Housing Restriction, in the form approved by the subsidizing agency, which shall contain a restriction requiring that the unit remain affordable to an eligible buyer in perpetuity. The Deed Rider shall be recorded senior to any liens on the Premises to protect the continued availability of and requirement for the affordable units in the event of any foreclosure, bankruptcy, refinancing or sale. Prior to the sale of any unit, the unit owner or his/her agent shall submit to the Bourne Housing Partnership Committee (BHCP) for its approval written rules for the selection of buyers of affordable units (the Buyer Selection Rules). The Buyer Selection Rules shall provide that all affordable units are to be sold through a lottery or buyer selection process, subject to the review and approval by the BHPC or its designee. Notwithstanding the foregoing, the restrictions and Buyer Selection Rules shall conform to the requirements of the subsidizing agency. The Applicant shall be responsible for all fees and expenses necessary to implement the initial buyer selection process, including all marketing and advertising costs; fees and expenses for subsequent re-sales shall be the responsibility of the seller.
5. Unless disapproved by MassHousing, the Bourne Housing Partnership Committee (BHPC) or its designee shall monitor all sales and re-sales of affordable units in

accordance with a Monitoring Agreement in the form required by MassHousing. The Monitoring Agreement shall be fully executed prior to the issuance of a building permit for any of the dwelling units permitted by this Decision.

6. Re-sales and Refinancing: Whenever an affordable unit is to be resold, the owner of such unit shall notify the BHCP or its designee, in accordance with the Regulatory Agreement and Deed Rider, and shall enter into a Monitoring Agreement, as approved by the Board's counsel, with either the BHCP or its designee, to monitor the re-sale to assure the continuous affordability of the unit and the purchase of the unit by an eligible buyer. The sale price shall be determined in the same manner as discussed above. The Monitoring Agreement shall require that the seller pay the cost of monitoring re-sales. Whenever an affordable unit is to be refinanced, the owner shall notify the BHCP or its designee, in accordance with the Regulatory Agreement and the Deed Rider, which shall state that the amount of all mortgages, home equity loans, and other loans secured by the affordable unit shall not exceed the maximum sales price calculated in accordance with this Decision. In addition to the foregoing, resale and refinancing arrangements shall conform to the requirements of the subsidizing agency.
7. All affordable units shall be indistinguishable from the exterior from the market rate units. The construction specifications for the affordable units shall be identical to the construction specifications of the market rate units. This condition shall not prohibit a market rate buyer from purchasing upgraded appliances, carpeting, countertops, or other interior amenities from the Applicant or its assigns.

VII. MARKETING/LOTTERY AFFORDABLE UNITS

The following conditions are imposed with respect to the issues of marketing, minority outreach, lottery, resale formula, perpetual affordability, and the deed rider as follows. The BHCP may direct the applicant to take additional steps to carry out the purposes of these conditions.

The selection of purchasers for the Affordable Units, including the administration of the Lottery, shall be administered by a consultant retained by the Applicant, subject to the Subsidizing Agency's approval. The Lottery shall be implemented pursuant to a Lottery Plan developed by the lottery consultant and approved by the Subsidizing Agency. If acceptable to the Subsidizing Agency, disputes concerning income or other qualification shall be resolved in the first instance by the Monitoring Agent and a party aggrieved by qualification-related decision of the Monitoring Agent may appeal the decision to the ZBA for a final determination.

The provisions of this section are intended to complement and not to override or supersede any applicable requirements of the Subsidizing Agency, fair marketing regulations of the Department of Housing and Community Development, the Massachusetts Commission Against Discrimination, MassHousing, or any authority with jurisdiction and like purpose, to provide low and/or moderate income housing.

1. A lottery will be held to locate buyers for each Phase of Development. Advertisements will be run in local area papers announcing the availability of homes, income guidelines, and contact information for obtaining applications. Mailings shall be sent to, and shall include but not be limited to, the Local Housing Partnership, the Bourne Town Hall, the Housing Assistance Corporation of Hyannis, DHCD, local public libraries, local places of worship, and housing assistance organizations, as well as applicants for prior phases of previously approved comprehensive permit projects that were not chosen in the previous lotteries. Each group will receive a copy of the advertisement as well as some blank applications.
2. In addition to the local community papers, advertisements shall be sent for publication to minority publications such as the Bay State Banner; El Mundo, etc., and mailings will be sent to local/regional organizations, social service agencies that have connections to minority communities, such as the NAACP and the Wampanoag Tribal Council. Prior to each lottery, the marketing agent will contact DHCD for an updated list of suggested publications. The outreach/marketing program shall be for a period of at least sixty (60) days prior to the selection of buyers.
3. Applications received from the outreach program will be reviewed and pre- screened for qualifications. Follow-up information will be requested as necessary to ensure that all applications include information as to Down Payment availability, mortgage pre-approval, assets, and first time buyer status. Upon review and receipt of all information, lottery applications will be placed into a pool based upon family size for the one and two bedrooms homes in each phase. A random drawing will then be conducted to select the designated number of candidates for each phase. All Applicants will be notified after the lottery of their status. Notifications will include information as to whether or not they were included in the lottery. If not, an explanation will be provided. All Applicants that were included in the lottery will be notified as to whether or not they were chosen. Those that were chosen during the drawing will be notified of a tentative delivery date for their home and will be contacted for an individual appointment to process their purchase. Those that were not chosen will be notified and advised that they will be notified of and included in subsequent drawings in future phases if they so choose.
4. To the extent permissible by law, the lottery system shall provide for residential preference of the Town Percentage (hereinafter defined) of the affordable units, so that only "Town residents" and minority applicants shall be included in the pool for each lottery for up to 70% of the affordable units sold to an eligible household. Thereafter, the lottery pool shall include all applicants, including but not limited to "Town residents." A "Town resident" is defined to include an applicant who lives or has lived in Bourne, currently works in Bourne, or who has immediate family (grandparents, parents, children, or siblings) who live in Bourne.

5. Minority applicants, if any, shall be included in all lottery pools.
6. In each of the above scenarios the three bedroom units will be reserved for first time homebuyers (defined as not having owned a home within three (3) years prior to the purchase, or a family that has been displaced by a divorce, etc.) and agree to occupy the unit as a primary residence.
7. Eligibility shall be determined prior to each lottery by using the current year HUD Median Income figures for Barnstable County. In all cases total household income and current assets for the family will be used to determine eligibility.
8. The re-sale of all affordable units shall be governed by the Deed Rider and/or Affordable Housing Restriction prepared by the subsidizing agency and shall be considered incorporated within this Decision.
9. All homeownership affordable units shall be owner occupied, except as may be allowed by the applicable subsidizing agency Deed Rider or Affordable Housing Restriction.
10. The above conditions concerning eligibility, pricing, affordability in perpetuity, monitoring, and owner occupation shall be set forth in a Deed Rider attached to all affordable units. The Deed Rider shall be recorded immediately following the Deed and shall be senior to any liens on the Premises to protect the continued availability of and requirement for the affordable units in the event of any foreclosure, bankruptcy, refinancing or sale.
11. The Applicant shall obtain the Subsidizing Agency's approval of a Buyer Selection Plan for the sale of the Affordable Units prior to putting any of the Affordable Units on the market. Buyers shall be selected through a fair lottery process (the "Lottery"), acceptable to the Subsidizing Agency.

VIII. CONSTRUCTION AND SUBMISSION REQUIREMENTS

1. Pre-Construction Submissions: Before the Applicant commences any construction activities the Applicant shall have:
 - a. Submitted Final Site Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, and with state and federal codes. Copies of the detailed, approved construction drawings (the "Final Site Plans") should also be filed in hard copy (10 full-scale sets) and in digital form with the Building Inspector. The Final Site Plans shall bear the signature and seal of a Massachusetts Professional Land Surveyor (PLS) and a Civil Professional Engineer

(PE). The Applicant must secure approval prior to construction pursuant to Paragraph VIII.4. The Final Site Plans shall contain the following:

- i. An existing conditions plan of topographic, utility, and property information.
- ii. Final stormwater management plans and improvements in accordance with applicable laws and regulations, which should include:
 - An existing conditions plan signed and sealed by a Massachusetts Professional Land Surveyor.
 - A lotting sheet signed and sealed by a Massachusetts Professional Land Surveyor.
 - Construction notes for each proposed infiltration system describing construction requirements.
 - Revision of the stormwater system showing the water quality tanks as offline structures, emergency overflows for each subsurface structure, and roof drain connections if any.
 - A Sediment and Erosion Control Plan.
 - More detailed General Notes addressing site controls (vertical and horizontal datum and benchmarks), construction standards, construction sequencing, erosion and sedimentation control procedures, and environmental (noise, vibration, dust and sedimentation), and safety compliance.
 - A note providing contact information, for the proposed gas, electric, and cable utilities.
- iii. Final landscaping plans prepared by a Massachusetts Registered Landscape Architect (RLA) to the detail required for use as on-site construction and planting drawings, improvements shall be consistent with the Approved Plans. Such plans shall include shade trees along the roadways and unit driveways and throughout the site, shrubs, and turf areas. Such plans shall indicate the specific types of active/passive recreational equipment to be installed within the open space and recreational areas located on the approved plans.
- iv. Final roadway plans and profiles for the main site roadway.
- v. Final utility plans and profiles including properly labeled drainage components and all site utilities including electric, gas, water supply lines, wastewater collection and disposal

facilities, building service connections, and all system components and appurtenances. The final roadway profile should extend to the centerline of Sandwich Road and show proposed drainage lines, water quality inlet tanks, and infiltration systems to the profile view including proposed depth of structures and depths to bottom of stone.

- vi. The location of electric, telephone, CATV, and gas lines and appurtenances shall be indicated on the drawings based upon final design of these systems by the utility company.
 - vii. Final Site Lighting plan.
 - viii. Final Photometric Drawing.
 - ix. Final Site Entrance Plan in accord with MassDOT requirements.
 - x. Size, location, legend, and illumination of entrance signage.
 - xi. if approved by MassDOT, a Roadway Improvement Plan showing pavement markings and other improvements to Sandwich Road required to provide a left turn lane at the entrance to Chase Estates.
- b. Obtained any and all permits and approvals from the Bourne Conservation Commission or the DEP which may be required under any state statute, code, or rule and regulation under its jurisdiction, to the extent not otherwise expressly covered by this Decision, including a final Order of Conditions or Superseding Order of Conditions under the Wetlands Protection Act as to any portion of the Site subject to the Wetlands Protection Act that are required by applicable state law prior to such commencement;
 - c. Obtained a National Pollutant Discharge Elimination System ("NPDES") stormwater permit issued for the Project, if required by applicable law;
 - d. Obtained, if needed, a Certificate of the Secretary of Environmental Affairs of compliance pursuant to 301 CMR 11.08(8)(a);
 - e. Delivered to the ZBA with copies to the Building Inspector, Planning Board, Board of Health, Conservation Commission, Superintendent of the DPW, Fire Chief, and Police Chief a complete Construction Management Plan (CMP) as described in condition #3, below.
 - f. A geotechnical engineering design report shall be submitted for the areas that are proposed to be graded at one foot horizontal to one foot vertical (1:1). Signed, sealed

slope stability calculations shall be provided by a geotechnical engineer that is based upon location specific subsurface testing.

- g. Earthwork computations shall be provided for the volume of cut and fill and the net volume on/off site. The number of trucks required for off-site transport shall be calculated.
 - h. Final Drainage Calculations and Report must be submitted. The complete stormwater design package shall be signed and sealed by the civil engineer of record, and shall conform to the methods and procedures set forth in the Massachusetts Stormwater Handbook. The design depicted on the plans currently on file is meant to demonstrate intent and not full construction level of detail.
 - i. Retaining walls exceeding ten (10) feet in height require a Building Permit and must be designed by a Massachusetts Structural Professional Engineer. Final design of retaining walls must be based on location specific soil tests. Safety fencing must be shown. For walls adjacent to property lines, sheeting, shoring, and bracing preventing encroachment on adjacent property must be shown.
2. Before the Applicant commences construction of any residential units, the Applicant shall have:
- a. Submitted Final Architectural Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, with the Massachusetts Building Code, and with all other state and federal codes. Copies of the detailed, approved architectural drawings (the “Final Architectural Plans”) should also be filed in hard copy and in digital form. The Final Architectural Plans shall bear the signature and seal of a Massachusetts Registered Architect (RA). The Applicant must secure approval pursuant to Paragraph VIII.4 prior to beginning unit construction. The Final Plans shall include a Building Code review.

The Final Architectural Plans shall depict twenty (20) 3-bedroom dwelling units and four (4) 2-bedroom units, and shall not show more than sixty-eight (68) total bedrooms on the site.

- b. Obtained any and all permits and approvals from the Bourne Board of Health and the DEP regarding disposal of wastewater generated by the Project that are required by applicable state laws prior to such commencement;
3. The Construction Management Plan shall address the following topics and items:

- i. Construction Administration
 - Hours of construction including equipment startup
 - Hours of construction delivery
 - Truck routes
 - Trash and debris removal
- ii. Construction Phasing and Schedule (critical path) timing and phasing of construction; site clearing; construction of roadways and utilities; buildings, etc. If the site is not expected to be completed in a single- phase, a detailed Construction Phasing Plan shall be submitted indicating access and utilities for each phase adequately addressing access and parking, emergency vehicle access, and utility services.
- iii. Communications
- iv. Noise and Dust Control
 - Tree removal (chipping, etc.)
 - Public street cleaning and repair
 - Dust
 - Noise
 - Rock crushing
- v. Blasting
 - Blasting Plan
 - Identification of petitioner's blasting consultant
 - Selection of independent blasting consultant
 - Selection of blasting contractor
 - Pre- and post-blast survey (scope and content)
 - Insurance coverage
 - Blasting limits
 - Notification to abutters of blasting schedule
 - Road closures (if necessary)
 - School bus conflicts (limits on hours)
- vi. Erosion Control
 - Silt sacks, hay bales, silt fences, etc.
 - Tree protection plan

 - Drainage infrastructure
- vii. Identification of existing underground utilities

- viii. Construction Staging
 - Staging areas
 - Site office trailers
 - Storage trailers/containers
 - Open storage areas
 - Delivery truck holding areas
 - Paved refueling areas with spill containment
- ix. Traffic and Parking (during construction)
 - On-site locations
 - Off-site locations
 - Snow removal
 - Police details
 - Warning signs
- x. Fire and Emergency
 - Temporary emergency access roadway
 - Emergency water supply throughout construction
 - Provision of a Knox padlock for construction fence gates
- xi. Construction Specifications

The CMP shall be reviewed pursuant to Paragraph VIII.4. The scope of the review of the CMP shall be for completeness and for consistency with generally accepted construction practices and for compliance with all the conditions of this Decision.

- 4. Procedure for Review and Approval.
 - a. When review and approval of a plan or document is required by any condition of this permit, the Applicant shall submit the plan or document to the Building Inspector and any other recipient specified by the permit condition. Upon such review and absent an objection by any of the specified recipients, within thirty (30) days of receipt, that such plan or document are inaccurate or inconsistent with or not in conformity with this Decision, the plan or document shall be deemed approved. If the submitted plan or document is required by state or federal law, rather than local regulations, it shall be deemed approved for purposes of this permit, but Town authorities may communicate any concerns to the applicable state or federal agency.
 - b. In the event there is an objection that the plan or document is inaccurate or inconsistent or not in conformity with this Decision, the Applicant may submit the matter in question to

the ZBA for its review for consistency; the ZBA shall hold a hearing within 45 days of the applicant's submission, and render a decision within 14 days after said hearing. Any matter related to this Decision to be reviewed and decided by the ZBA after this Decision is issued may be reviewed and decided by the members of the ZBA designated by the Chairman, even if those members did not sit on the hearings that led up to and resulted in this Decision. The Applicant may appeal any adverse ZBA decision to the Housing Appeals Committee.

IX. SITE DEVELOPMENT CONDITIONS

1. Prior to the commencement of any construction activities or any site development or site clearing, the Applicant shall meet with the Building Department, Police Chief or his representative, Fire Chief or his representative, the ZBA's Consulting Engineer (if any), and the Chair of the ZBA or his representative at a mutually convenient time and place during normal business hours to review the CMP, and to coordinate the Building Department's periodic inspections of the Project (the "Pre-Construction Meeting"). This meeting shall be open to the public.
2. At least two weeks prior to the commencement of any construction activities or site development or clearing, the Applicant shall submit to the ZBA, with a copy to the Police Chief, the Fire Chief, and the Building Inspector, a Construction Schedule, indicating the anticipated start and end points for each significant phase of development (site grubbing, clearing, and fill; construction of roadways and related infrastructure, excavation and blasting for foundations, framing and interior construction, etc.). The Construction Schedule shall also include the anticipated daily vehicle trips per phase, and the anticipated hours of the day during which heavy equipment and construction vehicles are expected to enter and exit the Site.
3. The Applicant shall ensure safe and convenient vehicular access to the Site during the entire duration of the Project.
4. The Applicant shall submit to the ZBA a construction and permitting schedule, prior to the commencement of any construction activities or any site development or clearing, and semi- annually thereafter to assist in project status update and review.
5. The Building Department or its appointed agents may, upon reasonable notice to the Applicant, conduct periodic inspections during the construction of the Project, to ensure compliance with the terms of this Decision and the state building code, and for consistency with generally-accepted construction and engineering practices for the installation of roadways, stormwater management facilities, utilities, and all development infrastructure.

6. The Applicant shall forward final architectural plans to the Building Inspector at the time of applying for building permits. All construction shall be inspected by the Building Inspector and shall be in compliance with all Massachusetts State Building Code requirements
7. The Applicant shall be responsible to ensure that nuisance conditions do not exist in and around the Site during the construction operations. The Applicant shall at all times use all reasonable means to minimize inconvenience to residents in the general area.
8. Dust - Methods of controlling dust shall meet all air pollutant standards as set forth by Federal and State regulatory agencies.
9. Noise - The Applicant shall implement measures to ensure that noise from project construction activities does not exceed acceptable levels, as set forth by Federal and State regulatory agencies.
10. Traffic - The Applicant shall implement necessary traffic safety controls to ensure a safe and convenient vehicular access in and around the Site. Any traffic problems that occur as a result of site operations and construction shall be mitigated immediately, at the expense of the Applicant.
11. Roads – The Applicant is responsible for the sweeping, removal of snow, and sanding of the internal roadways and driveways permitting access to residents, emergency vehicles, and others during construction and until the Homeowner Association has been legally established. The final coat of pavement on the internal roadways shall be installed after the base course has endured a full winter season. The Applicant shall promptly clean any debris or dirt deposited on Bourne or state controlled streets and roads.
12. Burial of any stumps or solid debris onsite is expressly prohibited. Localized burial of stones and/or boulders is prohibited to prevent the creation of voids from soil settlement over time.
13. Utilities, including but not necessarily limited to electric, gas, water, cable, and telephone shall be located underground per utility company standards and applicable codes, and DIGSAFE standards A final utility plan approved by the applicable public utilities shall be submitted to the Building Inspector prior to the commencement of any construction.
14. Stabilization Requirements – No disturbed areas that might contribute to erosion or sediment migration that are located onsite and under the applicant's control shall be left in an open, unstabilized condition longer than 30 days or as may be governed by the NPDES permit. Temporary stabilization shall be accomplished by hay bales, hay coverings, matting or other appropriate means. Final stabilization shall be accomplished

by loaming and seeding exposed areas in accordance with the approved landscaping plans or site plan.

15. Blasting - Any rock blasting shall be performed by a licensed blasting professional, who shall first obtain all required permits from the Bourne Fire Department. All blasting and removal of debris shall be performed in accordance with state regulations and local fire department requirements and shall provide evidence thereof to the Fire Chief.
 - a. Selection of the Blasting Contractor. A blasting contractor, acceptable to both the Applicant and the Bourne Fire Department, shall be selected after review of the qualifications of such contractor by a qualified independent geotechnical-blasting consultant who shall also be acceptable to both the Applicant and the Bourne Fire Department.
 - b. Independent Blasting Consultant. An independent geotechnical-blasting consultant shall be selected and paid for by the Applicant, subject to the approval of the Bourne Fire Department. The consultant shall review the qualifications of the blasting contractor, and review the final blasting plan prepared by the blasting contractor, check the calibration of the seismograph monitors, approve the location and installation of the seismograph monitors, and, if required by the Bourne Fire Department, shall determine the blast limits throughout the blast period and shall consult with the Bourne Fire Department on an as-needed basis throughout the blasting period.
 - c. Pre-blast Survey. Before any blasting on the Site, the Applicant shall conduct a pre-blasting survey that shall include video-recording of the foundations of all direct abutters to the Revised Project, and shall provide a copy of that survey to the ZBA and Fire Chief.
 - d. Insurance Coverage. The blasting contractor shall carry comprehensive public liability insurance in the amount of not less than \$1,000,000 for property damage in respect of any one occurrence and \$2,000,000 aggregate. A certificate shall be submitted to the Bourne Fire Department by the contractor documenting that the required coverage will be in force for the duration of the blasting at the Site. If there is a general contractor or developer associated with the blasting, each shall carry a minimum of \$1 million of comprehensive liability insurance.
 - e. Blasting Limits. The Commonwealth of Massachusetts blasting limits shall be observed. However, if, based upon the recommendation of the independent blasting consultant, the Bourne Fire Department believes that a lower limit is necessary to protect the Site and the abutting property that lower limit shall be in effect.
 - f. Notification. Not less than one week prior to the commencement of any period of blasting, the Applicant shall notify the immediate abutters within 200 feet of the blast

area, stating when the blasting period shall begin. Notification under this provision and under any other provision in the Comprehensive Permit shall be by the following three methods: (1) phone or in person; (2) by email; and (3) by letter. No perchlorate shall be used during blasting. Such notification shall include an explanation of the warning procedures for blasting including soundings. The Applicant shall send another letter notifying the same abutters that the blasting period has been completed. In addition, the Applicant shall notify the Fire Department 30 minutes prior to each blast, and a Fire Department detail is required for every blast, which shall be certified by the Fire Academy on the requirements of the state blasting regulation.

- g. Post-blasting Survey. After the completion of all blasting, the Applicant shall conduct a post-blasting survey that shall include video-recording of the foundations of all direct abutters to the Project, and shall provide a copy of that survey to the ZBA, Fire Chief, and each abutter, respectively, upon request.
- 16. Safety Fencing: During construction of the Project, the Building Inspector shall have authority to require fencing of the site or portions of the site to the extent required and appropriate to enhance safety by controlling access. A Knox padlock shall be used for any construction fence gates.
- 17. As Built Plans: Prior to the occupancy or use of the final “market rate” dwelling unit constituting a part of the Project, the Applicant shall submit to the ZBA an “As Built Plan” in paper and CAD format, showing all pavement, buildings, stormwater management structures, and other infrastructure as they exist on the Site, above and below grade, including appropriate grades and elevations. The plans shall be signed by a registered land surveyor and civil engineer, certifying that the Project as built substantially conforms and complies with the conditions of this Comprehensive Permit.
- 18. Trees. Prior to the commencement of any construction activities or any site development or clearing, if required by the Board’s Consulting Engineer, the Applicant shall erect a physical barrier such as a plastic fence to ensure that any existing trees on the locus be preserved to the extent consistent with the approved site plan and landscaping plans. If any such trees, having a caliper of four inches or greater at four feet from the ground, are destroyed or injured as a result of construction, the Applicant shall plant new trees in their place of a comparable species with a minimum height of nine feet at a ratio of 2 new trees for each destroyed tree. Such replanting shall be done by a qualified landscape professional.
- 19. Roadway Design: The surface course and binder course of the roadways, and the attendant shoulder widths and side slopes, shall conform to the Bourne Planning Board’s Subdivision Rules and Regulations except as waived herein. Roadway design to be indicated on the Final Site Plans shall include the following:

- a. The maximum roadway grade shall not exceed twelve (12) percent.
 - b. Install “No Parking Any Time” (UMTCD R7-1) signs for the hammerhead turnaround at the upper end of the principal on-site access drive.
- 20. Erosion control shall follow Best Management Practices and shall be maintained throughout the duration of the project.

Prior to the issuance of any certificate of occupancy, the applicant shall establish a maintenance plan for the stormwater system, which shall include but not be limited to scheduled inspections, thresholds for removal of sediments, and an educational program for residents for the continuing maintenance and protection of the stormwater system. The maintenance plan shall be reviewed pursuant to Paragraph VIII.4.

No sands or gravels may be removed from the site except those required to be removed to accomplish the conditions shown on the final site plan to be approved by the Board.

- 21. Stormwater Management:
 - a. Catchbasin spacing shall be reduced to a maximum of 150 feet on grades exceeding 6 percent.
 - b. Grate hydraulic calculations shall be submitted and double grate or cascade grate structures shall be added as appropriate to ensure that the design storm is captured.
 - d. Invert elevations of the stormwater quality structures shall be maintained above the recharge systems. The Stormceptor units should not be permitted to surcharge. Tailwater elevations that extend above the structural outlets shall not be permitted.
 - f. All subsurface structures shall support HS-20 loading in paved areas.
- 22. Water Distribution:
 - a. The applicant shall submit a water connection application to the Board of Water Commissioners, together with engineered drawings and other information reasonably requested or required by said Commissioners, consistent with its usual practices and procedures. If questions arise with regard to the project, the District's Engineer may be asked to review the plans and submit a finding.
 - b. The Bourne Fire Dept requires that fire hydrants not exceed 500 feet of separation. Hydrant flow records and test data must demonstrate a deliverable fire flow including simultaneous domestic flow while maintaining a minimum residual pressure of 20psi.

23. Individual on lot septic systems are provided for each duplex structure and maintenance of septic system(s) shall be the responsibility of the respective homeowners; provided, the Homeowner Association shall establish rules and a reserve fund to ensure that the Association can enforce the homeowners' obligation to maintain, test, and repair/replace their septic systems as needed to comply with applicable regulations.
24. The on-site sidewalk shall comply with applicable laws and regulations regarding handicap access.
25. Temporary construction signage and permanent entrance signage at Sandwich Road should be indicated on the plans and details furnished with respect to sign legend, dimensions, materials, colors, means of illumination. Signs shall comply with the requirements of the Bourne Zoning By-Law. The signs should be located to avoid interference with sight distance for exiting vehicles. Peer review of the sight distance limitations may be required.
26. The applicant shall verify whether or not the Postmaster will require a common mailbox facility. If required, the mailbox facility and associated parking shall be indicated on the site plan.
27. The sidewalk at Sandwich Road should be clearly indicated including the area intended to serve as a school bus waiting area.
28. The principal site access roadways should be signed for "No Parking" (MUTCD R7-1) on one side and parking restrictions should be enforceable by the Homeowner Association Documents.
29. A Site Lighting Plan shall be developed using a maximum pole height of 24 feet. Light fixtures should be consistent with residential scale and style typically acceptable in the town and should comply with all applicable laws and regulations.
30. During construction, the Applicant and his agents and employees shall conform to all local, state and federal laws regarding noise, vibration, dust and use of Town roads and utilities. The Applicant shall at all times use all reasonable means to minimize inconvenience to residents in the general area. If any units have been constructed and occupied, construction shall not commence on any day Monday through Friday before 7:30 AM or on Saturday before 8:30 AM, and all exterior construction activities shall cease by 6:00 PM on all days, and no construction or activity whatsoever shall take place on Sundays or legal holidays except for the limited purpose of providing emergency health or safety measures or except as otherwise allowed by the Building Inspector. All construction shall follow Best Management Practices for erosion and sediment control.

31. Construction of all dwelling units, utilities, roads, drainage structures, and all related appurtenances shall be in accordance with all applicable zoning bylaws and all other applicable local, state and federal regulations except as waived by this Decision.
32. All utilities shall be underground.
33. All area and roadway lighting shall be shielded or refracted as necessary in such a manner as to minimize light spill over to neighboring properties. Light fixtures shall incorporate dark skies principals and shall avoid upward projection of light.
34. All on-site storage of hazardous materials and hazardous wastes shall be on an impervious surface, with containment and access control, and all on-site vehicle fueling shall be conducted with industry recognized containment and access control. The CMP shall identify a designated fueling area and shall construct an impervious surface to accommodate construction vehicles. Containment shall be provided for a minimum of 50 gallons of fuel.
35. Prior to digging on any public land, the applicant shall comply with all applicable federal, state and local regulations and with all "dig safe" requirements.
36. Surety & Covenants: As security for the completion of the infrastructure related to the Project as shown on the Approved Plan, including, but not limited to, the binder coat of the roadway, sidewalks, drainage facilities, utilities, landscaping, and any other specific infrastructure shown on the "Approved Plan" (the "Infrastructure"), the release of occupancy permits for all housing units and the sale of all housing units in the Project shall be subject to the following restrictions:
 - a. No occupancy permit for a unit in any building shall be issued, and no sale of any unit shall be permitted, until: (1) the base and binder course for the roadway, parking areas, and relevant unit driveways shown on the Approved Plan has been installed; and (2) all Infrastructure described herein and as shown on the Plan has been constructed or installed so as to adequately serve said building unless a phasing plan is submitted for review and approval by the ZBA.
 - b. No occupancy permit for a unit in any building shall be issued, and no sale of any unit shall be permitted, until the Approved Plan has been recorded with the Registry of Deeds. This Comprehensive Permit shall be referenced on the Approved Plan prior to recording
37. The Applicant and its successors and assigns shall comply with the regulatory/ affordable housing restrictions, deed rider, monitoring agreements, and all other conditions applicable to the project approved by this Decision.

38. Nothing in this Decision shall be deemed to constitute a waiver of or from the jurisdiction of the Cape Cod Commission as granted that agency by the Cape Cod Commission Act, nor as a finding with respect to the Commission's jurisdiction, or lack of jurisdiction, over the project.
39. If construction authorized by this Amended Comprehensive Permit has not begun within three years of the date on which the amended permit becomes final, the permit shall lapse unless extended by the ZBA. The permit shall become final on the date that the written decision is filed in the office of the town clerk if no appeal is filed. Otherwise, it shall become final on the date the last appeal is decided or otherwise disposed of. The Project shall be completed expeditiously and, in any event, within five years of the date of the first building permit issued, unless extended by the ZBA.
40. The Board reserves the right, insofar as consistent with state law, to further review and amend this decision based upon any information that comes before the Board as a result of Applicant's future need to acquire permits from any local, county, state or federal authority, including but not limited to, the Cape Cod Commission.
41. No structure constructed under this Comprehensive Permit shall be altered, reconstructed, extended, or changed unless authorized by the ZBA by a special permit pursuant to the Zoning Bylaws and G.L. c.40A, s.6, as may be amended. Upon such an application for special permit, the Board shall determine, in the first instance, whether such alteration, reconstruction, extension or change is "substantial" or "insubstantial." For all special permit applications for insubstantial changes, the ZBA shall employ the standards of review set forth under the Zoning Bylaw pertaining to changes to pre-existing, nonconforming structures, as may be amended. Requests for substantial changes shall be treated as requests to amend this Comprehensive Permit. This paragraph shall not apply to the original construction of structures developed pursuant to this Comprehensive Permit by the Applicant, but shall apply to subsequent alterations, extensions, and changes to such structures.
42. The terms alteration, reconstruction, extension, and change, shall have the same meaning under the Massachusetts Zoning Act, G.L. c. 40A, §6 and the Bourne Zoning Bylaws.
43. The Applicant acknowledges that prior to the start of construction, the Applicant must obtain all required approvals from any and all other governmental agencies, departments or commissions whose approvals are necessary for this Project and such approvals must be consistent with this Decision.
44. The Applicant shall prepare Homeowner Association documents. The Homeowner Association shall be responsible for the ownership, maintenance and repair of the

roadways, storm water management systems, retention ponds, recharge facilities, retaining walls, the open space parcels, and other common amenities and services.

The Homeowner Association documents shall be subject to review and approval by the Board's counsel to insure compliance with the terms of this Comprehensive Permit decision. Said documents shall contain restrictions on all units preventing any increase in the number of bedrooms. Prior to the sale of any unit, the Homeowner Association documents shall be filed with Barnstable County Registry of Deeds.

The calculation of the percent of interest in the Homeowner Association for each unit shall be determined pursuant to relevant laws of the Commonwealth governing homeowner associations.

45. The final site plan is to be recorded at the Barnstable County Registry of Deeds and shall be recorded together with this Decision.
46. The Board requires that a note be placed on said final site plan stating that the Plan is the subject of a comprehensive permit under Mass. Gen. L. c.40B, sections 20-23.
47. The Town of Bourne shall be free of any liability arising out of the Board's approval of the site layout plan, and for any act, omission or negligence caused by the Applicant, its employees, agents, subcontractors, beneficiaries or trustees with relation to this Project.
48. The Bourne Planning Board's Subdivision Regulations and construction standards, except as waived herein, shall apply to the construction of the roadways, sidewalks, utilities and associated infrastructure of the Project. For the purposes of this condition, the entire project is considered to be a subdivision.
49. A permanent barrier, consisting of a stockade fence as shown on the Approved Plans, must be installed and maintained between Chase Estates at 230 Sandwich Road, Map 25, Parcel 9 and 14 Bosun Lane, Map 25, Parcel 15. This barrier must be maintained by the Applicant until the last dwelling unit is sold, and thereafter by the Homeowner Association.

X. MISCELLANEOUS LEGAL REQUIREMENTS

1. The Applicant shall establish a Homeowner Association for the Project in a form reviewed by the Board's counsel, and approved by the Subsidizing Agency and including provisions for operating and replacement reserves to be established and maintained.
2. Any sale or transfer of rights or interest in all or any part of the Site shall include a condition that successors are bound to the terms and conditions of this Decision.

3. The Applicant and/or subsequent Owner(s) shall be bound by all conditions and requirements set forth in this Comprehensive Permit.
4. In setting the beneficial interest in the Homeowner Association, the Applicant shall comply with all relevant laws of the Commonwealth governing homeowner associations.
5. The principle site roadways, driveways, utilities, drainage systems, water supply and distribution infrastructure, wastewater disposal system, and all other infrastructure shown on the Approved Plans as serving the Project, shall remain private and the Town of Bourne shall not have, now or ever, any legal responsibility for the operation or maintenance of the roadways, driveways and infrastructure, including but not limited to snow removal, garbage pickup, the stormwater management system, the on lot wastewater disposal systems, and landscape maintenance.

XI. APPLICANT'S REQUESTED WAIVERS

The Applicant has requested waivers from the By-Laws of the Town of Bourne, the Town of Bourne Zoning Bylaws and other local rules and regulations. The Applicant's requested waivers are set forth in its Application and as supplemented through the public hearing process. The ZBA's grant of waivers shall be subject to the terms and conditions imposed by this Decision, and to the extent that any waiver is inconsistent with a term or condition set forth elsewhere in this Decision, such term or condition shall govern. No grant of any waiver shall be deemed to waive compliance with any condition of approval of this Decision. Any waiver not granted below or otherwise included within this Decision shall be deemed denied.

The following waivers are granted:

Bourne Zoning Bylaw

Section 1230-1244. Site Plan - Special Permit Approval.

Section 2500. Intensity of Use Schedule (R40)

Section 2640. Development Scheduling.

Section 2660. Development Scheduling.

Section 3491(E)(4) - Stormwater Regulations

Section 3492(C) - Stormwater Regulations

Section 3493(G)(1)(b)(ii) - Stormwater Management Standards for Local Stormwater Permits

Section 3496. Inspection and Site Supervision (Stormwater)

Section 3498. Performance Bond (Stormwater)

Section 4400. Earth Removal.

Bourne Subdivision Regulations

Section 223-Standards of access

Section 261-Application Procedure

Section 264-Environmental Information Report

Section 265 - Plan Processing

Section 266 - Performance Guaranty

Section 267(c) - Ownership of Ways and Easements (15% security retainer)

Section 268 - Rescission

Section 312 - Required Cross Section

Section 322 - Widths

Section 323(a) & (f) -Grade

Section 325-Dead End streets

Section 326 - Preparation and Surfacing of Roadway

Section 327 - Curbs

Section 331-Sidewalk location

Section 332 - Preparation and Surfacing of Sidewalks

Section 341-Easement

Section 365 - Spoil Lots

Section 366-Reflective markers

Section 372 - Inspections

Section 374 - Compliance

Decision of the Board of Appeals:

For all the reasons stated above and on the record before it, pursuant to G.L. c.40B, ss.20-23, the Board voted to grant an Amended Comprehensive Permit to Chase Developers, Inc., for real property located at 230 Sandwich Road, Bourne, Massachusetts, on the terms and conditions stated herein.

Zoning Board of Appeals Bourne, Massachusetts

[SIGNATURE]

Appeals of this decision may be made pursuant to Section 17 of Massachusetts General Laws, Chapter 40A and shall be filed within twenty (20) days after the date this decision is filed with the Bourne Town Clerk.

Chase Estates

Town of Bourne Comprehensive Permit #08-10 Notice of Project Change

Chase Developers, Inc.

Proposed Edits to Comprehensive Permit (July 2021)

Attached are Chase Developers' proposed edits to the existing Comprehensive Permit. Notes in margin indicate the purpose and intent of each proposed edit:

0. These edits eliminate the text describing the 2008-2012 permit review and the rationale for the 2012 decision — specifically, the fact that the Town had achieved a 40B “safe harbor.” This text would be replaced with a description of the record and facts the Board considered in issuing the Amended Permit. These edits also acknowledge that the site has been cleared.
1. These edits address Change #1 — Number of Units and duplex lots vs. standalone condominium units— as described in the accompanying Expansion of Proposed Changes
2. These edits address Change #2 — Road Layout; Community Center and Pool
3. These edits address Change #3 — Curb Cut Permit Application
4. These edits address Change #4 — Sidewalk / Concrete Curb / Cape Cod Berm
5. These edits address Change #5 — Wastewater Disposal & Nitrogen
6. These edits address Change #6 — Town Purchase of Affordable Units
7. These edits address Change #7 — Consistency with 40B Regulations — including:
 - 7a. Requirement for revised plans & further ZBA review;
 - 7b. Fee for hiring consulting engineer and/or auditor;
 - 7c. Water supply
 - 7d. Handicap Access

- 7e. Performance bond as acceptable financial assurance mechanism.
- 8. These edits address Change #8 — Waivers and Non-Applicable Local Regulations
- 9. These edits address other miscellaneous issues.
- 10. These edits were made based on the peer reviewer's August 10, 2020 comments.

DECISION UPON APPLICATION OF CHASE DEVELOPERS, INC.

FOR A COMPREHENSIVE PERMIT UNDER MASSACHUSETTS GENERAL LAWS CHAPTER 40B, s.20-23

I. APPLICANT AND PUBLIC HEARING

A public hearing was opened on July 2, 2008 by the Bourne Zoning Board of Appeals (the “ZBA”) at the Bourne Town Hall, on the application of Chase Developers, Inc. (the “Applicant”) for a comprehensive permit under Massachusetts General Laws Chapter 40B, §§ 20-23 (“Chapter 40B” or the “Act”) and the Bourne Zoning By-Laws to build 32 condominium units, including 8 affordable units at 230 Sandwich Road (the “Project”) on approximately four (4) acres of land located off Sandwich Road in Bourne, Massachusetts (the “Site”).—

Pursuant to 760 CMR 56.03(8)(a), by letter dated July 7, 2008, the Board of Appeals notified the Applicant, with a copy to the Department of Housing and Community Development (DHCD), that the Board “considers a denial of the permit or the imposition of conditions or requirements would be consistent with local needs.” The applicant appealed to DHCD. Despite first agreeing with the Board’s claim of “safe harbor” pursuant to relevant regulations, DHCD’s Chief Counsel reversed her position and by letter dated August 15, 2008 concluded that the Board could not assert applicable “safe harbor” provisions in the regulations. The Board timely appealed DHCD’s assertion to the Housing Appeals Committee. By Decision dated June 8, 2009, the Housing Appeals Committee overturned the decision of DHCD, concluded that the Town of Bourne was consistent with local needs for the purposes of the present application and remanded the matter to the Board of Appeals.—

Following remand, the Applicant filed new materials pursuant to the remand order of the Housing Appeals Committee, a new public hearing was advertised and held, testimony WAS taken, the matter was continued on numerous occasions at the written request of the Applicant, the public hearing was thereafter closed on November 7, 2012, and this decision followed.—

[RECITE PROCEDURAL HISTORY OF REQUEST FOR AMENDED PERMIT]

The total Project shall include no more than ~~sixteentwenty~~ (1620) ~~condominium~~-dwelling units with no more than three (3) bedrooms each (including ~~the~~five affordable 3-bedroom units) and four (4) dwelling units with no more than two (2) bedrooms each (including one affordable 2-bedroom unit). ~~Four (4)~~A total of six (6) of the ~~condominium~~-units, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be affordable to qualified purchasers, in perpetuity.

The minutes and exhibits from the public hearing are available for public inspection in the office of the Town Clerk. A list of the exhibits is contained in the record and is appended hereto by reference.

II. NATURE OF APPLICATION; PROCEDURE REQUIRED BY STATUTE

In conducting its hearings in this matter, the ZBA is guided by G.L. c.40B, s.20-23 and applicable regulations ~~and the above noted Decision of the Housing Appeals Committee concluding that, for the instant matter, the Town of Bourne is “consistent with local needs” as that term is used in the statute and by the Courts.~~

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III. GOVERNING LAW

The law governing this case is The Low and Moderate Income Housing Act, Massachusetts General Laws, Chapter 40B, §§ 20-23 (the “Act”), and the regulations promulgated by the Department of Housing and Community Development (“DHCD”) Housing Appeals Committee, 760 CMR 56.00 (the “Regulations”).

SUMMARY OF DECISION

The ZBA hereby approves with the conditions set forth below, a comprehensive permit for Chase Developer’s Inc. for the Project depicted on the plans and materials identified in the record, specifically including ~~sixteen~~twenty-four (1624) dwelling units and consisting of ~~four (4)~~ six (6) units of low or moderate income housing pursuant to the terms, conditions and obligations imposed by G.L. 40B, s.20-23.

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IV. THE RECORD BEFORE THE BOARD UPON WHICH THIS DECISION IS BASED.

1. ~~C1.1 Title Sheet, dated 2/18/11, prepared by Highpoint Engineering~~Index Site Plan, dated May 18, 2021, prepared by Outback Engineering
2. ~~C2.1 Site Layout Plan, dated 2/18/11, prepared by Highpoint Engineering~~Legend and General Notes, dated May 18, 2021, prepared by Outback Engineering
3. ~~C3.1 Site Grading, Drainage and Utility Plan, dated 2/18/11, prepared by Highpoint Engineering~~Existing Conditions, dated May 18, 2021, prepared by Outback Engineering
4. ~~C4.1 Site Erosion Control Plan, dated 2/18/11, prepared by Highpoint Engineering~~Lotting Plan, dated May 18, 2021, prepared by Outback Engineering
5. ~~C5.1 Site Landscape Plan, dated 2/18/11, prepared by Highpoint Engineering~~Grading & Drainage Plan, dated May 18, 2021, prepared by Outback Engineering
6. ~~C6.1 Site Details, dated 2/18/11, prepared by Highpoint Engineering~~Utility Plan & Road Profile, dated May 18, 2021, prepared by Outback Engineering
7. ~~C6.2 Site Details, dated 2/18/11, prepared by Highpoint Engineering~~Layout & Materials Plan, dated May 18, 2021, prepared by Outback Engineering

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8. ~~2192A 1, Elevations, dated 07/01/02, prepared by Alan Mascord Design Associates-~~
Erosion Sedimentation and Control Plan, dated May 18, 2021, prepared by Outback Engineering—
- ~~9. 2192A 1, Floor Plan, dated 06/2/06, prepared by Alan Mascord Design Associates~~
9. Construction Details (2 sheets), dated May 18, 2021, prepared by Outback Engineering
10. Architectural Drawing & Renderings, dated May 18, 2021, prepared by Outback Engineering
4011. [Other documents entered into the record]
- ~~Response to comments Memo, dated 4/30/11, prepared by Highpoint Engineering—~~
- ~~11. Draft Master Deed, Chase Estates Condominium, not dated—~~
- ~~12. Draft Declaration of Trust and By-Laws of Chase Estates Condominium Trust, not dated—~~
- ~~13. Supplemental Response to Comments, dated 5/10/11, prepared by Garnick & Seudder—~~
- ~~14. Mass Highway Permit, Entitled Permit-Bourne, Permit #5-206-0029, not dated—~~
- ~~15. Nitrogen Loading Calculations, dated 4/30/11, prepared by Highpoint Engineering—~~
- ~~16. Hydrology Calculations, dated 3/15/11, prepared by Highpoint Engineering—~~
- ~~17. Hydrologic Analysis and Drainage Summary, dated 3/15/11, prepared by Highpoint Engineering—~~
- ~~18. Watershed Area Map, dated 3/15/11, prepared by Highpoint Engineering—~~
- ~~19. Infiltration Tests, dated 7/17/08, prepared by Holmes and McGrath, Inc.—~~
- ~~20. Form 11 – Soil Suitability Assessment forms, dated 7/22/08, prepared by Holmes and McGrath, Inc.—~~
- ~~21. Infiltration Tests Location Map, dated January 2010, prepared by Holmes and McGrath, Inc.—~~
- ~~22. Cover Letter, dated 2/22/11, prepared by Highpoint Engineering—~~

V. GENERAL CONDITIONS

1. ~~The plans referenced above are the “Approved Plans.” Prior to the commencement of any construction activities or any site development or clearing, the Applicant shall submit to the Building Inspector, Fire Department, and the ZBA’s designated peer review engineer, counsel and other designated individuals or firms, final comprehensive permit site plans and final engineering calculations consistent with this Decision and the Development Plans identified above, and including but not limited to earth work and stormwater disposal and related best management practices, plans for wastewater disposal system(s), plans for potable drinking water and fire fighting purposes, landscaping and architectural plans and all other plans and calculations needed for review for consistency with and conformity to this Decision. Upon such review and absent an objection by any of the above persons or entities within thirty (30) days of receipt of such documents that such plans and engineering calculations are inaccurate or inconsistent with or not in conformity with this Decision and the Development Plans identified above and those that are required to be submitted, the plans and engineering calculations shall be considered the “Approved Plans.” In the event there is an objection that the plans or engineering calculations are inaccurate or inconsistent or not in conformity with this Decision and the Development Plans identified above, the Applicant may submit the matter in question to the ZBA for its review for consistency; the ZBA shall hold a hearing within 45 days of the applicant’s submission, and render a decision within 14 days after said hearing. Any matter related to this Decision to be reviewed and decided by the ZBA after this Decision is issued may be reviewed and decided by the members of the ZBA designated by the Chairman, even if those members did not sit on the hearings that led up to and resulted in this Decision.~~

The Applicant or its agents shall maintain a copy of the Approved Plans and this Decision at the Site during construction.

2. This Decision shall be noted on the Approved Plans and both this Decision and the initial site plan sheet of the Approved Plans shall be recorded at the Barnstable County Registry of Deeds. Proof of recording shall be forwarded to the Building Inspector prior to ~~issuance of a building permit~~ construction.
3. The Applicant shall comply with all local bylaws, rules and regulations of the Town of Bourne and its boards and commissions in effect as of the date of this decision unless expressly waived herein or as otherwise addressed in these conditions.
4. The Applicant shall pay all fees of the Town of Bourne imposed generally with respect to construction projects and for the purposes of monitoring compliance of the construction

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and occupancy of the Project in accordance with this Comprehensive Permit, unless otherwise waived in this Decision.

5. The Applicant shall copy the ZBA on all material submissions made by or on behalf of the Applicant for permits or approvals from any federal, state, county, or Town official, board or commission that concerns the design and/or conditions set forth in this Decision, including but not limited to all testing results, official filings and other permits issued for the Project.
6. The Applicant shall comply in all respects with the State Building Code and any local published regulations or published schedule of fees of the Building Inspector. The Applicant shall pay all required fees for all such building permits including any fees customarily charged for inspections and permits unless otherwise waived in this Decision.
7. Prior to the commencement of construction, site development, or clearing, the Applicant shall post with the Town Treasurer security for Site Stabilization and Restoration. Prior to issuance of a Building Permit, vehicle access, emergency vehicle access, and utility service shall be provided to the site of each building for which a building permit is sought in accordance with a phasing plan approved by the Board. Prior to issuance of any Certificate of Occupancy, the Core Site Improvements required to provide vital access and utility service to all dwelling units, or those dwelling units contained within a particular phase of the Project as shown on a Phasing Plan approved by the Board, shall be complete as determined by the Board. Prior to issuance of any Certificate of Occupancy the applicant shall post the Minimum Required Security with the Town Treasurer for the overall project or for a particular phase of the Project as shown on a Phasing Plan approved by the Board. Once posted, security shall remain in full force and effect until the work secured thereby is satisfactorily completed as determined by the Board. However, the instrument serving as security may be changed by the Applicant from time to time with the agreement of the Board as set forth hereinafter. Failure to maintain the Minimum Required Security in full force and effect shall constitute due cause for the Building Inspector to revoke Building Permits. The Board may increase the Minimum Required Security to be posted by the Applicant if the Board determines that the actual construction cost plus contingency to complete the Site Improvements is ten percent (10%) more than the posted security value. The Applicant shall post additional security within forty-five days following receipt of notice from the Board. Upon completion of the work or portions thereof for which security has been provided, the Applicant may petition in writing with a copy to the Town Clerk for reduction or release of the posted security pertaining to the work completed satisfactorily as determined by the Board. If the work has been completed to its satisfaction, the Board will reduce the Minimum Required Security. If the work has not been completed to its satisfaction, the Board will inform the Applicant of the nature of the deficiencies in the work and will forgo or limit the amount of security authorized for release. The Board's decision with

respect to release of security will be rendered within 45 days following receipt of the petition. The instrument serving as security may consist of cash, a bankbook, a performance bond, or a trilateral agreement between a bank having a first mortgage on the property, the property owner, and the Town. The form of security shall be acceptable to the Board only if the language of the security agreement is acceptable to Town Counsel, both as to form, substance, and as to the financial stability of the bonding company or the bank that is party to any Trilateral Agreement. As used in this Decision, the term "Minimum Required Security" shall mean an amount established by the Board that is based upon the anticipated cost to be incurred by the Town in the event the Town completes all remaining work in accordance with applicable public procurement practices plus a construction cost contingency of fifteen percent (15%), except that the amount of security required shall never fall below ten percent (10%) of the amount first posted until final acceptance of all work, and security for plant materials shall not be released until one year has passed following initial planting. The term "Site Improvements" shall mean all required clearing, earthwork, paving, utilities, storm-drain including water quality measures and retention or detention facilities, paving, curbing, walkways, lighting, site entrance, retaining walls, septic systems, landscaping, testing, erosion controls, cleanup, and as-built drawings and data in compliance with the approved plans and Conditions of Approval. For the purposes of determining the Minimum Required Security, site improvements shall not include residential structures or site improvements within 10 feet of residential structures being submitted for a Certificate of Occupancy. The term "Core Site Improvements" shall mean "Site Improvements" as defined above but excludes the top course of the sidewalk and main access roadway pavement and tree and shrub planting. The term "Site Stabilization and Restoration" shall mean stabilization of disturbed areas and shall include grading, placement of a 2 inch thick layer of "plantable soil borrow," hydroseeding or other acceptable erosion control measures and establishment of ground cover consisting of a "woody mix" of grass, wildflower, shrub, and tree seeds.

8. Nothing in this Decision shall be interpreted as relieving the Applicant of its burden to obtain easements, licenses or written permission from any abutting property owner if, during the course of construction, it becomes necessary to enter upon abutting land for construction or planting purposes.
9. Each condition in this Decision shall run with the land and shall, in accordance with its terms, be applicable to and binding on the Applicant and the Applicant's successors and assigns; and reference to this Decision shall be incorporated in ~~the condominium Master Deed and in each Unit Deed recorded for the Project and for any every deed recorded for the Project and for any~~ dwelling unit in the Project.
10. This Decision permits the construction, use, and occupancy of ~~sixteentwenty (1620)~~ three (3)-bedroom housing units and ~~four (4)~~ two (2)-bedroom housing units on the Site. The

construction and use of the Site shall be in conformity with the Plans as modified by the Approved Plans, and there shall be no creation of additional housing units or any other structures or infrastructure or any increase in the number of bedrooms, except that which is shown on the Approved Plan, without further approval of the ZBA in the form of amendment to this Decision.

11. Prior to the commencement of ~~any clearing of the Site or any~~ construction on the Site-~~whatsoever~~, the Applicant shall have obtained all necessary permits and approvals for access to Sandwich Road (Route 6A) from state or county agencies.

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- ~~12. Prior to the commencement of any clearing of the Site or any construction on the Site-whatsoever, the Applicant shall make an initial deposit of \$5,000 into the ZBA's G.L. c. 44, sec. 53G consultant revolving fund account to fund the Consulting Engineer's and the Board's counsel's review of the Applicant's additional submissions set forth in this Decision, and any auditor hired by the ZBA to audit the project consistent with this Decision. Whenever the account balance is below \$2,000, the applicant shall deposit a sufficient amount to maintain a \$5,000 balance in said account. The funds required by this paragraph are in addition to the payment of any additional funds required by this Decision. Any unexpended funds after the ZBA's audit, or if and when the ZBA decides not to audit the project, shall be returned to the Applicant pursuant to G.L. c.44, s. 53G.~~

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- ~~13~~12. The Project shall consist of no greater than ~~sixteen~~twenty (16)20 three (3)-bedroom ~~condominium~~dwelling units, and four (4) two (2)-bedroom dwelling units, ~~four~~ (4) of which ~~five~~ (5) three (3)-bedroom units and one (1) two (2)-bedroom unit shall be affordable to low or moderate-income purchasers, in perpetuity, to households at or below 80% of area median income.

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- ~~14. The Applicant shall contact the Bourne Housing Authority, the Housing Assistance Corporation and the Bourne Affordable Housing Trust, prior to beginning construction, and again prior to marketing any of the units, to determine if any of those organizations has an interest in buying any of the affordable units for use as rental housing. If a positive response is received, the organization shall be offered the unit at no more than the maximum sales price for an affordable unit, before any of the units within the approved Project are marketed.—~~

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~~15~~13. The development and dwelling units shall comply with any applicable laws or regulations regarding handicap access.

~~16. All dwelling units shall be designed to meet Energy Star standards. The Applicant shall design and construct the Project such that wastewater generated by the Project, as measured at the down-gradient property line of the Project, shall not exceed 10 parts per million (ppm) of nitrogen and shall make best demonstrable efforts to reduce the nitrogen concentration in wastewater effluent to as close to 5 ppm as possible. The determination of resulting nitrogen loading and concentrations shall be conducted by a competent and qualified individual or firm prior to the issuance of a building permit for the Project. No building permit shall issue for the Project unless and until the Board is in receipt of a credible and predictive analysis, approved by the ZBA's engineering consultant, that the Project, as built, will not exceed 10 ppm of nitrogen and credible efforts have been made to reduce nitrogen concentrations to 5 ppm.—~~

~~17. Notwithstanding the above noted condition, in no case shall the fertilizers to be used at the project be greater than one (1) pound per thousand square feet of cultivated area per year, and said limitation shall be included in the condominium documents for the Project.—~~

~~18~~14. NoTwenty (20) dwelling units shall contain no more than three (3) bedrooms, and four (4) units shall contain no more than two (2) bedrooms, as the term “bedroom” is defined in the Town of Bourne Board of Health regulations310 CMR 15.000 (Title 5 regulations).

~~19. The three units at the lower end of the development shall be served by a sprinkler system for fire safety, as well as other dwelling units as required by local or state law.—~~

~~20. The roadway opening and the opening in the existing brick wall from the Project roadway onto Sandwich Road (Route 6A) shall be widened in accordance with Bourne Fire Department requirements. The intersection layout shall comply with MassDOT standards and requirements. The ZBA recommends that the intersection be modified to provide a 90 degree intersection angle and the westbound (west) shoulder of Sandwich Road should be widened to 22 feet to provide a “defacto” left turn lane. However, the ZBA understands that MassDOT has exclusive jurisdiction over Sandwich Road, and therefore the ZBA requires only that the intersection be modified as required by MassDOT. Copies of the MassDOT Access Permit shall be submitted to the Board. Unless disallowed by MassDOT, the intersection shall accommodate the largest fire department vehicle in a single turning movement. Any substantial modification to the intersection design as reflected on the MassDOT approved plans at the time of the issuance of the MassDOT permit shall be submitted to the Board for review and determination of consistency with this Decision. With regard to any matter submitted to the Board for review and~~

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~~determination of consistency with this Decision, the Board shall hold a hearing with 45 days of the submission and render a decision within 14 days after said hearing.~~

2415. No internal roadways within the Project shall have a traveled way width of less than twenty-two (2220) feet in width exclusive of berms and curbs.

2216. The number and location of the fire hydrants installed within the Project shall be as directed by the Fire Chief, and shall comply fully with applicable laws, codes, and requirements including without limitation NFPA and Bourne Water District requirements to be depicted on the ~~Approved~~Final Site Plans (as defined in Paragraph VIII.1).

2317. Four (4)–foot wide sidewalks, exclusive of the Cape Cod berm separating the sidewalk from the road, shall be constructed along the entire road “going up the hill”, and the width shall be increased in the area of any signs or other obstructions in order that there is at least a continuous 4 foot wide walking area throughout the entire sidewalk. ~~A Cape Cod berm is permissible next to the road only in those areas where there is a grass strip, measuring at least two feet wide, between the berm and the sidewalk. Otherwise, a vertical faced concrete curb next to the road is required. Construction shall comply with Section 332 of the Bourne Subdivision Rules and Regulations.—~~

24. ~~The applicant shall construct, and the Approved Plans shall reflect, a roadway from the lower end of the Project in front of the 3 connected units to the southern edge of the property line. The roadway design shall accommodate the largest fire department vehicle without encroachment into oncoming traffic. It is anticipated that this roadway may, in the future, connect to a roadway across the Upper Cape Regional Technical High School property and lead to a traffic light on Sandwich Road. Unless the traffic light is located directly in front of the present entrance/exitway, within 3 months after the traffic light is operating and the connecting road is completed, the present entrance/exitway shall be converted to a right turn in and right turn out only entrance/exitway, with appropriate signage.—~~

2518. The Applicant has submitted into the record a permit from Mass Highway to access and egress Sandwich Road (Route 6A). However, this permit was granted to provide access to a proposed single family residence only and clearly not for the number of dwelling units sought by the Applicant pursuant to its application for a Comprehensive Permit. Accordingly, ~~t~~This Comprehensive Permit is conditioned upon the applicant obtaining an expanded Access pPermit from ~~Mass Highway~~MassDOT for access to the Project approved herein, regardless of whether or not obtaining said expanded permit triggers the Massachusetts Environmental Policy Act or other state or regional regulatory requirements. The Access Permit from MassDOT shall be obtained and recorded in the Barnstable Registry of Deeds prior to construction. ~~In addition, the Board is using this decision to inform Mass Highway when it considers the Applicant’s application for such~~

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an extended permit that the Board of Appeals has concerns about the effect of an expanded permit upon the safety of vehicles traveling on Sandwich Road, as well as the safety of vehicles entering and exiting the proposed development. Members of the Board of Appeals and the public have found it difficult to exit to and from the numerous curb-cuts along Sandwich Road, especially and most noticeably, when making a left turn. The Board of Appeals has heard and given credit to testimony concerning the possible need of a left turn lane, or at least widening the road to allow traffic to flow in a southerly direction while a vehicle waits to turn left into the proposed development. The Board of Appeals has also heard testimony from the Applicant's traffic engineers to the effect that the traffic generated by the development as proposed will not increase safety concerns. However, the Board of Appeals defers to the expertise of the Mass Highway Department and makes no determination as to whether such an expanded permit ought to be granted, or if one is granted what conditions, if any, should be imposed by Mass Highway. It is important to note that the Board accepts, on behalf of the Town of Bourne, absolutely no responsibility for or contribution to, any costs associated with any improvements to the roadways or related infrastructure required by Mass Highway.

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26. The Applicant shall present this Decision, making specific reference to Conditions 20 and 25 above, to Mass Highway, together with its application for an expanded permit.

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— 27. Prior to commencement of construction, the applicant shall obtain written proof from the Bourne Water Department stating that potable water is available to the Project and that water pressure is adequate to serve the needs of the Project.

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— 28. Final landscaping improvements and plans prepared by a Massachusetts Registered Landscape Architect (RLA) to the detail required for use as on-site construction and planting drawings, including shade trees along the roadways and unit driveways and throughout the site, shrubs, and turf areas, indicating the specific types of active/passive recreational equipment to be installed within the open space and recreational areas located on the approved plans, must be submitted to the ZBA for review and approval and shall thereafter be considered part of the "Approved Plans." No construction shall commence until the final landscaping improvements and plans have been approved by the ZBA. [duplicative - see VIII.1]-

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— 29. Final architectural plans showing both interior and exterior and elevations, prepared by a Massachusetts Registered Architect to the detail required for use as on-site construction, must be submitted to the ZBA for review and approval and shall thereafter be considered part of the "Approved Plans". No construction shall commence until the final architectural plans have been approved by the ZBA. [duplicative - see VIII.2]-

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VI. AFFORDABLE HOUSING

301. ~~Four (4)~~ Five (5) ~~condominium-unit~~ 3-bedroom dwelling units, and one (1) 2-bedroom dwelling unit, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be sold to low or moderate income qualified purchasers, ~~unless purchased by one of the entities listed in paragraph 14 of this decision.~~ These dwelling units shall be located on an Affordable Units Location Plan. These dwelling units shall remain affordable pursuant to the terms and conditions of this Decision, in perpetuity or for the longest period allowed by law ~~and shall be restricted pursuant to an Affordable Housing Restriction as provided for in G.L. c.184, s.31-32.~~
NOTE: THIS IS ADDRESSED IN PARAGRAPH 33.

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342. Phasing-in of Affordable Units: No more than three certificates of occupancy shall be issued by the Building Inspector for units designated for sale at fair market prices (the “Market Rate Units”) until at least one certificate of occupancy is issued for an Affordable Unit. The proportion of Market Rate Unit certificates of occupancy issued to Affordable Unit certificates of occupancy issued shall at no time exceed 3:1. The last unit sold shall be a Market Rate Unit. The Affordable Units shall be reasonably interspersed within the Project, ~~and no more than one (1) Affordable Unit shall be amongst the three (3) units at the lower end of the development~~ and shall be shown on the site plans prior to Decision.

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323. The affordable units shall be sold to qualified households whose gross annual income is no greater than eighty percent (80%) of the median family income for Barnstable County, as published annually by the U.S. Department of Housing and Urban Development, adjusted for household size, and whose assets do not exceed the then current DHCD guidelines. The maximum sale price for the affordable units shall be the maximum purchase price affordable for a household with an income that does not exceed seventy percent (70%) of the median family income for Barnstable County, as published annually by the U.S. Department of Housing and Urban Development.

334. Each conveyance of an affordable unit shall include a Deed Rider or Affordable Housing Restriction, in the form approved by the subsidizing agency, which shall contain a restriction requiring that the unit remain affordable ~~(either to an eligible buyer or to an eligible renter, as applicable)~~ in perpetuity. The Deed Rider shall be recorded senior to any liens on the Premises to protect the continued availability of and requirement for the affordable units in the event of any foreclosure, bankruptcy, refinancing or sale. Prior to the sale of any unit, the unit owner or his/her agent shall submit to the Bourne Housing Partnership Committee (BHCP) for its approval written rules for the selection of buyers of affordable units (the Buyer Selection Rules). The Buyer Selection Rules shall provide that all affordable units are to be sold through a lottery or buyer selection process, subject to the review and approval by the BHPC or its designee. Notwithstanding the foregoing, the restrictions and Buyer Selection Rules shall conform to the requirements of the subsidizing agency. The Applicant shall be responsible for all fees and expenses necessary to implement the **initial** buyer selection process, including all marketing and

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advertising costs; fees and expenses for subsequent re-sales shall be the responsibility of the seller.

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345. Unless disapproved by MassHousing, the Bourne Housing Partnership Committee (BHPC) or its designee shall monitor all sales and re-sales of affordable units in accordance with a Monitoring Agreement in the form required by MassHousing. The Monitoring Agreement shall be fully executed prior to the issuance of a building permit for any of the dwelling units permitted by this Decision.

356. Re-sales and Refinancing: Whenever an affordable unit is to be resold, the owner of such unit shall notify the BHCP or its designee, in accordance with the Regulatory Agreement and Deed Rider, and shall enter into a Monitoring Agreement, as approved by the Board's counsel, with either the BHCP or its designee, to monitor the re-sale to assure the continuous affordability of the unit and the purchase of the unit by an eligible buyer. The sale price shall be determined in the same manner as discussed above. The Monitoring Agreement shall require that the seller pay the cost of monitoring re-sales. Whenever an affordable unit is to be refinanced, the owner shall notify the BHPC or its designee, in accordance with the Regulatory Agreement and the Deed Rider, which shall state that the amount of all mortgages, home equity loans, and other loans secured by the affordable unit shall not exceed the maximum sales price calculated in accordance with this Decision. In addition to the foregoing, resale and refinancing arrangements shall conform to the requirements of the subsidizing agency.

367. All affordable units shall be indistinguishable from the exterior from the market rate units. The construction specifications for the affordable units shall be identical to the construction specifications of the market rate units. This condition shall not prohibit a market rate buyer from purchasing upgraded appliances, carpeting, ~~or~~ countertops, or other interior amenities from the Applicant or its assigns.

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VII. MARKETING/LOTTERY AFFORDABLE UNITS

The following conditions are imposed with respect to the issues of marketing, minority outreach, lottery, resale formula, perpetual affordability, ~~possible sale of units to the Bourne Housing Authority, Bourne Affordable Housing Trust, or the Housing Assistance Corporation for rental purposes~~, and the deed rider as follows. The BHPC may direct the applicant to take additional steps to carry out the purposes of these conditions.

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The selection of purchasers for the Affordable Units, including the administration of the Lottery, shall be administered by a consultant retained by the Applicant, subject to the Subsidizing Agency's approval. The Lottery shall be implemented pursuant to a Lottery Plan developed by the lottery consultant and approved by the Subsidizing Agency. If acceptable to the Subsidizing Agency, disputes concerning income or other qualification shall be resolved in the first instance

by the Monitoring Agent and a party aggrieved by qualification-related decision of the Monitoring Agent may appeal the decision to the ZBA for a final determination.

The provisions of this section are intended to complement and not to override or supersede any applicable requirements of the Subsidizing Agency, fair marketing regulations of the Department of Housing and Community Development, the Massachusetts Commission Against Discrimination, MassHousing, or any authority with jurisdiction and like purpose, to provide low and/or moderate income housing.

1. A lottery will be held to locate buyers for each Phase of Development. Advertisements will be run in local area papers announcing the availability of homes, income guidelines, and contact information for obtaining applications. Mailings shall be sent to, and shall include but not be limited to, the Local Housing Partnership, the Bourne Town Hall, the Housing Assistance Corporation of Hyannis, DHCD, local public libraries, local places of worship, and housing assistance organizations, as well as applicants for prior phases of previously approved comprehensive permit projects that were not chosen in the previous lotteries. Each group will receive a copy of the advertisement as well as some blank applications.
2. In addition to the local community papers, advertisements shall be sent for publication to minority publications such as the Bay State Banner; El Mundo, etc., and mailings will be sent to local/regional organizations, social service agencies that have connections to minority communities, such as the NAACP and the Wampanoag Tribal Council. Prior to each lottery, the marketing agent will contact DHCD for an updated list of suggested publications. The outreach/marketing program shall be for a period of at least sixty (60) days prior to the selection of buyers.
3. Applications received from the outreach program will be reviewed and pre- screened for qualifications. Follow-up information will be requested as necessary to ensure that all applications include information as to Down Payment availability, mortgage pre-approval, assets, and first time buyer status. Upon review and receipt of all information, lottery applications will be placed into a pool based upon family size for the one and two bedrooms homes in each phase. A random drawing will then be conducted to select the designated number of candidates for each phase. All Applicants will be notified after the lottery of their status. Notifications will include information as to whether or not they were included in the lottery. If not, an explanation will be provided. All Applicants that were included in the lottery will be notified as to whether or not they were chosen. Those that were chosen during the drawing will be notified of a tentative delivery date for their home and will be contacted for an individual appointment to process their purchase. Those that were not chosen will be notified and advised that they will be notified of and included in subsequent drawings in future phases if they so choose.

4. To the extent permissible by law, the lottery system shall provide for residential preference of the Town Percentage (hereinafter defined) of the affordable units, so that only "Town residents" and minority applicants shall be included in the pool for each lottery for up to 70% of the affordable units sold to an eligible household. Thereafter, the lottery pool shall include all applicants, including but not limited to "Town residents." A "Town resident" is defined to include an applicant who lives or has lived in Bourne, currently works in Bourne, or who has immediate family (grandparents, parents, children, or siblings) who live in Bourne.
5. Minority applicants, if any, shall be included in all lottery pools.
6. In each of the above scenarios the three bedroom units will be reserved for first time homebuyers (defined as not having owned a home within three (3) years prior to the purchase, or a family that has been displaced by a divorce, etc.) and agree to occupy the unit as a primary residence.
7. Eligibility shall be determined prior to each lottery by using the current year HUD Median Income figures for Barnstable County. In all cases total household income and current assets for the family will be used to determine eligibility.
8. The re-sale of all affordable units shall be governed by the Deed Rider and/or Affordable Housing Restriction prepared by the subsidizing agency and shall be considered incorporated within this Decision.
9. All homeownership affordable units shall be owner occupied, ~~except those units owned by the Bourne Housing Authority, the Bourne Affordable Housing Trust, or the Housing Assistance Corporation, and~~ except as may be allowed by the applicable subsidizing agency Deed Rider or Affordable Housing Restriction.
10. The above conditions concerning eligibility, pricing, affordability in perpetuity, monitoring, and owner occupation shall be set forth in a Deed Rider attached to all affordable units. The Deed Rider shall be recorded immediately following the Deed and shall be senior to any liens on the Premises to protect the continued availability of and requirement for the affordable units in the event of any foreclosure, bankruptcy, refinancing or sale.
11. The Applicant shall obtain the Subsidizing Agency's approval of a Buyer Selection Plan for the sale of the Affordable Units prior to putting any of the Affordable Units on the market. Buyers shall be selected through a fair lottery process (the "Lottery"), acceptable to the Subsidizing Agency.

VIII. CONSTRUCTION AND SUBMISSION REQUIREMENTS

1. Pre-Construction Submissions: Before the Applicant commences any construction activities ~~or clearing on or off the Site~~, the Applicant shall have:

- a. Submitted Final Site Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, and with state and federal codes. Copies of the detailed, approved construction drawings (the “Final Site Plans”) should also be filed in hard copy (~~210~~ full-scale sets) and in digital form with the ~~Board, the Building Inspector, and the ZBA consulting engineer~~. The Final Site Plans shall bear the signature and seal of a Massachusetts Professional Land Surveyor (PLS) and a Civil Professional Engineer (PE). The Applicant must secure approval ~~of the Building Inspector and the ZBA consulting engineer~~ prior to construction ~~and allow forty-five (45) days to review the detailed construction drawings. Where applicable, the ZBA shall have forty-five (45) days to hold a hearing and fourteen (14) days thereafter to issue its decision pursuant to Paragraph VIII.4.~~ The Final Site Plans shall contain the following:

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- i. An existing conditions plan of topographic, utility, and property information.
- ii. ~~The Final Site Plans should include stormwater management plans and improvements in accordance with the standards set forth in the Bourne Subdivision Rules and Regulations not waived by this Decision, and with DEP's Storm Water Management Standards. DEP's Storm Water Management Standards shall apply whether or not the site is subject to the Massachusetts “Wetlands Protection Act (MGL Ch 131 §40).”~~applicable laws and regulations.:

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- An existing conditions plan signed and sealed by a Massachusetts Professional Land Surveyor.
- A lotting sheet signed and sealed by a Massachusetts Professional Land Surveyor.
- Construction notes for each proposed infiltration system describing construction requirements.
- Revision of the stormwater system showing the water quality tanks as offline structures, emergency overflows for each subsurface structure, and roof drain connections if any.
- A Sediment and Erosion Control Plan.
- More detailed General Notes addressing site controls (vertical and horizontal datum and benchmarks), construction standards, construction sequencing, erosion and

sedimentation control procedures, and environmental (noise, vibration, dust and sedimentation), and safety compliance.

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- A note providing contact information, for the proposed gas, electric, and cable utilities.

iii. Final landscaping plans prepared by a Massachusetts Registered Landscape Architect (RLA) to the detail required for use as on-site construction and planting drawings, improvements shall be consistent with the Approved Plans. Such plans shall include shade trees along the roadways and unit driveways and throughout the site, shrubs, and turf areas. Such plans shall indicate the specific types of active/passive recreational equipment to be installed within the open space and recreational areas located on the approved plans.

iv. Final roadway plans and profiles for the main site roadway ~~and for the extension to the south property line near the existing garage.~~

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v. Final utility plans and profiles including properly labeled drainage components and all site utilities including electric, gas, water supply lines, wastewater collection and disposal facilities, building service connections, and all system components and appurtenances. The final roadway profile should extend to the centerline of Sandwich Road and show proposed drainage lines, water quality inlet tanks, and infiltration systems to the profile view including proposed depth of structures and depths to bottom of stone.

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vi. The location of electric, telephone, CATV, and gas lines and appurtenances shall be indicated on the drawings based upon final design of these systems by the utility company.

vii. Final Site Lighting plan.

viii. Final Photometric Drawing.

ix. Final Site Entrance Plan in accord with MassDOT requirements.

x. Size, location, legend, and illumination of entrance signage.

xi. if approved by MassDOT, a Roadway Improvement Plan showing pavement markings and other improvements to Sandwich Road required to provide a left turn lane at the entrance to Chase Estates.

b. ~~Final Roadway Reconstruction Plan accommodating change to right turn in/ right turn out only access to Sandwich Road and connection to the proposed road to the south.~~

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~~e. — Obtained from the Building Inspector a written confirmation that the stormwater management system, landscaping plan, architectural floor plans and the Approved Plans² are in conformity with the conditions of this Decision.~~

b. Obtained any and all permits and approvals from the Bourne Conservation Commission or the DEP which may be required under any state statute, code, or rule and regulation under its jurisdiction, to the extent not otherwise expressly covered by this Decision, including a final Order of Conditions or Superseding Order of Conditions under the Wetlands Protection Act as to any portion of the Site subject to the Wetlands Protection Act that are required by applicable state law prior to such commencement;

c. Obtained a National Pollutant Discharge Elimination System (“NPDES”) stormwater permit issued for the Project, if required by applicable law;

d. Obtained, if needed, a Certificate of the Secretary of Environmental Affairs of compliance pursuant to 301 CMR 11.08(8)(a);

~~d. — Submitted Final Architectural Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, with the Massachusetts Building Code, and with all other state and federal codes. Copies of the detailed, approved architectural drawings (the “Final Architectural Plans”) should also be filed in hard copy and in digital form. The Final Architectural Plans shall bear the signature and seal of a Massachusetts Registered Architect (RA). The Applicant must secure approval of the Building Inspector prior to construction and allow forty five (45) days to review the architectural drawings. The Final Plans shall include a Building Code review. [moved to VIII.2]—~~

~~e. — Obtained any and all permits and approvals from the Bourne Board of Health and the DEP regarding disposal of wastewater generated by the Project that are required by applicable laws prior to such commencement; [moved to VIII.2]~~

~~f. — Obtained any and all permits and approvals from the Bourne Conservation Commission, other municipal agencies and/or the DEP regarding management and control of stormwater generated by the Project that are required by applicable law prior to such commencement; [see VIII.1.b]—~~

~~g. — Obtained any and all permits and approvals from the Bourne Conservation Commission or the DEP which may be required under any statute, code, or rule and regulation under its jurisdiction, to the extent not otherwise expressly covered by this Decision, including a final Order of Conditions or Superseding Order of Conditions under the Wetlands~~

~~Protection Act as to any portion of the Site subject to the Wetlands Protection Act that are required by applicable law prior to such commencement; [see VIII.1.b]—~~

~~h. — Obtained a National Pollutant Discharge Elimination System (“NPDES”) stormwater permit issued for the Project; [see VIII.1.c]—~~

~~i. — Obtained, if needed, a Certificate of the Secretary of Environmental Affairs of compliance pursuant to 301 CMR 11.08(8)(a); [see VIII.1.d]~~

~~j. — Delivered to the ZBA final architectural drawings for the buildings/Units to be constructed as shown in the Architectural Plans, providing a sealed depiction of the front, rear and side elevations, signed and sealed by a Massachusetts Registered Architect (RA);~~

~~i. — Architectural plans shall include single family units and the attached units located in the existing garage. The garage units shall reflect the preliminary plans furnished to the Board.—~~

~~ii. — The applicant is encouraged to enhance the architectural quality of the designs. The final architectural plans shall be compatible with the setting and shall be consistent with the architectural character of the Town.—~~

~~iii. — The architectural plans shall be designed based upon the Bourne Board of Health “Bedroom Definition Regulation” (04/24/1992) and the number of bedrooms shall not exceed three (3) bedrooms per unit or a total of forty eight (48) bedrooms on the site.—~~

ke. Delivered to the ZBA with copies to the Building Inspector, Planning Board, Board of Health, Conservation Commission, Superintendent of the DPW, Fire Chief, and Police Chief a complete Construction Management Plan (CMP) as described in condition #3, below.

f. A geotechnical engineering design report shall be submitted for the areas that are proposed to be graded at one foot horizontal to one foot vertical (1:1). Signed, sealed slope stability calculations shall be provided by a geotechnical engineer that is based upon location specific subsurface testing.

g. Earthwork computations shall be provided for the volume of cut and fill and the net volume on/off site. The number of trucks required for off-site transport shall be calculated.

h. Final Drainage Calculations and Report must be submitted. The complete stormwater design package shall be signed and sealed by the civil engineer of record, and shall

conform to the methods and procedures set forth in the Massachusetts Stormwater Handbook. The design depicted on the plans currently on file is meant to demonstrate intent and not full construction level of detail.

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- i. Retaining walls exceeding ten (10) feet in height require a Building Permit and must be designed by a Massachusetts Structural Professional Engineer. Final design of retaining walls must be based on location specific soil tests. Safety fencing must be shown. For walls adjacent to property lines, sheeting, shoring, and bracing preventing encroachment on adjacent property must be shown.
2. Before the Applicant commences construction of any residential units, the Applicant shall have:
 - a. Submitted Final Architectural Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, with the Massachusetts Building Code, and with all other state and federal codes. Copies of the detailed, approved architectural drawings (the "Final Architectural Plans") should also be filed in hard copy and in digital form. The Final Architectural Plans shall bear the signature and seal of a Massachusetts Registered Architect (RA). The Applicant must secure approval pursuant to Paragraph VIII.4 prior to beginning unit construction. The Final Plans shall include a Building Code review.

The Final Architectural Plans shall depict twenty (20) 3-bedroom dwelling units and four (4) 2-bedroom units, and shall not show more than sixty-eight (68) total bedrooms on the site.
 - b. Obtained any and all permits and approvals from the Bourne Board of Health and the DEP regarding disposal of wastewater generated by the Project that are required by applicable state laws prior to such commencement;

~~which shall~~ 3. The Construction Management Plan shall address the following topics and items:

- i. Construction Administration
 - Hours of construction including equipment startup
 - Hours of construction delivery
 - Truck routes
 - Trash and debris removal
- ii. Construction Phasing and Schedule (critical path) timing and phasing of construction; site clearing; construction of roadways and utilities; buildings, etc. If the site is not expected

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to be completed in a single- phase, a detailed Construction Phasing Plan shall be submitted indicating access and utilities for each phase adequately addressing access and parking, emergency vehicle access, and utility services.

iii. Communications

iv. Noise and Dust Control

Tree removal (chipping, etc.)

Public street cleaning and repair

Dust

Noise

Rock crushing

v. Blasting

Blasting Plan

Identification of petitioner's blasting consultant

Selection of independent blasting consultant

Selection of blasting contractor

Pre- and post-blast survey (scope and content)

Insurance coverage

Blasting limits

Notification to abutters of blasting schedule

Road closures (if necessary)

School bus conflicts (limits on hours)

vi. Erosion Control

Silt sacks, hay bales, silt fences, etc.

Tree protection plan

Drainage infrastructure

vii. Identification of existing underground utilities

viii. Construction Staging

Staging areas

Site office trailers

Storage trailers/containers

Open storage areas

Delivery truck holding areas

~~Refueling areas~~ Paved refueling areas with spill containment

- ix. Traffic and Parking (during construction)
 - On-site locations
 - Off-site locations
 - Snow removal
 - Police details
 - Warning signs
- x. Fire and Emergency
 - Temporary emergency access roadway
 - Emergency water supply throughout construction
 - Provision of a Knox padlock for construction fence gates
- xi. Construction Specifications

The CMP shall be reviewed pursuant to Paragraph VIII.4. The scope of the ZBA's review of the CMP shall be for completeness and for consistency with generally accepted construction practices and for compliance with all the conditions of this Decision. ~~The ZBA's engineer shall confirm his/her acceptance of the CMP and report the same to the ZBA within 30 days after a complete submission from the Applicant.~~

- ~~i. Final Drainage Calculations and Report must be submitted. The complete stormwater design package shall be signed and sealed by the civil engineer of record. Stormwater calculations shall document groundwater conditions, soils tests, runoff calculations, inlet capacity calculations, sub-surface stormwater recharge calculations, pre and post-developed watershed and subcatchment plans, etc. The design depicted on the plans currently on file is meant to demonstrate intent and not full construction level of detail. [moved; see VIII.1.h].~~
- ~~i. The calculations shall incorporate changes in the drainage system relating to relocating the subsurface retention facilities to the side of or out of principal site roadway if suitable locations for said facilities are available.~~
- ~~ii. The sizing of the subsurface recharge facilities must be based on the appropriate design rate based upon the Massachusetts Stormwater Handbook. With the "Dynamic Field" method, the design rate is one-half the observed rate. With the "Static" or "Simple-Dynamic" methods, the Rawls Rates at the location and soil depth where recharge is used.~~
- ~~iii. Test data must be submitted to determine the saturated hydraulic conductivity for design purposes. A minimum of one test must be provided for each subsurface recharge facility.~~

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As set forth in the DEP Massachusetts Stormwater Handbook, saturated hydraulic conductivity rates must be determined at the actual location and soil layer where recharge is proposed when the "Dynamic Field" method is proposed. With the "Dynamic Field" method, the design rate is one-half the observed rate. When the "Static" or "Simple Dynamic" methods are proposed, the Rawls Rates at the location and soil depth where recharge is proposed shall be presumed to represent the saturated hydraulic conductivity. Field test methods to assess saturated hydraulic conductivity for the "Dynamic Field" method must simulate the "field-saturated" condition. See ASTM D5126-90 (2004) Standard Guide for Comparison of Field Methods for Determining Hydraulic Conductivity in the Vadose Zone. The saturated hydraulic conductivity analysis must be conducted by the Competent Soils Professional. Acceptable tests include: i) Guelph permeameter—ASTM D5126-90 Method; ii) Falling head permeameter—ASTM D5126-90 Method; iii) Double ring permeameter or infiltrometer—ASTM D3385-03, D5093-026, D5126-90 Methods; or iv) Amoozegar or Amoozegar permeameter—Amoozegar 1992. Title 5 percolation test data is not an acceptable test for saturated hydraulic conductivity.—

- iv.—Rational formula pipe calculations should be submitted demonstrating open channel flow at adequate capacity for the design storm.—
- m.—The current site landscaping shown on the plans must be revised and the number of shade trees increased. Additional native species including native varieties of Oak (*Quercus* spp.), American Beech (*Fagus grandifolia*), pitch pines (*Pinus rigida*), hollies (*Ilex* spp.) should be included. The area devoted to turf grass should be limited and should be indicated on the plans. Drought tolerant grass mixtures should be specified and a minimum depth of loam of 4-6 inches. Installation of automatic irrigation system is prohibited.—
- n.—A geotechnical engineering design report shall be submitted for the sandy slope, approximately 30 feet in height located along the southern edge of the property that is proposed to be graded at one foot horizontal to one foot vertical (1:1) down into the project, behind Units 4 and 5. Signed, sealed slope stability calculations shall be provided by a geotechnical engineer that is based upon location specific subsurface testing.—
- o.—Earthwork computations shall be provided for the volume of cut and fill and the net volume on/off site. The number of trucks required for off-site transport shall be calculated.—
- p.—Retaining walls exceeding ten (10) feet in height require a Building Permit and must be designed by a Massachusetts Structural Professional Engineer. Retaining wall design shall comply with the following:—[see VIII.1.i]—

- ~~i. Test pits or soil borings are required to determine soil type. Soil information can then be used to determine the wall design requirements including the factor of safety for bearing capacity and sliding.~~
- ~~ii. If the structural plans are provided by the retaining wall manufacturer, the design shall be based upon site specific geotechnical information and cannot be qualified by requiring further determination of geotechnical conditions after issuance of the signed and sealed structural drawings.~~
- ~~iii. The structural plans should indicate methods for sheeting, shoring, and bracing for wall segments in proximity to property lines to control encroachment onto adjacent properties during excavation and backfill, if necessary.~~
- ~~iv. To the extent appropriate, the safety fence should wrap the ends of the wall to deter access.~~
- ~~v. To the extent required, engineering peer review should be provided at the applicant's expense.~~

4. Procedure for Review and Approval.

- a. When review and approval of a plan or document is required by any condition of this permit, the Applicant shall submit the plan or document to the Building Inspector and any other recipient specified by the permit condition. Upon such review and absent an objection by any of the specified recipients, within thirty (30) days of receipt, that such plan or document are inaccurate or inconsistent with or not in conformity with this Decision, the plan or document shall be deemed approved. If the submitted plan or document is required by state or federal law, rather than local regulations, it shall be deemed approved for purposes of this permit, but Town authorities may communicate any concerns to the applicable state or federal agency.
- b. In the event there is an objection that the plan or document is inaccurate or inconsistent or not in conformity with this Decision, the Applicant may submit the matter in question to the ZBA for its review for consistency; the ZBA shall hold a hearing within 45 days of the applicant's submission, and render a decision within 14 days after said hearing. Any matter related to this Decision to be reviewed and decided by the ZBA after this Decision is issued may be reviewed and decided by the members of the ZBA designated by the Chairman, even if those members did not sit on the hearings that led up to and resulted in this Decision. The Applicant may appeal any adverse ZBA decision to the Housing Appeals Committee.

IX. SITE DEVELOPMENT CONDITIONS

1. Prior to the commencement of any construction activities or any site development or site clearing, the Applicant shall meet with the Building Department, Police Chief or his representative, Fire Chief or his representative, the ZBA's Consulting Engineer (if any), and the Chair of the ZBA or his representative at a mutually convenient time and place during normal business hours to review the CMP, and to coordinate the Building Department's periodic inspections of the Project (the "Pre-Construction Meeting"). This meeting shall be open to the public.
2. At least two weeks prior to the commencement of any construction activities or site development or clearing, the Applicant shall submit to the ZBA, with a copy to the Police Chief, the Fire Chief, and the Building Inspector, a Construction Schedule, indicating the anticipated start and end points for each significant phase of development (site grubbing, clearing, and fill; construction of roadways and related infrastructure, excavation and blasting for foundations, framing and interior construction, etc.). The Construction Schedule shall also include the anticipated daily vehicle trips per phase, and the anticipated hours of the day during which heavy equipment and construction vehicles are expected to enter and exit the Site.
3. The Applicant shall ensure safe and convenient vehicular access to the Site during the entire duration of the Project. ~~Municipal representatives shall be permitted access to the Site to observe and inspect the Site and construction progress until such time as the Project has been completed.~~ [see 5, below]
4. The Applicant shall submit to the ZBA a construction and permitting schedule, prior to the commencement of any construction activities or any site development or clearing, and semi- annually thereafter to assist in project status update and review.
5. The Building Department or its appointed agents may, upon reasonable notice to the Applicant, conduct periodic inspections during the construction of the Project, to ensure compliance with the terms of this Decision and the state building code, and for consistency with generally-accepted construction and engineering practices for the installation of roadways, stormwater management facilities, utilities, and all development infrastructure. ~~Inspections during the construction phase shall be conducted at the expense of the Applicant.~~
6. The Applicant shall forward final architectural plans to the Building Inspector at the time of applying for building permits. All construction shall be inspected by the Building Inspector and shall be in compliance with all Massachusetts State Building Code requirements

7. The Applicant shall be responsible to ensure that nuisance conditions do not exist in and around the Site during the construction operations. The Applicant shall at all times use all reasonable means to minimize inconvenience to residents in the general area.
8. Dust - Methods of controlling dust shall meet all air pollutant standards as set forth by Federal and State regulatory agencies.
9. Noise - The Applicant shall implement measures to ensure that noise from project construction activities does not exceed acceptable levels, as set forth by Federal and State regulatory agencies.
10. Traffic - The Applicant shall implement necessary traffic safety controls to ensure a safe and convenient vehicular access in and around the Site. Any traffic problems that occur as a result of site operations and construction shall be mitigated immediately, at the expense of the Applicant.
11. Roads – The Applicant is responsible for the sweeping, removal of snow, and sanding of the internal roadways and driveways permitting access to residents, emergency vehicles, and others during construction and until the ~~Condominium Association~~ Homeowner Association has been legally established. The final coat of pavement on the internal roadways shall be installed after the base course has endured a full winter season. The Applicant shall promptly clean any debris or dirt deposited on Bourne or state controlled streets and roads.
12. Burial of any stumps or solid debris onsite is expressly prohibited. Localized burial of stones and/or boulders is prohibited to prevent the creation of voids from soil settlement over time.
- ~~13. Soil material to be used as backfill for pipes, roads, and/or structures (i.e. detention basins) shall be tested at the expense of the Applicant by a qualified firm acceptable to the Building Department. Testing of said backfill shall be performed in conformance with standards and frequencies reasonably established by the Building Department—~~
1413. Utilities, including but not necessarily limited to electric, gas, water, cable, and telephone shall be located underground per utility company standards and applicable codes, and DIGSAFE standards A final utility plan approved by the applicable public utilities shall be submitted to the Building Inspector prior to the commencement of any construction.
1514. Stabilization Requirements – No disturbed areas that might contribute to erosion or sediment migration that are located onsite and under the applicant's control shall be left in an open, unstabilized condition longer than 30 days or as may be governed by the NPDES permit. Temporary stabilization shall be accomplished by hay bales, hay

coverings, matting or other appropriate means. Final stabilization shall be accomplished by loaming and seeding exposed areas in accordance with the approved landscaping plans or site plan.

4615. Blasting - Any rock blasting shall be performed by a licensed blasting professional, who shall first obtain all required permits from the Bourne Fire Department. All blasting and removal of debris shall be performed in accordance with state regulations and local fire department requirements and shall provide evidence thereof to the Fire Chief.
- a. Selection of the Blasting Contractor. A blasting contractor, acceptable to both the Applicant and the Bourne Fire Department, shall be selected after review of the qualifications of such contractor by a qualified independent geotechnical-blasting consultant who shall also be acceptable to both the Applicant and the Bourne Fire Department.
 - b. Independent Blasting Consultant. An independent geotechnical-blasting consultant shall be selected and paid for by the Applicant, subject to the approval of the Bourne Fire Department. The consultant shall review the qualifications of the blasting contractor, and review the final blasting plan prepared by the blasting contractor, check the calibration of the seismograph monitors, approve the location and installation of the seismograph monitors, and, if required by the Bourne Fire Department, shall determine the blast limits throughout the blast period and shall consult with the Bourne Fire Department on an as-needed basis throughout the blasting period.
 - c. Pre-blast Survey. Before any blasting on the Site, the Applicant shall conduct a pre-blasting survey that shall include video-recording of the foundations of all direct abutters to the Revised Project, and shall provide a copy of that survey to the ZBA and Fire Chief.
 - d. Insurance Coverage. The blasting contractor shall carry comprehensive public liability insurance in the amount of not less than \$1,000,000 for property damage in respect of any one occurrence and \$2,000,000 aggregate. A certificate shall be submitted to the Bourne Fire Department by the contractor documenting that the required coverage will be in force for the duration of the blasting at the Site. If there is a general contractor or developer associated with the blasting, each shall carry a minimum of \$1 million of comprehensive liability insurance.
 - e. Blasting Limits. The Commonwealth of Massachusetts blasting limits shall be observed. However, if, based upon the recommendation of the independent blasting consultant, the Bourne Fire Department believes that a lower limit is necessary to protect the Site and the abutting property that lower limit shall be in effect.

- f. Notification. Not less than one week prior to the commencement of any period of blasting, the Applicant shall notify the immediate abutters within 200 feet of the blast area, stating when the blasting period shall begin. Notification under this provision and under any other provision in the Comprehensive Permit shall be by the following three methods: (1) phone or in person; (2) by email; and (3) by letter. No perchlorate shall be used during blasting. Such notification shall include an explanation of the warning procedures for blasting including soundings. The Applicant shall send another letter notifying the same abutters that the blasting period has been completed. In addition, the Applicant shall notify the Fire Department 30 minutes prior to each blast, and a Fire Department detail is required for every blast, which shall be certified by the Fire Academy on the requirements of the state blasting regulation.
- g. Post-blasting Survey. After the completion of all blasting, the Applicant shall conduct a post-blasting survey that shall include video-recording of the foundations of all direct abutters to the Project, and shall provide a copy of that survey to the ZBA, Fire Chief, and each abutter, respectively, upon request.

14716. Safety Fencing: During construction of the Project, the Building Inspector shall have authority to require fencing of the site or portions of the site to the extent required and appropriate to enhance safety by controlling access. A Knox padlock shall be used for any construction fence gates.

14817. As Built Plans: Prior to the occupancy or use of the final “market rate” dwelling unit constituting a part of the Project, the Applicant shall submit to the ZBA an “As Built Plan” in paper and CAD format, showing all pavement, buildings, stormwater management structures, and other infrastructure as they exist on the Site, above and below grade, including appropriate grades and elevations. The plans shall be signed by a registered land surveyor and civil engineer, certifying that the Project as built substantially conforms and complies with the conditions of this Comprehensive Permit.

14918. Trees. Prior to the commencement of any construction activities or any site development or clearing, if required by the Board’s Consulting Engineer, the Applicant shall erect a physical barrier such as a plastic fence to ensure that any existing trees on the locus be preserved ~~within forty feet of the property line on all sides which shall not be touched during construction and to ensure that there is a protective radius within the drip line around such trees~~ to the extent consistent with the approved site plan and landscaping plans. If any such trees, having a caliper of four inches or greater at four feet from the ground, are destroyed or injured as a result of construction, the Applicant shall plant new trees in their place of a comparable species with a minimum height of nine feet at a ratio of 2 new trees for each destroyed tree. Such replanting shall be done by a qualified landscape professional.

2019. Roadway Design: The surface course and binder course of the roadways, and the attendant shoulder widths and side slopes, shall conform to the Bourne Planning Board's Subdivision Rules and Regulations **except as waived herein**. Roadway design to be indicated on the Final Site Plans shall include the following:

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a. The maximum roadway grade shall not exceed **tentwelve (4012)** percent.

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~~b. The main access roadway in front of the existing garage building shall be widened to provide a 22-foot wide traveled way exclusive of berms and shall extend to the south property line. A 4-foot wide sidewalk shall be provided.~~

~~c. Upon the installation of a traffic light on Sandwich Road that is not located in front of the present entrance/exitway, and completion of construction of a connection to the proposed roadway to the south, the current access to Sandwich Road shall be changed to a right turn in/right turn out access.~~

~~db.~~ Install "No Parking Any Time" (UMTCD R7-1) signs for the **hammerhead** turnaround at the upper end of the principal on-site access drive.

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2120. ~~With respect to drainage and erosion control, the Town Building Inspector and the Town the Department of Public Works shall review the plans to determine that they are substantially consistent with the preliminary plans and in substantial compliance with the conditions of this permit, and the applicant shall comply with the EPA's National Pollutant Discharge Elimination System II (NPDES II). Said drainage shall be designed using Best Management Practices (BMP's) and shall conform to the Massachusetts Stormwater Management Standards. This will include, but not be limited to, the use of pre-cast concentric concrete catch basins including oil/grit separators to remove sediments and hydrocarbons from the stormwater runoff. The groundwater elevation shall be verified, and a minimum separation of two feet from the bottom of the drainage system and seasonal high groundwater shall be maintained. During construction, the access road entrance shall be stabilized with stone and gravel to a depth of six inches and a length of fifty (50) feet for removal of sediment from construction vehicle tires when leaving the site. Prior to issuance of any certificates of occupancy, the plans for stormwater drainage system serving the land and buildings in which such certificates of occupancy are being sought shall be subject to inspection by Town Public Works, the Board's peer review engineer consultant, and the Town Building Inspector. Erosion control shall follow Best Management Practices and shall be maintained throughout the duration of the project.~~

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~~Prior to the issuance of any certificate of occupancy, The~~the applicant shall establish a maintenance plan for the stormwater system, which shall include but not be limited to scheduled inspections, thresholds for removal of sediments, and an educational program

for residents for the continuing maintenance and protection of the stormwater system.; The maintenance plan shall be reviewed ~~for compliance with BMPs and approved by the Town Public Works and the Town Building Services department prior to~~ construction pursuant to Paragraph VIII.4. The applicant shall pay for the cost of an independent engineering review of the proposed stormwater management plan, if requested by the Town.

No sands or gravels ~~or other materials~~ may be removed from the site except those required to be removed to accomplish the conditions shown on the final site plan to be approved by the Board.

~~Prior to the commencement of construction the Building Inspector shall confirm that he has reviewed the plans as required herein for compliance with the conditions of this permit. The Building Inspector shall do so within 30 days of submission of final plans by the Applicant to the Board and the Building Inspector.~~

2221. Stormwater Management:

- a. Catchbasin spacing shall be reduced to a maximum of 150 feet on grades exceeding 6 percent.
- b. Grate hydraulic calculations shall be submitted and double grate or cascade grate structures shall be added as appropriate to ensure that the design storm is captured.
- ~~c. The applicant shall use best efforts to relocate the stormwater recharge systems out of the principal site access roadway or as near to the side of the principal site access roadway as practicable.~~
- d. Invert elevations of the stormwater quality structures shall be maintained above the recharge systems. The Stormceptor units should not be permitted to surcharge. Tailwater elevations that extend above the structural outlets shall not be permitted.
- ~~e. Roof water shall be recharged in separate roof water recharge facilities, whether drywells, rain gardens, or lawn depressions.~~
- f. All subsurface structures shall support HS-20 loading in paved areas.

2322. Water Distribution:

- A a. ~~The water main size, type, connection and all related parts and fixtures will be specified by Bourne Water District. The engineered project drawing must be submitted for approval to the Superintendent of the Bourne Water District. The applicant must also~~

~~submit an engineered study of static pressures and fire flows throughout the entire development. These plans and study and a letter from t~~The applicant shall request~~ingsubmit a water connection application and water must be brought before to the Board of Water Commissioners, together with engineered drawings and other information reasonably requested or required by said Commissioners, consistent with its usual practices and procedures. Only the Board of Water Commissioners has the right to approve a request for a water connection to the Bourne Water District system. If questions arise with regard to the project, the District's Engineer may be asked to review the plans and submit a finding. The cost for this will be at the expense of the applicant. Once plans are approved, any change to the plans must again come before the Superintendent for approval.~~

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- Bb. The Bourne Fire Dept requires that fire hydrants not exceed 500 feet of separation. Hydrant flow records and test data must demonstrate a deliverable fire flow including simultaneous domestic flow while maintaining a minimum residual pressure of 20psi.

2423. ~~The septic system shall be redesigned to include Recirculating Sand Filter (RSF) equivalent technology to denitrify the wastewater prior to discharge to the Soil Absorption System (SAS).—~~

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- ~~a. The RSF equivalent technology shall reduce nitrogen loading to less than 10 ppm and to as close to 5 ppm as feasible.~~
- ~~b. Nitrogen loading calculations shall comply with Board of Health requirements and Technical Bulletin 91-001—Nitrogen Loading, dated April 1992 issued by the Cape Cod Commission Water Resources Office. The nitrogen loading shall be recomputed using a loading rate of 35 mg/l for wastewater and fertilizer application rate of three (3) pounds per thousand square feet of lawn area.—~~
- ~~c. Maintenance of the Individual on lot septic systems are provided for each duplex structure and maintenance of septic system(s) shall be the responsibility of the Homeowners' Association. the respective homeowners; provided, the Homeowner Association shall establish rules and a reserve fund to ensure that the Association can enforce the homeowners' obligation to maintain, test, and repair/replace their septic systems as needed to comply with applicable regulations.~~

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2524. The on-site sidewalk shall comply with ~~Massachusetts AAB~~applicable laws and regulations regarding handicap access requirements. ~~Accessible ramps should be shown on the plans in plain view with spot grades and an accessible ramp detail should be added to the detail sheets. The applicant is advised that dipping the sidewalk at unit driveways where the profile grade line of the principle access roadway exceeds 8 percent is not consistent with AAB requirements.—~~

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2625. Temporary construction signage and permanent entrance signage at Sandwich Road should be indicated on the plans and details furnished with respect to sign legend, dimensions, materials, colors, means of illumination. Signs shall comply with the requirements of the Bourne Zoning By-Law. The signs should be located to avoid interference with sight distance for exiting vehicles. Peer review of the sight distance limitations may be required.

2726. The applicant shall verify whether or not the Postmaster will require a common mailbox facility. If required, the mailbox facility and associated parking shall be indicated on the site plan.

2827. The sidewalk at Sandwich Road should be clearly indicated including the area intended to serve as a school bus waiting area.

2928. The principal site access roadways should be signed for "No Parking" (MUTCD R7-1) on one side and parking restrictions should be enforceable by the Condominium Homeowner Association Documents.

3029. A Site Lighting Plan shall be developed using a maximum pole height of 4624 feet. Light fixtures should be consistent with residential scale and style typically acceptable in the town and should comply with all dark-sky requirements of the Cape Cod Commission. Average illumination levels on pavement and walkways should be between one-half and one (1/2 and 1) foot-candles and should comply with IESNA recommendations. Illumination levels at the property lines should not exceed 0.25 foot-candles. Illumination levels at the main entrance on Sandwich Road and at the on-site intersection at Station 0+50± should be 5± foot-candles applicable laws and regulations.

3230. During construction, the Applicant and his agents and employees shall conform to all local, state and federal laws regarding noise, vibration, dust and use of Town roads and utilities. The Applicant shall at all times use all reasonable means to minimize inconvenience to residents in the general area. If any units have been constructed and occupied, Construction shall not commence on any day Monday through Friday before 7:30 AM or on Saturday before 8:30 AM, and All exterior construction activities shall cease by 6:00 PM on all days, and No construction or activity whatsoever shall take place on Sundays or legal holidays except for the limited purpose of providing emergency health or safety measures or except as otherwise allowed by the Building Inspector. All construction shall follow Best Management Practices for erosion and sediment control.

3331. Construction of all dwelling units, utilities, roads, drainage structures, and all related appurtenances shall be in accordance with all applicable zoning bylaws and all other applicable local, state and federal regulations except as waived by this Decision.

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34. ~~The Project shall comply with all rules, regulations and permit requirements of the DEP with respect to stormwater management, stormwater disposal, wastewater disposal, best management practices and any and all regulations, if applicable, of the Bourne Board of Health that are not specifically waived herein. The stormwater management system shall comply with the DEP Stormwater Management Standards whether or not the site is subject to the Massachusetts “Wetlands Protection Act (MGL Ch 131 §40).”~~

3532. All utilities shall be underground.

3633. All area and roadway lighting shall be shielded or refracted as necessary in such a manner as to minimize light spill over to neighboring properties. Light fixtures shall incorporate dark skies principals and shall avoid upward projection of light.

3734. All on-site storage of hazardous materials and hazardous wastes shall be on an impervious surface, with containment and access control, and all on-site vehicle fueling shall be conducted with industry recognized containment and access control. The CMP shall identify a designated fueling area and shall construct an impervious surface to accommodate construction vehicles. Containment shall be provided for a minimum of 50 gallons of fuel.

3835. Prior to digging on any public land, the applicant shall ~~deliver written notice to the Chief of Police at least 48 hours prior to digging, and, if requested by the Chief, shall arrange for a police detail; and shall comply with any and all other reasonable safety-related requests made by the Chief. In addition, at least 48 hours prior to digging on any public land, the applicant shall deliver written notice to the Bourne Water District, the Bourne Sewer Department, the Bourne Department of Public Works, the gas company, and the electric company, and comply~~ comply with all applicable federal, state and local regulations and with all "dig safe" requirements.

3936. Surety & Covenants: As security for the completion of the infrastructure related to the Project as shown on the Approved Plan, including, but not limited to, the binder coat of the roadway, sidewalks, ~~parking areas and common areas, recreational areas, sewage disposal system,~~ drainage facilities, utilities, landscaping, and any other specific infrastructure shown on the “Approved Plan” (the “Infrastructure”), the release of occupancy permits for all housing units and the sale of all housing units in the Project shall be subject to the following restrictions:

- a. No occupancy permit for a unit in any building shall be issued, and no sale of any unit shall be permitted, until: (1) the base and binder course for the roadway, parking areas, and relevant unit driveways shown on the Approved Plan has been installed; and (2) all Infrastructure described herein and as shown on the Plan has been constructed or installed

so as to adequately serve said building unless a phasing plan is submitted for review and approval by the ZBA.

- b. No occupancy permit for a unit in any building shall be issued, and no sale of any unit shall be permitted, until the Approved Plan has been recorded with the Registry of Deeds. This Comprehensive Permit shall be referenced on the Approved Plan prior to recording

4037. The Applicant and its successors and assigns shall comply with the regulatory/ affordable housing restrictions, deed rider, monitoring agreements, and all other conditions applicable to the project approved by this Decision. ~~This comprehensive permit shall not be transferred or assigned without prior, written approval of the ZBA.~~

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4138. Nothing in this Decision shall be deemed to constitute a waiver of or from the jurisdiction of the Cape Cod Commission as granted that agency by the Cape Cod Commission Act, ~~nor as a finding with respect to the Commission's jurisdiction, or lack of jurisdiction, over the project..~~

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4239. If construction authorized by this Amended Comprehensive Permit has not begun within three years of the date on which the amended permit becomes final, the permit shall lapse unless extended by the ZBA. The permit shall become final on the date that the written decision is filed in the office of the town clerk if no appeal is filed. Otherwise, it shall become final on the date the last appeal is decided or otherwise disposed of. The Project shall be completed expeditiously and, in any event, within five years of the date of the first building permit issued, unless extended by the ZBA.

4340. The Board reserves the right, insofar as consistent with state law, to further review and amend this decision based upon any information that comes before the Board as a result of Applicant's future need to acquire permits from any local, county, state or federal authority, including but not limited to, the Cape Cod Commission. —

44. ~~If, between the date this Decision is filed in the office of the Bourne Town Clerk— and the completion of the Project, the applicant seeks to make changes to the project, it shall promptly notify the ZBA in writing, describing such change. Within 30 days of receipt of written notification, the ZBA shall determine and notify the applicant whether it deems the change substantial or insubstantial. If the ZBA determines the change is insubstantial, the comprehensive permit shall be deemed to incorporate the change. If the ZBA determines the change is substantial, it shall hold a public hearing within 30 days of its determination and issue a decision within 40 days of the close of the hearing. See 760-CMR 56.05(11). NOTE: 760 CMR 56.05(11) dictates the procedure for proposed changes to an approved project.~~

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4541. ~~Notwithstanding the provisions of paragraph 44, above, n~~No structure constructed under this Comprehensive Permit shall be altered, reconstructed, extended, or changed unless authorized by the ZBA by a special permit pursuant to the Zoning Bylaws and G.L. c. 40A, s.6, as may be amended. Upon such an application for special permit, the Board shall determine, in the first instance, whether such alteration, reconstruction, extension or change is “substantial” or “insubstantial.” For all special permit applications for insubstantial changes, the ZBA shall employ the standards of review set forth under the Zoning Bylaw pertaining to changes to pre-existing, nonconforming structures, as may be amended. Requests for substantial changes shall be treated as requests to amend this Comprehensive Permit. This ~~P~~paragraph ~~(45)~~ shall not apply to the original construction of structures developed pursuant to this Comprehensive Permit by the Applicant, but shall apply to subsequent alterations, extensions, and changes to such structures.

4642. The terms alteration, reconstruction, extension, and change, shall have the same meaning under the Massachusetts Zoning Act, G.L. c. 40A, §6 and the Bourne Zoning Bylaws.

47. ~~Where these conditions specify the submission of a plan, study, obtaining of a permit or approval or other related analysis, these conditions shall be considered a condition precedent to the requirement that, no grading, land disturbance, issuance of any building permit or construction of any structure or infrastructure shall commence until said plans, study or analysis have been reviewed and have received a final acknowledgment and approval by the permitting agency or the Building Inspector that the plans, study or analysis are consistent with this Decision.~~

4843. The Applicant acknowledges that prior to the start of construction, the Applicant must obtain all required approvals from any and all other governmental agencies, departments or commissions whose approvals are necessary for this Project and such approvals must be consistent with this Decision.

4944. The Applicant shall prepare ~~Condominium Trust and Condominium~~Homeowner Association documents. The ~~Condominium Trust~~Homeowner Association shall be responsible for the ownership, maintenance and repair of the roadways, storm water management systems, ~~the wastewater treatment facilities including denitrification components,~~ retention ponds, recharge facilities, retaining walls, the open space parcels, and other common amenities and services. ~~The Condominium Trust and Condominium Association documents shall contain provisions for “limited” or “exclusive” common areas associated with the town homes with the effect that each unit owner, with the exception of the three (3) dwelling units closest to Sandwich Road, shall be responsible for maintaining the open space area immediately adjacent to his or her units so that the cost of maintaining the same shall not be a common expense assessed against any affordable unit or any market unit.~~

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~~The Condominium Trust and Condominium Association Documents shall disclose the fact that nearby land is used by a gun club as a shooting range and provide that, by virtue of accepting ownership of a unit, unit owners acknowledge that they have purchased their units with full knowledge and acceptance of extraordinary noise emanating from the nearby land.~~ The Condominium Trust and Condominium Homeowner Association documents shall be subject to review and approval by the Board's counsel to insure compliance with the terms of this Comprehensive Permit decision. Said documents shall contain restrictions on all units preventing any increase in the number of bedrooms. ~~The number of bedrooms in any unit shall be determined in accordance with the Town of Bourne Board of Health regulations.~~ Prior to the sale of any unit, the Condominium Trust and Condominium Homeowner Association documents shall be filed with Barnstable County Registry of Deeds.

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The calculation of the percent of ~~common~~ interest in the Homeowner Association ~~or~~ for each ~~condominium~~ unit shall be determined pursuant to relevant laws of the Commonwealth governing ~~condominium ownership~~ homeowner associations.

- ~~—50. The final landscaping plan is subject to reasonable review by the ZBA for consistency with this Decision. No permit shall issue prior to such approval unless the Board fails to act within forty-five (45) days after receipt of said plan from the applicant, in which case approval shall be deemed to have occurred.~~

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- 5145. The final site plan is to be recorded at the Barnstable County Registry of Deeds and shall be recorded together with this Decision.

- 5246. The Board requires that a note be placed on said final site plan stating that the Plan is the subject of a comprehensive permit under Mass. Gen. L. c.40B, sections 20-23.

- 5347. The Town of Bourne shall be free of any liability arising out of the Board's approval of the site layout plan, and for any act, omission or negligence caused by the Applicant, its employees, agents, subcontractors, beneficiaries or trustees with relation to this Project.

- ~~—54. Profit Cap and Regulatory Agreement: To conform to the intent of G.L. c. 40B, s. 20-23 that profits from the Project be reasonable and limited, the Applicant shall be limited to an overall profit cap of twenty percent (20%) of total development costs of the Project, in accordance with the requirements of the Subsidizing Agency (the "Profit Cap"). The ZBA may elect to review, for accuracy, the Subsidizing Agency's own audit of the Project. Said review shall use the same standards as the Project Administrator, and may utilize the services of an independent auditor selected by the ZBA and paid for by the Applicant. Evidence of the recording of the approved Regulatory Agreement shall be provided to the~~

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~~Board prior to the issuance of any building permit. In addition to the foregoing, the Regulatory Agreement shall conform to the requirements of the Subsidizing Agency.~~

- ~~—55. The applicant shall confirm in writing to the ZBA that the Project Eligibility letter issued by MassHousing for this locus is still in full force and effect and if so, the applicant shall comply with all of the conditions stated in the Project Eligibility (Site Approval) letter from MassHousing dated May 15, 2008.~~

- ~~—5648.~~ The Bourne Planning Board's Subdivision Regulations and construction standards, ~~in their entirety~~ except as waived herein, shall apply to the construction of the roadways, sidewalks, utilities and associated infrastructure of the Project. For the purposes of this condition, the entire project is considered to be a subdivision.-

- ~~—5749.~~ A permanent barrier, consisting of a stockade fence as shown on the Approved Plans, must be installed and maintained between Chase Estates at 230 Sandwich Road, Map 25, Parcel 9 and 14 Bosun Lane, Map 25, Parcel 15. ~~This barrier to be in the form of a fence and/or berm sufficient to prevent the passage of vehicles.~~ This barrier must be maintained by the Applicant until the last dwelling unit is sold, and thereafter by the ~~condominium~~ Homeowner Association.

X. MISCELLANEOUS LEGAL REQUIREMENTS

1. The Applicant shall establish a ~~condominium owners' association (the "Condo Association")~~ Homeowner Association for the Project in a form reviewed by the Board's counsel, and approved by the Subsidizing Agency and including provisions for ~~operating and replacement~~ reserves to be established and maintained ~~for repairs to, or replacement of, and maintenance of the wastewater disposal system(s).~~
2. Any sale or transfer of rights or interest in all or any part of the Site shall include a condition that successors are bound to the terms and conditions of this Decision. ~~This Comprehensive Permit may not be transferred to a person other than the Applicant, or to an entity of which the Applicant controls less than 50%, without the written approval of the ZBA and the execution of any reasonable instruments or documents that may be required for the perpetual enforcement of this Comprehensive Permit pursuant to the Board's counsel's review and approval by the Subsidizing Agency. Note: The deleted text is inconsistent with 760 CMR 56.00.~~
3. The Applicant and/or subsequent Owner(s) shall be bound by all conditions and requirements set forth in this Comprehensive Permit.
4. In setting the beneficial interest in the ~~condominium common areas in the Condominium Master Deeds~~ Homeowner Association, the Applicant shall comply with all relevant laws of the Commonwealth governing ~~condominium ownership~~ homeowner associations.

5. The principle site roadways, driveways, utilities, drainage systems, water supply and distribution infrastructure, wastewater disposal system, and all other infrastructure shown on the Approved Plans as serving the Project, shall remain private and the Town of Bourne shall not have, now or ever, any legal responsibility for the operation or maintenance of the roadways, driveways and infrastructure, including but not limited to snow removal, garbage pickup, the stormwater management system, the on lot wastewater disposal systems, and landscape maintenance.

XI. APPLICANT'S REQUESTED WAIVERS

The Applicant has requested waivers from the By-Laws of the Town of Bourne, the Town of Bourne Zoning Bylaws and other local rules and regulations. The Applicant's requested waivers are set forth in its Application and as supplemented through the public hearing process. The ZBA's grant of waivers shall be subject to the terms and conditions imposed by this Decision, and to the extent that any waiver is inconsistent with a term or condition set forth elsewhere in this Decision, such term or condition shall govern. No grant of any waiver shall be deemed to waive compliance with any condition of approval of this Decision. Any waiver not granted below or otherwise included within this Decision shall be deemed denied.

~~The ZBA's decision with respect to each waiver request is as follows: Waivers Requested and Granted from the Bourne Zoning Bylaw:—~~

- ~~—1.— Section 2200. Multi Family Dwelling.—~~
- ~~—2.— Section 2440. Two or more Principal Buildings.—~~
- ~~—3.— Section 2500. Intensity of Use Schedule (retaining wall over 6 feet inside the setback).—~~
- ~~—4.— Section 3500. Landscaping and screening.—~~
- ~~—5.— Section 3560. High Fences or Walls.—~~

Bourne Zoning Bylaw

Section 1230-1244. Site Plan - Special Permit Approval.

Section 2500. Intensity of Use Schedule (R40)

Section 2640. Development Scheduling.

Section 2660. Development Scheduling.

Section 3491(E)(4) - Stormwater Regulations

Section 3492(C) - Stormwater Regulations

Section 3493(G)(1)(b)(ii) - Stormwater Management Standards for Local Stormwater Permits

Section 3496. Inspection and Site Supervision (Stormwater)

Section 3498. Performance Bond (Stormwater)

Section 4400. Earth Removal.

Bourne Subdivision Regulations

Section 223-Standards of access

Section 261-Application Procedure

Section 264-Environmental Information Report

Section 265 - Plan Processing

Section 266 - Performance Guaranty

Section 267(c) - Ownership of Ways and Easements (15% security retainer)

Section 268 - Rescission

Section 312 - Required Cross Section

Section 322 - Widths

Section 323(a) & (f) -Grade

Section 325-Dead End streets

Section 326 - Preparation and Surfacing of Roadway

Section 327 - Curbs

Section 331-Sidewalk location

Section 332 - Preparation and Surfacing of Sidewalks

Section 341-Easement

Section 365 - Spoil Lots

Section 366-Reflective markers

Section 372 - Inspections

Section 374 - Compliance

Decision of the Board of Appeals:

For all the reasons stated above and on the record before it, pursuant to G.L. c.40B, ss.20-23, the Board voted 4-0 (~~Lee Berger, Timothy Sawyer, Judith Riordan, and Wade Keene voting in favor~~) to grant GRANT WITH THE ABOVE NOTED CONDITIONS, ~~thean Amended~~ Comprehensive Permit ~~application of~~ Chase Developers, Inc., for real property located at 230 Sandwich Road, Bourne, Massachusetts, on the terms and conditions stated herein.

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Zoning Board of Appeals Bourne, Massachusetts

~~Lee Berger, Chairman Date: November 28, 2012~~ [SIGNATURE]—

Appeals of this decision may be made pursuant to Section 17 of Massachusetts General Laws, Chapter 40A and shall be filed within twenty (20) days after the date this decision is filed with the Bourne Town Clerk.

Chase Estates

Town of Bourne Comprehensive Permit #08-10
Notice of Project Change

Chase Developers, Inc.

Explanation of Proposed Changes (July 2021)

Overview:

Proposed changes will:

1. Make the project economically feasible

- Add 8 units, to help offset increased drag from affordable units and sharp rise in material costs
- Eliminate costly, unnecessary permit conditions

2. Improve the character and desirability of the neighborhood

- Eliminate townhome-style units in garage building, and provide 24 attractive, moderately-priced duplex-style homes

3. Eliminate permit conditions that exceed ZBA authority but were assented to (or overlooked) in 2012 because the Town was in a 40B “safe harbor” and Chase Developers had no basis to appeal them at the time

- Septic systems and nitrogen loading
- Sale of affordable units to the Town
- Others

4. Clarify the requirements and procedure for submittal of final construction plans after ZBA issues comprehensive permit

- What plans are required, and when
- Procedure and scope of review

Change #1:

Number of Units

Current Permit:	16 Units: 3 townhome-style units in existing garage structure 13 new single-family homes
Proposed:	24 Units: 24 new duplex-style homes Existing garage structure to be demolished
Reason for Change:	<p>Project economics have changed since 2012. From 2012-2019:</p> <ul style="list-style-type: none"> * Residential construction costs increased by ~ 41% (and further increased, dramatically, since the Covid pandemic) * Sale price for affordable units can't be increased to keep pace <ul style="list-style-type: none"> * Median household income increased by ~ 14% (2012-2019) * Mortgage rates went up by about 13% * Property tax rate went up by about 16% (\$ per thousand) * Home insurance rates went up by about 24% in MA * Additional units needed to offset increased drag by affordable units * Townhome-style units in garage being replaced with more desirable single-family homes

	2012	2019	% Increase	Source:
Residential Construction Cost Index (see below)	76	107	41%	edzarenski.com
Median 3-bedroom house in Bourne (July)	\$255,000	\$360,000	41%	trulia.com
Median household income (Barnstable County)	\$80,000	\$91,000	14%	U.S. Dept. of Housing and Urban Development
Monthly income of family at 70% of median	\$4,667	\$5,308	14%	
30% of monthly income	\$1,400	\$1,592	14%	
Avg. rate for 30-year fixed mtg (2012; 2019 ytd)	3.66%	4.13%	13%	Freddie Mac
Property tax rate (per thousand)	\$9.12	\$10.54	16%	Town of Bourne
Insurance Rate (MA HO-3 comparable policy 2011-2018)	\$835	\$1038	24%	NAIC.org

Change #2:

Road Layout; Community Center & Pool

Current Permit:	Access road (22') curves to the far right-hand side of the property; Stub road to Upper Cape Tech. School at bottom of property;
Proposed:	Access road goes up the center of the property; homes on both sides; Width of access road reduced to 20 feet; No stub road (eliminate General Condition #24 in permit);
Reason for Change:	<p>The changes will improve neighborhood character and desirability, and make more efficient use of space (e.g., more usable grassy area, less pavement).</p> <p>The stub road to Upper Cape Tech no longer serves any purpose. The ZBA required the stub road as part of the 2012 permit because, at the time, it was expected that a road would be constructed across the school property, as a means of access and egress for the Canalside Commons development, and as a means for traffic to by-pass the Bourne rotary. The stub road requirement was based on speculation that proved overly optimistic; the Canalside Commons development plan fell through, and there are no plans to develop the site at any time in the foreseeable future. It no longer makes any sense to build a stub road on the property; it adds cost and impervious area to the project, and provides no benefit.</p>

Change #3:

Curb Cut Permit Application

Current Permit:	Chase Developers must obtain revised curb cut permit from MassHighway; Curb cut permit application must notify MassHighway that “the Board of Appeals has concerns about effect of an expanded permit upon the safety of vehicles traveling on Sandwich Road, as well as the safety of vehicles entering and exiting the proposed development,” and that the Board of Appeal recommends certain improvements to Sandwich Road be required as part of the revised curb cut permit (General Permit Conditions #20 and #25).
Proposed:	Eliminate permit conditions that are meant to discourage MassHighway from issuing a revised curb cut permit with reasonable conditions based on traffic studies; Delete language from Conditions 20 and 25.
Reason for Change:	<p>The conditions in the current permit are costly, burdensome, and inconsistent with applicable laws and regulations.</p> <p>As the permit acknowledges, MassDOT “has exclusive jurisdiction over Sandwich Road.” The procedure and criteria for MassDOT to evaluate applications for curb cut permits, and for municipalities to object to any requested permit, are set forth in M.G.L. c. 81, § 21 and 720 CMR 13.00.</p> <p>The procedure for municipal input is as follows: “Under M.G.L. c. 81, § 21, the Board or Department in a municipality with authority over public roadways may notify MassHighway by registered mail of its objection to a proposed new or modified residential or commercial driveway intersecting the [State Highway Layout]. If MassHighway agrees with the objection, which must be based on traffic safety concerns, MassHighway shall not grant the permit.”</p>

Change #4:

Sidewalk / Concrete Curb / Cape Cod Berm

Current Permit:	4-foot sidewalk required along right-hand side of road, with either (i) Cape Cod Berm and 2-foot-wide grass strip, or (ii) vertical concrete curb, separating road from sidewalk. (General Condition #23)
Proposed:	4-foot sidewalk on the along right-hand side of road, separated from road with a Cape Cod Berm (no grass strip).
Reason for Change:	A grass strip between the road and the sidewalk makes it difficult to plow without tearing up the grass. It also reduces the usable front yard area of the houses, and is an inefficient waste of valuable space.

Change #5:

Wastewater Disposal & Nitrogen

Current Permit:	Project must meet Cape Cod Commission septic standards: Septic design must include Recirculating Sand Filter equivalent technology to reduce nitrogen loading to less than 10 parts per million; Permit regulates stormwater runoff and dictates nitrogen loading rates for wastewater (35 mg/l) & fertilizer (3 lbs / sf lawn area). (Site Development Condition #24)
Proposed:	Project must comply with Title 5 standards and state/federal stormwater management standards; not Cape Cod Commission standards.
Reason for Change:	<p>The development must comply with Title 5, and with state & federal stormwater management standards.</p> <p>The Board of Appeals has no authority under Chapter 40B to further regulate the project's septic systems or stormwater runoff.</p> <p>Chapter 40B does not allow a board of appeals to impose restrictions that aren't dictated by existing local regulations. See 760 CMR 56.02 (definition of "Consistent with Local Needs").</p> <p>There is no Town of Bourne regulation authorizing any board or department to apply Cape Cod Commission standards to this project. The Commission's regulations apply only to "Developments of Regional Impact" (DRIs). A residential development is not a DRI unless it "proposes to divide land into 30 or more residential lots," or "to create or add 30 or more Residential Dwelling Units." See Barnstable County Ordinance 14-03 (Cape Cod Commission Enabling Regulations, as Amended).</p> <p>The development parcel is not located within 100 feet of any wetland resource, and is therefore outside the jurisdiction of the Bourne Conservation Commission. There is no basis in local regulations for the Board of Appeals to impose conditions relating to stormwater runoff.</p>

Change #6:

Town Purchase of Affordable Units

Current Permit:	Chase Developers must give the Bourne Housing Authority, Housing Assistance Corporation, and Bourne Affordable Housing Trust the opportunity to purchase any of the affordable units, for use as rental housing. (General Condition #14).
Proposed:	Eliminate the requirement to offer units for sale to Town of Bourne housing entities.
Reason for Change:	The existing condition is problematic for two reasons. First, it exceeds the ZBA's authority (the Town does not impose this condition on non-40B subdivisions). Second, it would interfere with the ability of buyers to obtain conventional mortgage financing, and diminish the value of the market rate units in the development. Neither Fannie Mae nor Freddie Mac will not underwrite a unit mortgage for a condominium if a single entity (or related entities) owns more than 2 units in the development.

Change #7:

Consistency with 40B Regulations

Current Permit:	The permit imposes numerous conditions that are inconsistent with Chapter 40B and 760 CMR 56. Some of the conditions related to procedural matters (e.g. the process for reviewing any future project changes). Other conditions impose substantive requirements regarding the construction of the project. See 7a - 7e, below.
Proposed:	Eliminate conditions that are inconsistent with Chapter 40B and 760 CMR 56. See 7a - 7e, below.
Reason for Change:	<p>The ZBA does not have authority to impose conditions on a 40B project unless those conditions are based on existing local regulations that would otherwise apply to the project. Likewise, the ZBA may not impose conditions that local boards don't ordinarily impose on non-40B developments. See 760 CMR 56.02 (definition of "Consistent with Local Needs").</p> <p>There are many conditions in the existing permit exceed the ZBA's authority. Those conditions would add tremendous cost to the project, and would invite disputes regarding compliance.</p> <p>During the review process that led to the current permit, it was determined that the Town had achieved a "safe harbor" under Chapter 40B and could reject the proposal outright. Thus, Chase Developers was in no position to appeal any of the conditions imposed in the permit.</p> <p>The Town is no longer in a 40B safe harbor, and the burdensome conditions in the existing permit (along with other factors) have made it impossible for Chase Developers to construct the project.</p>

Change #7a:

Further Revision and Review of Plans

Current Permit:	<p>Chase Developers must revise the plans for the development to comply with certain conditions imposed in the permit, and submit the revised plans for ZBA review and approval before construction. The current permit has a lot of confusing and duplicative language on this subject. The permit also includes very technical requirements that aren't based on local regulations, but on state regulations or guidelines that don't fall within the ZBA's purview.</p>
Proposed:	<p>Chase Developers will submit a full set of plans, to be reviewed during the public hearing commencing on August 21, 2019. Any revisions to address ZBA questions or concerns will be made and reviewed during the hearing. Plans referenced in the Amended Permit (the "Approved Plans") will not be subject to further revision or review.</p> <p>Final plans ("Final Site Plans") and detailed architectural plans ("Final Architectural Plans") — consistent with the Approved Plans, but at a level of detail sufficient for construction — will be submitted prior to construction, for final review.</p> <p>The proposed permit revisions clarify what final plans need to be submitted, and at what point during the development process. The proposed permit also establishes a uniform procedure for review and approval by town authorities, and clarifies that the developer may appeal any adverse decision to the HAC. Duplicative language is eliminated.</p> <p>The revisions also eliminate overly prescriptive technical requirements that are based on state regulations or guidelines, and clarify that Town authorities are not the arbiters of state law compliance. Compliance with state or federal law is outside the scope of the ZBA / Building Inspector review of final plans.</p>
Reason for Change:	<p>An "approval" that is contingent on plans being revised and submitted for further review isn't really an approval. Under Chapter 40B, a "Comprehensive Permit" must be an actual approval of the plans reviewed in the public hearing.</p> <p>Detailed technical conditions that aren't based on applicable local regulations exceed the ZBA's authority.</p> <p>Clarifying exactly what submissions are required after the permit is issued, and what the review procedure is, will help prevent future disputes.</p>

Change #7b:

Fee for Hiring of Consulting Engineer and/or Auditor

Current Permit:	Chase Developers must deposit \$5,000 into a fund, and replenish as needed, to pay for the ZBA to hire a consulting engineer and/or auditor to monitor and review compliance with the permit.
Proposed:	No payment for consulting engineer or auditor review.
Reason for Change:	The ZBA has not promulgated regulations authorizing it impose a fee for the employment of outside consultants for Chapter 40B projects. Without such regulations, the ZBA does have authority to require Chase Developers to pay for consultant review. <u>See</u> M.G.L. c. 44, § 53G. See also 760 CMR 56.05(b)(4) (“a review fee may only be imposed in compliance with applicable law and the board’s rules”). The Bourne Zoning Bylaw authorizes consultant review fees for special permits under M.G.L. c. 40A, not for comprehensive permits under c. 40B.

Change #7c:

Water Supply

Current Permit:	Chase Developers must provide proof from Water Department that potable water is available to the project and that pressure is adequate to serve the needs of the project. (General Condition #27)
Proposed:	Chase Developers must apply for a water connection from the Bourne Water District, and provide such plans and other supporting materials as are ordinarily required. Delete General Condition #27.
Reason for Change:	A town is obligated to provide potable water to residents in areas served by public water supply infrastructure, and may not withhold water from a 40B development. Further, the Bourne Water District recently affirmed that it has ample water. See Cape Cod Times, Jan. 18, 2019 (“Bourne Water District: Marijuana Facility Would Not Impact Water Supply”).

Change #7d:

Handicap Access

Current Permit:	13 units must be handicap accessible, with ramps and accessible bathrooms; 5 units must be modifiable for a handicapped resident (at developers' expense for affordable units); sidewalks must comply with Architectural Access Board ("AAB") standards. (General Condition #15, Construction & Submissions Condition #25)
Proposed:	The project must comply with any applicable laws and regulations regarding handicap access.
Reason for Change:	AAB standards apply to public buildings, not private dwellings. There is no local bylaw or regulation that allows a board to impose the costly conditions in the current permit regarding handicap accessibility. Those conditions exceed the Board's authority under Chapter 40B.

Change #7e:

Financial Security

Current Permit:	Chase Developers must provide financial security to ensure the permitted work will be completed once it is started. Security must be in the form of cash, bankbook, or tripartite agreement between the Town, the developer, and the developer's first mortgage lender.
Proposed:	Add performance bond as an acceptable form of financial security.
Reason for Change:	The Town's normal practice is to allow a performance bond as a method of financial security. See Town of Bourne Subdivision Control Regulations, § 266 ("Performance Guarantee"). Under Chapter 40B, the ZBA may not impose restrictions on a 40B developer that are not imposed equally on developers of non-40B subdivisions. See 760 CMR 56.02 (definition of "Consistent with Local Needs").

Change #8:

Waivers and Inapplicable Local Requirements

Current Permit:	
Proposed:	A more detailed waiver list is provided.
Reason for Change:	Board has requested a more detailed waiver list.

Chase Estates

Town of Bourne Comprehensive Permit #08-10
Notice of Project Change

Chase Developers, Inc.

**Proposed Amended Comprehensive Permit (July 2021)
as compared to
Previously Proposed Amended Comprehensive Permit
(August 2020)**

showing changes after peer review

DECISION UPON APPLICATION OF CHASE DEVELOPERS, INC.

FOR A COMPREHENSIVE PERMIT UNDER MASSACHUSETTS GENERAL LAWS CHAPTER 40B, s.20-23

I. APPLICANT AND PUBLIC HEARING

[RECITE PROCEDURAL HISTORY OF REQUEST FOR AMENDED PERMIT]

~~The total Project shall include no more than twenty-four (20) dwelling units with no more than three (3) bedrooms each (including five affordable 3-bedroom units) and four (4) dwelling units with no more than two (2) bedrooms each (including one affordable 2-bedroom unit). Five of the units,~~ The total Project shall include no more than twenty (20) dwelling units with no more than three (3) bedrooms each (including five affordable 3-bedroom units) and four (4) dwelling units with no more than two (2) bedrooms each (including one affordable 2-bedroom unit). A total of six (6) of the units, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be affordable to qualified purchasers, in perpetuity.

The minutes and exhibits from the public hearing are available for public inspection in the office of the Town Clerk. A list of the exhibits is contained in the record and is appended hereto by reference.

II. NATURE OF APPLICATION; PROCEDURE REQUIRED BY STATUTE

In conducting its hearings in this matter, the ZBA is guided by G.L. c.40B, s.20-23 and applicable regulations.

III. GOVERNING LAW

The law governing this case is The Low and Moderate Income Housing Act, Massachusetts General Laws, Chapter 40B, §§ 20-23 (the “Act”), and the regulations promulgated by the Department of Housing and Community Development (“DHCD”) Housing Appeals Committee, 760 CMR 56.00 (the “Regulations”).

SUMMARY OF DECISION

The ZBA hereby approves with the conditions set forth below, a comprehensive permit for Chase Developer’s Inc. for the Project depicted on the plans and materials identified in the record, specifically including twenty-four (2024) dwelling units and consisting of ~~five~~six (56) units of low or moderate income housing pursuant to the terms, conditions and obligations imposed by G.L. 40B, s.20-23.

IV. THE RECORD BEFORE THE BOARD UPON WHICH THIS DECISION IS BASED.

1. ~~C1.1 Title Sheet, dated [date of revised plan]~~Index Site Plan, dated May 18, 2021, prepared by Outback Engineering
2. ~~C2.1 Site Layout Plan, dated [date of revised plan]~~Legend and General notes, dated May 18, 2021, prepared by Outback Engineering
3. ~~C3.1 Site Grading, Drainage and Utility Plan, dated [date of revised plan]~~Existing Conditions, dated May 18, 2021, prepared by Outback Engineering
4. ~~C4.1 Site Erosion Control Plan, dated [date of revised plan]~~Lotting Plan, dated May 18, 2021, prepared by Outback Engineering
5. ~~C5.1 Site Landscape Plan, dated [date of revised plan]~~Grading & Drainage Plan, dated May 18, 2021, prepared by Outback Engineering
6. ~~C6.1 Site Details, dated [date of revised plan]~~Utility Plan & Road Profile, dated May 18, 2021, prepared by Outback Engineering
7. ~~C6.2 Site Details, dated [date of revised plan]~~Layout & Materials Plan, dated May 18, 2021, prepared by Outback Engineering
8. ~~[Revised architectural drawings to be provided]~~Erosion Sedimentation and Control Plan, dated May 18, 2021, prepared by Outback Engineering
9. Construction Details (2 sheets), dated May 18, 2021, prepared by Outback Engineering
10. Architectural Drawing & Renderings, dated May 18, 2021, prepared by Outback Engineering
911. [Other documents entered into the record]

V. GENERAL CONDITIONS

1. The plans referenced above are the “Approved Plans.”

The Applicant or its agents shall maintain a copy of the Approved Plans and this Decision at the Site during construction.

2. This Decision shall be noted on the Approved Plans and both this Decision and the initial site plan sheet of the Approved Plans shall be recorded at the Barnstable County Registry

of Deeds. Proof of recording shall be forwarded to the Building Inspector prior to issuance of a building permit construction.

3. The Applicant shall comply with all local bylaws, rules and regulations of the Town of Bourne and its boards and commissions in effect as of the date of this decision unless expressly waived herein or as otherwise addressed in these conditions.
4. The Applicant shall pay all fees of the Town of Bourne imposed generally with respect to construction projects and for the purposes of monitoring compliance of the construction and occupancy of the Project in accordance with this Comprehensive Permit, unless otherwise waived in this Decision; ~~provided, however, that the Applicant is not required to pay any fee for the Board or the Town to employ any outside consultant.~~
5. The Applicant shall copy the ZBA on all material submissions made by or on behalf of the Applicant for permits or approvals from any federal, state, county, or Town official, board or commission that concerns the design and/or conditions set forth in this Decision, including but not limited to all testing results, official filings and other permits issued for the Project.
6. The Applicant shall comply in all respects with the State Building Code and any local published regulations or published schedule of fees of the Building Inspector. The Applicant shall pay all required fees for all such building permits including any fees customarily charged for inspections and permits unless otherwise waived in this Decision.
7. Prior to the commencement of construction, site development, or clearing, the Applicant shall post with the Town Treasurer security for Site Stabilization and Restoration. Prior to issuance of a Building Permit, vehicle access, emergency vehicle access, and utility service shall be provided to the site of each building for which a building permit is sought in accordance with a phasing plan approved by the Board. Prior to issuance of any Certificate of Occupancy, the Core Site Improvements required to provide vital access and utility service to all dwelling units, or those dwelling units contained within a particular phase of the Project as shown on a Phasing Plan approved by the Board, shall be complete as determined by the Board. Prior to issuance of any Certificate of Occupancy the applicant shall post the Minimum Required Security with the Town Treasurer for the overall project or for a particular phase of the Project as shown on a Phasing Plan approved by the Board. Once posted, security shall remain in full force and effect until the work secured thereby is satisfactorily completed as determined by the Board. However, the instrument serving as security may be changed by the Applicant from time to time with the agreement of the Board as set forth hereinafter. Failure to maintain the Minimum Required Security in full force and effect shall constitute due cause for the Building Inspector to revoke Building Permits. The Board may increase the

Minimum Required Security to be posted by the Applicant if the Board determines that the actual construction cost plus contingency to complete the Site Improvements is ten percent (10%) more than the posted security value. The Applicant shall post additional security within forty-five days following receipt of notice from the Board. Upon completion of the work or portions thereof for which security has been provided, the Applicant may petition in writing with a copy to the Town Clerk for reduction or release of the posted security pertaining to the work completed satisfactorily as determined by the Board. If the work has been completed to its satisfaction, the Board will reduce the Minimum Required Security. If the work has not been completed to its satisfaction, the Board will inform the Applicant of the nature of the deficiencies in the work and will forgo or limit the amount of security authorized for release. The Board's decision with respect to release of security will be rendered within 45 days following receipt of the petition. The instrument serving as security may consist of cash, a bankbook, a performance bond, or a trilateral agreement between a bank having a first mortgage on the property, the property owner, and the Town. The form of security shall be acceptable to the Board only if the language of the security agreement is acceptable to Town Counsel, both as to form, substance, and as to the financial stability of the bonding company or the bank that is party to any Trilateral Agreement. As used in this Decision, the term "Minimum Required Security" shall mean an amount established by the Board that is based upon the anticipated cost to be incurred by the Town in the event the Town completes all remaining work in accordance with applicable public procurement practices plus a construction cost contingency of fifteen percent (15%), except that the amount of security required shall never fall below ten percent (10%) of the amount first posted until final acceptance of all work, and security for plant materials shall not be released until one year has passed following initial planting. The term "Site Improvements" shall mean all required clearing, earthwork, paving, utilities, storm-drain including water quality measures and retention or detention facilities, paving, curbing, walkways, lighting, site entrance, retaining walls, septic systems, landscaping, testing, erosion controls, cleanup, and as-built drawings and data in compliance with the approved plans and Conditions of Approval. For the purposes of determining the Minimum Required Security, site improvements shall not include residential structures or site improvements within 10 feet of residential structures being submitted for a Certificate of Occupancy. The term "Core Site Improvements" shall mean "Site Improvements" as defined above but excludes the top course of the sidewalk and main access roadway pavement and tree and shrub planting. The term "Site Stabilization and Restoration" shall mean stabilization of disturbed areas and shall include grading, placement of a 2 inch thick layer of "plantable soil borrow," hydroseeding or other acceptable erosion control measures and establishment of ground cover consisting of a "woody mix" of grass, wildflower, shrub, and tree seeds.

8. Nothing in this Decision shall be interpreted as relieving the Applicant of its burden to obtain easements, licenses or written permission from any abutting property owner if,

during the course of construction, it becomes necessary to enter upon abutting land for construction or planting purposes.

9. Each condition in this Decision shall run with the land and shall, in accordance with its terms, be applicable to and binding on the Applicant and the Applicant's successors and assigns; and reference to this Decision shall be incorporated in every deed recorded for the Project and for any dwelling unit in the Project.
10. This Decision permits the construction, use, and occupancy of twenty (20) three (3)-bedroom housing units and four (4) two (2)-bedroom housing units on the Site. The construction and use of the Site shall be in conformity with the Plans as modified by the Approved Plans, and there shall be no creation of additional housing units or any other structures or infrastructure or any increase in the number of bedrooms, except that which is shown on the Approved Plan, without further approval of the ZBA in the form of amendment to this Decision.
11. Prior to the commencement of construction on the Site, the Applicant shall have obtained all necessary permits and approvals for access to Sandwich Road (Route 6A) from state or county agencies.—

~~—12. Intentionally omitted.~~

- ~~13~~12. The Project shall consist of no greater than twenty (20) three (3)-bedroom dwelling units single family homes (“units”) and four (4) two (2)-bedroom dwelling units, five (5) of which five (5) three (3)-bedroom units and one (1) two (2)-bedroom unit shall be affordable to low or moderate-income purchasers, in perpetuity, to households at or below 80% of area median income.—

~~—14. Intentionally omitted.~~

- ~~15~~13. The development and dwelling units shall comply with any applicable laws or regulations regarding handicap access.—

~~—16. Intentionally omitted.~~

~~—17. Intentionally omitted.~~

- ~~18~~14. No dwelling unit shall contain more than three (3) bedrooms Twenty (20) dwelling units shall contain no more than three (3) bedrooms, and four (4) units shall contain no more than two (2) bedrooms, as the term “bedroom” is defined in 310 CMR 15.000 (Title 5 regulations).

2415. No internal roadways within the Project shall have a traveled way width of less than twenty (20) feet in width exclusive of berms and curbs.

2216. The number and location of the fire hydrants installed within the Project shall be as directed by the Fire Chief, and shall comply fully with applicable laws, codes, and requirements including without limitation NFPA and Bourne Water District requirements to be depicted on the Final Site Plans (as defined in Paragraph XVIII.1).

2317. Four (4) foot wide sidewalks, exclusive of the Cape Cod berm separating the sidewalk from the road, shall be constructed along the entire road “going up the hill”, and the width shall be increased in the area of any signs or other obstructions in order that there is at least a continuous 4 foot wide walking area throughout the entire sidewalk.

~~24. Intentionally omitted.~~

2518. This Comprehensive Permit is conditioned upon the applicant obtaining an expanded ~~curb cut permit from Mass Highway~~ Access Permit from MassDOT for ~~access-~~ to the Project approved herein, regardless of whether or not obtaining said expanded permit triggers the Massachusetts Environmental Policy Act or other state or regional regulatory requirements. ~~The Access Permit from MassDOT shall be obtained and recorded in the Barnstable Registry of Deeds prior to construction.~~

~~26. Intentionally omitted.~~

~~27. Intentionally omitted.~~

~~28. Intentionally omitted.~~

~~29. Intentionally omitted.~~

VI. AFFORDABLE HOUSING

1. ~~Five (5) units~~ Five (5) 3-bedroom dwelling units, and one (1) 2-bedroom dwelling unit, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be sold to low or moderate income qualified purchasers. These dwelling units shall be located on an Affordable Units Location Plan. These dwelling units shall remain affordable pursuant to the terms and conditions of this Decision, in perpetuity or for the longest period allowed by law.
2. Phasing-in of Affordable Units: No more than three certificates of occupancy shall be issued by the Building Inspector for units designated for sale at fair market prices (the “Market Rate Units”) until at least one certificate of occupancy is issued for an

Affordable Unit. The proportion of Market Rate Unit certificates of occupancy issued to Affordable Unit certificates of occupancy issued shall at no time exceed 3:1. The last unit sold shall be a Market Rate Unit. The Affordable Units shall be reasonably interspersed within the Project and shall be shown on the site plans prior to Decision.

3. The affordable units shall be sold to qualified households whose gross annual income is no greater than eighty percent (80%) of the median family income for Barnstable County, as published annually by the U.S. Department of Housing and Urban Development, adjusted for household size, and whose assets do not exceed the then current DHCD guidelines. The maximum sale price for the affordable units shall be the maximum purchase price affordable for a household with an income that does not exceed seventy percent (70%) of the median family income for Barnstable County, as published annually by the U.S. Department of Housing and Urban Development.
4. Each conveyance of an affordable unit shall include a Deed Rider or Affordable Housing Restriction, in the form approved by the subsidizing agency, which shall contain a restriction requiring that the unit remain affordable to an eligible buyer in perpetuity. The Deed Rider shall be recorded senior to any liens on the Premises to protect the continued availability of and requirement for the affordable units in the event of any foreclosure, bankruptcy, refinancing or sale. Prior to the sale of any unit, the unit owner or his/her agent shall submit to the Bourne Housing Partnership Committee (BHCP) for its approval written rules for the selection of buyers of affordable units (the Buyer Selection Rules). The Buyer Selection Rules shall provide that all affordable units are to be sold through a lottery or buyer selection process, subject to the review and approval by the BHPC or its designee. Notwithstanding the foregoing, the restrictions and Buyer Selection Rules shall conform to the requirements of the subsidizing agency. The Applicant shall be responsible for all fees and expenses necessary to implement the initial buyer selection process, including all marketing and advertising costs; fees and expenses for subsequent re-sales shall be the responsibility of the seller
5. Unless disapproved by MassHousing, the Bourne Housing Partnership Committee (BHPC) or its designee shall monitor all sales and re-sales of affordable units in accordance with a Monitoring Agreement in the form required by MassHousing. The Monitoring Agreement shall be fully executed prior to the issuance of a building permit for any of the dwelling units permitted by this Decision.
6. Re-sales and Refinancing: Whenever an affordable unit is to be resold, the owner of such unit shall notify the BHCP or its designee, in accordance with the Regulatory Agreement and Deed Rider, and shall enter into a Monitoring Agreement, as approved by the Board's counsel, with either the BHCP or its designee, to monitor the re-sale to assure the continuous affordability of the unit and the purchase of the unit by an eligible buyer. The sale price shall be determined in the same manner as discussed above. The Monitoring

Agreement shall require that the seller pay the cost of monitoring re-sales. Whenever an affordable unit is to be refinanced, the owner shall notify the BHPC or its designee, in accordance with the Regulatory Agreement and the Deed Rider, which shall state that the amount of all mortgages, home equity loans, and other loans secured by the affordable unit shall not exceed the maximum sales price calculated in accordance with this Decision. In addition to the foregoing, resale and refinancing arrangements shall conform to the requirements of the subsidizing agency.

7. All affordable units shall be indistinguishable from the exterior from the market rate units. The construction specifications for the affordable units shall be identical to the construction specifications of the market rate units. This condition shall not prohibit a market rate buyer from purchasing upgraded appliances, carpeting, countertops, or other interior amenities from the Applicant or its assigns.

VII. MARKETING/LOTTERY AFFORDABLE UNITS

The following conditions are imposed with respect to the issues of marketing, minority outreach, lottery, resale formula, perpetual affordability, and the deed rider as follows. The BHPC may direct the applicant to take additional steps to carry out the purposes of these conditions.

The selection of purchasers for the Affordable Units, including the administration of the Lottery, shall be administered by a consultant retained by the Applicant, subject to the Subsidizing Agency's approval. The Lottery shall be implemented pursuant to a Lottery Plan developed by the lottery consultant and approved by the Subsidizing Agency. If acceptable to the Subsidizing Agency, disputes concerning income or other qualification shall be resolved in the first instance by the Monitoring Agent and a party aggrieved by qualification-related decision of the Monitoring Agent may appeal the decision to the ZBA for a final determination.

The provisions of this section are intended to complement and not to override or supersede any applicable requirements of the Subsidizing Agency, fair marketing regulations of the Department of Housing and Community Development, the Massachusetts Commission Against Discrimination, MassHousing, or any authority with jurisdiction and like purpose, to provide low and/or moderate income housing.

1. A lottery will be held to locate buyers for each Phase of Development. Advertisements will be run in local area papers announcing the availability of homes, income guidelines, and contact information for obtaining applications. Mailings shall be sent to, and shall include but not be limited to, the Local Housing Partnership, the Bourne Town Hall, the Housing Assistance Corporation of Hyannis, DHCD, local public libraries, local places of worship, and housing assistance organizations, as well as applicants for prior phases of previously approved comprehensive permit projects that were not chosen in the previous lotteries. Each group will receive a copy of the advertisement as well as some blank applications.

2. In addition to the local community papers, advertisements shall be sent for publication to minority publications such as the Bay State Banner; El Mundo, etc., and mailings will be sent to local/regional organizations, social service agencies that have connections to minority communities, such as the NAACP and the Wampanoag Tribal Council. Prior to each lottery, the marketing agent will contact DHCD for an updated list of suggested publications. The outreach/marketing program shall be for a period of at least sixty (60) days prior to the selection of buyers.
3. Applications received from the outreach program will be reviewed and pre- screened for qualifications. Follow-up information will be requested as necessary to ensure that all applications include information as to Down Payment availability, mortgage pre-approval, assets, and first time buyer status. Upon review and receipt of all information, lottery applications will be placed into a pool based upon family size for the one and two bedrooms homes in each phase. A random drawing will then be conducted to select the designated number of candidates for each phase. All Applicants will be notified after the lottery of their status. Notifications will include information as to whether or not they were included in the lottery. If not, an explanation will be provided. All Applicants that were included in the lottery will be notified as to whether or not they were chosen. Those that were chosen during the drawing will be notified of a tentative delivery date for their home and will be contacted for an individual appointment to process their purchase. Those that were not chosen will be notified and advised that they will be notified of and included in subsequent drawings in future phases if they so choose.
4. To the extent permissible by law, the lottery system shall provide for residential preference of the Town Percentage (hereinafter defined) of the affordable units, so that only "Town residents" and minority applicants shall be included in the pool for each lottery for up to 70% of the affordable units sold to an eligible household. Thereafter, the lottery pool shall include all applicants, including but not limited to "Town residents." A "Town resident" is defined to include an applicant who lives or has lived in Bourne, currently works in Bourne, or who has immediate family (grandparents, parents, children, or siblings) who live in Bourne.
5. Minority applicants, if any, shall be included in all lottery pools.
6. In each of the above scenarios the three bedroom units will be reserved for first time homebuyers (defined as not having owned a home within three (3) years prior to the purchase, or a family that has been displaced by a divorce, etc.) and agree to occupy the unit as a primary residence.
7. Eligibility shall be determined prior to each lottery by using the current year HUD Median Income figures for Barnstable County. In all cases total household income and current assets for the family will be used to determine eligibility.

8. The re-sale of all affordable units shall be governed by the Deed Rider and/or Affordable Housing Restriction prepared by the subsidizing agency and shall be considered incorporated within this Decision.
9. All homeownership affordable units shall be owner occupied, except as may be allowed by the applicable subsidizing agency Deed Rider or Affordable Housing Restriction.
10. The above conditions concerning eligibility, pricing, affordability in perpetuity, monitoring, and owner occupation shall be set forth in a Deed Rider attached to all affordable units. The Deed Rider shall be recorded immediately following the Deed and shall be senior to any liens on the Premises to protect the continued availability of and requirement for the affordable units in the event of any foreclosure, bankruptcy, refinancing or sale.
11. The Applicant shall obtain the Subsidizing Agency's approval of a Buyer Selection Plan for the sale of the Affordable Units prior to putting any of the Affordable Units on the market. Buyers shall be selected through a fair lottery process (the "Lottery"), acceptable to the Subsidizing Agency.

VIII. CONSTRUCTION AND SUBMISSION REQUIREMENTS

1. Pre-Construction Submissions: Before the Applicant commences any construction activities the Applicant shall have:
 - a. Submitted Final Site Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, and with state and federal codes. Copies of the detailed, approved construction drawings (the "Final Site Plans") should also be filed in hard copy (10 full-scale sets) and in digital form with the Building Inspector. The Final Site Plans shall bear the signature and seal of a Massachusetts Professional Land Surveyor (PLS) and a Civil Professional Engineer (PE). The Applicant must secure approval prior to construction pursuant to Paragraph VIII.4. The Final Site Plans shall contain the following:
 - i. An existing conditions plan of topographic, utility, and property information.
 - ii. The Final Site Plans should include stormwater management plans and improvements in accordance with applicable laws and regulations.
 - An existing conditions plan signed and sealed by a Massachusetts Professional Land Surveyor.
 - A lotting sheet signed and sealed by a Massachusetts Professional Land Surveyor.

- Construction notes for each proposed infiltration system describing construction requirements.
- Revision of the stormwater system showing the water quality tanks as offline structures, emergency overflows for each subsurface structure, and roof drain connections if any.
- A Sediment and Erosion Control Plan.
- More detailed General Notes addressing site controls (vertical and horizontal datum and benchmarks), construction standards, construction sequencing, erosion and sedimentation control procedures, and environmental (noise, vibration, dust and sedimentation), and safety compliance.
- A note providing contact information, for the proposed gas, electric, and cable utilities.

iii. Final landscaping plans prepared by a Massachusetts Registered Landscape Architect (RLA) to the detail required for use as on-site construction and planting drawings, improvements shall be consistent with the Approved Plans. Such plans shall include shade trees along the roadways and unit driveways and throughout the site, shrubs, and turf areas. Such plans shall indicate the specific types of active/passive recreational equipment to be installed within the open space and recreational areas located on the approved plans.

iv. Final roadway plans and profiles for the main site roadway.

v. Final utility plans and profiles including properly labeled drainage components and all site utilities including electric, gas, water supply lines, wastewater collection and disposal facilities, building service connections, and all system components and appurtenances. **The final roadway profile should extend to the centerline of Sandwich Road and show proposed drainage lines, water quality inlet tanks, and infiltration systems to the profile view including proposed depth of structures and depths to bottom of stone.**

vi. The location of electric, telephone, CATV, and gas lines and appurtenances shall be indicated on the drawings based upon final design of these systems by the utility company.

vii. Final Site Lighting plan.

viii. Final Photometric Drawing.

ix. Final Site Entrance Plan in accord with MassDOT requirements.

x. Size, location, legend, and illumination of entrance signage.

xi. if approved by MassDOT, a Roadway Improvement Plan showing pavement markings and other improvements to Sandwich Road required to provide a left turn lane at the entrance to Chase Estates.

- b. Obtained any and all permits and approvals from the Bourne Conservation Commission or the DEP which may be required under any state statute, code, or rule and regulation under its jurisdiction, to the extent not otherwise expressly covered by this Decision, including a final Order of Conditions or Superseding Order of Conditions under the Wetlands Protection Act as to any portion of the Site subject to the Wetlands Protection Act that are required by applicable state law prior to such commencement;
- c. Obtained a National Pollutant Discharge Elimination System (“NPDES”) stormwater permit issued for the Project, if required by applicable law;
- d. Obtained, if needed, a Certificate of the Secretary of Environmental Affairs of compliance pursuant to 301 CMR 11.08(8)(a);
- e. Delivered to the ZBA with copies to the Building Inspector, Planning Board, Board of Health, Conservation Commission, Superintendent of the DPW, Fire Chief, and Police Chief a complete Construction Management Plan (CMP) as described in condition #3, below.
- f. A geotechnical engineering design report shall be submitted for the areas that are proposed to be graded at one foot horizontal to one foot vertical (1:1). Signed, sealed slope stability calculations shall be provided by a geotechnical engineer that is based upon location specific subsurface testing.
- g. Earthwork computations shall be provided for the volume of cut and fill and the net volume on/off site. The number of trucks required for off-site transport shall be calculated.
- h. Final Drainage Calculations and Report must be submitted. The complete stormwater design package shall be signed and sealed by the civil engineer of record, and shall conform to the methods and procedures set forth in the Massachusetts Stormwater

Handbook. The design depicted on the plans currently on file is meant to demonstrate intent and not full construction level of detail.

- i. Retaining walls exceeding ten (10) feet in height require a Building Permit and must be designed by a Massachusetts Structural Professional Engineer. **Final design of retaining walls must be based on location specific soil tests. Safety fencing must be shown. For walls adjacent to property lines, sheeting, shoring, and bracing preventing encroachment on adjacent property must be shown.**
2. Before the Applicant commences construction of any residential units, the Applicant shall have:
 - a. Submitted Final Architectural Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, with the Massachusetts Building Code, and with all other state and federal codes. Copies of the detailed, approved architectural drawings (the “Final Architectural Plans”) should also be filed in hard copy and in digital form. The Final Architectural Plans shall bear the signature and seal of a Massachusetts Registered Architect (RA). The Applicant must secure approval pursuant to Paragraph VIII.4 prior to beginning unit construction. The Final Plans shall include a Building Code review.

~~The number of bedrooms shown in the Final Architectural Plans shall not exceed three bedrooms per unit or a total of sixty bedrooms on the site. The Final Architectural Plans shall depict twenty (20) 3-bedroom dwelling units and four (4) 2-bedroom units, and shall not show more than sixty-eight (68) total bedrooms on the site.~~
 - b. Obtained any and all permits and approvals from the Bourne Board of Health and the DEP regarding disposal of wastewater generated by the Project that are required by applicable state laws prior to such commencement;

3. The Construction Management Plan shall address the following topics and items:

- i. Construction Administration
 - Hours of construction **including equipment startup**
 - Hours of construction delivery
 - Truck routes
 - Trash and debris removal
- ii. Construction Phasing and Schedule (critical path) timing and phasing of construction; site clearing; construction of roadways and utilities; buildings, etc. If the site is not expected to be completed in a single- phase, a detailed Construction Phasing Plan shall be

submitted indicating access and utilities for each phase adequately addressing access and parking, emergency vehicle access, and utility services.

iii. Communications

iv. Noise and Dust Control

- Tree removal (chipping, etc.)
- Public street cleaning and repair
- Dust
- Noise
- Rock crushing

v. Blasting

- Blasting Plan
- Identification of petitioner's blasting consultant
- Selection of independent blasting consultant
- Selection of blasting contractor
- Pre- and post-blast survey (scope and content)
- Insurance coverage
- Blasting limits
- Notification to abutters of blasting schedule
- Road closures (if necessary)
- School bus conflicts (limits on hours)

vi. Erosion Control

- Silt sacks, hay bales, silt fences, etc.
- Tree protection plan

- Drainage infrastructure

vii. Identification of existing underground utilities

viii. Construction Staging

- Staging areas
- Site office trailers
- Storage trailers/containers
- Open storage areas
- Delivery truck holding areas
- Paved** refueling areas **with spill containment**

- ix. Traffic and Parking (during construction)
 - On-site locations
 - Off-site locations
 - Snow removal
 - Police details
 - Warning signs
- x. Fire and Emergency
 - Temporary emergency access roadway
 - Emergency water supply throughout construction
 - Provision of a Knox padlock for construction fence gates
- xi. Construction Specifications

The CMP shall be reviewed pursuant to Paragraph VIII.4. The scope of the review of the CMP shall be for completeness and for consistency with generally accepted construction practices and for compliance with all the conditions of this Decision.

4. Procedure for Review and Approval.

- a. When review and approval of a plan or document is required by any condition of this permit, the Applicant shall submit the plan or document to the Building Inspector and any other recipient specified by the permit condition. Upon such review and absent an objection by any of the specified recipients, within thirty (30) days of receipt, that such plan or document are inaccurate or inconsistent with or not in conformity with this Decision, the plan or document shall be deemed approved. If the submitted plan or document is required by state or federal law, rather than local regulations, it shall be deemed approved for purposes of this permit, but Town authorities may communicate any concerns to the applicable state or federal agency.
- b. In the event there is an objection that the plan or document is inaccurate or inconsistent or not in conformity with this Decision, the Applicant may submit the matter in question to the ZBA for its review for consistency; the ZBA shall hold a hearing within 45 days of the applicant's submission, and render a decision within 14 days after said hearing. Any matter related to this Decision to be reviewed and decided by the ZBA after this Decision is issued may be reviewed and decided by the members of the ZBA designated by the Chairman, even if those members did not sit on the hearings that led up to and resulted in this Decision. The Applicant may appeal any adverse ZBA decision to the Housing Appeals Committee.

IX. SITE DEVELOPMENT CONDITIONS

1. Prior to the commencement of any construction activities or any site development or site clearing, the Applicant shall meet with the Building Department, Police Chief or his representative, Fire Chief or his representative, the ZBA's Consulting Engineer (if any), and the Chair of the ZBA or his representative at a mutually convenient time and place during normal business hours to review the CMP, and to coordinate the Building Department's periodic inspections of the Project (the "Pre-Construction Meeting"). This meeting shall be open to the public.
2. At least two weeks prior to the commencement of any construction activities or site development or clearing, the Applicant shall submit to the ZBA, with a copy to the Police Chief, the Fire Chief, and the Building Inspector, a Construction Schedule, indicating the anticipated start and end points for each significant phase of development (site grubbing, clearing, and fill; construction of roadways and related infrastructure, excavation and blasting for foundations, framing and interior construction, etc.). The Construction Schedule shall also include the anticipated daily vehicle trips per phase, and the anticipated hours of the day during which heavy equipment and construction vehicles are expected to enter and exit the Site.
3. The Applicant shall ensure safe and convenient vehicular access to the Site during the entire duration of the Project.
4. The Applicant shall submit to the ZBA a construction and permitting schedule, prior to the commencement of any construction activities or any site development or clearing, and semi- annually thereafter to assist in project status update and review.
5. The Building Department or its appointed agents may, upon reasonable notice to the Applicant, conduct periodic inspections during the construction of the Project, to ensure compliance with the terms of this Decision and the state building code, and for consistency with generally-accepted construction and engineering practices for the installation of roadways, stormwater management facilities, utilities, and all development infrastructure.
6. The Applicant shall forward final architectural plans to the Building Inspector at the time of applying for building permits. All construction shall be inspected by the Building Inspector and shall be in compliance with all Massachusetts State Building Code requirements.
7. The Applicant shall be responsible to ensure that nuisance conditions do not exist in and around the Site during the construction operations. The Applicant shall at all times use all reasonable means to minimize inconvenience to residents in the general area.

8. Dust - Methods of controlling dust shall meet all air pollutant standards as set forth by Federal and State regulatory agencies.
9. Noise - The Applicant shall implement measures to ensure that noise from project construction activities does not exceed acceptable levels, as set forth by Federal and State regulatory agencies.
10. Traffic - The Applicant shall implement necessary traffic safety controls to ensure a safe and convenient vehicular access in and around the Site. Any traffic problems that occur as a result of site operations and construction shall be mitigated immediately, at the expense of the Applicant.
11. Roads – The Applicant is responsible for the sweeping, removal of snow, and sanding of the internal roadways and driveways permitting access to residents, emergency vehicles, and others during construction and until the Homeowner Association has been legally established. The final coat of pavement on the internal roadways shall be installed after the base course has endured a full winter season. The Applicant shall promptly clean any debris or dirt deposited on Bourne or state controlled streets and roads.
12. Burial of any stumps or solid debris onsite is expressly prohibited. Localized burial of stones and/or boulders is prohibited to prevent the creation of voids from soil settlement over time.—
- ~~13. —Intentionally omitted.~~
1413. Utilities, including but not necessarily limited to electric, gas, water, cable, and telephone shall be located underground per utility company standards and applicable codes, and DIGSAFE standards A final utility plan approved by the applicable public utilities shall be submitted to the Building Inspector prior to the commencement of any construction.
1514. Stabilization Requirements – No disturbed areas that might contribute to erosion or sediment migration that are located onsite and under the applicant’s control shall be left in an open, unstabilized condition longer than 30 days or as may be governed by the NPDES permit. Temporary stabilization shall be accomplished by hay bales, hay coverings, matting or other appropriate means. Final stabilization shall be accomplished by loaming and seeding exposed areas in accordance with the approved landscaping plans or site plan.
1615. Blasting - Any rock blasting shall be performed by a licensed blasting professional, who shall first obtain all required permits from the Bourne Fire Department. All blasting and removal of debris shall be performed in accordance with state regulations and local fire department requirements and shall provide evidence thereof to the Fire Chief.

- a. Selection of the Blasting Contractor. A blasting contractor, acceptable to both the Applicant and the Bourne Fire Department, shall be selected after review of the qualifications of such contractor by a qualified independent geotechnical-blasting consultant who shall also be acceptable to both the Applicant and the Bourne Fire Department.
- b. Independent Blasting Consultant. An independent geotechnical-blasting consultant shall be selected and paid for by the Applicant, subject to the approval of the Bourne Fire Department. The consultant shall review the qualifications of the blasting contractor, and review the final blasting plan prepared by the blasting contractor, check the calibration of the seismograph monitors, approve the location and installation of the seismograph monitors, and, if required by the Bourne Fire Department, shall determine the blast limits throughout the blast period and shall consult with the Bourne Fire Department on an as-needed basis throughout the blasting period.
- c. Pre-blast Survey. Before any blasting on the Site, the Applicant shall conduct a pre-blasting survey that shall include video-recording of the foundations of all direct abutters to the Revised Project, and shall provide a copy of that survey to the ZBA and Fire Chief.
- d. Insurance Coverage. The blasting contractor shall carry comprehensive public liability insurance in the amount of not less than \$1,000,000 for property damage in respect of any one occurrence and \$2,000,000 aggregate. A certificate shall be submitted to the Bourne Fire Department by the contractor documenting that the required coverage will be in force for the duration of the blasting at the Site. If there is a general contractor or developer associated with the blasting, each shall carry a minimum of \$1 million of comprehensive liability insurance.
- e. Blasting Limits. The Commonwealth of Massachusetts blasting limits shall be observed. However, if, based upon the recommendation of the independent blasting consultant, the Bourne Fire Department believes that a lower limit is necessary to protect the Site and the abutting property that lower limit shall be in effect.
- f. Notification. Not less than one week prior to the commencement of any period of blasting, the Applicant shall notify the immediate abutters within 200 feet of the blast area, stating when the blasting period shall begin. Notification under this provision and under any other provision in the Comprehensive Permit shall be by the following three methods: (1) phone or in person; (2) by email; and (3) by letter. No perchlorate shall be used during blasting. Such notification shall include an explanation of the warning procedures for blasting including soundings. The Applicant shall send another letter notifying the same abutters that the blasting period has been completed. In addition, the Applicant shall notify the Fire Department 30 minutes prior to each blast, and a Fire

Department detail is required for every blast, which shall be certified by the Fire Academy on the requirements of the state blasting regulation.

- g. Post-blasting Survey. After the completion of all blasting, the Applicant shall conduct a post-blasting survey that shall include video-recording of the foundations of all direct abutters to the Project, and shall provide a copy of that survey to the ZBA, Fire Chief, and each abutter, respectively, upon request.

4716. Safety Fencing: During construction of the Project, the Building Inspector shall have authority to require fencing of the site or portions of the site to the extent required and appropriate to enhance safety by controlling access. A Knox padlock shall be used for any construction fence gates.

4817. As Built Plans: Prior to the occupancy or use of the final “market rate” dwelling unit constituting a part of the Project, the Applicant shall submit to the ZBA an “As Built Plan” in paper and CAD format, showing all pavement, buildings, stormwater management structures, and other infrastructure as they exist on the Site, above and below grade, including appropriate grades and elevations. The plans shall be signed by a registered land surveyor and civil engineer, certifying that the Project as built substantially conforms and complies with the conditions of this Comprehensive Permit.

4918. Trees. Prior to the commencement of any construction activities or any site development or clearing, if required by the Board’s Consulting Engineer, the Applicant shall erect a physical barrier such as a plastic fence to ensure that any existing trees on the locus be preserved to the extent consistent with the approved site plan and landscaping plans. If any such trees, having a caliper of four inches or greater at four feet from the ground, are destroyed or injured as a result of construction, the Applicant shall plant new trees in their place of a comparable species with a minimum height of nine feet at a ratio of 2 new trees for each destroyed tree. Such replanting shall be done by a qualified landscape professional.

2019. Roadway Design: The surface course and binder course of the roadways, and the attendant shoulder widths and side slopes, shall conform to the Bourne Planning Board’s Subdivision Rules and Regulations except as waived herein. Roadway design to be indicated on the Final Site Plans shall include the following:

a. The maximum roadway grade shall not exceed twelve (12) percent.—

—b. ~~Intentionally omitted.~~—

—c. ~~Intentionally omitted.~~—

- db. Install “No Parking Any Time” (UMTCD R7-1) signs for the hammerhead turnaround at the upper end of the principal on-site access drive.

- 2120. Erosion control shall follow Best Management Practices and shall be maintained throughout the duration of the project.

Prior to the issuance of any certificate of occupancy, the applicant shall establish a maintenance plan for the stormwater system, which shall include but not be limited to scheduled inspections, thresholds for removal of sediments, and an educational program for residents for the continuing maintenance and protection of the stormwater system. The maintenance plan shall be reviewed pursuant to Paragraph VIII.4.

No sands or gravels may be removed from the site except those required to be removed to accomplish the conditions shown on the final site plan to be approved by the Board.

- 2221. Stormwater Management:

- a. Catchbasin spacing shall be reduced to a maximum of 150 feet on grades exceeding 6 percent.
- b. Grate hydraulic calculations shall be submitted and double grate or cascade grate structures shall be added as appropriate to ensure that the design storm is captured.
- d. Invert elevations of the stormwater quality structures shall be maintained above the recharge systems. The Stormceptor units should not be permitted to surcharge. Tailwater elevations that extend above the structural outlets shall not be permitted.
- f. All subsurface structures shall support HS-20 loading in paved areas.

- 2322. **Water Distribution:**

- Aa. The applicant shall submit a water connection application to the Board of Water Commissioners, together with engineered drawings and other information reasonably requested or required by said Commissioners, consistent with its usual practices and procedures. ~~Only the Board of Water Commissioners has the right to approve a request for a water connection to the Bourne Water District system.~~ If questions arise with regard to the project, the District's Engineer may be asked to review the plans and submit a finding.

- b. The Bourne Fire Dept requires that fire hydrants not exceed 500 feet of separation. Hydrant flow records and test data must demonstrate a deliverable fire flow including simultaneous domestic flow while maintaining a minimum residual pressure of 20psi.

2423. ~~Maintenance of septic system(s) and wastewater disposal infrastructure shall be the responsibility of the Homeowners' Association.~~ Individual on lot septic systems are provided for each duplex structure and maintenance of septic system(s) shall be the responsibility of the respective homeowners; provided, the Homeowner Association shall establish rules and a reserve fund to ensure that the Association can enforce the homeowners' obligation to maintain, test, and repair/replace their septic systems as needed to comply with applicable regulations.

2524. The on-site sidewalk shall comply with applicable laws and regulations regarding handicap access.

2625. Temporary construction signage and permanent entrance signage at Sandwich Road should be indicated on the plans and details furnished with respect to sign legend, dimensions, materials, colors, means of illumination. Signs shall comply with the requirements of the Bourne Zoning By-Law. The signs should be located to avoid interference with sight distance for exiting vehicles. Peer review of the sight distance limitations may be required.

2726. The applicant shall verify whether or not the Postmaster will require a common mailbox facility. If required, the mailbox facility and associated parking shall be indicated on the site plan.

2827. The sidewalk at Sandwich Road should be clearly indicated including the area intended to serve as a school bus waiting area.

2928. The principal site access roadways should be signed for "No Parking" (MUTCD R7-1) on one side and parking restrictions should be enforceable by the Homeowner Association Documents.

3029. A Site Lighting Plan shall be developed using a maximum pole height of 24 feet. Light fixtures should be consistent with residential scale and style typically acceptable in the town and should comply with all applicable laws and regulations. —

31. ~~Intentionally omitted.~~

3230. During construction, the Applicant and his agents and employees shall conform to all local, state and federal laws regarding noise, vibration, dust and use of Town roads and utilities. The Applicant shall at all times use all reasonable means to minimize

inconvenience to residents in the general area. If any units have been constructed and occupied, construction shall not commence on any day Monday through Friday before 7:30 AM or on Saturday before 8:30 AM, and all exterior construction activities shall cease by 6:00 PM on all days, and no construction or activity whatsoever shall take place on Sundays or legal holidays except for the limited purpose of providing emergency health or safety measures or except as otherwise allowed by the Building Inspector. All construction shall follow Best Management Practices for erosion and sediment control.

- 3331. Construction of all dwelling units, utilities, roads, drainage structures, and all related appurtenances shall be in accordance with all applicable zoning bylaws and all other applicable local, state and federal regulations except as waived by this Decision. —

34. —~~Intentionally omitted.~~—

- 3532. All utilities shall be underground.

- 3633. All area and roadway lighting shall be shielded or refracted as necessary in such a manner as to minimize light spill over to neighboring properties. Light fixtures shall incorporate dark skies principals and shall avoid upward projection of light.

- 3734. All on-site storage of hazardous materials and hazardous wastes shall be on an impervious surface, with containment and access control, and all on-site vehicle fueling shall be conducted with industry recognized containment and access control. The CMP shall identify a designated fueling area and shall construct an impervious surface to accommodate construction vehicles. Containment shall be provided for a minimum of 50 gallons of fuel.

- 3835. Prior to digging on any public land, the applicant shall comply with all applicable federal, state and local regulations and with all "dig safe" requirements.

- 3936. Surety & Covenants: As security for the completion of the infrastructure related to the Project as shown on the Approved Plan, including, but not limited to, the binder coat of the roadway, sidewalks, ~~parking areas and common areas, recreational areas, sewage disposal system,~~ drainage facilities, utilities, landscaping, and any other specific infrastructure shown on the "Approved Plan" (the "Infrastructure"), the release of occupancy permits for all housing units and the sale of all housing units in the Project shall be subject to the following restrictions:

- a. No occupancy permit for a unit in any building shall be issued, and no sale of any unit shall be permitted, until: (1) the base and binder course for the roadway, parking areas, and relevant unit driveways shown on the Approved Plan has been installed; and (2) all Infrastructure described herein and as shown on the Plan has been constructed or installed

so as to adequately serve said building unless a phasing plan is submitted for review and approval by the ZBA.

- b. No occupancy permit for a unit in any building shall be issued, and no sale of any unit shall be permitted, until the Approved Plan has been recorded with the Registry of Deeds. This Comprehensive Permit shall be referenced on the Approved Plan prior to recording

4037. The Applicant and its successors and assigns shall comply with the regulatory/ affordable housing restrictions, deed rider, monitoring agreements, and all other conditions applicable to the project approved by this Decision.

4138. Nothing in this Decision shall be deemed to constitute a waiver of or from the jurisdiction of the Cape Cod Commission as granted that agency by the Cape Cod Commission Act, nor as a finding with respect to the Commission's jurisdiction, or lack of jurisdiction, over the project.

4239. If construction authorized by this Amended Comprehensive Permit has not begun within three years of the date on which the amended permit becomes final, the permit shall lapse unless extended by the ZBA. The permit shall become final on the date that the written decision is filed in the office of the town clerk if no appeal is filed. Otherwise, it shall become final on the date the last appeal is decided or otherwise disposed of. The Project shall be completed expeditiously and, in any event, within five years of the date of the first building permit issued, unless extended by the ZBA.

4340. The Board reserves the right, insofar as consistent with state law, to further review and amend this decision based upon any information that comes before the Board as a result of Applicant's future need to acquire permits from any local, county, state or federal authority, including but not limited to, the Cape Cod Commission.—

44.—~~Intentionally omitted.~~

4541. No structure constructed under this Comprehensive Permit shall be altered, reconstructed, extended, or changed unless authorized by the ZBA by a special permit pursuant to the Zoning Bylaws and G.L. c.40A, s.6, as may be amended. Upon such an application for special permit, the Board shall determine, in the first instance, whether such alteration, reconstruction, extension or change is “substantial” or “insubstantial.” For all special permit applications for insubstantial changes, the ZBA shall employ the standards of review set forth under the Zoning Bylaw pertaining to changes to pre-existing, nonconforming structures, as may be amended. Requests for substantial changes shall be treated as requests to amend this Comprehensive Permit. This paragraph shall not apply to the original construction of structures developed pursuant to this Comprehensive

Permit by the Applicant, but shall apply to subsequent alterations, extensions, and changes to such structures.

4642. The terms alteration, reconstruction, extension, and change, shall have the same meaning under the Massachusetts Zoning Act, G.L. c. 40A, §6 and the Bourne Zoning Bylaws.—

47.—~~Intentionally omitted.~~

4843. The Applicant acknowledges that prior to the start of construction, the Applicant must obtain all required approvals from any and all other governmental agencies, departments or commissions whose approvals are necessary for this Project and such approvals must be consistent with this Decision.

4944. The Applicant shall prepare Homeowner Association documents. The Homeowner Association shall be responsible for the ownership, maintenance and repair of the roadways, storm water management systems, ~~the wastewater treatment facilities~~, retention ponds, recharge facilities, retaining walls, the open space parcels, and other common amenities and services.

The Homeowner Association documents shall be subject to review and approval by the Board's counsel to insure compliance with the terms of this Comprehensive Permit decision. Said documents shall contain restrictions on all units preventing any increase in the number of bedrooms. Prior to the sale of any unit, the Homeowner Association documents shall be filed with Barnstable County Registry of Deeds.

The calculation of the percent of interest in the Homeowner Association for each unit shall be determined pursuant to relevant laws of the Commonwealth governing homeowner associations.—

50.—~~Intentionally omitted.~~

5145. The final site plan is to be recorded at the Barnstable County Registry of Deeds and shall be recorded together with this Decision.

5246. The Board requires that a note be placed on said final site plan stating that the Plan is the subject of a comprehensive permit under Mass. Gen. L. c.40B, sections 20-23.

5347. The Town of Bourne shall be free of any liability arising out of the Board's approval of the site layout plan, and for any act, omission or negligence caused by the Applicant, its employees, agents, subcontractors, beneficiaries or trustees with relation to this Project.

5448. ~~Intentionally omitted.~~ The Bourne Planning Board's Subdivision Regulations and construction standards, except as waived herein, shall apply to the construction of the roadways, sidewalks, utilities and associated infrastructure of the Project. For the purposes of this condition, the entire project is considered to be a subdivision.—

55. ~~Intentionally omitted.~~

56. ~~Intentionally omitted.~~

5749. ~~Prior to issuance of any Building Permits, a permanent barrier fence, sufficient to prevent the passage of vehicles~~ A permanent barrier, consisting of a stockade fence as shown on the Approved Plans, must be installed and maintained between Chase Estates at 230 Sandwich Road, Map 25, Parcel 9 and 14 Bosun Lane, Map 25, Parcel 15. This barrier must be maintained by the Applicant until the last dwelling unit is sold, and thereafter by the Homeowner Association.

X. MISCELLANEOUS LEGAL REQUIREMENTS

1. The Applicant shall establish a Homeowners Association for the Project in a form reviewed by the Board's counsel, and approved by the Subsidizing Agency and including provisions for operating and replacement reserves to be established and maintained.
2. Any sale or transfer of rights or interest in all or any part of the Site shall include a condition that successors are bound to the terms and conditions of this Decision.
3. The Applicant and/or subsequent Owner(s) shall be bound by all conditions and requirements set forth in this Comprehensive Permit.
4. In setting the beneficial interest in the Homeowner Association, the Applicant shall comply with all relevant laws of the Commonwealth governing homeowner associations.
5. The principle site roadways, driveways, utilities, drainage systems, water supply and distribution infrastructure, wastewater disposal system, and all other infrastructure shown on the Approved Plans as serving the Project, shall remain private and the Town of Bourne shall not have, now or ever, any legal responsibility for the operation or maintenance of the roadways, driveways and infrastructure, including but not limited to snow removal, garbage pickup, the stormwater management system, the on lot wastewater disposal systems, and landscape maintenance.

XI. APPLICANT'S REQUESTED WAIVERS

The Applicant has requested waivers from the By-Laws of the Town of Bourne, the Town of Bourne Zoning Bylaws and other local rules and regulations. The Applicant's requested waivers

are set forth in its Application and as supplemented through the public hearing process. The ZBA's grant of waivers shall be subject to the terms and conditions imposed by this Decision, and to the extent that any waiver is inconsistent with a term or condition set forth elsewhere in this Decision, such term or condition shall govern. No grant of any waiver shall be deemed to waive compliance with any condition of approval of this Decision. Any waiver not granted below or otherwise included within this Decision shall be deemed denied.

The following waivers are granted:

~~Bourne Zoning Bylaw, Section 1230. Site Plan—Special Permit Approval.—~~

~~Bourne Zoning Bylaw, Section 2200. Use Regulations.—~~

~~Bourne Zoning Bylaw, Section 2440. Dimensional Regulations.—~~

~~Bourne Zoning Bylaw, Section 2500. Intensity of Use Schedule.—~~

~~Bourne Zoning Bylaw, Section 2600. Development Scheduling.—~~

~~Bourne Zoning Bylaw, Section 3300. Parking Requirements.—~~

~~Bourne Zoning Bylaw, Section 3340. Egress Standards.—~~

~~Bourne Zoning Bylaw, Section 3500. Landscaping and screening.—~~

~~Bourne Zoning Bylaw, Section 3560. High Fences or Walls.—~~

~~Bourne Zoning Bylaw, Section 4400. Earth Removal.—~~

~~Bourne General Bylaw, Section 3.7. Wetland and Natural Resource Protection—~~

~~Bourne General Bylaw, Section 3.13. Development Mitigation—~~

~~Bourne Wetland Regulations—~~

~~Board of Health Bedroom Definition Regulation—~~

~~Cape Cod Commission Enabling Regulations Governing Review of Developments of Regional Impact, and Minimum Performance Standards for Developments of Regional Impact—~~

~~Bourne Subdivision Regulations~~Bourne Zoning Bylaw

Section 1230-1244. Site Plan - Special Permit Approval.

Section 2500. Intensity of Use Schedule (R40)

Section 2640. Development Scheduling.

Section 2660. Development Scheduling.

Section 3491(E)(4) - Stormwater Regulations

Section 3492(C) - Stormwater Regulations

Section 3493(G)(1)(b)(ii) - Stormwater Management Standards for Local Stormwater Permits

Section 3496. Inspection and Site Supervision (Stormwater)

Section 3498. Performance Bond (Stormwater)

Section 4400. Earth Removal.

Bourne Subdivision Regulations

Section 223-Standards of access

Section 261-Application Procedure

Section 264-Environmental Information Report

Section 265 - Plan Processing

Section 266 - Performance Guaranty

Section 267(c) - Ownership of Ways and Easements (15% security retainer)

Section 268 - Rescission

Section 312 - Required Cross Section

Section 322 - Widths

Section 323(a) & (f) -Grade

Section 325-Dead End streets

Section 326 - Preparation and Surfacing of Roadway

Section 327 - Curbs

Section 331-Sidewalk location

Section 332 - Preparation and Surfacing of Sidewalks

Section 341-Easement

Section 365 - Spoil Lots

Section 366-Reflective markers

Section 372 - Inspections

Section 374 - Compliance

Decision of the Board of Appeals:

For all the reasons stated above and on the record before it, pursuant to G.L. c.40B, ss.20-23, the Board voted to grant an Amended Comprehensive Permit to Chase Developers, Inc., for real property located at 230 Sandwich Road, Bourne, Massachusetts, on the terms and conditions stated herein.

Zoning Board of Appeals Bourne, Massachusetts

[SIGNATURE]

Appeals of this decision may be made pursuant to Section 17 of Massachusetts General Laws, Chapter 40A and shall be filed within twenty (20) days after the date this decision is filed with the Bourne Town Clerk.



165 East Grove Street
Middleborough, MA 02346

Tel # 508-946-9231 www.outback-eng.com Fax # 508-947-8873

Civil Engineers ★ Land Surveyors ★ Environmental Consultants ★ Soil Testing Services
October 30, 2019

Amy B. Kullar, Chairperson
Board of Appeals
Bourne Town Hall
24 Perry Avenue, Room 203
Buzzards Bay, MA 02532

Re: Chase Estates, Comprehensive Permit No. 08-18
Revised Plan Submittal for Insubstantial Change

Dear Chairperson Kullar,

On behalf of Chase Developers, Inc. and Thomas C. Pappas, as Trustee of 230 Sandwich Road Realty Trust (collectively, "**Chase**"), we are submitting the enclosed preliminary Subdivision Plans and Preliminary Drainage Report, both with revision dates of October 30, 2019 with changes requested by the Board at the October 2, 2019 hearing, as follows:

1. Added a stockade fence along the south property boundary with Upper Cape Tech and along the east boundary to Bosun's Lane. Trees are also proposed between homes along the areas where existing vegetation has been removed.
2. Revised drainage layout to relocate proposed infiltration systems out of paved areas where possible. The Drainage Report was revised to reflect the new systems.
3. Prepared a plan entitled Emergency Vehicle Turning Movements, dated October 28, 2019, demonstrating the town's fire apparatus is able to turn around on site. This plan is currently under review by the Fire Dept. and their findings shall be forwarded to the Board when available.
4. We've also commenced correspondence with the Bourne Water District and will provide additional details when available.
5. Please note we also met with MassDOT on October 25, 2019 to review the new entrance access permit requirements off of Sandwich Road. The personnel they indicated that the general layout and location of the new entrance appears to be acceptable, and that additional details will need to be provided for their ultimate decision after town approvals. These details included providing a left hand turn lane on the southbound approach of Sandwich Road and modifications to the existing pavement striping. Subject to MassDOT's approval, we have shown the proposed left turn lane and striping on the revised plans.

We appreciate your consideration of this matter, and look forward to meeting with the Board to discuss these changes on November 6, 2019. If you have any comments or questions, please let us know.

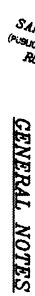
Sincerely,

OUTBACK ENGINEERING, INC.


James A. Pavlik, P.E.
Principal, Project Manager

Attachments

cc: Tom Pappas, Drew Hoyt



- ## LEGEND

0
●
■

POLICE / COURT REPORTER
CONCRETE FOUND
THICK BRUSH
TREES

WINDMILL
WATER PUMP OUT
WATER GATE
WATER LINE (APPROXIMATE LOCATION)
CUTTER MARK

CAS LANE

PLAN INDEX	
SHEET	DESCRIPTION
1	PRELIMINARY SITE PLAN
2	PRELIMINARY LOTTING PLAN
3	PRELIMINARY UTILITY & PAVEMENT PLAN
4	PRELIMINARY GRADING & DRAINAGE
5-6	PRELIMINARY CONSTRUCTION DETAILS

- # REQUESTED WAIVER LIST
1. BOARDE ZONING BY-LAW, SECTION 102. SITE PLAN - SPECIAL PRIMA APPROVAL.
 2. BOARDE ZONING BY-LAW, SECTION 200. USE REGULATIONS.
 3. BOARDE ZONING BY-LAW, SECTION 244. DIMENSIONAL REGULATIONS.
 4. BOARDE ZONING BY-LAW, SECTION 300. UTILITY OF USE SCHEDULE.
 5. BOARDE ZONING BY-LAW, SECTION 300. DEVELOPMENT SCHEDULING.
 6. BOARDE ZONING BY-LAW, SECTION 300. PARKING REQUIREMENTS.
 7. BOARDE ZONING BY-LAW, SECTION 300. FENCES STANDARDS.
 8. BOARDE ZONING BY-LAW, SECTION 300. LANDSCAPING AND SCREENING.
 9. BOARDE ZONING BY-LAW, SECTION 300. FLOOD HAZARD ON WATERS.
 10. BOARDE ZONING BY-LAW, SECTION 400. FARM REVENUES.
 11. BOARDE GENERAL BY-LAW, SECTION 3.1. WETLAND AND NATURAL RESOURCE PROTECTION.
 12. BOARDE GENERAL BY-LAW, SECTION 3.1. DEVELOPMENT INITIATION.
 13. BOARDE WETLAND REGULATIONS.
 14. BOARD OF HEALTH ORDINANCE REGULATIONS.
 15. BOARD OF COMMUNITY PLANNING REGULATIONS ORDINANCE REVIEW OF DEVELOPMENTS OF RESIDENTIAL, COMMERCIAL AND INDUSTRIAL DEVELOPMENTS OF RESIDENTIAL IMPACT.
 16. BOARD OF COMMUNITY PLANNING REGULATIONS ORDINANCE REVIEW OF DEVELOPMENTS OF RESIDENTIAL, COMMERCIAL AND INDUSTRIAL DEVELOPMENTS OF RESIDENTIAL IMPACT.

REVISIONS		
NO.	DATE	DESCRIPTION
1.	10/20/79	REV. FOR ERL MEETING
1.	10/16/79	ADDITION OF MATERIALS

10-30-19

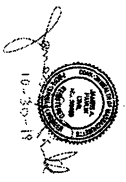
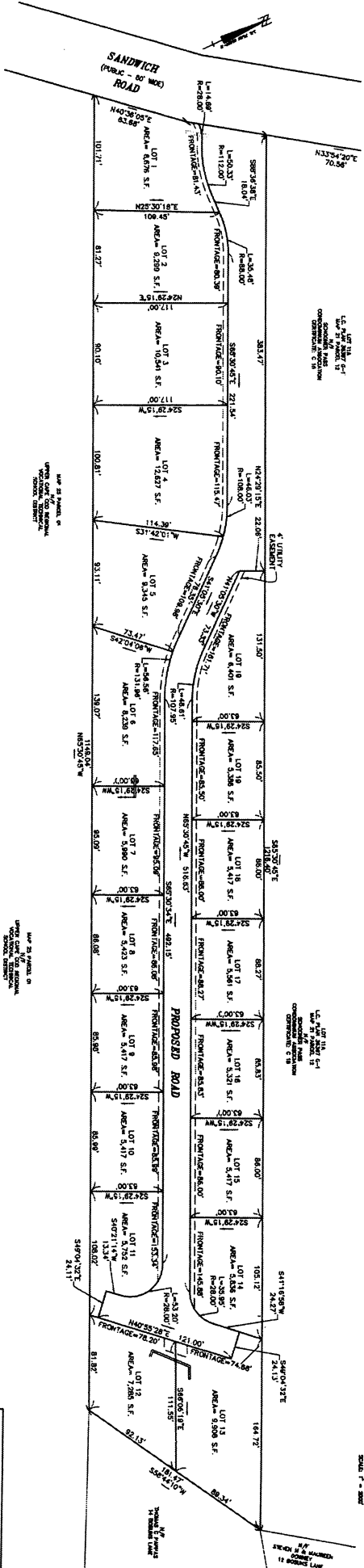
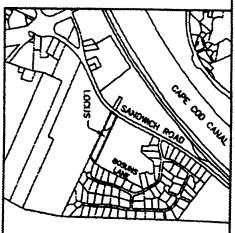
OWNER
230 SANDWICH ROAD REALTY TRUST
14 BOSUNS LANE
BOURNE MA

PRELIMINARY SITE
PLAN
"CHASE ESTATES"
SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS

Outback
Engineering
Incorporated

185 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508)-946-8231
FAX: (508)-947-8873
www.outback-eng.com

DATE: SEP 16 2019	
DRAWN BY: KMD	CHECKED BY: JJP
SCALE: 1"=40'	SHEET 1 OF 6
05-3294A	



REVISIONS	
NO.	DATE
1	10/30/19
2	10/30/19
3	10/30/19

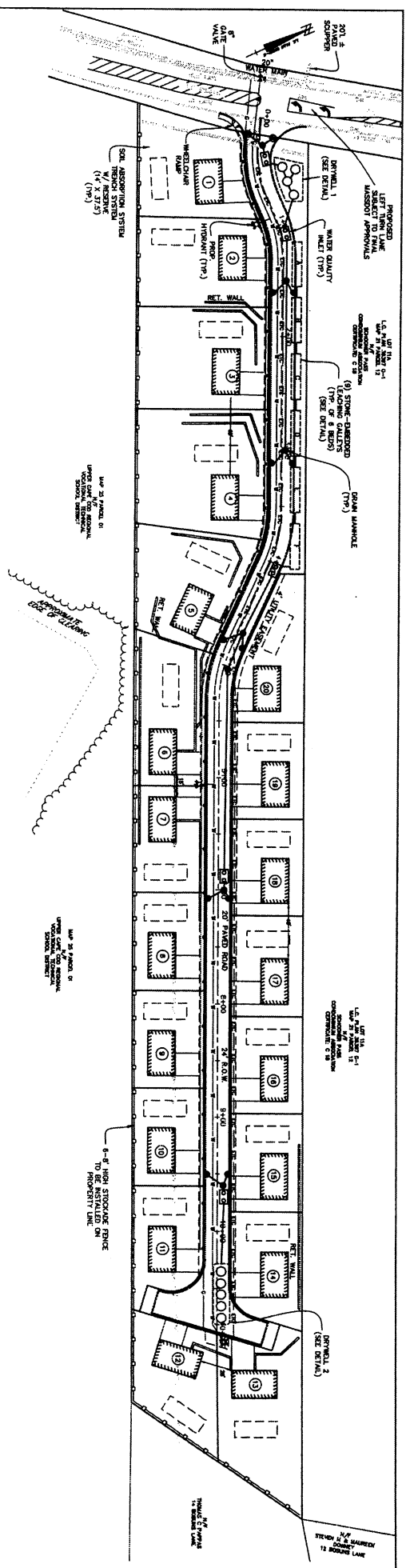
OWNER
230 SANDWICH ROAD REALTY TRUST
BROOKLINE, MA

PRELIMINARY LOTTING SHEET
"CHASE ESTATES"
SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS

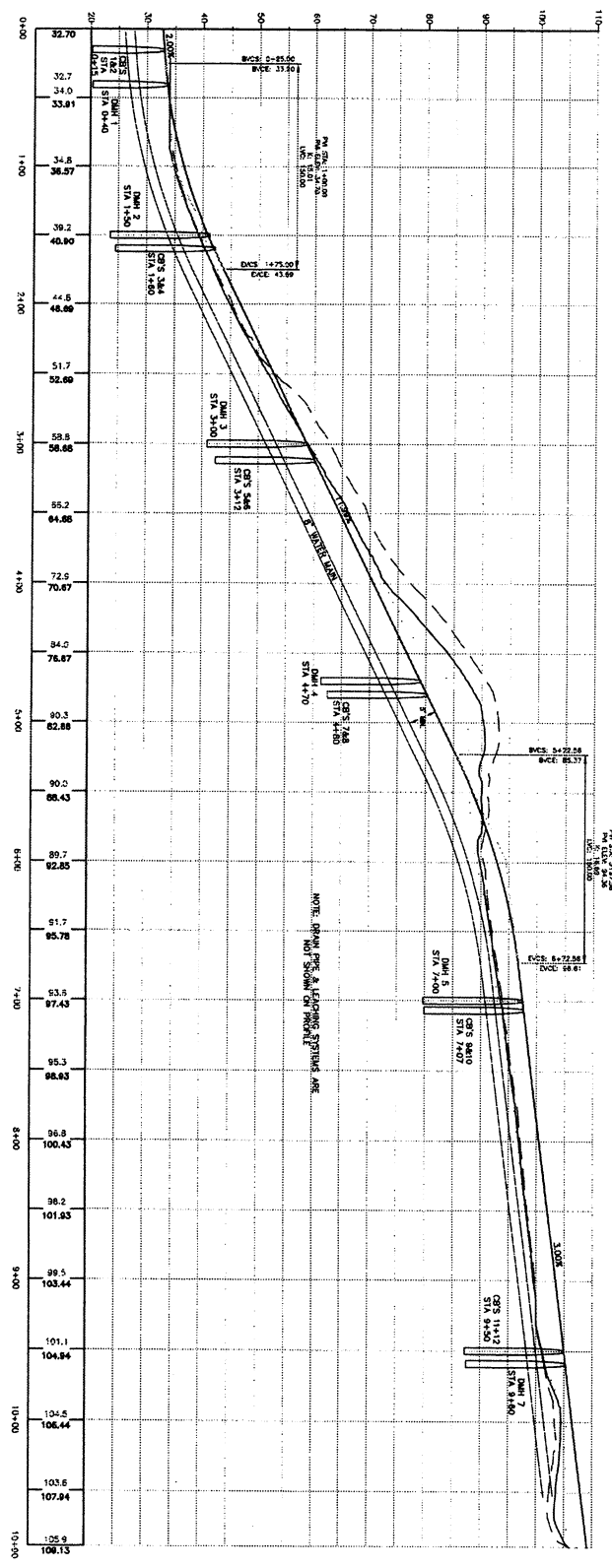
Outback Engineering
165 EAST GORSE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508) 946-9231
FAX: (508) 947-8873
www.outback-eng.com

DATE: SEPTEMBER 24, 2019
SCALE: 1" = 100'
SHEET NO. 1 OF 1

08-3294A



PLAN VIEW:
SCALE: 1" = 40'



PROFILE VIEW:
SCALE: H 1" = 40', V 1" = 10'



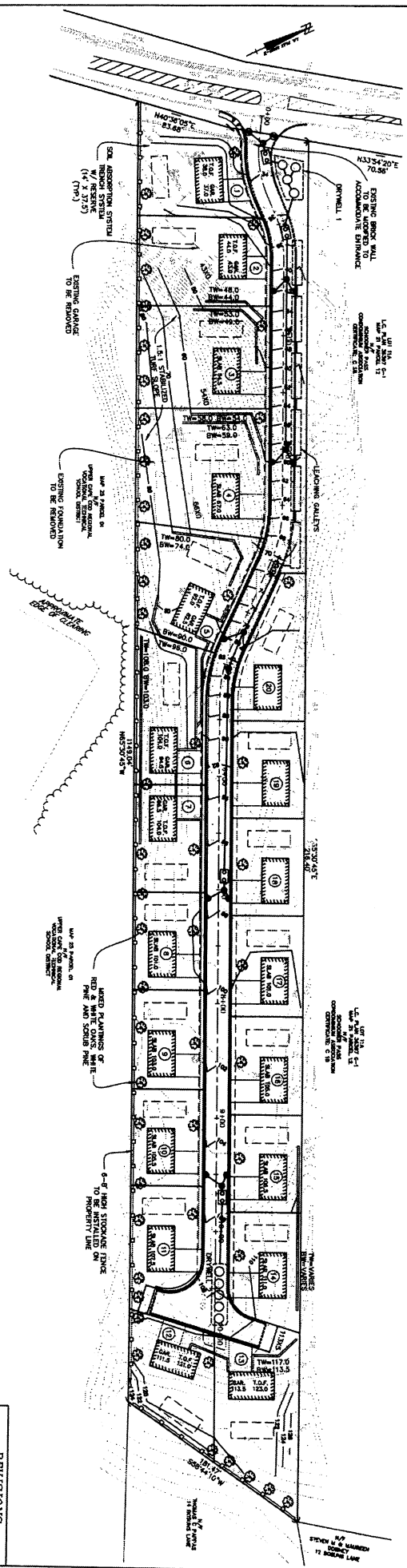
NO.	DATE	REVISIONS
1	10/30/14	ISSUED FOR PERMIT
2	10/30/14	REVISIONS

OWNER
230 SANDWICH ROAD REALTY TRUST
14 BOWNE LANE
BOWNE, MA

PRELIMINARY
UTILITY & PROFILE
PLAN
"CHASE ESTATES"
SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOWNE
MASSACHUSETTS

165 EAST GROVE STREET
MILFORD, MA 01905
TEL: (508) 346-9234
FAX: (508) 347-8873
www.outback-eng.com

DATE: 10/30/14
DRAWN BY: JLD
SCALE: 1" = 40'
CHECKED BY: JLD
SCALE: 1" = 10'
DATE: 10/30/14
PROJECT: 08-3894A



GENERAL NOTES

1. FOUNDATION BUILDINGS SHALL BE PROVIDED AT FRONT OF EACH HOME CONSIDERING OF MAINTENANCE AND ACCESS.
2. LOCATIONS OF RETAINING WALLS BETWEEN AND IN FRONT OF HOMES ARE NOT ALL PRESENTED. NO WALLS SHALL EXCEED 6 FEET IN HEIGHT WITHOUT BUILDING DEPARTMENT APPROVAL.
3. SPECIES OF PLANTINGS ALONG THE SITE DRIVEWAY SHALL BE FROM TOWN APPROVED LIST. SEEDS, SEEDLINGS AND SITE DESIGN FOR EACH LOT. ACTUAL PLANTINGS SHALL BE SUBJECT TO FINAL APPROVALS FROM TOWN BOARD OF HEALTH AND BUILDING DEPARTMENT.

10-30-19

REVISIONS			
NO.	DATE	BY	REVISION
1	10/30/19	JAMES W. BROWN	ISSUED FOR PERMITTING

OWNER
230 SANDWICH ROAD REALTY TRUST
BOURNE, MA

PRELIMINARY
GRADING & DRAINAGE
PLAN
"CHASE ESTATES"
SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS

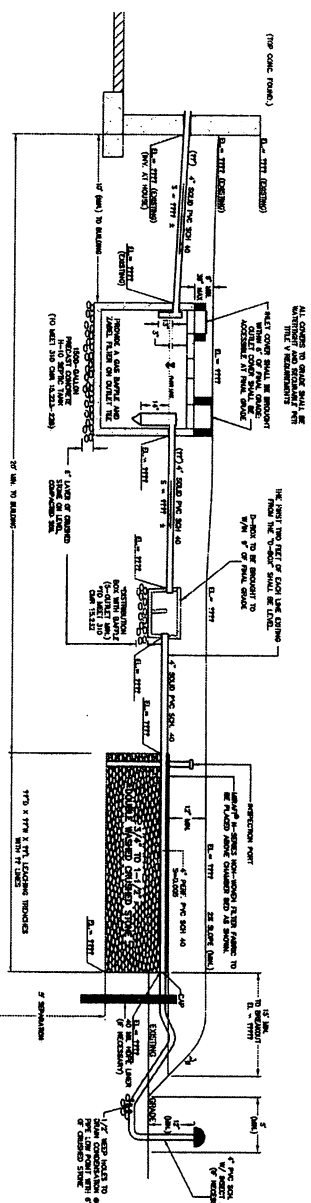
Outback Engineering
INCORPORATED

185 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508) 946-9231
FAX: (508) 947-8873
www.outback-eng.com

DRAWN BY: JAMES W. BROWN
CHECKED BY: JAMES W. BROWN
DATE: SEPTEMBER 24, 2019

SCALE: 1"=40'
SHEET 1 OF 6

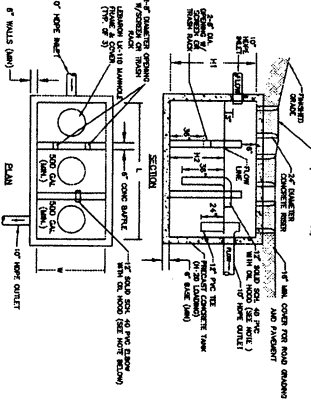
08-3934



SEPTIC SYSTEM PROFILE WITH TRENCHES
NOT TO SCALE

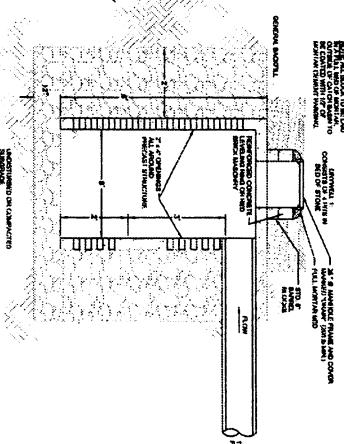
- DESIGN CALCULATIONS:
1. DETERMINE THE TOTAL DAILY SEWAGE PRODUCTION FROM THE HOUSE.
 2. DETERMINE THE TOTAL DAILY SEWAGE PRODUCTION FROM THE HOUSE.
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 6. DETERMINE THE TOTAL DAILY SEWAGE PRODUCTION FROM THE HOUSE.

SAMPLE SEPTIC SYSTEM SIZING CALCULATIONS

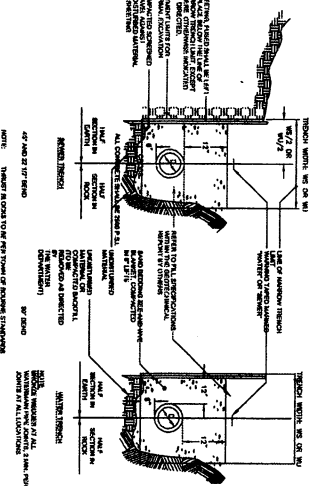
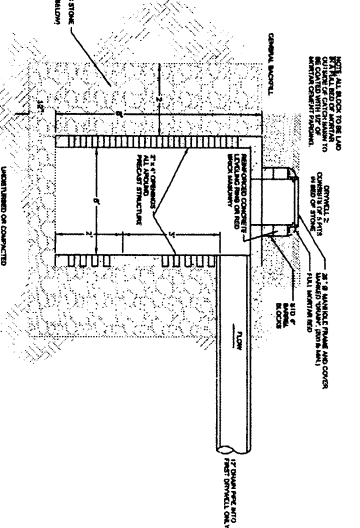


WATER QUALITY INLET
(H-20 LOADING)
NOT TO SCALE

DRYWELL 1: STONE EMBEDDED DRYWELL
NOT TO SCALE



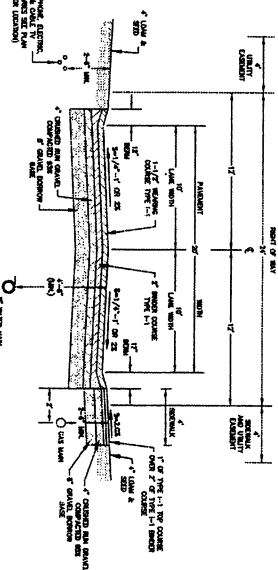
DRYWELL 2: STONE EMBEDDED DRYWELL
NOT TO SCALE



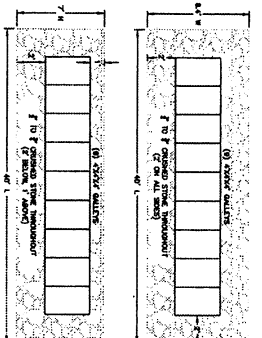
WATER AND SEWER TRENCH
NOT TO SCALE

TRENCH WIDTH (INCHES)	NO. OF PIPES	NO. OF MANHOLES
48"	1	1
60"	2	2
72"	3	3
84"	4	4
96"	5	5
108"	6	6
120"	7	7
132"	8	8
144"	9	9
156"	10	10
168"	11	11
180"	12	12

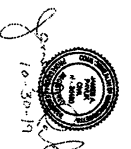
TYPICAL ROADWAY CROSS SECTION
NOT TO SCALE



LEACHING GALLEY
NOT TO SCALE



QUALITY	AMOUNT	TOP STONE	BOTTOM
A	37.6	38.1	38.1
B	42.2	40.7	38.7
C	48.2	46.7	40.7
D	54.2	52.7	46.7
E	60.2	58.7	52.7
F	66.2	64.7	58.7



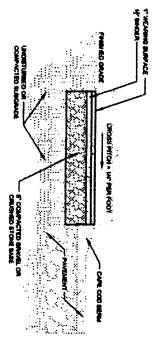
Outback Engineering, Inc.
185 EAST GROVE STREET
MILFORD, MA 01940
TEL: (508) 946-8230
FAX: (508) 947-8873
www.outback-eng.com

DATE: SEPTEMBER 24, 2018
DRAWN BY: JLD
SCALE: AS SHOWN
08-3281A

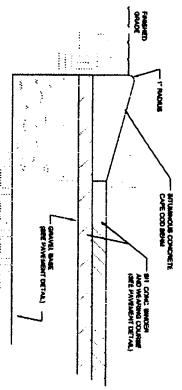
REVISIONS:
1. DATE: 10/10/18
2. DATE: 10/10/18
3. DATE: 10/10/18

OWNER:
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS

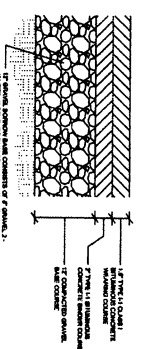
PRELIMINARY
CONSTRUCTION
DETAIL SHEET
"CHASE ESTATES"
SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS



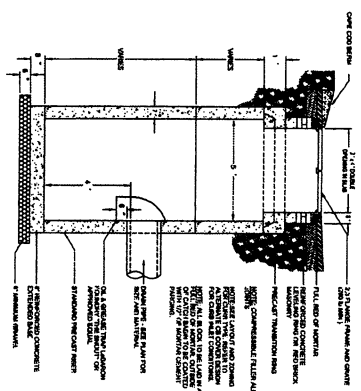
BITUMINOUS CONCRETE SIDEWALK
NOT TO SCALE



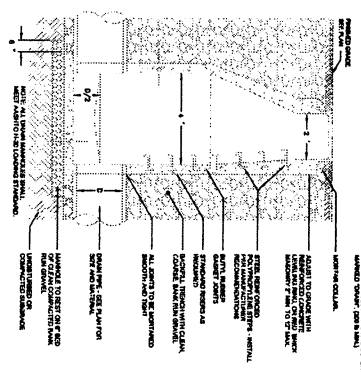
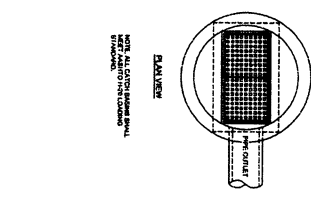
CURB AND GUTTER
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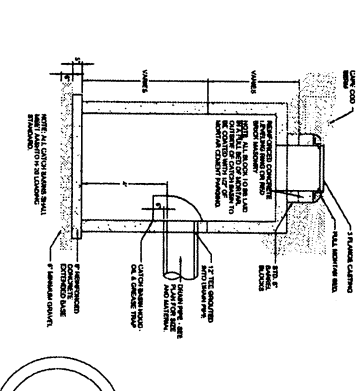
BITUMINOUS CONCRETE PAVEMENT
NOT TO SCALE



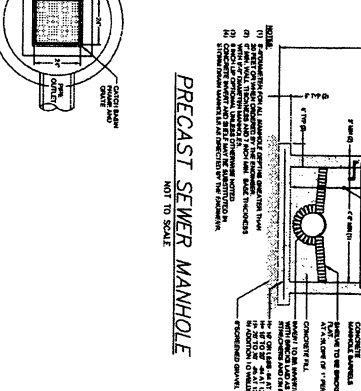
5' DIAMETER DOUBLE GRATE CATCH BASIN
NOT TO SCALE



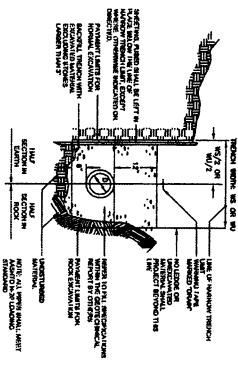
PRECAST DRAIN MANHOLE
NOT TO SCALE



SINGLE GRATE CATCH BASIN
NOT TO SCALE

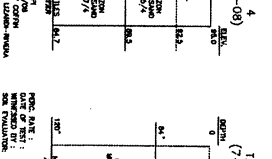
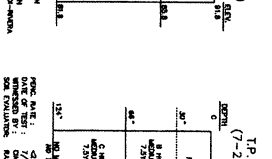
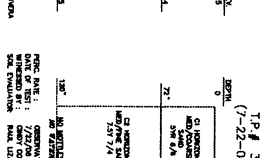
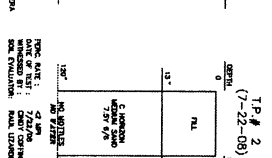
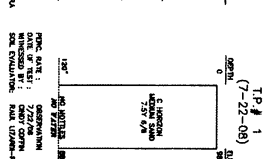
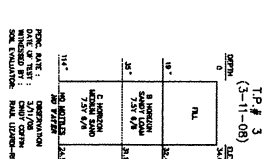
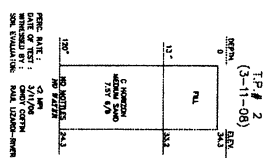
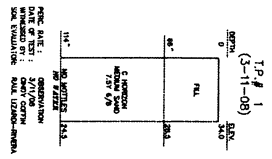


PRECAST SEWER MANHOLE
NOT TO SCALE

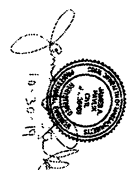


DRAINAGE TRENCH
NOT TO SCALE

TRENCH WIDTH WAS OR WAS NOT			
DATE OF TEST	NO. UNTESTED	NO. TESTED	
12" AND SMALLER	7 - 0	4 - 2	
16" AND LARGER	0.0 - 0.05	0.0 - 0.05	



TEST PIT LOGS
NOT TO SCALE



REVISIONS

NO.	DATE	REVISION
1	07/27/08	ISSUED FOR PERMIT
2	07/27/08	ISSUED FOR CONSTRUCTION

OWNER
230 SANDWICH LANE
BOSTON, MA

**PRELIMINARY
CONSTRUCTION
DETAIL SHEET
"CHASE ESTATES"
SUBDIVISION
AT
230 SANDWICH ROAD
IN
BOURNE
MASSACHUSETTS**

**Outback
Engineering**
160 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508) 942-4822
WWW.OUTBACK-ENG.COM

DATE: SEPTEMBER 24, 2008
SCALE: AS SHOWN
SHEET 1 OF 8
DRAWN BY: JLD
CHECKED BY: JLD

PRELIMINARY DRAINAGE REPORT

“CHASE ESTATES” RESIDENTIAL SUBDIVISION in BOURNE, MASSACHUSETTS

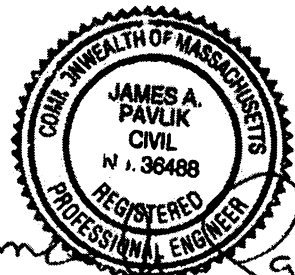
**SEPTEMBER 24, 2019
REVISED: October 30, 2019**

Prepared for:
230 Sandwich Road Realty Trust
14 Bosuns Lane
Bourne, Massachusetts

Prepared by:

**Outback
Engineering**
Incorporated

165 East Grove Street
Middleborough, Massachusetts 02346
Tel.: (508) 946-9231 Fax: (508) 947-8873
www.outback-eng.com



PRELIMINARY DRAINAGE REPORT
"CHASE ESTATES"
BOURNE, MASSACHUSETTS

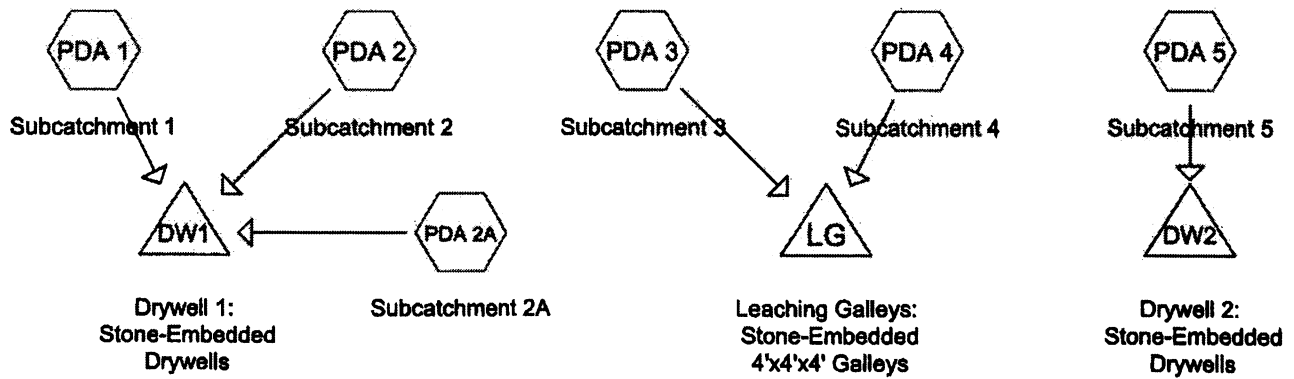
Chase Estates is a proposed 20-lot, residential subdivision permitted under a Comprehensive Permit per MGL Ch. 40B. The project was previously permitted as a 16-unit condominium, and is being modified as a 20-lot subdivision with a 1090-ft. long road. The road is proposed as 20-ft. wide with Cape Cod berms and a 4' sidewalk on one side, with town water, gas, underground cable utilities, and individual onsite Title 5 septic systems. The preliminary subdivision plans show proposed drainage facilities to control stormwater runoff, and the preliminary calculations herein document that stormwater runoff for the 100-year design storm can be contained in proposed leaching drywells based on infiltration rates previously determined by other engineers on the project.

Appendix A contains the hydrology calculations based on watersheds flowing to catch basins in the roads that are piped to precast concrete leaching pits surrounded by crushed stone to infiltrate the runoff.

Appendix B shows the watersheds flowing to these drainage systems.

Final design will include additional details based on additional soil testing, including pipe sizing calculations and water quality pretreatment systems.

Appendix A
POST-DEVELOPMENT HYDROLOGY CALCULATIONS



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Type III 24-hr 100 Year Rainfall=7.10"

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Page 2

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPDA 1: Subcatchment1	Runoff Area=35,551 sf 25.00% Impervious Runoff Depth=1.37" Tc=6.0 min UI Adjusted CN=46 Runoff=1.03 cfs 0.093 af
SubcatchmentPDA 2: Subcatchment2	Runoff Area=25,379 sf 33.33% Impervious Runoff Depth=2.58" Tc=6.0 min CN=59 Runoff=1.67 cfs 0.125 af
SubcatchmentPDA 2A: Subcatchment2A	Runoff Area=24,285 sf 27.58% Impervious Runoff Depth=1.46" Tc=6.0 min UI Adjusted CN=47 Runoff=0.77 cfs 0.068 af
SubcatchmentPDA 3: Subcatchment3	Runoff Area=58,293 sf 59.34% Impervious Runoff Depth=4.13" Tc=6.0 min CN=74 Runoff=6.35 cfs 0.461 af
SubcatchmentPDA 4: Subcatchment4	Runoff Area=32,934 sf 50.00% Impervious Runoff Depth=3.60" Tc=6.0 min CN=69 Runoff=3.12 cfs 0.227 af
SubcatchmentPDA 5: Subcatchment5	Runoff Area=35,956 sf 50.00% Impervious Runoff Depth=3.60" Tc=6.0 min CN=69 Runoff=3.41 cfs 0.247 af
Pond DW1: Drywell 1: Stone-Embedded	Peak Elev=6.05' Storage=2,404 cf Inflow=3.46 cfs 0.286 af Outflow=0.89 cfs 0.285 af
Pond DW2: Drywell 2: Stone-Embedded	Peak Elev=7.94' Storage=3,421 cf Inflow=3.41 cfs 0.247 af Outflow=0.47 cfs 0.247 af
Pond LG: Leaching Galleys: Stone-Embedded	Peak Elev=6.52' Storage=6,380 cf Inflow=9.47 cfs 0.687 af Outflow=2.35 cfs 0.687 af

Total Runoff Area = 4.876 ac Runoff Volume = 1.220 af Average Runoff Depth = 3.00"
56.18% Pervious = 2.739 ac 43.82% Impervious = 2.137 ac

Summary for Subcatchment PDA 1: Subcatchment 1

Runoff = 1.03 cfs @ 12.11 hrs, Volume= 0.093 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

Area (sf)	CN	Adj	Description
8,888	98		Unconnected pavement, HSG A
26,663	39		>75% Grass cover, Good, HSG A
35,551	54	46	Weighted Average, UI Adjusted
26,663			75.00% Pervious Area
8,888			25.00% Impervious Area
8,888			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PDA 2: Subcatchment 2

Runoff = 1.67 cfs @ 12.10 hrs, Volume= 0.125 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

Area (sf)	CN	Description
8,460	98	Unconnected pavement, HSG A
16,919	39	>75% Grass cover, Good, HSG A
25,379	59	Weighted Average
16,919		66.67% Pervious Area
8,460		33.33% Impervious Area
8,460		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PDA 2A: Subcatchment 2A

Runoff = 0.77 cfs @ 12.11 hrs, Volume= 0.068 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

Hydrocad

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Type III 24-hr 100 Year Rainfall=7.10"

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Area (sf)	CN	Adj	Description
6,698	98		Unconnected pavement, HSG A
17,587	39		>75% Grass cover, Good, HSG A
24,285	55	47	Weighted Average, UI Adjusted
17,587			72.42% Pervious Area
6,698			27.58% Impervious Area
6,698			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PDA 3: Subcatchment 3

Runoff = 6.35 cfs @ 12.09 hrs, Volume= 0.461 af, Depth= 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

Area (sf)	CN	Description
34,591	98	Unconnected pavement, HSG A
23,702	39	>75% Grass cover, Good, HSG A
58,293	74	Weighted Average
23,702		40.66% Pervious Area
34,591		59.34% Impervious Area
34,591		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PDA 4: Subcatchment 4

Runoff = 3.12 cfs @ 12.09 hrs, Volume= 0.227 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

Area (sf)	CN	Description
16,467	98	Unconnected pavement, HSG A
16,467	39	>75% Grass cover, Good, HSG A
32,934	69	Weighted Average
16,467		50.00% Pervious Area
16,467		50.00% Impervious Area
16,467		100.00% Unconnected

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Type III 24-hr 100 Year Rainfall=7.10"

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Page 5

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PDA 5: Subcatchment 5

Runoff = 3.41 cfs @ 12.09 hrs, Volume= 0.247 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.10"

Area (sf)	CN	Description
17,978	98	Unconnected pavement, HSG A
17,978	39	>75% Grass cover, Good, HSG A
35,956	69	Weighted Average
17,978		50.00% Pervious Area
17,978		50.00% Impervious Area
17,978		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Pond DW1: Drywell 1: Stone-Embedded Drywells

Inflow Area = 1.956 ac, 28.22% Impervious, Inflow Depth = 1.75" for 100 Year event
 Inflow = 3.46 cfs @ 12.11 hrs, Volume= 0.286 af
 Outflow = 0.89 cfs @ 11.95 hrs, Volume= 0.285 af, Atten= 74%, Lag= 0.0 min
 Discarded = 0.89 cfs @ 11.95 hrs, Volume= 0.285 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 6.05' @ 12.55 hrs Surf.Area= 786 sf Storage= 2,404 cf

Plug-Flow detention time= 16.4 min calculated for 0.285 af (100% of inflow)
 Center-of-Mass det. time= 14.8 min (890.7 - 875.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1.00'	1,206 cf	8.00'D x 6.00'H Vertical Cone/Cylinder x 4 Inside #2 1,527 cf Overall - 6.0" Wall Thickness = 1,206 cf
#2	0.00'	1,590 cf	Custom Stage Data (Prismatic) Listed below 5,502 cf Overall - 1,527 cf Embedded = 3,975 cf x 40.0% Voids
		2,796 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.00	786	0	0
7.00	786	5,502	5,502

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	49.170 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.89 cfs @ 11.95 hrs HW=0.08' (Free Discharge)

1=Exfiltration (Exfiltration Controls 0.89 cfs)

Summary for Pond DW2: Drywell 2: Stone-Embedded Drywells

Inflow Area = 0.825 ac, 50.00% Impervious, Inflow Depth = 3.60" for 100 Year event
 Inflow = 3.41 cfs @ 12.09 hrs, Volume= 0.247 af
 Outflow = 0.47 cfs @ 11.70 hrs, Volume= 0.247 af, Atten= 86%, Lag= 0.0 min
 Discarded = 0.47 cfs @ 11.70 hrs, Volume= 0.247 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 7.94' @ 12.72 hrs Surf.Area= 748 sf Storage= 3,421 cf

Plug-Flow detention time= 53.6 min calculated for 0.247 af (100% of inflow)

Center-of-Mass det. time= 53.5 min (885.9 - 832.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1.00'	2,011 cf	8.00'D x 8.00'H Vertical Cone/Cylinderx 5 Inside #2
#2	0.00'	1,889 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
			6,732 cf Overall - 2,011 cf Embedded = 4,721 cf x 40.0% Voids
			3,899 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.00	748	0	0
9.00	748	6,732	6,732

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	27.080 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.47 cfs @ 11.70 hrs HW=0.10' (Free Discharge)

1=Exfiltration (Exfiltration Controls 0.47 cfs)

Summary for Pond LG: Leaching Galleys: Stone-Embedded 4'x4'x4' Galleys

Inflow Area = 2.094 ac, 55.97% Impervious, Inflow Depth = 3.94" for 100 Year event
 Inflow = 9.47 cfs @ 12.09 hrs, Volume= 0.687 af
 Outflow = 2.35 cfs @ 11.85 hrs, Volume= 0.687 af, Atten= 75%, Lag= 0.0 min
 Discarded = 2.35 cfs @ 11.85 hrs, Volume= 0.687 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 6.52' @ 12.49 hrs Surf.Area= 2,016 sf Storage= 6,380 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 14.3 min (839.3 - 825.0)

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Type III 24-hr 100 Year Rainfall=7.10"

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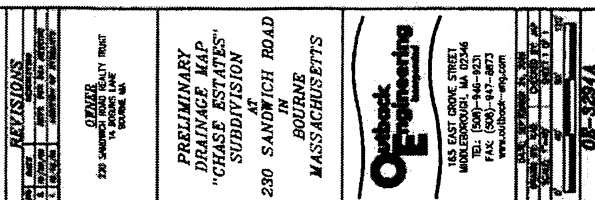
Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	729 cf	8.40'W x 40.00'L x 7.00'H Field A 2,352 cf Overall - 530 cf Embedded = 1,822 cf x 40.0% Voids
#2A	2.00'	399 cf	Concrete Galley 4x4x4 x 9 Inside #1 Inside= 42.0"W x 43.0"H => 12.67 sf x 3.50'L = 44.3 cf Outside= 52.8"W x 48.0"H => 14.72 sf x 4.00'L = 58.9 cf
1,128 cf x 6.00 = 6,768 cf Total Available Storage			

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	50.450 in/hr Exfiltration over Surface area

Discarded OutFlow Max=2.35 cfs @ 11.85 hrs HW=0.12' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 2.35 cfs)

Appendix B
PRELIMINARY POST-DEVELOPMENT DRAINAGE MAP



NOTES:
1. PDA-1, 2, AND 2A COMBINE RUNOFF TO DRYWELL 1.
2. PDA-3 & 4 COMBINE RUNOFF TO LEACHING GALLEYS.
3. PDA-5 FLOWS TO DRYWELL 2.

Chase Estates

Town of Bourne Comprehensive Permit #08-10
Notice of Project Change

Chase Developers, Inc.

Proposed Amended Comprehensive Permit including Supplemental Changes

Attached is the proposed Amended Comprehensive Permit for Chase Estates. This is the same as previously submitted in advance of the Board's August 21, 2019 meeting, except for (i) the changes noted in the Supplemental Proposed Edits document filed simultaneously herewith, and (ii) formatting edits (alignment of paragraph numbers).

DECISION UPON APPLICATION OF CHASE DEVELOPERS, INC.

FOR A COMPREHENSIVE PERMIT UNDER MASSACHUSETTS GENERAL LAWS CHAPTER 40B, s.20-23

I. APPLICANT AND PUBLIC HEARING

[RECITE PROCEDURAL HISTORY OF ORIGINAL AND AMENDED PERMIT]

The total Project shall include no more than twenty (20) single family homes (“units”) with no more than three (3) bedrooms each (including the affordable units). Five (5) of the units, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be affordable to qualified purchasers, in perpetuity.

The minutes and exhibits from the public hearing are available for public inspection in the office of the Town Clerk. A list of the exhibits is contained in the record and is appended hereto by reference.

II. NATURE OF APPLICATION; PROCEDURE REQUIRED BY STATUTE

In conducting its hearings in this matter, the ZBA is guided by G.L. c.40B, s.20-23 and applicable regulations.

III. GOVERNING LAW

The law governing this case is The Low and Moderate Income Housing Act, Massachusetts General Laws, Chapter 40B, §§ 20-23 (the “Act”), and the regulations promulgated by the Department of Housing and Community Development (“DHCD”) Housing Appeals Committee, 760 CMR 56.00 (the “Regulations”).

SUMMARY OF DECISION

The ZBA hereby approves with the conditions set forth below, a comprehensive permit for Chase Developer’s Inc. for the Project depicted on the plans and materials identified in the record, specifically including twenty (20) dwelling units and consisting of five (5) units of low or moderate income housing pursuant to the terms, conditions and obligations imposed by G.L. 40B, s.20-23.

IV. THE RECORD BEFORE THE BOARD UPON WHICH THIS DECISION IS BASED.

1. C1.1 Title Sheet, dated [date of revised plan], prepared by Outback Engineering

2. C2.1 Site Layout Plan, dated [date of revised plan], prepared by Outback Engineering
3. C3.1 Site Grading, Drainage and Utility Plan, dated [date of revised plan], prepared by Outback Engineering
4. C4.1 Site Erosion Control Plan, dated [date of revised plan], prepared by Outback Engineering
5. C5.1 Site Landscape Plan, dated [date of revised plan], prepared by Outback Engineering
6. C6.1 Site Details, dated [date of revised plan], prepared by Outback Engineering
7. C6.2 Site Details, dated [date of revised plan], prepared by Outback Engineering
8. [Revised architectural drawings to be provided]
9. [Other documents entered into the record]

V. GENERAL CONDITIONS

1. The plans referenced above are the “Approved Plans.”

The Applicant or its agents shall maintain a copy of the Approved Plans and this Decision at the Site during construction.

2. This Decision shall be noted on the Approved Plans and both this Decision and the initial site plan sheet of the Approved Plans shall be recorded at the Barnstable County Registry of Deeds. Proof of recording shall be forwarded to the Building Inspector prior to issuance of a building permit.
3. The Applicant shall comply with all local bylaws, rules and regulations of the Town of Bourne and its boards and commissions in effect as of the date of this decision unless expressly waived herein or as otherwise addressed in these conditions.
4. The Applicant shall pay all fees of the Town of Bourne imposed generally with respect to construction projects and for the purposes of monitoring compliance of the construction and occupancy of the Project in accordance with this Comprehensive Permit, unless otherwise waived in this Decision; provided, however, that the Applicant is not required to pay any fee for the Board or the Town to employ any outside consultant.

5. The Applicant shall copy the ZBA on all material submissions made by or on behalf of the Applicant for permits or approvals from any federal, state, county, or Town official, board or commission that concerns the design and/or conditions set forth in this Decision, including but not limited to all testing results, official filings and other permits issued for the Project.
6. The Applicant shall comply in all respects with the State Building Code and any local published regulations or published schedule of fees of the Building Inspector. The Applicant shall pay all required fees for all such building permits including any fees customarily charged for inspections and permits unless otherwise waived in this Decision.
7. Prior to the commencement of construction, site development, or clearing, the Applicant shall post with the Town Treasurer security for Site Stabilization and Restoration. Prior to issuance of a Building Permit, emergency vehicle access shall be provided to the site of each building for which a building permit is sought. Prior to issuance of any Certificate of Occupancy, the Core Site Improvements required to provide vital access and utility service to all dwelling units, or those dwelling units contained within a particular phase of the Project as shown on a Phasing Plan approved by the Board, shall be complete as determined by the Board. Prior to issuance of any Certificate of Occupancy the applicant shall post the Minimum Required Security with the Town Treasurer for the overall project or for a particular phase of the Project as shown on a Phasing Plan approved by the Board. Once posted, security shall remain in full force and effect until the work secured thereby is satisfactorily completed as determined by the Board. However, the instrument serving as security may be changed by the Applicant from time to time with the agreement of the Board as set forth hereinafter. Failure to maintain the Minimum Required Security in full force and effect shall constitute due cause for the Building Inspector to revoke Building Permits. The Board may increase the Minimum Required Security to be posted by the Applicant if the Board determines that the actual construction cost plus contingency to complete the Site Improvements is ten percent (10%) more than the posted security value. The Applicant shall post additional security within forty-five days following receipt of notice from the Board. Upon completion of the work or portions thereof for which security has been provided, the Applicant may petition in writing with a copy to the Town Clerk for reduction or release of the posted security pertaining to the work completed satisfactorily as determined by the Board. If the work has been completed to its satisfaction, the Board will reduce the Minimum Required Security. If the work has not been completed to its satisfaction, the Board will inform the Applicant of the nature of the deficiencies in the work and will forgo or limit the amount of security authorized for release. The Board's decision with respect to release of security will be rendered within 45 days following receipt of the petition. The instrument serving as security may consist of cash, a bankbook, a performance bond, or a trilateral agreement between a bank having a first mortgage on the property, the property owner, and the Town. The form of security shall be acceptable to the Board only if the language

of the security agreement is acceptable to Town Counsel, both as to form, substance, and as to the financial stability of the bonding company or the bank that is party to any Trilateral Agreement. As used in this Decision, the term “Minimum Required Security” shall mean an amount established by the Board that is based upon the anticipated cost to be incurred by the Town in the event the Town completes all remaining work in accordance with applicable public procurement practices plus a construction cost contingency of fifteen percent (15%), except that the amount of security required shall never fall below ten percent (10%) of the amount first posted until final acceptance of all work, and security for plant materials shall not be released until one year has passed following initial planting. The term “Site Improvements” shall mean all required clearing, earthwork, paving, utilities, storm-drain including water quality measures and retention or detention facilities, paving, curbing, walkways, lighting, site entrance, retaining walls, septic systems, landscaping, testing, erosion controls, cleanup, and as-built drawings and data in compliance with the approved plans and Conditions of Approval. For the purposes of determining the Minimum Required Security, site improvements shall not include residential structures or site improvements within 10 feet of residential structures being submitted for a Certificate of Occupancy. The term “Core Site Improvements” shall mean “Site Improvements” as defined above but excludes the top course of the sidewalk and main access roadway pavement and tree and shrub planting. The term “Site Stabilization and Restoration” shall mean stabilization of disturbed areas and shall include grading, placement of a 2 inch thick layer of “plantable soil borrow,” hydroseeding or other acceptable erosion control measures and establishment of ground cover consisting of a “woody mix” of grass, wildflower, shrub, and tree seeds.

8. Nothing in this Decision shall be interpreted as relieving the Applicant of its burden to obtain easements, licenses or written permission from any abutting property owner if, during the course of construction, it becomes necessary to enter upon abutting land for construction or planting purposes.
9. Each condition in this Decision shall run with the land and shall, in accordance with its terms, be applicable to and binding on the Applicant and the Applicant’s successors and assigns; and reference to this Decision shall be incorporated in every deed recorded for the Project and for any dwelling unit in the Project.
10. This Decision permits the construction, use, and occupancy of twenty (20) three (3) bedroom housing units on the Site. The construction and use of the Site shall be in conformity with the Plans as modified by the Approved Plans, and there shall be no creation of additional housing units or any other structures or infrastructure or any increase in the number of bedrooms, except that which is shown on the Approved Plan, without further approval of the ZBA in the form of amendment to this Decision.

11. Prior to the commencement of construction on the Site, the Applicant shall have obtained all necessary permits and approvals for access to Sandwich Road (Route 6A) from state or county agencies.
12. Intentionally omitted.
13. The Project shall consist of no greater than twenty (20) three (3)-bedroom single family homes (“units”), five (5) of which shall be affordable to low or moderate-income purchasers, in perpetuity, to households at or below 80% of area median income.
14. Intentionally omitted.
15. The development and dwelling units shall comply with any applicable laws or regulations regarding handicap access.
16. Intentionally omitted.
17. Intentionally omitted.
18. No dwelling unit shall contain more than three (3) bedrooms, as the term “bedroom” is defined in 310 CMR 15.000 (Title 5 regulations).
19. Intentionally omitted.
20. Intentionally omitted.
21. No internal roadways within the Project shall have a traveled way width of less than twenty (20) feet in width exclusive of berms and curbs.
22. The number and location of the fire hydrants installed within the Project shall be as directed by the Fire Chief, and shall comply fully with applicable laws, codes, and requirements including without limitation NFPA and Bourne Water District requirements to be depicted on the Final Site Plans (as defined in Paragraph XIII.1, below).
23. Four (4) foot wide sidewalks, exclusive of the Cape Cod berm separating the sidewalk from the road, shall be constructed along the entire road “going up the hill”, and the width shall be increased in the area of any signs or other obstructions in order that there is at least a continuous 4 foot wide walking area throughout the entire sidewalk.
24. Intentionally omitted.

25. This Comprehensive Permit is conditioned upon the applicant obtaining an expanded curb-cut permit from Mass Highway for access to the Project approved herein, regardless of whether or not obtaining said expanded permit triggers the Massachusetts Environmental Policy Act or other state or regional regulatory requirements.
26. Intentionally omitted.
27. Intentionally omitted.
28. Intentionally omitted.
29. Intentionally omitted.

VI. AFFORDABLE HOUSING

30. Five (5) units, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be sold to low or moderate income qualified purchasers. These dwelling units shall be located on an Affordable Units Location Plan. These dwelling units shall remain affordable pursuant to the terms and conditions of this Decision, in perpetuity or for the longest period allowed by law.
31. Phasing-in of Affordable Units: No more than three certificates of occupancy shall be issued by the Building Inspector for units designated for sale at fair market prices (the "Market Rate Units") until at least one certificate of occupancy is issued for an Affordable Unit. The proportion of Market Rate Unit certificates of occupancy issued to Affordable Unit certificates of occupancy issued shall at no time exceed 3:1. The last unit sold shall be a Market Rate Unit. The Affordable Units shall be reasonably interspersed within the Project.
32. The affordable units shall be sold to qualified households whose gross annual income is no greater than eighty percent (80%) of the median family income for Barnstable County, as published annually by the U.S. Department of Housing and Urban Development, adjusted for household size, and whose assets do not exceed the then current DHCD guidelines. The maximum sale price for the affordable units shall be the maximum purchase price affordable for a household with an income that does not exceed seventy percent (70%) of the median family income for Barnstable County, as published annually by the U.S. Department of Housing and Urban Development.
33. Each conveyance of an affordable unit shall include a Deed Rider or Affordable Housing Restriction, in the form approved by the subsidizing agency, which shall contain a restriction requiring that the unit remain affordable to an eligible buyer in perpetuity. The Deed Rider shall be recorded senior to any liens on the Premises to protect the continued

availability of and requirement for the affordable units in the event of any foreclosure, bankruptcy, refinancing or sale. Prior to the sale of any unit, the unit owner or his/her agent shall submit to the Bourne Housing Partnership Committee (BHCP) for its approval written rules for the selection of buyers of affordable units (the Buyer Selection Rules). The Buyer Selection Rules shall provide that all affordable units are to be sold through a lottery or buyer selection process, subject to the review and approval by the BHPC or its designee. Notwithstanding the foregoing, the restrictions and Buyer Selection Rules shall conform to the requirements of the subsidizing agency. The Applicant shall be responsible for all fees and expenses necessary to implement the initial buyer selection process, including all marketing and advertising costs; fees and expenses for subsequent re-sales shall be the responsibility of the seller

34. Unless disapproved by MassHousing, the Bourne Housing Partnership Committee (BHPC) or its designee shall monitor all sales and re-sales of affordable units in accordance with a Monitoring Agreement in the form required by MassHousing. The Monitoring Agreement shall be fully executed prior to the issuance of a building permit for any of the dwelling units permitted by this Decision.
35. Re-sales and Refinancing: Whenever an affordable unit is to be resold, the owner of such unit shall notify the BHCP or its designee, in accordance with the Regulatory Agreement and Deed Rider, and shall enter into a Monitoring Agreement, as approved by the Board's counsel, with either the BHCP or its designee, to monitor the re-sale to assure the continuous affordability of the unit and the purchase of the unit by an eligible buyer. The sale price shall be determined in the same manner as discussed above. The Monitoring Agreement shall require that the seller pay the cost of monitoring re-sales. Whenever an affordable unit is to be refinanced, the owner shall notify the BHPC or its designee, in accordance with the Regulatory Agreement and the Deed Rider, which shall state that the amount of all mortgages, home equity loans, and other loans secured by the affordable unit shall not exceed the maximum sales price calculated in accordance with this Decision. In addition to the foregoing, resale and refinancing arrangements shall conform to the requirements of the subsidizing agency.
36. All affordable units shall be indistinguishable from the exterior from the market rate units. The construction specifications for the affordable units shall be identical to the construction specifications of the market rate units. This condition shall not prohibit a market rate buyer from purchasing upgraded appliances, carpeting, countertops, or other interior amenities from the Applicant or its assigns.

VII. MARKETING/LOTTERY AFFORDABLE UNITS

The following conditions are imposed with respect to the issues of marketing, minority outreach, lottery, resale formula, perpetual affordability, and the deed rider as follows. The BHPC may direct the applicant to take additional steps to carry out the purposes of these conditions.

The selection of purchasers for the Affordable Units, including the administration of the Lottery, shall be administered by a consultant retained by the Applicant, subject to the Subsidizing Agency's approval. The Lottery shall be implemented pursuant to a Lottery Plan developed by the lottery consultant and approved by the Subsidizing Agency. If acceptable to the Subsidizing Agency, disputes concerning income or other qualification shall be resolved in the first instance by the Monitoring Agent and a party aggrieved by qualification-related decision of the Monitoring Agent may appeal the decision to the ZBA for a final determination.

The provisions of this section are intended to complement and not to override or supersede any applicable requirements of the Subsidizing Agency, fair marketing regulations of the Department of Housing and Community Development, the Massachusetts Commission Against Discrimination, MassHousing, or any authority with jurisdiction and like purpose, to provide low and/or moderate income housing.

1. A lottery will be held to locate buyers for each Phase of Development. Advertisements will be run in local area papers announcing the availability of homes, income guidelines, and contact information for obtaining applications. Mailings shall be sent to, and shall include but not be limited to, the Local Housing Partnership, the Bourne Town Hall, the Housing Assistance Corporation of Hyannis, DHCD, local public libraries, local places of worship, and housing assistance organizations, as well as applicants for prior phases of previously approved comprehensive permit projects that were not chosen in the previous lotteries. Each group will receive a copy of the advertisement as well as some blank applications.
2. In addition to the local community papers, advertisements shall be sent for publication to minority publications such as the Bay State Banner; El Mundo, etc., and mailings will be sent to local/regional organizations, social service agencies that have connections to minority communities, such as the NAACP and the Wampanoag Tribal Council. Prior to each lottery, the marketing agent will contact DHCD for an updated list of suggested publications. The outreach/marketing program shall be for a period of at least sixty (60) days prior to the selection of buyers.
3. Applications received from the outreach program will be reviewed and pre-screened for qualifications. Follow-up information will be requested as necessary to ensure that all applications include information as to Down Payment availability, mortgage pre-approval, assets, and first time buyer status. Upon review and receipt of all information, lottery applications will be placed into a pool based upon family size for the one and two bedrooms homes in each phase. A random drawing will then be conducted to select the designated number of candidates for each phase. All Applicants will be notified after the lottery of their status. Notifications will include information as to whether or not they were included in the lottery. If not, an explanation will be provided. All Applicants that were included in the lottery will be notified as to whether or not they were chosen. Those that were chosen during the drawing will be notified of a tentative delivery date for their

home and will be contacted for an individual appointment to process their purchase. Those that were not chosen will be notified and advised that they will be notified of and included in subsequent drawings in future phases if they so choose.

4. To the extent permissible by law, the lottery system shall provide for residential preference of the Town Percentage (hereinafter defined) of the affordable units, so that only "Town residents" and minority applicants shall be included in the pool for each lottery for up to 70% of the affordable units sold to an eligible household. Thereafter, the lottery pool shall include all applicants, including but not limited to "Town residents." A "Town resident" is defined to include an applicant who lives or has lived in Bourne, currently works in Bourne, or who has immediate family (grandparents, parents, children, or siblings) who live in Bourne.
5. Minority applicants, if any, shall be included in all lottery pools.
6. In each of the above scenarios the three bedroom units will be reserved for first time homebuyers (defined as not having owned a home within three (3) years prior to the purchase, or a family that has been displaced by a divorce, etc.) and agree to occupy the unit as a primary residence.
7. Eligibility shall be determined prior to each lottery by using the current year HUD Median Income figures for Barnstable County. In all cases total household income and current assets for the family will be used to determine eligibility.
8. The re-sale of all affordable units shall be governed by the Deed Rider and/or Affordable Housing Restriction prepared by the subsidizing agency and shall be considered incorporated within this Decision.
9. All homeownership affordable units shall be owner occupied, except as may be allowed by the applicable subsidizing agency Deed Rider or Affordable Housing Restriction.
10. The above conditions concerning eligibility, pricing, affordability in perpetuity, monitoring, and owner occupation shall be set forth in a Deed Rider attached to all affordable units. The Deed Rider shall be recorded immediately following the Deed and shall be senior to any liens on the Premises to protect the continued availability of and requirement for the affordable units in the event of any foreclosure, bankruptcy, refinancing or sale.
11. The Applicant shall obtain the Subsidizing Agency's approval of a Buyer Selection Plan for the sale of the Affordable Units prior to putting any of the Affordable Units on the market. Buyers shall be selected through a fair lottery process (the "Lottery"), acceptable to the Subsidizing Agency.

VIII. CONSTRUCTION AND SUBMISSION REQUIREMENTS

1. Pre-Construction Submissions: Before the Applicant commences any construction activities the Applicant shall have:
 - a. Submitted Final Site Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, and with state and federal codes. Copies of the detailed, approved construction drawings (the “Final Site Plans”) should also be filed in hard copy (10 full-scale sets) and in digital form with the Building Inspector. The Final Site Plans shall bear the signature and seal of a Massachusetts Professional Land Surveyor (PLS) and a Civil Professional Engineer (PE). The Applicant must secure approval prior to construction pursuant to Paragraph VIII.4. The Final Site Plans shall contain the following:
 - i. An existing conditions plan of topographic, utility, and property information.
 - ii. Final stormwater management plans and improvements in accordance with applicable laws and regulations.
 - iii. Final landscaping plans prepared by a Massachusetts Registered Landscape Architect (RLA) to the detail required for use as on-site construction and planting drawings, improvements shall be consistent with the Approved Plans. Such plans shall include shade trees along the roadways and unit driveways and throughout the site, shrubs, and turf areas. Such plans shall indicate the specific types of active/passive recreational equipment to be installed within the open space and recreational areas located on the approved plans.
 - iv. Final roadway plans and profiles for the main site roadway.
 - v. Final utility plans and profiles including properly labeled drainage components and all site utilities including electric, gas, water supply lines, wastewater collection and disposal facilities, building service connections, and all system components and appurtenances.
 - vi. The location of electric, telephone, CATV, and gas lines and appurtenances shall be indicated on the drawings based upon final design of these systems by the utility company.
 - vii. Final Site Lighting plan.
 - viii. Final Photometric Drawing.

- ix. Final Site Entrance Plan in accord with MassDOT requirements.
 - x. Size, location, legend, and illumination of entrance signage.
- b. Obtained any and all permits and approvals from the Bourne Conservation Commission or the DEP which may be required under any state statute, code, or rule and regulation under its jurisdiction, to the extent not otherwise expressly covered by this Decision, including a final Order of Conditions or Superseding Order of Conditions under the Wetlands Protection Act as to any portion of the Site subject to the Wetlands Protection Act that are required by applicable state law prior to such commencement;
 - c. Obtained a National Pollutant Discharge Elimination System (“NPDES”) stormwater permit issued for the Project, if required by applicable law;
 - d. Obtained, if needed, a Certificate of the Secretary of Environmental Affairs of compliance pursuant to 301 CMR 11.08(8)(a);
 - e. Delivered to the ZBA with copies to the Building Inspector, Planning Board, Board of Health, Conservation Commission, Superintendent of the DPW, Fire Chief, and Police Chief a complete Construction Management Plan (CMP) as described in condition #3, below.
 - f. A geotechnical engineering design report shall be submitted for the areas that are proposed to be graded at one foot horizontal to one foot vertical (1:1). Signed, sealed slope stability calculations shall be provided by a geotechnical engineer that is based upon location specific subsurface testing.
 - g. Earthwork computations shall be provided for the volume of cut and fill and the net volume on/off site. The number of trucks required for off-site transport shall be calculated.
 - h. Final Drainage Calculations and Report must be submitted. The complete stormwater design package shall be signed and sealed by the civil engineer of record, and shall conform to the methods and procedures set forth in the Massachusetts Stormwater Handbook. The design depicted on the plans currently on file is meant to demonstrate intent and not full construction level of detail.
 - i. Retaining walls exceeding ten (10) feet in height require a Building Permit and must be designed by a Massachusetts Structural Professional Engineer.
- 2. Before the Applicant commences construction of any residential units, the Applicant shall have:

- a. Submitted Final Architectural Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, with the Massachusetts Building Code, and with all other state and federal codes. Copies of the detailed, approved architectural drawings (the “Final Architectural Plans”) should also be filed in hard copy and in digital form. The Final Architectural Plans shall bear the signature and seal of a Massachusetts Registered Architect (RA). The Applicant must secure approval pursuant to Paragraph VIII.4 prior to beginning unit construction. The Final Plans shall include a Building Code review.

The number of bedrooms shown in the Final Architectural Plans shall not exceed three bedrooms per unit or a total of sixty (60) bedrooms on the site.

- b. Obtained any and all permits and approvals from the Bourne Board of Health and the DEP regarding disposal of wastewater generated by the Project that are required by applicable state laws prior to such commencement;
3. The Construction Management Plan shall address the following topics and items:
 - i. Construction Administration
 - Hours of construction
 - Hours of construction delivery
 - Truck routes
 - Trash and debris removal
 - ii. Construction Phasing and Schedule (critical path) timing and phasing of construction; site clearing; construction of roadways and utilities; buildings, etc. If the site is not expected to be completed in a single- phase, a detailed Construction Phasing Plan shall be submitted indicating access and utilities for each phase adequately addressing access and parking, emergency vehicle access, and utility services.
 - iii. Communications
 - iv. Noise and Dust Control
 - Tree removal (chipping, etc.)
 - Public street cleaning and repair
 - Dust
 - Noise
 - Rock crushing
 - v. Blasting
 - Blasting Plan
 - Identification of petitioner's blasting consultant

- Selection of independent blasting consultant
- Selection of blasting contractor
- Pre- and post-blast survey (scope and content)
- Insurance coverage
- Blasting limits
- Notification to abutters of blasting schedule
- Road closures (if necessary)
- School bus conflicts (limits on hours)

vi. Erosion Control

- Silt sacks, hay bales, silt fences, etc.
- Tree protection plan

- Drainage infrastructure

vii. Identification of existing underground utilities

viii. Construction Staging

- Staging areas
- Site office trailers
- Storage trailers/containers
- Open storage areas
- Delivery truck holding areas
- Refueling areas

ix. Traffic and Parking (during construction)

- On-site locations
- Off-site locations
- Snow removal
- Police details
- Warning signs

x. Fire and Emergency

- Temporary emergency access roadway
- Emergency water supply throughout construction
- Provision of a Knox padlock for construction fence gates

xi. Construction Specifications

The CMP shall be reviewed pursuant to Paragraph VIII.4. The scope of the review of the CMP shall be for completeness and for consistency with generally accepted construction practices and for compliance with all the conditions of this Decision.

4. Procedure for Review and Approval.
 - a. When review and approval of a plan or document is required by any condition of this permit, the Applicant shall submit the plan or document to the Building Inspector and any other recipient specified by the permit condition. Upon such review and absent an objection by any of the specified recipients, within thirty (30) days of receipt, that such plan or document are inaccurate or inconsistent with or not in conformity with this Decision, the plan or document shall be deemed approved. If the submitted plan or document is required by state or federal law, rather than local regulations, it shall be deemed approved for purposes of this permit, but Town authorities may communicate any concerns to the applicable state or federal agency.
 - b. In the event there is an objection that the plan or document is inaccurate or inconsistent or not in conformity with this Decision, the Applicant may submit the matter in question to the ZBA for its review for consistency; the ZBA shall hold a hearing within 45 days of the applicant's submission, and render a decision within 14 days after said hearing. Any matter related to this Decision to be reviewed and decided by the ZBA after this Decision is issued may be reviewed and decided by the members of the ZBA designated by the Chairman, even if those members did not sit on the hearings that led up to and resulted in this Decision. The Applicant may appeal any adverse ZBA decision to the Housing Appeals Committee.

IX. SITE DEVELOPMENT CONDITIONS

1. Prior to the commencement of any construction activities or any site development or site clearing, the Applicant shall meet with the Building Department, Police Chief or his representative, Fire Chief or his representative, the ZBA's Consulting Engineer (if any), and the Chair of the ZBA or his representative at a mutually convenient time and place during normal business hours to review the CMP, and to coordinate the Building Department's periodic inspections of the Project (the "Pre-Construction Meeting"). This meeting shall be open to the public.
2. At least two weeks prior to the commencement of any construction activities, the Applicant shall submit to the ZBA, with a copy to the Police Chief, the Fire Chief, and the Building Inspector, a Construction Schedule, indicating the anticipated start and end points for each significant phase of development (site grubbing, clearing, and fill; construction of roadways and related infrastructure, excavation and blasting for

foundations, framing and interior construction, etc.). The Construction Schedule shall also include the anticipated daily vehicle trips per phase, and the anticipated hours of the day during which heavy equipment and construction vehicles are expected to enter and exit the Site.

3. The Applicant shall ensure safe and convenient vehicular access to the Site during the entire duration of the Project.
4. The Applicant shall submit to the ZBA a construction and permitting schedule, prior to the commencement of any construction activities or any site development or clearing, and semi- annually thereafter to assist in project status update and review.
5. The Building Department or its appointed agents may, upon reasonable notice to the Applicant, conduct periodic inspections during the construction of the Project, to ensure compliance with the terms of this Decision and the state building code, and for consistency with generally-accepted construction and engineering practices for the installation of roadways, stormwater management facilities, utilities, and all development infrastructure.
6. The Applicant shall forward final architectural plans to the Building Inspector at the time of applying for building permits. All construction shall be inspected by the Building Inspector and shall be in compliance with all Massachusetts State Building Code requirements
7. The Applicant shall be responsible to ensure that nuisance conditions do not exist in and around the Site during the construction operations. The Applicant shall at all times use all reasonable means to minimize inconvenience to residents in the general area.
8. Dust - Methods of controlling dust shall meet all air pollutant standards as set forth by Federal and State regulatory agencies.
9. Noise - The Applicant shall implement measures to ensure that noise from project construction activities does not exceed acceptable levels, as set forth by Federal and State regulatory agencies.
10. Traffic - The Applicant shall implement necessary traffic safety controls to ensure a safe and convenient vehicular access in and around the Site. Any traffic problems that occur as a result of site operations and construction shall be mitigated immediately, at the expense of the Applicant.
11. Roads – The Applicant is responsible for the sweeping, removal of snow, and sanding of the internal roadways and driveways permitting access to residents, emergency vehicles,

and others during construction and until the Homeowner Association has been legally established. The final coat of pavement on the internal roadways shall be installed after the base course has endured a full winter season. The Applicant shall promptly clean any debris or dirt deposited on Bourne or state controlled streets and roads.

12. Burial of any stumps or solid debris onsite is expressly prohibited. Localized burial of stones and/or boulders is prohibited to prevent the creation of voids from soil settlement over time.
13. Intentionally omitted.
14. Utilities, including but not necessarily limited to electric, gas, water, cable, and telephone shall be located underground per utility company standards and applicable codes, and DIGSAFE standards. A final utility plan approved by the applicable public utilities shall be submitted to the Building Inspector prior to the commencement of any construction.
15. Stabilization Requirements – No disturbed areas that might contribute to erosion or sediment migration that are located onsite and under the applicant's control shall be left in an open, unstabilized condition longer than 30 days or as may be governed by the NPDES permit. Temporary stabilization shall be accomplished by hay bales, hay coverings, matting or other appropriate means. Final stabilization shall be accomplished by loaming and seeding exposed areas in accordance with the approved landscaping plans or site plan.
16. Blasting - Any rock blasting shall be performed by a licensed blasting professional, who shall first obtain all required permits from the Bourne Fire Department. All blasting and removal of debris shall be performed in accordance with state regulations and local fire department requirements and shall provide evidence thereof to the Fire Chief.
 - a. Selection of the Blasting Contractor. A blasting contractor, acceptable to both the Applicant and the Bourne Fire Department, shall be selected after review of the qualifications of such contractor by a qualified independent geotechnical-blasting consultant who shall also be acceptable to both the Applicant and the Bourne Fire Department.
 - b. Independent Blasting Consultant. An independent geotechnical-blasting consultant shall be selected and paid for by the Applicant, subject to the approval of the Bourne Fire Department. The consultant shall review the qualifications of the blasting contractor, and review the final blasting plan prepared by the blasting contractor, check the calibration of the seismograph monitors, approve the location and installation of the seismograph monitors, and, if required by the Bourne Fire Department, shall determine the blast limits

throughout the blast period and shall consult with the Bourne Fire Department on an as-needed basis throughout the blasting period.

- c. Pre-blast Survey. Before any blasting on the Site, the Applicant shall conduct a pre-blasting survey that shall include video-recording of the foundations of all direct abutters to the Revised Project, and shall provide a copy of that survey to the ZBA and Fire Chief.
 - d. Insurance Coverage. The blasting contractor shall carry comprehensive public liability insurance in the amount of not less than \$1,000,000 for property damage in respect of any one occurrence and \$2,000,000 aggregate. A certificate shall be submitted to the Bourne Fire Department by the contractor documenting that the required coverage will be in force for the duration of the blasting at the Site. If there is a general contractor or developer associated with the blasting, each shall carry a minimum of \$1 million of comprehensive liability insurance.
 - e. Blasting Limits. The Commonwealth of Massachusetts blasting limits shall be observed. However, if, based upon the recommendation of the independent blasting consultant, the Bourne Fire Department believes that a lower limit is necessary to protect the Site and the abutting property that lower limit shall be in effect.
 - f. Notification. Not less than one week prior to the commencement of any period of blasting, the Applicant shall notify the immediate abutters within 200 feet of the blast area, stating when the blasting period shall begin. Notification under this provision and under any other provision in the Comprehensive Permit shall be by the following three methods: (1) phone or in person; (2) by email; and (3) by letter. No perchlorate shall be used during blasting. Such notification shall include an explanation of the warning procedures for blasting including soundings. The Applicant shall send another letter notifying the same abutters that the blasting period has been completed. In addition, the Applicant shall notify the Fire Department 30 minutes prior to each blast, and a Fire Department detail is required for every blast, which shall be certified by the Fire Academy on the requirements of the state blasting regulation.
 - g. Post-blasting Survey. After the completion of all blasting, the Applicant shall conduct a post-blasting survey that shall include video-recording of the foundations of all direct abutters to the Project, and shall provide a copy of that survey to the ZBA, Fire Chief, and each abutter, respectively, upon request.
17. Safety Fencing: During construction of the Project, the Building Inspector shall have authority to require fencing of the site or portions of the site to the extent required and appropriate to enhance safety by controlling access. A Knox padlock shall be used for any construction fence gates.

18. As Built Plans: Prior to the occupancy or use of the final “market rate” dwelling unit constituting a part of the Project, the Applicant shall submit to the ZBA an “As Built Plan” in paper and CAD format, showing all pavement, buildings, stormwater management structures, and other infrastructure as they exist on the Site, above and below grade, including appropriate grades and elevations. The plans shall be signed by a registered land surveyor and civil engineer, certifying that the Project as built substantially conforms and complies with the conditions of this Comprehensive Permit.
19. Trees. Prior to the commencement of any construction activities or any site development or clearing, if required by the Board’s Consulting Engineer, the Applicant shall erect a physical barrier such as a plastic fence to ensure that any existing trees on the locus be preserved to the extent consistent with the approved site plan and landscaping plans. If any such trees, having a caliper of four inches or greater at four feet from the ground, are destroyed or injured as a result of construction, the Applicant shall plant new trees in their place of a comparable species with a minimum height of nine feet at a ratio of 2 new trees for each destroyed tree. Such replanting shall be done by a qualified landscape professional.
20. Roadway Design: The surface course and binder course of the roadways, and the attendant shoulder widths and side slopes, shall conform to the Bourne Planning Board’s Subdivision Rules and Regulations except as waived herein. Roadway design to be indicated on the Final Site Plans shall include the following:
 - a. The maximum roadway grade shall not exceed twelve (12) percent.
 - b. Intentionally omitted.
 - c. Intentionally omitted.
 - d. Install “No Parking Any Time” (UMTCD R7-1) signs for the turnaround at the upper end of the principal on-site access drive.
21. Erosion control shall follow Best Management Practices and shall be maintained throughout the duration of the project.

Prior to the issuance of any certificate of occupancy, the applicant shall establish a maintenance plan for the stormwater system, which shall include but not be limited to scheduled inspections, thresholds for removal of sediments, and an educational program for residents for the continuing maintenance and protection of the stormwater system. The maintenance plan shall be reviewed pursuant to Paragraph VIII.4.

No sands or gravels may be removed from the site except those required to be removed to accomplish the conditions shown on the final site plan to be approved by the Board.

22. Stormwater Management:
 - a. Catchbasin spacing shall be reduced to a maximum of 150 feet on grades exceeding 6 percent.
 - b. Grate hydraulic calculations shall be submitted and double grate or cascade grate structures shall be added as appropriate to ensure that the design storm is captured.
 - d. Invert elevations of the stormwater quality structures shall be maintained above the recharge systems. The Stormceptor units should not be permitted to surcharge. Tailwater elevations that extend above the structural outlets shall not be permitted.
 - f. All subsurface structures shall support HS-20 loading in paved areas.
23. a. The applicant shall submit a water connection application to the Board of Water Commissioners, together with engineered drawings and other information reasonably requested or required by said Commissioners, consistent with its usual practices and procedures. Only the Board of Water Commissioners has the right to approve a request for a water connection to the Bourne Water District system. If questions arise with regard to the project, the District's Engineer may be asked to review the plans and submit a finding.
- b. The Bourne Fire Dept requires that fire hydrants not exceed 500 feet of separation. Hydrant flow records and test data must demonstrate a deliverable fire flow including simultaneous domestic flow while maintaining a minimum residual pressure of 20psi.
24. Maintenance of septic system(s) and wastewater disposal infrastructure shall be the responsibility of the Homeowners' Association.
25. The on-site sidewalk shall comply with applicable laws and regulations regarding handicap access.
26. Temporary construction signage and permanent entrance signage at Sandwich Road should be indicated on the plans and details furnished with respect to sign legend, dimensions, materials, colors, means of illumination. Signs shall comply with the requirements of the Bourne Zoning By-Law. The signs should be located to avoid interference with sight distance for exiting vehicles. Peer review of the sight distance limitations may be required.

27. The applicant shall verify whether or not the Postmaster will require a common mailbox facility. If required, the mailbox facility and associated parking shall be indicated on the site plan.
28. The sidewalk at Sandwich Road should be clearly indicated including the area intended to serve as a school bus waiting area.
29. The principal site access roadways should be signed for “No Parking” (MUTCD R7-1) and parking restrictions should be enforceable by the Homeowner Association Documents.
30. A Site Lighting Plan shall be developed using a maximum pole height of 24 feet. Light fixtures should be consistent with residential scale and style typically acceptable in the town and should comply with all applicable laws and regulations.
31. Intentionally omitted.
32. During construction, the Applicant and his agents and employees shall conform to all local, state and federal laws regarding noise, vibration, dust and use of Town roads and utilities. The Applicant shall at all times use all reasonable means to minimize inconvenience to residents in the general area. If any units have been constructed and occupied, construction shall not commence on any day Monday through Friday before 7:30 AM or on Saturday before 8:30 AM, and all exterior construction activities shall cease by 6:00 PM on all days, and no construction or activity whatsoever shall take place on Sundays or legal holidays except for the limited purpose of providing emergency health or safety measures or except as otherwise allowed by the Building Inspector. All construction shall follow Best Management Practices for erosion and sediment control.
33. Construction of all dwelling units, utilities, roads, drainage structures, and all related appurtenances shall be in accordance with all applicable zoning bylaws and all other applicable local, state and federal regulations except as waived by this Decision.
34. Intentionally omitted.
35. All utilities shall be underground.
36. All area and roadway lighting shall be shielded or refracted as necessary in such a manner as to minimize light spill over to neighboring properties.
37. All on-site storage of hazardous materials and hazardous wastes shall be on an impervious surface, with containment and access control, and all on-site vehicle fueling shall be conducted with industry recognized containment and access control. The CMP

shall identify a designated fueling area and shall construct an impervious surface to accommodate construction vehicles. Containment shall be provided for a minimum of 50 gallons of fuel.

38. Prior to digging on any public land, the applicant shall comply with all applicable federal, state and local regulations and with all "dig safe" requirements.
39. Surety & Covenants: As security for the completion of the infrastructure related to the Project as shown on the Approved Plan, including, but not limited to, the binder coat of the roadway, sidewalks, parking areas and common areas, recreational areas, sewage disposal system, drainage facilities, utilities, landscaping, and any other specific infrastructure shown on the "Approved Plan" (the "Infrastructure"), the release of occupancy permits for all housing units and the sale of all housing units in the Project shall be subject to the following restrictions:
 - a. No occupancy permit for a unit in any building shall be issued, and no sale of any unit shall be permitted, until: (1) the base and binder course for the roadway, parking areas, and relevant unit driveways shown on the Approved Plan has been installed; and (2) all Infrastructure described herein and as shown on the Plan has been constructed or installed so as to adequately serve said building unless a phasing plan is submitted for review and approval by the ZBA.
 - b. No occupancy permit for a unit in any building shall be issued, and no sale of any unit shall be permitted, until the Approved Plan has been recorded with the Registry of Deeds. This Comprehensive Permit shall be referenced on the Approved Plan prior to recording
40. The Applicant and its successors and assigns shall comply with the regulatory/ affordable housing restrictions, deed rider, monitoring agreements, and all other conditions applicable to the project approved by this Decision.
41. Nothing in this Decision shall be deemed to constitute a waiver of or from the jurisdiction of the Cape Cod Commission as granted that agency by the Cape Cod Commission Act.
42. If construction authorized by this Comprehensive Permit has not begun within three years of the date on which the permit becomes final, the permit shall lapse unless extended by the ZBA. The permit shall become final on the date that the written decision is filed in the office of the town clerk if no appeal is filed. Otherwise, it shall become final on the date the last appeal is decided or otherwise disposed of. The Project shall be completed expeditiously and, in any event, within five years of the date of the first building permit issued, unless extended by the ZBA.

43. The Board reserves the right, insofar as consistent with state law, to further review and amend this decision based upon any information that comes before the Board as a result of Applicant's future need to acquire permits from any local, county, state or federal authority, including but not limited to, the Cape Cod Commission.
44. Intentionally omitted.
45. No structure constructed under this Comprehensive Permit shall be altered, reconstructed, extended, or changed unless authorized by the ZBA by a special permit pursuant to the Zoning Bylaws and G.L. c.40A, s.6, as may be amended. Upon such an application for special permit, the Board shall determine, in the first instance, whether such alteration, reconstruction, extension or change is “substantial” or “insubstantial.” For all special permit applications for insubstantial changes, the ZBA shall employ the standards of review set forth under the Zoning Bylaw pertaining to changes to pre-existing, nonconforming structures, as may be amended. Requests for substantial changes shall be treated as requests to amend this Comprehensive Permit. This Paragraph (45) shall not apply to the original construction of structures developed pursuant to this Comprehensive Permit by the Applicant, but shall apply to subsequent alterations, extensions, and changes to such structures.
46. The terms alteration, reconstruction, extension, and change, shall have the same meaning under the Massachusetts Zoning Act, G.L. c. 40A, §6 and the Bourne Zoning Bylaws.
47. Intentionally omitted.
48. The Applicant acknowledges that prior to the start of construction, the Applicant must obtain all required approvals from any and all other governmental agencies, departments or commissions whose approvals are necessary for this Project and such approvals must be consistent with this Decision.
49. The Applicant shall prepare Homeowner Association documents. The Homeowner Association shall be responsible for the ownership, maintenance and repair of the roadways, storm water management systems, , retention ponds, recharge facilities, retaining walls, the open space parcels, and other common amenities and services.

The Homeowner Association documents shall be subject to review and approval by the Board’s counsel to insure compliance with the terms of this Comprehensive Permit decision. Said documents shall contain restrictions on all units preventing any increase in the number of bedrooms. Prior to the sale of any unit, the Homeowner Association documents shall be filed with Barnstable County Registry of Deeds.

The calculation of the percent of interest in the Homeowner Association for each unit shall be determined pursuant to relevant laws of the Commonwealth governing homeowner associations.

50. Intentionally omitted.
51. The final site plan is to be recorded at the Barnstable County Registry of Deeds and shall be recorded together with this Decision.
52. The Board requires that a note be placed on said final site plan stating that the Plan is the subject of a comprehensive permit under Mass. Gen. L. c.40B, sections 20-23.
53. The Town of Bourne shall be free of any liability arising out of the Board's approval of the site layout plan, and for any act, omission or negligence caused by the Applicant, its employees, agents, subcontractors, beneficiaries or trustees with relation to this Project.
54. Intentionally omitted.
55. Intentionally omitted.
56. Intentionally omitted.
57. Prior to issuance of any Building Permits, a permanent barrier fence, sufficient to prevent the passage of vehicles, must be installed and maintained between Chase Estates at 230 Sandwich Road, Map 25, Parcel 9 and 14 Bosun Lane, Map 25, Parcel 15. This barrier fence must be maintained by the Applicant until the last dwelling unit is sold, and thereafter by the Homeowner Association.

X. MISCELLANEOUS LEGAL REQUIREMENTS

1. The Applicant shall establish a Homeowners Association for the Project in a form reviewed by the Board's counsel, and approved by the Subsidizing Agency and including provisions for operating and replacement reserves to be established and maintained.
2. Any sale or transfer of rights or interest in all or any part of the Site shall include a condition that successors are bound to the terms and conditions of this Decision.
3. The Applicant and/or subsequent Owner(s) shall be bound by all conditions and requirements set forth in this Comprehensive Permit.
4. In setting the beneficial interest in the Homeowner Association, the Applicant shall comply with all relevant laws of the Commonwealth governing homeowner associations.

5. The principle site roadways, driveways, utilities, drainage systems, water supply and distribution infrastructure, wastewater disposal system, and all other infrastructure shown on the Approved Plans as serving the Project, shall remain private and the Town of Bourne shall not have, now or ever, any legal responsibility for the operation or maintenance of the roadways, driveways and infrastructure, including but not limited to snow removal, garbage pickup, the stormwater management system, the wastewater disposal system, and landscape maintenance.

XI. APPLICANT'S REQUESTED WAIVERS

The Applicant has requested waivers from the By-Laws of the Town of Bourne, the Town of Bourne Zoning Bylaws and other local rules and regulations. The Applicant's requested waivers are set forth in its Application and as supplemented through the public hearing process. The ZBA's grant of waivers shall be subject to the terms and conditions imposed by this Decision, and to the extent that any waiver is inconsistent with a term or condition set forth elsewhere in this Decision, such term or condition shall govern. No grant of any waiver shall be deemed to waive compliance with any condition of approval of this Decision. Any waiver not granted below or otherwise included within this Decision shall be deemed denied.

The following waivers are granted:

Bourne Zoning Bylaw, Section 1230. Site Plan - Special Permit Approval.

Bourne Zoning Bylaw, Section 2200. Use Regulations.

Bourne Zoning Bylaw, Section 2400. Dimensional Regulations.

Bourne Zoning Bylaw, Section 2500. Intensity of Use Schedule.

Bourne Zoning Bylaw, Section 2600. Development Scheduling.

Bourne Zoning Bylaw, Section 3300. Parking Requirements.

Bourne Zoning Bylaw, Section 3340. Egress Standards.

Bourne Zoning Bylaw, Section 3500. Landscaping and screening.

Bourne Zoning Bylaw, Section 3560. High Fences or Walls.

Bourne Zoning Bylaw, Section 4260. Nonconforming Affordable Lots.

Bourne Zoning Bylaw, Section 4400. Earth Removal.

Bourne General Bylaw, Section 3.7. Wetland and Natural Resource Protection

Bourne General Bylaw, Section 3.13. Development Mitigation

Bourne Wetland Regulations

Board of Health Bedroom Definition Regulation

Cape Cod Commission Enabling Regulations Governing Review of Developments of Regional Impact, and Minimum Performance Standards for Developments of Regional Impact

Bourne Subdivision Regulations

Decision of the Board of Appeals:

For all the reasons stated above and on the record before it, pursuant to G.L. c.40B, ss.20-23, the Board voted to grant an Amended Comprehensive Permit to Chase Developers, Inc., for real property located at 230 Sandwich Road, Bourne, Massachusetts, on the terms and conditions stated herein.

Zoning Board of Appeals Bourne, Massachusetts

[SIGNATURE]

Appeals of this decision may be made pursuant to Section 17 of Massachusetts General Laws, Chapter 40A and shall be filed within twenty (20) days after the date this decision is filed with the Bourne Town Clerk.

Chase Estates

Town of Bourne Comprehensive Permit #08-10 Notice of Project Change

Chase Developers, Inc.

Proposed Edits to Comprehensive Permit

Attached are Chase Developers' proposed edits to the existing Comprehensive Permit. Notes in margin indicate the purpose and intent of each proposed edit:

0. These edits eliminate the text describing the 2008-2012 permit review and the rationale for the 2012 decision — specifically, the fact that the Town had achieved a 40B “safe harbor.” This text would be replaced with a description of the record and facts the Board considered in issuing the Amended Permit.
1. These edits address Change #1 — Number of Units — as described in the accompanying Expansion of Proposed Changes
2. These edits address Change #2 — Road Layout; Community Center and Pool
3. These edits address Change #3 — Curb Cut Permit Application
4. These edits address Change #4 — Sidewalk / Concrete Curb / Cape Cod Berm
5. These edits address Change #5 — Wastewater Disposal & Nitrogen
6. These edits address Change #6 — Town Purchase of Affordable Units
7. These edits address Change #7 — Consistency with 40B Regulations — including:
 - 7a. Requirement for revised plans & further ZBA review;
 - 7b. Fee for hiring consulting engineer and/or auditor;
 - 7c. Water supply
 - 7d. Handicap Access
8. These edits address Change #8 — Waivers and Non-Applicable Local Regulations
9. These edits address other miscellaneous issues.

DECISION UPON APPLICATION OF CHASE DEVELOPERS, INC.

FOR A COMPREHENSIVE PERMIT UNDER MASSACHUSETTS GENERAL LAWS CHAPTER 40B, s.20-23

I. APPLICANT AND PUBLIC HEARING

A public hearing was opened on July 2, 2008 by the Bourne Zoning Board of Appeals (the “ZBA”) at the Bourne Town Hall, on the application of Chase Developers, Inc. (the “Applicant”) for a comprehensive permit under Massachusetts General Laws Chapter 40B, §§ 20-23 (“Chapter 40B” or the “Act”) and the Bourne Zoning By-Laws to build 32 condominium units, including 8 affordable units at 230 Sandwich Road (the “Project”) on approximately four (4) acres of land located off Sandwich Road in Bourne, Massachusetts (the “Site”).—

Pursuant to 760 CMR 56.03(8)(a), by letter dated July 7, 2008, the Board of Appeals notified the Applicant, with a copy to the Department of Housing and Community Development (DHCD), that the Board “considers a denial of the permit or the imposition of conditions or requirements would be consistent with local needs.” The applicant appealed to DHCD. Despite first agreeing with the Board’s claim of “safe harbor” pursuant to relevant regulations, DHCD’s Chief Counsel reversed her position and by letter dated August 15, 2008 concluded that the Board could not assert applicable “safe harbor” provisions in the regulations. The Board timely appealed DHCD’s assertion to the Housing Appeals Committee. By Decision dated June 8, 2009, the Housing Appeals Committee overturned the decision of DHCD, concluded that the Town of Bourne was consistent with local needs for the purposes of the present application and remanded the matter to the Board of Appeals.—

Following remand, the Applicant filed new materials pursuant to the remand order of the Housing Appeals Committee, a new public hearing was advertised and held, testimony WAS taken, the matter was continued on numerous occasions at the written request of the Applicant, the public hearing was thereafter closed on November 7, 2012, and this decision followed.—

[RECITE PROCEDURAL HISTORY OF REQUEST FOR AMENDED PERMIT]

The total Project shall include no more than ~~sixteentwenty~~ (1620) condominium units with no more than three (3) bedrooms each (including the affordable units). ~~Four(4)~~Five (5) of the condominium units, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be affordable to qualified purchasers, in perpetuity.

The minutes and exhibits from the public hearing are available for public inspection in the office of the Town Clerk. A list of the exhibits is contained in the record and is appended hereto by reference.

II. NATURE OF APPLICATION; PROCEDURE REQUIRED BY STATUTE

In conducting its hearings in this matter, the ZBA is guided by G.L. c.40B, s.20-23 and applicable regulations ~~and the above noted Decision of the Housing Appeals Committee concluding that, for the instant matter, the Town of Bourne is “consistent with local needs” as that term is used in the statute and by the Courts.~~

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III. GOVERNING LAW

The law governing this case is The Low and Moderate Income Housing Act, Massachusetts General Laws, Chapter 40B, §§ 20-23 (the “Act”), and the regulations promulgated by the Department of Housing and Community Development (“DHCD”) Housing Appeals Committee, 760 CMR 56.00 (the “Regulations”).

~~The purported purposes of the Act are satisfied by complying with specific statutory or regulatory thresholds, including a town’s compliance with an approved Housing Production Plan. As found by the Housing Appeals Committee, for the purposes of the instant application, the Town of Bourne has satisfied its housing obligations pursuant to the relevant regulations and is, therefore, “consistent with local needs” pursuant to the statute. (See, In the Matter of Bourne Zoning Board of Appeals and Chase Developers, Inc., No. 2008-11, June 8, 2009)—~~

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~~As Bourne is deemed “consistent with local needs,” the Board of Appeals may deny the instant application or approve the application with conditions, even if the imposition of conditions renders the project “uneconomic”.~~

SUMMARY OF DECISION

The ZBA hereby approves with the conditions set forth below, a comprehensive permit for Chase Developer’s Inc. for the Project depicted on the plans and materials identified in the record, specifically including ~~sixteentwenty~~ (1620) dwelling units and consisting of ~~four~~ (4) five (5) units of low or moderate income housing pursuant to the terms, conditions and obligations imposed by G.L. 40B, s.20-23.

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IV. THE RECORD BEFORE THE BOARD UPON WHICH THIS DECISION IS BASED.

1. C1.1 Title Sheet, dated ~~2/18/11~~[date of revised plan, to be submitted in advance of public hearing], prepared by ~~HighpointOutback~~ Engineering
2. C2.1 Site Layout Plan, dated ~~2/18/11~~[date of revised plan, to be submitted in advance of public hearing], prepared by ~~HighpointOutback~~ Engineering
3. C3.1 Site Grading, Drainage and Utility Plan, dated ~~2/18/11~~[date of revised plan, to be submitted in advance of public hearing], prepared by ~~HighpointOutback~~ Engineering
4. C4.1 Site Erosion Control Plan, dated ~~2/18/11~~[date of revised plan, to be submitted in advance of public hearing], prepared by ~~HighpointOutback~~ Engineering

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5. C5.1 Site Landscape Plan, dated 2/18/11[date of revised plan, to be submitted in advance of public hearing], prepared by HighpointOutback Engineering
6. C6.1 Site Details, dated 2/18/11[date of revised plan, to be submitted in advance of public hearing], prepared by HighpointOutback Engineering
7. C6.2 Site Details, dated 2/18/11[date of revised plan, to be submitted in advance of public hearing], prepared by HighpointOutback Engineering
8. ~~2192A 1, Elevations, dated 07/01/02, prepared by Alan Mascord Design-Associates~~[Revised architectural drawings to be provided in advance of public hearing]
9. ~~2192A 1, Floor Plan, dated 06/2/06, prepared by Alan Mascord Design-Associates~~[Revised architectural drawings to be provided in advance of public hearing]
10. [Other documents entered into the record]

~~Response to comments Memo, dated 4/30/11, prepared by Highpoint Engineering—~~

~~—11. Draft Master Deed, Chase Estates Condominium, not dated—~~

~~—12. Draft Declaration of Trust and By-Laws of Chase Estates Condominium Trust, not dated—~~

~~—13. Supplemental Response to Comments, dated 5/10/11, prepared by Garnick & Scudder—~~

~~—14. Mass Highway Permit, Entitled Permit Bourne, Permit #5-206-0029, not dated—~~

~~—15. Nitrogen Loading Calculations, dated 4/30/11, prepared by Highpoint Engineering—~~

~~—16. Hydrology Calculations, dated 3/15/11, prepared by Highpoint Engineering—~~

~~—17. Hydrologic Analysis and Drainage Summary, dated 3/15/11, prepared by Highpoint Engineering—~~

~~—18. Watershed Area Map, dated 3/15/11, prepared by Highpoint Engineering—~~

~~—19. Infiltration Tests, dated 7/17/08, prepared by Holmes and McGrath, Inc.—~~

~~—20. Form 11 - Soil Suitability Assessment forms, dated 7/22/08, prepared by Holmes and McGrath, Inc.—~~

- ~~21. Infiltration Tests Location Map, dated January 2010, prepared by Holmes and McGrath, Inc.~~
- ~~22. Cover Letter, dated 2/22/11, prepared by Highpoint Engineering~~
- ~~23. Comment Letter, dated 2/22/11, prepared by Highpoint Engineering~~

V. GENERAL CONDITIONS

1. ~~The plans referenced above are the “Approved Plans.” Prior to the commencement of any construction activities or any site development or clearing, the Applicant shall submit to the Building Inspector, Fire Department, and the ZBA’s designated peer review engineer, counsel and other designated individuals or firms, final comprehensive permit site plans and final engineering calculations consistent with this Decision and the Development Plans identified above, and including but not limited to earth work and stormwater disposal and related best management practices, plans for wastewater disposal system(s), plans for potable drinking water and fire fighting purposes, landscaping and architectural plans and all other plans and calculations needed for review for consistency with and conformity to this Decision. Upon such review and absent an objection by any of the above persons or entities within thirty (30) days of receipt of such documents that such plans and engineering calculations are inaccurate or inconsistent with or not in conformity with this Decision and the Development Plans identified above and those that are required to be submitted, the plans and engineering calculations shall be considered the “Approved Plans.” In the event there is an objection that the plans or engineering calculations are inaccurate or inconsistent or not in conformity with this Decision and the Development Plans identified above, the Applicant may submit the matter in question to the ZBA for its review for consistency; the ZBA shall hold a hearing within 45 days of the applicant’s submission, and render a decision within 14 days after said hearing. Any matter related to this Decision to be reviewed and decided by the ZBA after this Decision is issued may be reviewed and decided by the members of the ZBA designated by the Chairman, even if those members did not sit on the hearings that led up to and resulted in this Decision.~~

The Applicant or its agents shall maintain a copy of the Approved Plans and this Decision at the Site during construction.

2. This Decision shall be noted on the Approved Plans and both this Decision and the initial site plan sheet of the Approved Plans shall be recorded at the Barnstable County Registry of Deeds. Proof of recording shall be forwarded to the Building Inspector prior to issuance of a building permit.

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3. The Applicant shall comply with all local bylaws, rules and regulations of the Town of Bourne and its boards and commissions in effect as of the date of this decision unless expressly waived herein or as otherwise addressed in these conditions.
4. The Applicant shall pay all fees of the Town of Bourne imposed generally with respect to construction projects and for the purposes of monitoring compliance of the construction and occupancy of the Project in accordance with this Comprehensive Permit, unless otherwise waived in this Decision; **provided, however, that –the Applicant is not required to pay any fee for the Board or the Town to employ any outside consultant.**
5. The Applicant shall copy the ZBA on all material submissions made by or on behalf of the Applicant for permits or approvals from any federal, state, county, or Town official, board or commission that concerns the design and/or conditions set forth in this Decision, including but not limited to all testing results, official filings and other permits issued for the Project.
6. The Applicant shall comply in all respects with the State Building Code and any local published regulations or published schedule of fees of the Building Inspector. The Applicant shall pay all required fees for all such building permits including any fees customarily charged for inspections and permits unless otherwise waived in this Decision.
7. Prior to the commencement of construction, site development, or clearing, the Applicant shall post with the Town Treasurer security for Site Stabilization and Restoration. Prior to issuance of a Building Permit, emergency vehicle access shall be provided to the site of each building for which a building permit is sought. Prior to issuance of any Certificate of Occupancy, the Core Site Improvements required to provide vital access and utility service to all dwelling units, or those dwelling units contained within a particular phase of the Project as shown on a Phasing Plan approved by the Board, shall be complete as determined by the Board. Prior to issuance of any Certificate of Occupancy the applicant shall post the Minimum Required Security with the Town Treasurer for the overall project or for a particular phase of the Project as shown on a Phasing Plan approved by the Board. Once posted, security shall remain in full force and effect until the work secured thereby is satisfactorily completed as determined by the Board. However, the instrument serving as security may be changed by the Applicant from time to time with the agreement of the Board as set forth hereinafter. Failure to maintain the Minimum Required Security in full force and effect shall constitute due cause for the Building Inspector to revoke Building Permits. The Board may increase the Minimum Required Security to be posted by the Applicant if the Board determines that the actual construction cost plus contingency to complete the Site Improvements is ten percent (10%) more than the posted security value. The Applicant shall post additional security within forty-five days following receipt of notice from the Board. Upon completion of the work or

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portions thereof for which security has been provided, the Applicant may petition in writing with a copy to the Town Clerk for reduction or release of the posted security pertaining to the work completed satisfactorily as determined by the Board. If the work has been completed to its satisfaction, the Board will reduce the Minimum Required Security. If the work has not been completed to its satisfaction, the Board will inform the Applicant of the nature of the deficiencies in the work and will forgo or limit the amount of security authorized for release. The Board's decision with respect to release of security will be rendered within 45 days following receipt of the petition. The instrument serving as security may consist of cash, a bankbook, a performance bond, or a trilateral agreement between a bank having a first mortgage on the property, the property owner, and the Town. The form of security shall be acceptable to the Board only if the language of the security agreement is acceptable to Town Counsel, both as to form, substance, and as to the financial stability of the bonding company or the bank that is party to any Trilateral Agreement. As used in this Decision, the term "Minimum Required Security" shall mean an amount established by the Board that is based upon the anticipated cost to be incurred by the Town in the event the Town completes all remaining work in accordance with applicable public procurement practices plus a construction cost contingency of fifteen percent (15%), except that the amount of security required shall never fall below ten percent (10%) of the amount first posted until final acceptance of all work, and security for plant materials shall not be released until one year has passed following initial planting. The term "Site Improvements" shall mean all required clearing, earthwork, paving, utilities, storm-drain including water quality measures and retention or detention facilities, paving, curbing, walkways, lighting, site entrance, retaining walls, septic systems, landscaping, testing, erosion controls, cleanup, and as-built drawings and data in compliance with the approved plans and Conditions of Approval. For the purposes of determining the Minimum Required Security, site improvements shall not include residential structures or site improvements within 10 feet of residential structures being submitted for a Certificate of Occupancy. The term "Core Site Improvements" shall mean "Site Improvements" as defined above but excludes the top course of the sidewalk and main access roadway pavement and tree and shrub planting. The term "Site Stabilization and Restoration" shall mean stabilization of disturbed areas and shall include grading, placement of a 2 inch thick layer of "plantable soil borrow," hydroseeding or other acceptable erosion control measures and establishment of ground cover consisting of a "woody mix" of grass, wildflower, shrub, and tree seeds.

8. Nothing in this Decision shall be interpreted as relieving the Applicant of its burden to obtain easements, licenses or written permission from any abutting property owner if, during the course of construction, it becomes necessary to enter upon abutting land for construction or planting purposes.
9. Each condition in this Decision shall run with the land and shall, in accordance with its terms, be applicable to and binding on the Applicant and the Applicant's successors and assigns; and reference to this Decision shall be incorporated in the condominium Master

Deed and in each Unit Deed recorded for the Project and for any dwelling unit in the Project.

10. This Decision permits the construction, use, and occupancy of ~~sixteentwenty~~ (1620) three (3) bedroom housing units on the Site. The construction and use of the Site shall be in conformity with the Plans as modified by the Approved Plans, and there shall be no creation of additional housing units or any other structures or infrastructure or any increase in the number of bedrooms, except that which is shown on the Approved Plan, without further approval of the ZBA in the form of amendment to this Decision.

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11. Prior to the commencement of ~~any clearing of the Site or any~~ construction on the Site-~~whatsoever~~, the Applicant shall have obtained all necessary permits and approvals for access to Sandwich Road (Route 6A) from state or county agencies.

12. ~~prior to the commencement of any clearing of the Site or any construction on the Site-whatsoever, the Applicant shall make an initial deposit of \$5,000 into the ZBA's G.L. c. 44, sec. 53G consultant revolving fund account to fund the Consulting Engineer's and the Board's counsel's review of the Applicant's additional submissions set forth in this Decision, and any auditor hired by the ZBA to audit the project consistent with this Decision. Whenever the account balance is below \$2,000, the applicant shall deposit a sufficient amount to maintain a \$5,000 balance in said account. The funds required by this paragraph are in addition to the payment of any additional funds required by this Decision. Any unexpended funds after the ZBA's audit, or if and when the ZBA decides not to audit the project, shall be returned to the Applicant pursuant to G.L. c.44, s. 53G.~~

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13. The Project shall consist of no greater than ~~sixteentwenty~~ (1620) three (3)-bedroom condominium units, ~~four~~ (4)-~~five~~ (5) of which shall be affordable to low or moderate-income purchasers, in perpetuity, to households at or below 80% of area median income.

14. ~~The Applicant shall contact the Bourne Housing Authority, the Housing Assistance Corporation and the Bourne Affordable Housing Trust, prior to beginning construction, and again prior to marketing any of the units, to determine if any of those organizations has an interest in buying any of the affordable units for use as rental housing. If a positive response is received, the organization shall be offered the unit at no more than the maximum sales price for an affordable unit, before any of the units within the approved Project are marketed.—~~

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15. The development and dwelling units shall comply with any applicable laws or regulations regarding handicap access. ~~No fewer than thirteen (13) of the dwelling units shall be “visitable” by wheelchair-bound persons (including ramps to the first floor and accessible bathrooms), and no fewer than five (5) units shall be able to be modified at a reasonable cost to accommodate any potential buyer who may have a disability. If a buyer who has such a disability is purchasing one of the affordable units, the cost of the modifications shall not increase the sales price of the affordable unit.~~
16. ~~All dwelling units shall be designed to meet Energy Star standards. The Applicant shall design and construct the Project such that wastewater generated by the Project, as measured at the down-gradient property line of the Project, shall not exceed 10 parts per million (ppm) of nitrogen and shall make best demonstrable efforts to reduce the nitrogen concentration in wastewater effluent to as close to 5 ppm as possible. The determination of resulting nitrogen loading and concentrations shall be conducted by a competent and qualified individual or firm prior to the issuance of a building permit for the Project. No building permit shall issue for the Project unless and until the Board is in receipt of a credible and predictive analysis, approved by the ZBA’s engineering consultant, that the Project, as built, will not exceed 10 ppm of nitrogen and credible efforts have been made to reduce nitrogen concentrations to 5 ppm.—~~
17. ~~Notwithstanding the above noted condition, in no case shall the fertilizers to be used at the project be greater than one (1) pound per thousand square feet of cultivated area per year, and said limitation shall be included in the condominium documents for the Project.~~
18. No dwelling unit shall contain more than three (3) bedrooms, as the term “bedroom” is defined in the Town of Bourne Board of Health regulations 310 CMR 15.000 (Title 5 regulations).
19. ~~The three units at the lower end of the development shall be served by a sprinkler system for fire safety, as well as other dwelling units as required by local or state law.~~
20. The roadway opening and the opening in the existing brick wall from the Project roadway onto Sandwich Road (Route 6A) shall be widened in accordance with Bourne Fire Department requirements. The intersection layout shall comply with MassDOT standards and requirements. The ZBA recommends that the intersection be modified to provide a 90 degree intersection angle and the westbound (west) shoulder of Sandwich Road should be widened to 22 feet to provide a “defacto” left turn lane. However, the ZBA understands that MassDOT has exclusive jurisdiction over Sandwich Road, and therefore the ZBA requires only that the intersection be modified as required by MassDOT. Copies of the MassDOT Access Permit shall be submitted to the Board. Unless disallowed by MassDOT, the intersection shall accommodate the largest fire department vehicle in a single turning movement. Any substantial modification to the intersection design as

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~~reflected on the MassDOT approved plans at the time of the issuance of the MassDOT permit shall be submitted to the Board for review and determination of consistency with this Decision. With regard to any matter submitted to the Board for review and determination of consistency with this Decision, the Board shall hold a hearing with 45 days of the submission and render a decision within 14 days after said hearing.~~

21. No internal roadways within the Project shall have a traveled way width of less than twenty~~two~~ (2220) feet in width exclusive of berms and curbs.
22. The number and location of the fire hydrants installed within the Project shall be as directed by the Fire Chief, and shall comply fully with applicable laws, codes, and requirements including without limitation NFPA and Bourne Water District requirements to be depicted on the ~~Approved~~Final Site Plans (as defined in Paragraph XIII.1, below).
23. Four (4) foot wide sidewalks, exclusive of the Cape Cod berm separating the sidewalk from the road, shall be constructed along the entire road “going up the hill”, and the width shall be increased in the area of any signs or other obstructions in order that there is at least a continuous 4 foot wide walking area throughout the entire sidewalk. ~~A Cape Cod berm is permissible next to the road only in those areas where there is a grass strip, measuring at least two feet wide, between the berm and the sidewalk. Otherwise, a vertical faced concrete curb next to the road is required. Construction shall comply with Section 332 of the Bourne Subdivision Rules and Regulations.—~~
24. ~~The applicant shall construct, and the Approved Plans shall reflect, a roadway from the lower end of the Project in front of the 3 connected units to the southern edge of the property line. The roadway design shall accommodate the largest fire department vehicle without encroachment into oncoming traffic. It is anticipated that this roadway may, in the future, connect to a roadway across the Upper Cape Regional Technical High School property and lead to a traffic light on Sandwich Road. Unless the traffic light is located directly in front of the present entrance/exitway, within 3 months after the traffic light is operating and the connecting road is completed, the present entrance/exitway shall be converted to a right turn in and right turn out only entrance/exitway, with appropriate signage.—~~
25. ~~The Applicant has submitted into the record a permit from Mass Highway to access and egress Sandwich Road (Route 6A). However, this permit was granted to provide access to a proposed single family residence only and clearly not for the number of dwelling units sought by the Applicant pursuant to its application for a Comprehensive Permit.~~ Accordingly, ~~t~~This Comprehensive Permit is conditioned upon the applicant obtaining an expanded curb-cut permit from Mass Highway for access to the Project approved herein, regardless of whether or not obtaining said expanded permit triggers the Massachusetts Environmental Policy Act or other state or regional regulatory requirements. ~~In addition,~~

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the Board is using this decision to inform Mass Highway when it considers the Applicant's application for such an extended permit that the Board of Appeals has concerns about the effect of an expanded permit upon the safety of vehicles traveling on Sandwich Road, as well as the safety of vehicles entering and exiting the proposed development. Members of the Board of Appeals and the public have found it difficult to exit to and from the numerous curb cuts along Sandwich Road, especially and most noticeably, when making a left turn. The Board of Appeals has heard and given credit to testimony concerning the possible need of a left turn lane, or at least widening the road to allow traffic to flow in a southerly direction while a vehicle waits to turn left into the proposed development. The Board of Appeals has also heard testimony from the Applicant's traffic engineers to the effect that the traffic generated by the development as proposed will not increase safety concerns. However, the Board of Appeals defers to the expertise of the Mass Highway Department and makes no determination as to whether such an expanded permit ought to be granted, or if one is granted what conditions, if any, should be imposed by Mass Highway. It is important to note that the Board accepts, on behalf of the Town of Bourne, absolutely no responsibility for or contribution to, any costs associated with any improvements to the roadways or related infrastructure required by Mass Highway.

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26. The Applicant shall present this Decision, making specific reference to Conditions 20 and 25 above, to Mass Highway, together with its application for an expanded permit.
27. Prior to commencement of construction, the applicant shall obtain written proof from the Bourne Water Department stating that potable water is available to the Project and that water pressure is adequate to serve the needs of the Project.
28. Final landscaping improvements and plans prepared by a Massachusetts Registered Landscape Architect (RLA) to the detail required for use as on-site construction and planting drawings, including shade trees along the roadways and unit driveways and throughout the site, shrubs, and turf areas, indicating the specific types of active/passive recreational equipment to be installed within the open space and recreational areas located on the approved plans, must be submitted to the ZBA for review and approval and shall thereafter be considered part of the "Approved Plans." No construction shall commence until the final landscaping improvements and plans have been approved by the ZBA.[duplicative - see VIII.1]-
29. Final architectural plans showing both interior and exterior and elevations, prepared by a Massachusetts Registered Architect to the detail required for use as on-site construction, must be submitted to the ZBA for review and approval and shall thereafter be considered part of the "Approved Plans". No construction shall commence until the final architectural plans have been approved by the ZBA.[duplicative - see VIII.2]-

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VI. AFFORDABLE HOUSING

30. ~~Four (4)~~ Five (5) condominium units, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be sold to low or moderate income qualified purchasers, ~~unless purchased by one of the entities listed in paragraph 14 of this decision.~~ These dwelling units shall be located on an Affordable Units Location Plan. These dwelling units shall remain affordable pursuant to the terms and conditions of this Decision, in perpetuity or for the longest period allowed by law ~~and shall be restricted pursuant to an Affordable Housing Restriction as provided for in G.L. c.184, s. 31-32.~~ NOTE: THIS IS ADDRESSED IN PARAGRAPH 33.
31. Phasing-in of Affordable Units: No more than three certificates of occupancy shall be issued by the Building Inspector for units designated for sale at fair market prices (the “Market Rate Units”) until at least one certificate of occupancy is issued for an Affordable Unit. The proportion of Market Rate Unit certificates of occupancy issued to Affordable Unit certificates of occupancy issued shall at no time exceed 3:1. The last unit sold shall be a Market Rate Unit. The Affordable Units shall be reasonably interspersed within the Project, ~~and no more than one (1) Affordable Unit shall be amongst the three (3) units at the lower end of the development.~~
32. The affordable units shall be sold to qualified households whose gross annual income is no greater than eighty percent (80%) of the median family income for Barnstable County, as published annually by the U.S. Department of Housing and Urban Development, adjusted for household size, and whose assets do not exceed the then current DHCD guidelines. The maximum sale price for the affordable units shall be the maximum purchase price affordable for a household with an income that does not exceed seventy percent (70%) of the median family income for Barnstable County, as published annually by the U.S. Department of Housing and Urban Development.
33. Each conveyance of an affordable unit shall include a Deed Rider or Affordable Housing Restriction, in the form approved by the subsidizing agency, which shall contain a restriction requiring that the unit remain affordable ~~(either to an eligible buyer or to an eligible renter, as applicable)~~ in perpetuity. The Deed Rider shall be recorded senior to any liens on the Premises to protect the continued availability of and requirement for the affordable units in the event of any foreclosure, bankruptcy, refinancing or sale. Prior to the sale of any unit, the unit owner or his/her agent shall submit to the Bourne Housing Partnership Committee (BHCP) for its approval written rules for the selection of buyers of affordable units (the Buyer Selection Rules). The Buyer Selection Rules shall provide that all affordable units are to be sold through a lottery or buyer selection process, subject to the review and approval by the BHPC or its designee. Notwithstanding the foregoing, the restrictions and Buyer Selection Rules shall conform to the requirements of the subsidizing agency. The Applicant shall be responsible for all fees and expenses necessary to implement the initial buyer selection process, including all marketing and

advertising costs; fees and expenses for subsequent re-sales shall be the responsibility of the seller.

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34. Unless disapproved by MassHousing, the Bourne Housing Partnership Committee (BHPC) or its designee shall monitor all sales and re-sales of affordable units in accordance with a Monitoring Agreement in the form required by MassHousing. The Monitoring Agreement shall be fully executed prior to the issuance of a building permit for any of the dwelling units permitted by this Decision.
35. Re-sales and Refinancing: Whenever an affordable unit is to be resold, the owner of such unit shall notify the BHCP or its designee, in accordance with the Regulatory Agreement and Deed Rider, and shall enter into a Monitoring Agreement, as approved by the Board's counsel, with either the BHCP or its designee, to monitor the re-sale to assure the continuous affordability of the unit and the purchase of the unit by an eligible buyer. The sale price shall be determined in the same manner as discussed above. The Monitoring Agreement shall require that the seller pay the cost of monitoring re-sales. Whenever an affordable unit is to be refinanced, the owner shall notify the BHPC or its designee, in accordance with the Regulatory Agreement and the Deed Rider, which shall state that the amount of all mortgages, home equity loans, and other loans secured by the affordable unit shall not exceed the maximum sales price calculated in accordance with this Decision. In addition to the foregoing, resale and refinancing arrangements shall conform to the requirements of the subsidizing agency.
36. All affordable units shall be indistinguishable from the exterior from the market rate units. The construction specifications for the affordable units shall be identical to the construction specifications of the market rate units. This condition shall not prohibit a market rate buyer from purchasing upgraded appliances, carpeting, ~~or~~ countertops, or other interior amenities from the Applicant or its assigns.

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VII. MARKETING/LOTTERY AFFORDABLE UNITS

The following conditions are imposed with respect to the issues of marketing, minority outreach, lottery, resale formula, perpetual affordability, ~~possible sale of units to the Bourne Housing Authority, Bourne Affordable Housing Trust, or the Housing Assistance Corporation for rental purposes~~, and the deed rider as follows. The BHPC may direct the applicant to take additional steps to carry out the purposes of these conditions.

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The selection of purchasers for the Affordable Units, including the administration of the Lottery, shall be administered by a consultant retained by the Applicant, subject to the Subsidizing Agency's approval. The Lottery shall be implemented pursuant to a Lottery Plan developed by the lottery consultant and approved by the Subsidizing Agency. If acceptable to the Subsidizing Agency, disputes concerning income or other qualification shall be resolved in the first instance

by the Monitoring Agent and a party aggrieved by qualification-related decision of the Monitoring Agent may appeal the decision to the ZBA for a final determination.

The provisions of this section are intended to complement and not to override or supersede any applicable requirements of the Subsidizing Agency, fair marketing regulations of the Department of Housing and Community Development, the Massachusetts Commission Against Discrimination, MassHousing, or any authority with jurisdiction and like purpose, to provide low and/or moderate income housing.

1. A lottery will be held to locate buyers for each Phase of Development. Advertisements will be run in local area papers announcing the availability of homes, income guidelines, and contact information for obtaining applications. Mailings shall be sent to, and shall include but not be limited to, the Local Housing Partnership, the Bourne Town Hall, the Housing Assistance Corporation of Hyannis, DHCD, local public libraries, local places of worship, and housing assistance organizations, as well as applicants for prior phases of previously approved comprehensive permit projects that were not chosen in the previous lotteries. Each group will receive a copy of the advertisement as well as some blank applications.
2. In addition to the local community papers, advertisements shall be sent for publication to minority publications such as the Bay State Banner; El Mundo, etc., and mailings will be sent to local/regional organizations, social service agencies that have connections to minority communities, such as the NAACP and the Wampanoag Tribal Council. Prior to each lottery, the marketing agent will contact DHCD for an updated list of suggested publications. The outreach/marketing program shall be for a period of at least sixty (60) days prior to the selection of buyers.
3. Applications received from the outreach program will be reviewed and pre- screened for qualifications. Follow-up information will be requested as necessary to ensure that all applications include information as to Down Payment availability, mortgage pre-approval, assets, and first time buyer status. Upon review and receipt of all information, lottery applications will be placed into a pool based upon family size for the one and two bedrooms homes in each phase. A random drawing will then be conducted to select the designated number of candidates for each phase. All Applicants will be notified after the lottery of their status. Notifications will include information as to whether or not they were included in the lottery. If not, an explanation will be provided. All Applicants that were included in the lottery will be notified as to whether or not they were chosen. Those that were chosen during the drawing will be notified of a tentative delivery date for their home and will be contacted for an individual appointment to process their purchase. Those that were not chosen will be notified and advised that they will be notified of and included in subsequent drawings in future phases if they so choose.

4. To the extent permissible by law, the lottery system shall provide for residential preference of the Town Percentage (hereinafter defined) of the affordable units, so that only "Town residents" and minority applicants shall be included in the pool for each lottery for up to 70% of the affordable units sold to an eligible household. Thereafter, the lottery pool shall include all applicants, including but not limited to "Town residents." A "Town resident" is defined to include an applicant who lives or has lived in Bourne, currently works in Bourne, or who has immediate family (grandparents, parents, children, or siblings) who live in Bourne.
5. Minority applicants, if any, shall be included in all lottery pools.
6. In each of the above scenarios the three bedroom units will be reserved for first time homebuyers (defined as not having owned a home within three (3) years prior to the purchase, or a family that has been displaced by a divorce, etc.) and agree to occupy the unit as a primary residence.
7. Eligibility shall be determined prior to each lottery by using the current year HUD Median Income figures for Barnstable County. In all cases total household income and current assets for the family will be used to determine eligibility.
8. The re-sale of all affordable units shall be governed by the Deed Rider and/or Affordable Housing Restriction prepared by the subsidizing agency and shall be considered incorporated within this Decision.
9. All homeownership affordable units shall be owner occupied, ~~except those units owned by the Bourne Housing Authority, the Bourne Affordable Housing Trust, or the Housing Assistance Corporation, and~~ except as may be allowed by the applicable subsidizing agency Deed Rider or Affordable Housing Restriction.
10. The above conditions concerning eligibility, pricing, affordability in perpetuity, monitoring, and owner occupation shall be set forth in a Deed Rider attached to all affordable units. The Deed Rider shall be recorded immediately following the Deed and shall be senior to any liens on the Premises to protect the continued availability of and requirement for the affordable units in the event of any foreclosure, bankruptcy, refinancing or sale.
11. The Applicant shall obtain the Subsidizing Agency's approval of a Buyer Selection Plan for the sale of the Affordable Units prior to putting any of the Affordable Units on the market. Buyers shall be selected through a fair lottery process (the "Lottery"), acceptable to the Subsidizing Agency.

VIII. CONSTRUCTION AND SUBMISSION REQUIREMENTS

1. Pre-Construction Submissions: Before the Applicant commences any construction activities ~~or clearing on or off the Site~~, the Applicant shall have:
 - a. Submitted Final Site Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, and with state and federal codes. Copies of the detailed, approved construction drawings (the “Final Site Plans”) should also be filed in hard copy (~~210~~ full-scale sets) and in digital form with the ~~Board, the Building Inspector, and the ZBA consulting engineer~~. The Final Site Plans shall bear the signature and seal of a Massachusetts Professional Land Surveyor (PLS) and a Civil Professional Engineer (PE). The Applicant must secure approval ~~of the Building Inspector and the ZBA consulting engineer~~ prior to construction ~~and allow forty-five (45) days to review the detailed construction drawings. Where applicable, the ZBA shall have forty-five (45) days to hold a hearing and fourteen (14) days thereafter to issue its decision pursuant to Paragraph VIII.4.~~ The Final Site Plans shall contain the following:
 - i. An existing conditions plan of topographic, utility, and property information.
 - ii. Final stormwater management plans and improvements in accordance with ~~the standards set forth in the Bourne Subdivision Rules and Regulations not waived by this Decision, and with DEP's Storm Water Management Standards. DEP's Storm Water Management Standards shall apply whether or not the site is subject to the Massachusetts “Wetlands Protection Act (MGL Ch 131 §40).”~~ applicable laws and regulations.
 - iii. Final landscaping plans prepared by a Massachusetts Registered Landscape Architect (RLA) to the detail required for use as on-site construction and planting drawings, improvements shall be consistent with the Approved Plans. Such plans shall include shade trees along the roadways and unit driveways and throughout the site, shrubs, and turf areas. Such plans shall indicate the specific types of active/passive recreational equipment to be installed within the open space and recreational areas located on the approved plans.
 - iv. Final roadway plans and profiles for the main site roadway ~~and for the extension to the south property line near the existing garage.~~
 - v. Final utility plans and profiles including properly labeled drainage components and all site utilities including electric, gas, water supply lines, wastewater collection and disposal facilities, building service connections, and all system components and appurtenances.
 - vi. The location of electric, telephone, CATV, and gas lines and appurtenances shall be indicated on the drawings based upon final design of these systems by the utility company.

- vii. Final Site Lighting plan.
- viii. Final Photometric Drawing.
- ix. Final Site Entrance Plan in accord with MassDOT requirements.
- x. Size, location, legend, and illumination of entrance signage.

~~b. Final Roadway Reconstruction Plan accommodating change to right turn in/ right turn out only access to Sandwich Road and connection to the proposed road to the south.~~

~~c. Obtained from the Building Inspector a written confirmation that the stormwater management system, landscaping plan, architectural floor plans and the Approved Plans' are in conformity with the conditions of this Decision.~~

b. Obtained any and all permits and approvals from the Bourne Conservation Commission or the DEP which may be required under any state statute, code, or rule and regulation under its jurisdiction, to the extent not otherwise expressly covered by this Decision, including a final Order of Conditions or Superseding Order of Conditions under the Wetlands Protection Act as to any portion of the Site subject to the Wetlands Protection Act that are required by applicable state law prior to such commencement;

c. Obtained a National Pollutant Discharge Elimination System ("NPDES") stormwater permit issued for the Project, if required by applicable law;

d. Obtained, if needed, a Certificate of the Secretary of Environmental Affairs of compliance pursuant to 301 CMR 11.08(8)(a);

~~d. Submitted Final Architectural Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, with the Massachusetts Building Code, and with all other state and federal codes. Copies of the detailed, approved architectural drawings (the "Final Architectural Plans") should also be filed in hard copy and in digital form. The Final Architectural Plans shall bear the signature and seal of a Massachusetts Registered Architect (RA). The Applicant must secure approval of the Building Inspector prior to construction and allow forty-five (45) days to review the architectural drawings. The Final Plans shall include a Building Code review. [moved to VIII.2]~~

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e. ~~Obtained any and all permits and approvals from the Bourne Board of Health and the DEP regarding disposal of wastewater generated by the Project that are required by applicable laws prior to such commencement; [moved to VIII.2]~~

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f. ~~Obtained any and all permits and approvals from the Bourne Conservation Commission, other municipal agencies and/or the DEP regarding management and control of stormwater generated by the Project that are required by applicable law prior to such commencement; [see XIII.1.b]—~~

g. ~~Obtained any and all permits and approvals from the Bourne Conservation Commission or the DEP which may be required under any statute, code, or rule and regulation under its jurisdiction, to the extent not otherwise expressly covered by this Decision, including a final Order of Conditions or Superseding Order of Conditions under the Wetlands Protection Act as to any portion of the Site subject to the Wetlands Protection Act that are required by applicable law prior to such commencement; [see XIII.1.b]—~~

h. ~~Obtained a National Pollutant Discharge Elimination System (“NPDES”) stormwater permit issued for the Project; [see XIII.1.c]—~~

i. ~~Obtained, if needed, a Certificate of the Secretary of Environmental Affairs of compliance pursuant to 301 CMR 11.08(8)(a); [see XIII.1.d]~~

j. ~~Delivered to the ZBA final architectural drawings for the buildings/Units to be constructed as shown in the Architectural Plans, providing a scaled depiction of the front, rear and side elevations, signed and sealed by a Massachusetts Registered Architect (RA);~~

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~~i. Architectural plans shall include single family units and the attached units located in the existing garage. The garage units shall reflect the preliminary plans furnished to the Board.—~~

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~~ii. The applicant is encouraged to enhance the architectural quality of the designs. The final architectural plans shall be compatible with the setting and shall be consistent with the architectural character of the Town.—~~

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~~iii. The architectural plans shall be designed based upon the Bourne Board of Health “Bedroom Definition Regulation” (04/24/1992) and the number of bedrooms shall not exceed three (3) bedrooms per unit or a total of forty eight (48) bedrooms on the site.—~~

ke. Delivered to the ZBA with copies to the Building Inspector, Planning Board, Board of Health, Conservation Commission, Superintendent of the DPW, Fire Chief, and

Police Chief a complete Construction Management Plan (CMP) as described in condition #3, below.

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- f. A geotechnical engineering design report shall be submitted for the areas that are proposed to be graded at one foot horizontal to one foot vertical (1:1). Signed, sealed slope stability calculations shall be provided by a geotechnical engineer that is based upon location specific subsurface testing.
 - g. Earthwork computations shall be provided for the volume of cut and fill and the net volume on/off site. The number of trucks required for off-site transport shall be calculated.
 - h. Final Drainage Calculations and Report must be submitted. The complete stormwater design package shall be signed and sealed by the civil engineer of record, and shall conform to the methods and procedures set forth in the Massachusetts Stormwater Handbook. The design depicted on the plans currently on file is meant to demonstrate intent and not full construction level of detail.
 - i. Retaining walls exceeding ten (10) feet in height require a Building Permit and must be designed by a Massachusetts Structural Professional Engineer.
2. Before the Applicant commences construction of any residential units, the Applicant shall have:
- a. Submitted Final Architectural Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, with the Massachusetts Building Code, and with all other state and federal codes. Copies of the detailed, approved architectural drawings (the "Final Architectural Plans") should also be filed in hard copy and in digital form. The Final Architectural Plans shall bear the signature and seal of a Massachusetts Registered Architect (RA). The Applicant must secure approval pursuant to Paragraph VIII.4 prior to beginning unit construction. The Final Plans shall include a Building Code review.
- The number of bedrooms shown in the Final Architectural Plans shall not exceed three bedrooms per unit or a total of sixty (60) bedrooms on the site.
- b. Obtained any and all permits and approvals from the Bourne Board of Health and the DEP regarding disposal of wastewater generated by the Project that are required by applicable state laws prior to such commencement;

~~which shall~~ 3. The Construction Management Plan shall address the following topics and items:

- i. Construction Administration
 - Hours of construction
 - Hours of construction delivery
 - Truck routes
 - Trash and debris removal
- ii. Construction Phasing and Schedule (critical path) timing and phasing of construction; site clearing; construction of roadways and utilities; buildings, etc. If the site is not expected to be completed in a single- phase, a detailed Construction Phasing Plan shall be submitted indicating access and utilities for each phase adequately addressing access and parking, emergency vehicle access, and utility services.
- iii. Communications
- iv. Noise and Dust Control
 - Tree removal (chipping, etc.)
 - Public street cleaning and repair
 - Dust
 - Noise
 - Rock crushing
- v. Blasting
 - Blasting Plan
 - Identification of petitioner's blasting consultant
 - Selection of independent blasting consultant
 - Selection of blasting contractor
 - Pre- and post-blast survey (scope and content)
 - Insurance coverage
 - Blasting limits
 - Notification to abutters of blasting schedule
 - Road closures (if necessary)
 - School bus conflicts (limits on hours)
- vi. Erosion Control
 - Silt sacks, hay bales, silt fences, etc.
 - Tree protection plan

 - Drainage infrastructure

- vii. Identification of existing underground utilities
- viii. Construction Staging
 - Staging areas
 - Site office trailers
 - Storage trailers/containers
 - Open storage areas
 - Delivery truck holding areas
 - Refueling areas
- ix. Traffic and Parking (during construction)
 - On-site locations
 - Off-site locations
 - Snow removal
 - Police details
 - Warning signs
- x. Fire and Emergency
 - Temporary emergency access roadway
 - Emergency water supply throughout construction
 - Provision of a Knox padlock for construction fence gates
- xi. Construction Specifications

The CMP shall be reviewed pursuant to Paragraph VIII.4. The scope of the ZBA's review of the CMP shall be for completeness and for consistency with generally accepted construction practices and for compliance with all the conditions of this Decision. ~~The ZBA's engineer shall confirm his/her acceptance of the CMP and report the same to the ZBA within 30 days after a complete submission from the Applicant.~~

- ~~1. Final Drainage Calculations and Report must be submitted. The complete stormwater design package shall be signed and sealed by the civil engineer of record. Stormwater calculations shall document groundwater conditions, soils tests, runoff calculations, inlet capacity calculations, sub-surface stormwater recharge calculations, pre and post-developed watershed and subcatchment plans, etc. The design depicted on the plans currently on file is meant to demonstrate intent and not full construction level of detail. [moved; see XIII.1.h].~~

- ~~i. The calculations shall incorporate changes in the drainage system relating to relocating the subsurface retention facilities to the side of or out of principal site roadway if suitable locations for said facilities are available.—~~
- ~~ii. The sizing of the subsurface recharge facilities must be based on the appropriate design rate based upon the Massachusetts Stormwater Handbook. With the “Dynamic Field” method, the design rate is one half the observed rate. With the “Static” or “Simple Dynamic” methods, the Rawls Rates at the location and soil depth where recharge is used.—~~
- ~~iii. Test data must be submitted to determine the saturated hydraulic conductivity for design purposes. A minimum of one test must be provided for each subsurface recharge facility. As set forth in the DEP Massachusetts Stormwater Handbook, saturated hydraulic conductivity rates must be determined at the actual location and soil layer where recharge is proposed when the “Dynamic Field” method is proposed. With the “Dynamic Field” method, the design rate is one half the observed rate. When the “Static” or “Simple Dynamic” methods are proposed, the Rawls Rates at the location and soil depth where recharge is proposed shall be presumed to represent the saturated hydraulic conductivity. Field test methods to assess saturated hydraulic conductivity for the “Dynamic Field” method must simulate the “field saturated” condition. See ASTM D5126-90 (2004) Standard Guide for Comparison of Field Methods for Determining Hydraulic Conductivity in the Vadose Zone. The saturated hydraulic conductivity analysis must be conducted by the Competent Soils Professional. Acceptable tests include: i) Guelph permeameter—ASTM D5126-90 Method; ii) Falling head permeameter—ASTM D5126-90 Method; iii) Double ring permeameter or infiltrometer—ASTM D3385-03, D5093-026, D5126-90 Methods; or iv) Amoozegar permeameter—Amoozegar 1992. Title 5 percolation test data is not an acceptable test for saturated hydraulic conductivity.—~~
- ~~iv. Rational formula pipe calculations should be submitted demonstrating open channel flow at adequate capacity for the design storm.—~~
- ~~m. The current site landscaping shown on the plans must be revised and the number of shade trees increased. Additional native species including native varieties of Oak (*Quercus* spp.), American Beech (*Fagus grandifolia*), pitch pines (*Pinus rigida*), hollies (*Ilex* spp.) should be included. The area devoted to turf grass should be limited and should be indicated on the plans. Drought tolerant grass mixtures should be specified and a minimum depth of loam of 4-6 inches. Installation of automatic irrigation system is prohibited.—~~
- ~~n. A geotechnical engineering design report shall be submitted for the sandy slope, approximately 30 feet in height located along the southern edge of the property that is~~

~~proposed to be graded at one foot horizontal to one foot vertical (1:1) down into the project, behind Units 4 and 5. Signed, sealed slope stability calculations shall be provided by a geotechnical engineer that is based upon location specific subsurface testing.—~~

- ~~o. Earthwork computations shall be provided for the volume of cut and fill and the net volume on/off site. The number of trucks required for off-site transport shall be calculated.—~~
- ~~p. Retaining walls exceeding ten (10) feet in height require a Building Permit and must be designed by a Massachusetts Structural Professional Engineer. Retaining wall design shall comply with the following: [see VIII.1.i]—~~
 - ~~i. Test pits or soil borings are required to determine soil type. Soil information can then be used to determine the wall design requirements including the factor of safety for bearing capacity and sliding.—~~
 - ~~ii. If the structural plans are provided by the retaining wall manufacturer, the design shall be based upon site specific geotechnical information and cannot be qualified by requiring further determination of geotechnical conditions after issuance of the signed and sealed structural drawings.—~~
 - ~~iii. The structural plans should indicate methods for sheeting, shoring, and bracing for wall segments in proximity to property lines to control encroachment onto adjacent properties during excavation and backfill, if necessary.—~~
 - ~~iv. To the extent appropriate, the safety fence should wrap the ends of the wall to deter access.—~~
 - ~~v. To the extent required, engineering peer review should be provided at the applicant's expense.—~~

4. Procedure for Review and Approval.

- a. When review and approval of a plan or document is required by any condition of this permit, the Applicant shall submit the plan or document to the Building Inspector and any other recipient specified by the permit condition. Upon such review and absent an objection by any of the specified recipients, within thirty (30) days of receipt, that such plan or document are inaccurate or inconsistent with or not in conformity with this Decision, the plan or document shall be deemed approved. If the submitted plan or document is required by state or federal law, rather than local regulations, it shall be

deemed approved for purposes of this permit, but Town authorities may communicate any concerns to the applicable state or federal agency.

- b. In the event there is an objection that the plan or document is inaccurate or inconsistent or not in conformity with this Decision, the Applicant may submit the matter in question to the ZBA for its review for consistency; the ZBA shall hold a hearing within 45 days of the applicant's submission, and render a decision within 14 days after said hearing. Any matter related to this Decision to be reviewed and decided by the ZBA after this Decision is issued may be reviewed and decided by the members of the ZBA designated by the Chairman, even if those members did not sit on the hearings that led up to and resulted in this Decision. The Applicant may appeal any adverse ZBA decision to the Housing Appeals Committee.

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IX. SITE DEVELOPMENT CONDITIONS

1. Prior to the commencement of any construction activities or any site development or site clearing, the Applicant shall meet with the Building Department, Police Chief or his representative, Fire Chief or his representative, the ZBA's Consulting Engineer (if any), and the Chair of the ZBA or his representative at a mutually convenient time and place during normal business hours to review the CMP, and to coordinate the Building Department's periodic inspections of the Project (the "Pre-Construction Meeting"). This meeting shall be open to the public.
2. At least two weeks prior to the commencement of any construction activities ~~or site development or clearing~~, the Applicant shall submit to the ZBA, with a copy to the Police Chief, the Fire Chief, and the Building Inspector, a Construction Schedule, indicating the anticipated start and end points for each significant phase of development (site grubbing, clearing, and fill; construction of roadways and related infrastructure, excavation and blasting for foundations, framing and interior construction, etc.). The Construction Schedule shall also include the anticipated daily vehicle trips per phase, and the anticipated hours of the day during which heavy equipment and construction vehicles are expected to enter and exit the Site.
3. The Applicant shall ensure safe and convenient vehicular access to the Site during the entire duration of the Project. ~~Municipal representatives shall be permitted access to the Site to observe and inspect the Site and construction progress until such time as the Project has been completed. [see 5, below]~~
4. The Applicant shall submit to the ZBA a construction and permitting schedule, prior to the commencement of any construction activities or any site development or clearing, and semi- annually thereafter to assist in project status update and review.

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5. The Building Department or its appointed agents may, upon reasonable notice to the Applicant, conduct periodic inspections during the construction of the Project, to ensure compliance with the terms of this Decision and the state building code, and for consistency with generally-accepted construction and engineering practices for the installation of roadways, stormwater management facilities, utilities, and all development infrastructure. ~~Inspections during the construction phase shall be conducted at the expense of the Applicant.~~
6. The Applicant shall forward final architectural plans to the Building Inspector at the time of applying for building permits. All construction shall be inspected by the Building Inspector and shall be in compliance with all Massachusetts State Building Code requirements
7. The Applicant shall be responsible to ensure that nuisance conditions do not exist in and around the Site during the construction operations. The Applicant shall at all times use all reasonable means to minimize inconvenience to residents in the general area.
8. Dust - Methods of controlling dust shall meet all air pollutant standards as set forth by Federal and State regulatory agencies.
9. Noise - The Applicant shall implement measures to ensure that noise from project construction activities does not exceed acceptable levels, as set forth by Federal and State regulatory agencies.
10. Traffic - The Applicant shall implement necessary traffic safety controls to ensure a safe and convenient vehicular access in and around the Site. Any traffic problems that occur as a result of site operations and construction shall be mitigated immediately, at the expense of the Applicant.
11. Roads – The Applicant is responsible for the sweeping, removal of snow, and sanding of the internal roadways and driveways permitting access to residents, emergency vehicles, and others during construction and until the Condominium Association has been legally established. The final coat of pavement on the internal roadways shall be installed after the base course has endured a full winter season. The Applicant shall promptly clean any debris or dirt deposited on Bourne or state controlled streets and roads.
12. Burial of any stumps or solid debris onsite is expressly prohibited. Localized burial of stones and/or boulders is prohibited to prevent the creation of voids from soil settlement over time.
13. ~~Soil material to be used as backfill for pipes, roads, and/or structures (i.e. detention basins) shall be tested at the expense of the Applicant by a qualified firm acceptable to~~

~~the Building Department. Testing of said backfill shall be performed in conformance with standards and frequencies reasonably established by the Building Department—~~

14. Utilities, including but not necessarily limited to electric, gas, water, cable, and telephone shall be located underground per utility company standards and applicable codes, and DIGSAFE standards. A final utility plan approved by the applicable public utilities shall be submitted to the Building Inspector prior to the commencement of any construction.
15. Stabilization Requirements – No disturbed areas that might contribute to erosion or sediment migration that are located onsite and under the applicant's control shall be left in an open, unstabilized condition longer than 30 days or as may be governed by the NPDES permit. Temporary stabilization shall be accomplished by hay bales, hay coverings, matting or other appropriate means. Final stabilization shall be accomplished by loaming and seeding exposed areas in accordance with the approved landscaping plans or site plan.
16. Blasting - Any rock blasting shall be performed by a licensed blasting professional, who shall first obtain all required permits from the Bourne Fire Department. All blasting and removal of debris shall be performed in accordance with state regulations and local fire department requirements and shall provide evidence thereof to the Fire Chief.
 - a. Selection of the Blasting Contractor. A blasting contractor, acceptable to both the Applicant and the Bourne Fire Department, shall be selected after review of the qualifications of such contractor by a qualified independent geotechnical-blasting consultant who shall also be acceptable to both the Applicant and the Bourne Fire Department.
 - b. Independent Blasting Consultant. An independent geotechnical-blasting consultant shall be selected and paid for by the Applicant, subject to the approval of the Bourne Fire Department. The consultant shall review the qualifications of the blasting contractor, and review the final blasting plan prepared by the blasting contractor, check the calibration of the seismograph monitors, approve the location and installation of the seismograph monitors, and, if required by the Bourne Fire Department, shall determine the blast limits throughout the blast period and shall consult with the Bourne Fire Department on an as-needed basis throughout the blasting period.
 - c. Pre-blast Survey. Before any blasting on the Site, the Applicant shall conduct a pre-blasting survey that shall include video-recording of the foundations of all direct abutters to the Revised Project, and shall provide a copy of that survey to the ZBA and Fire Chief.
 - d. Insurance Coverage. The blasting contractor shall carry comprehensive public liability insurance in the amount of not less than \$1,000,000 for property damage in respect of any

one occurrence and \$2,000,000 aggregate. A certificate shall be submitted to the Bourne Fire Department by the contractor documenting that the required coverage will be in force for the duration of the blasting at the Site. If there is a general contractor or developer associated with the blasting, each shall carry a minimum of \$1 million of comprehensive liability insurance.

- e. **Blasting Limits.** The Commonwealth of Massachusetts blasting limits shall be observed. However, if, based upon the recommendation of the independent blasting consultant, the Bourne Fire Department believes that a lower limit is necessary to protect the Site and the abutting property that lower limit shall be in effect.
 - f. **Notification.** Not less than one week prior to the commencement of any period of blasting, the Applicant shall notify the immediate abutters within 200 feet of the blast area, stating when the blasting period shall begin. Notification under this provision and under any other provision in the Comprehensive Permit shall be by the following three methods: (1) phone or in person; (2) by email; and (3) by letter. No perchlorate shall be used during blasting. Such notification shall include an explanation of the warning procedures for blasting including soundings. The Applicant shall send another letter notifying the same abutters that the blasting period has been completed. In addition, the Applicant shall notify the Fire Department 30 minutes prior to each blast, and a Fire Department detail is required for every blast, which shall be certified by the Fire Academy on the requirements of the state blasting regulation.
 - g. **Post-blasting Survey.** After the completion of all blasting, the Applicant shall conduct a post-blasting survey that shall include video-recording of the foundations of all direct abutters to the Project, and shall provide a copy of that survey to the ZBA, Fire Chief, and each abutter, respectively, upon request.
17. **Safety Fencing:** During construction of the Project, the Building Inspector shall have authority to require fencing of the site or portions of the site to the extent required and appropriate to enhance safety by controlling access. A Knox padlock shall be used for any construction fence gates.
18. **As Built Plans:** Prior to the occupancy or use of the final “market rate” dwelling unit constituting a part of the Project, the Applicant shall submit to the ZBA an “As Built Plan” in paper and CAD format, showing all pavement, buildings, stormwater management structures, and other infrastructure as they exist on the Site, above and below grade, including appropriate grades and elevations. The plans shall be signed by a registered land surveyor and civil engineer, certifying that the Project as built substantially conforms and complies with the conditions of this Comprehensive Permit.

19. Trees. Prior to the commencement of any construction activities or any site development or clearing, if required by the Board's Consulting Engineer, the Applicant shall erect a physical barrier such as a plastic fence to ensure that any existing trees on the locus be preserved ~~within forty feet of the property line on all sides which shall not be touched during construction and to ensure that there is a protective radius within the drip line around such trees~~ to the extent consistent with the approved site plan and landscaping plans. If any ~~such~~ trees, having a caliper of four inches or greater at four feet from the ground, are destroyed or injured as a result of construction, the Applicant shall plant new trees in their place of a comparable species with a minimum height of nine feet at a ratio of 2 new trees for each destroyed tree. Such replanting shall be done by a qualified landscape professional.

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20. Roadway Design: The surface course and binder course of the roadways, and the attendant shoulder widths and side slopes, shall conform to the Bourne Planning Board's Subdivision Rules and Regulations ~~except as waived herein~~. Roadway design to be indicated on the Final Site Plans shall include the following:

- a. The maximum roadway grade shall not exceed ~~ten~~twelve (12) percent.
- b. ~~The main access roadway in front of the existing garage building shall be widened to provide a 22-foot wide traveled way exclusive of berms and shall extend to the south property line. A 4-foot wide sidewalk shall be provided.~~
- c. ~~Upon the installation of a traffic light on Sandwich Road that is not located in front of the present entrance/exitway, and completion of construction of a connection to the proposed roadway to the south, the current access to Sandwich Road shall be changed to a right turn in/right turn out access.~~
- d. Install "No Parking Any Time" (UMTCD R7-1) signs for the turnaround at the upper end of the principal on-site access drive.

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21. ~~With respect to drainage and erosion control, the Town Building Inspector and the Town the Department of Public Works shall review the plans to determine that they are substantially consistent with the preliminary plans and in substantial compliance with the conditions of this permit, and the applicant shall comply with the EPA's National Pollutant Discharge Elimination System II (NPDES II). Said drainage shall be designed using Best Management Practices (BMP's) and shall conform to the Massachusetts Stormwater Management Standards. This will include, but not be limited to, the use of pre-cast concentric concrete catch basins including oil/grit separators to remove sediments and hydrocarbons from the stormwater runoff. The groundwater elevation shall be verified, and a minimum separation of two feet from the bottom of the drainage system and seasonal high groundwater shall be maintained. During construction, the~~

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~~access road entrance shall be stabilized with stone and gravel to a depth of six inches and a length of fifty (50) feet for removal of sediment from construction vehicle tires when leaving the site. Prior to issuance of any certificates of occupancy, the plans for stormwater drainage system serving the land and buildings in which such certificates of occupancy are being sought shall be subject to inspection by Town Public Works, the Board's peer review engineer consultant, and the Town Building Inspector. Erosion control shall follow Best Management Practices and shall be maintained throughout the duration of the project.~~

~~Prior to the issuance of any certificate of occupancy, The applicant shall establish a maintenance plan for the stormwater system, which shall include but not be limited to scheduled inspections, thresholds for removal of sediments, and an educational program for residents for the continuing maintenance and protection of the stormwater system. The maintenance plan shall be reviewed for compliance with BMPs and approved by the Town Public Works and the Town Building Services department prior to construction pursuant to Paragraph VIII.4. The applicant shall pay for the cost of an independent engineering review of the proposed stormwater management plan, if requested by the Town.~~

~~No sands or gravels or other materials may be removed from the site except those required to be removed to accomplish the conditions shown on the final site plan to be approved by the Board.~~

~~Prior to the commencement of construction the Building Inspector shall confirm that he has reviewed the plans as required herein for compliance with the conditions of this permit. The Building Inspector shall do so within 30 days of submission of final plans by the Applicant to the Board and the Building Inspector.~~

22. Stormwater Management:

- a. Catchbasin spacing shall be reduced to a maximum of 150 feet on grades exceeding 6 percent.
- b. Grate hydraulic calculations shall be submitted and double grate or cascade grate structures shall be added as appropriate to ensure that the design storm is captured.
- ~~c. The applicant shall use best efforts to relocate the stormwater recharge systems out of the principal site access roadway or as near to the side of the principal site access roadway as practicable.~~

- d. Invert elevations of the stormwater quality structures shall be maintained above the recharge systems. The Stormceptor units should not be permitted to surcharge. Tailwater elevations that extend above the structural outlets shall not be permitted.

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~~e. Roof water shall be recharged in separate roof water recharge facilities, whether drywells, rain gardens, or lawn depressions.~~

- f. All subsurface structures shall support HS-20 loading in paved areas.

23. A. ~~The water main size, type, connection and all related parts and fixtures will be specified by Bourne Water District. The engineered project drawing must be submitted for approval to the Superintendent of the Bourne Water District. The applicant must also submit an engineered study of static pressures and fire flows throughout the entire development. These plans and study and a letter from t~~The applicant shall request~~submit~~ a water connection application and water must be brought before to the Board of Water Commissioners, together with engineered drawings and other information reasonably requested or required by said Commissioners, consistent with its usual practices and procedures. Only the Board of Water Commissioners has the right to approve a request for a water connection to the Bourne Water District system. If questions arise with regard to the project, the District's Engineer may be asked to review the plans and submit a finding. ~~The cost for this will be at the expense of the applicant. Once plans are approved, any change to the plans must again come before the Superintendent for approval.~~

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- B. The Bourne Fire Dept requires that fire hydrants not exceed 500 feet of separation. Hydrant flow records and test data must demonstrate a deliverable fire flow including simultaneous domestic flow while maintaining a minimum residual pressure of 20psi.

24. ~~The septic system shall be redesigned to include Recirculating Sand Filter (RSF) equivalent technology to denitrify the wastewater prior to discharge to the Soil Absorption System (SAS).~~

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~~a. The RSF equivalent technology shall reduce nitrogen loading to less than 10 ppm and to as close to 5 ppm as feasible.~~

- b. ~~Nitrogen loading calculations shall comply with Board of Health requirements and Technical Bulletin 91-001—Nitrogen Loading, dated April 1992 issued by the Cape Cod Commission Water Resources Office. The nitrogen loading shall be recomputed using a loading rate of 35 mg/l for wastewater and fertilizer application rate of three (3) pounds per thousand square feet of lawn area.~~

- c. Maintenance of ~~the~~ septic system(s) and wastewater disposal infrastructure shall be the responsibility of the Homeowners' Association.
25. The on-site sidewalk shall comply with ~~Massachusetts AAB~~ applicable laws and regulations regarding handicap access requirements. ~~Accessible ramps should be shown on the plans in plain view with spot grades and an accessible ramp detail should be added to the detail sheets. The applicant is advised that dipping the sidewalk at unit driveways where the profile grade line of the principle access roadway exceeds 8 percent is not consistent with AAB requirements.~~
26. Temporary construction signage and permanent entrance signage at Sandwich Road should be indicated on the plans and details furnished with respect to sign legend, dimensions, materials, colors, means of illumination. Signs shall comply with the requirements of the Bourne Zoning By-Law. The signs should be located to avoid interference with sight distance for exiting vehicles. Peer review of the sight distance limitations may be required.
27. The applicant shall verify whether or not the Postmaster will require a common mailbox facility. If required, the mailbox facility and associated parking shall be indicated on the site plan.
28. The sidewalk at Sandwich Road should be clearly indicated including the area intended to serve as a school bus waiting area.
29. The principal site access roadways should be signed for "No Parking" (MUTCD R7-1) and parking restrictions should be enforceable by the Condominium Documents.
30. A Site Lighting Plan shall be developed using a maximum pole height of ~~46~~ 24 feet. Light fixtures should be consistent with residential scale and style typically acceptable in the town and should comply with all ~~dark-sky requirements of the Cape Cod Commission. Average illumination levels on pavement and walkways should be between one-half and one (1/2 and 1) foot-candles and should comply with IESNA recommendations. Illumination levels at the property lines should not exceed 0.25 foot-candles. Illumination levels at the main entrance on Sandwich Road and at the on-site intersection at Station 0+50 should be 5 foot-candles~~ applicable laws and regulations.
32. During construction, the Applicant and his agents and employees shall conform to all local, state and federal laws regarding noise, vibration, dust and use of Town roads and utilities. The Applicant shall at all times use all reasonable means to minimize inconvenience to residents in the general area. ~~If any units have been constructed and occupied, C~~ construction shall not commence on any day Monday through Friday before 7:30 AM or on Saturday before 8:30 AM, ~~and A~~ exterior construction activities shall

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cease by 6:00 PM on all days, ~~and, N~~ no construction or activity whatsoever shall take place on Sundays or legal holidays except for the limited purpose of providing emergency health or safety measures ~~or except as otherwise allowed by the Building Inspector~~. All construction shall follow Best Management Practices for erosion and sediment control.

33. Construction of all dwelling units, utilities, roads, drainage structures, and all related appurtenances shall be in accordance with all applicable zoning bylaws and all other applicable local, state and federal regulations except as waived by this Decision.
34. ~~The Project shall comply with all rules, regulations and permit requirements of the DEP with respect to stormwater management, stormwater disposal, wastewater disposal, best management practices and any and all regulations, if applicable, of the Bourne Board of Health that are not specifically waived herein. The stormwater management system shall comply with the DEP Stormwater Management Standards whether or not the site is subject to the Massachusetts "Wetlands Protection Act (MGL Ch 131 §40)."~~
35. All utilities shall be underground.
36. All area and roadway lighting shall be shielded or refracted as necessary in such a manner as to minimize light spill over to neighboring properties.
37. All on-site storage of hazardous materials and hazardous wastes shall be on an impervious surface, with containment and access control, and all on-site vehicle fueling shall be conducted with industry recognized containment and access control. The CMP shall identify a designated fueling area and shall construct an impervious surface to accommodate construction vehicles. Containment shall be provided for a minimum of 50 gallons of fuel.
38. ~~Prior to digging on any public land, the applicant shall deliver written notice to the Chief of Police at least 48 hours prior to digging, and, if requested by the Chief, shall arrange for a police detail; and shall comply with any and all other reasonable safety-related requests made by the Chief. In addition, at least 48 hours prior to digging on any public land, the applicant shall deliver written notice to the Bourne Water District, the Bourne Sewer Department, the Bourne Department of Public Works, the gas company, and the electric company, and comply with all applicable federal, state and local regulations and with all "dig safe" requirements.~~
39. Surety & Covenants: As security for the completion of the infrastructure related to the Project as shown on the Approved Plan, including, but not limited to, the binder coat of the roadway, sidewalks, parking areas and common areas, recreational areas, sewage disposal system, drainage facilities, utilities, landscaping, and any other specific infrastructure shown on the "Approved Plan" (the "Infrastructure"), the release of

occupancy permits for all housing units and the sale of all housing units in the Project shall be subject to the following restrictions:

- a. No occupancy permit for a unit in any building shall be issued, and no sale of any unit shall be permitted, until: (1) the base and binder course for the roadway, parking areas, and relevant unit driveways shown on the Approved Plan has been installed; and (2) all Infrastructure described herein and as shown on the Plan has been constructed or installed so as to adequately serve said building unless a phasing plan is submitted for review and approval by the ZBA.
 - b. No occupancy permit for a unit in any building shall be issued, and no sale of any unit shall be permitted, until the Approved Plan has been recorded with the Registry of Deeds. This Comprehensive Permit shall be referenced on the Approved Plan prior to recording
40. The Applicant and its successors and assigns shall comply with the regulatory/ affordable housing restrictions, deed rider, monitoring agreements, and all other conditions applicable to the project approved by this Decision. ~~This comprehensive permit shall not be transferred or assigned without prior, written approval of the ZBA.~~
41. Nothing in this Decision shall be deemed to constitute a waiver of or from the jurisdiction of the Cape Cod Commission as granted that agency by the Cape Cod Commission Act.
42. If construction authorized by this Comprehensive Permit has not begun within three years of the date on which the permit becomes final, the permit shall lapse unless extended by the ZBA. The permit shall become final on the date that the written decision is filed in the office of the town clerk if no appeal is filed. Otherwise, it shall become final on the date the last appeal is decided or otherwise disposed of. The Project shall be completed expeditiously and, in any event, within five years of the date of the first building permit issued, unless extended by the ZBA.
43. The Board reserves the right, insofar as consistent with state law, to further review and amend this decision based upon any information that comes before the Board as a result of Applicant's future need to acquire permits from any local, county, state or federal authority, including but not limited to, the Cape Cod Commission.
44. ~~If, between the date this Decision is filed in the office of the Bourne Town Clerk— and the completion of the Project, the applicant seeks to make changes to the project, it shall promptly notify the ZBA in writing, describing such change. Within 30 days of receipt of written notification, the ZBA shall determine and notify the applicant whether it deems the change substantial or insubstantial. If the ZBA determines the change is insubstantial, the comprehensive permit shall be deemed to incorporate the change. If the ZBA determines the change is substantial, it shall hold a public hearing within 30 days of~~

~~its determination and issue a decision within 40 days of the close of the hearing. See 760 CMR 56.05(11). NOTE: 760 CMR 56.05(11) dictates the procedure for proposed changes to an approved project.~~

45. Notwithstanding the provisions of paragraph 44, above, no structure constructed under this Comprehensive Permit shall be altered, reconstructed, extended, or changed unless authorized by the ZBA by a special permit pursuant to the Zoning Bylaws and G.L. c. 40A, s.6, as may be amended. Upon such an application for special permit, the Board shall determine, in the first instance, whether such alteration, reconstruction, extension or change is “substantial” or “insubstantial.” For all special permit applications for insubstantial changes, the ZBA shall employ the standards of review set forth under the Zoning Bylaw pertaining to changes to pre-existing, nonconforming structures, as may be amended. Requests for substantial changes shall be treated as requests to amend this Comprehensive Permit. This Paragraph (45) shall not apply to the original construction of structures developed pursuant to this Comprehensive Permit by the Applicant, but shall apply to subsequent alterations, extensions, and changes to such structures.
46. The terms alteration, reconstruction, extension, and change, shall have the same meaning under the Massachusetts Zoning Act, G.L. c. 40A, §6 and the Bourne Zoning Bylaws.
47. ~~Where these conditions specify the submission of a plan, study, obtaining of a permit or approval or other related analysis, these conditions shall be considered a condition precedent to the requirement that, no grading, land disturbance, issuance of any building permit or construction of any structure or infrastructure shall commence until said plans, study or analysis have been reviewed and have received a final acknowledgment and approval by the permitting agency or the Building Inspector that the plans, study or analysis are consistent with this Decision.~~
48. The Applicant acknowledges that prior to the start of construction, the Applicant must obtain all required approvals from any and all other governmental agencies, departments or commissions whose approvals are necessary for this Project and such approvals must be consistent with this Decision.
49. The Applicant shall prepare Condominium Trust and Condominium Association documents. The Condominium Trust shall be responsible for the ownership, maintenance and repair of the roadways, storm water management systems, the wastewater treatment facilities ~~including denitrification components~~, retention ponds, recharge facilities, retaining walls, the open space parcels, and other common amenities and services. The Condominium Trust and Condominium Association documents ~~shall~~may contain provisions for “limited” or “exclusive” common areas associated with the town homes with the effect that each unit owner, ~~with the exception of the three (3) dwelling units closest to Sandwich Road,~~ shall be responsible for maintaining the open space area

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immediately adjacent to his or her units so that the cost of maintaining the same shall not be a common expense assessed against any affordable unit or any market unit.

~~The Condominium Trust and Condominium Association Documents shall disclose the fact that nearby land is used by a gun club as a shooting range and provide that, by virtue of accepting ownership of a unit, unit owners acknowledge that they have purchased their units with full knowledge and acceptance of extraordinary noise emanating from the nearby land.~~ The Condominium Trust and Condominium Association documents shall be subject to review and approval by the Board's counsel to insure compliance with the terms of this Comprehensive Permit decision. Said documents shall contain restrictions on all units preventing any increase in the number of bedrooms. ~~The number of bedrooms in any unit shall be determined in accordance with the Town of Bourne Board of Health regulations.~~ Prior to the sale of any unit, the Condominium Trust and Condominium Association documents shall be filed with Barnstable County Registry of Deeds.

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The calculation of the percent of common interest of each condominium unit shall be determined pursuant to relevant laws of the Commonwealth governing condominium ownership.

50. ~~The final landscaping plan is subject to reasonable review by the ZBA for consistency with this Decision. No permit shall issue prior to such approval unless the Board fails to act within forty-five (45) days after receipt of said plan from the applicant, in which case approval shall be deemed to have occurred.~~

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51. The final site plan is to be recorded at the Barnstable County Registry of Deeds and shall be recorded together with this Decision.
52. The Board requires that a note be placed on said final site plan stating that the Plan is the subject of a comprehensive permit under Mass. Gen. L. c.40B, sections 20-23.
53. The Town of Bourne shall be free of any liability arising out of the Board's approval of the site layout plan, and for any act, omission or negligence caused by the Applicant, its employees, agents, subcontractors, beneficiaries or trustees with relation to this Project.

54. ~~Profit Cap and Regulatory Agreement: To conform to the intent of G.L. c. 40B, s. 20-23 that profits from the Project be reasonable and limited, the Applicant shall be limited to an overall profit cap of twenty percent (20%) of total development costs of the Project, in accordance with the requirements of the Subsidizing Agency (the "Profit Cap"). The ZBA may elect to review, for accuracy, the Subsidizing Agency's own audit of the Project. Said review shall use the same standards as the Project Administrator, and may utilize the services of an independent auditor selected by the ZBA and paid for by the Applicant. Evidence of the recording of the approved Regulatory Agreement shall be provided to the~~

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~~Board prior to the issuance of any building permit. In addition to the foregoing, the Regulatory Agreement shall conform to the requirements of the Subsidizing Agency.—~~

55. ~~The applicant shall confirm in writing to the ZBA that the Project Eligibility letter issued by MassHousing for this locus is still in full force and effect and if so, the applicant shall comply with all of the conditions stated in the Project Eligibility (Site Approval) letter from MassHousing dated May 15, 2008. NOTE: This Comprehensive Permit is subject to MassHousing issuing a final approval of the project pursuant to 760 CMR 56.04(7). NOTE: This is the procedure prescribed by the 40B regulations. See 760 CMR 56.04(7), 56.05(8)(c).~~

56. ~~The Bourne Planning Board's Subdivision Regulations and construction standards, in their entirety, shall apply to the construction of the roadways, sidewalks, utilities and associated infrastructure of the Project. For the purposes of this condition, the entire project is considered to be a subdivision.—~~

- ~~57. Prior to issuance of any Building Permits, a permanent barrier must be installed and maintained between Chase Estates at 230 Sandwich Road, Map 25, Parcel 9 and 14 Bosun Lane, Map 25, Parcel 15. This barrier to be in the form of a fence and/or berm sufficient to prevent the passage of vehicles. This barrier must be maintained by the Applicant until the last dwelling unit is sold, and thereafter by the condominium association.—~~

X. MISCELLANEOUS LEGAL REQUIREMENTS

1. The Applicant shall establish a condominium owners' association (the "Condo Association") for the Project in a form reviewed by the Board's counsel, and approved by the Subsidizing Agency and including provisions for reserves to be established and maintained for repairs to, or replacement of, and maintenance of the wastewater disposal system(s).
2. Any sale or transfer of rights or interest in all or any part of the Site shall include a condition that successors are bound to the terms and conditions of this Decision. ~~This Comprehensive Permit may not be transferred to a person other than the Applicant, or to an entity of which the Applicant controls less than 50%, without the written approval of the ZBA and the execution of any reasonable instruments or documents that may be required for the perpetual enforcement of this Comprehensive Permit pursuant to the Board's counsel's review and approval by the Subsidizing Agency. Note: The deleted text is inconsistent with 760 CMR 56.00.~~
3. The Applicant and/or subsequent Owner(s) shall be bound by all conditions and requirements set forth in this Comprehensive Permit.

4. In setting the beneficial interest in the condominium common areas in the Condominium Master Deeds, the Applicant shall comply with all relevant laws of the Commonwealth governing condominium ownership.
5. The principle site roadways, driveways, utilities, drainage systems, water supply and distribution infrastructure, wastewater disposal system, and all other infrastructure shown on the Approved Plans as serving the Project, shall remain private and the Town of Bourne shall not have, now or ever, any legal responsibility for the operation or maintenance of the roadways, driveways and infrastructure, including but not limited to snow removal, garbage pickup, the stormwater management system, the wastewater disposal system, and landscape maintenance.

XI. APPLICANT'S REQUESTED WAIVERS

The Applicant has requested waivers from the By-Laws of the Town of Bourne, the Town of Bourne Zoning Bylaws and other local rules and regulations. The Applicant's requested waivers are set forth in its Application and as supplemented through the public hearing process. The ZBA's grant of waivers shall be subject to the terms and conditions imposed by this Decision, and to the extent that any waiver is inconsistent with a term or condition set forth elsewhere in this Decision, such term or condition shall govern. No grant of any waiver shall be deemed to waive compliance with any condition of approval of this Decision. Any waiver not granted below or otherwise included within this Decision shall be deemed denied.

~~The ZBA's decision with respect to each waiver request is as follows: Waivers Requested and Granted from the Bourne Zoning Bylaw: The following waivers are granted:-~~

- ~~—1.— Section 2200. Multi Family Dwelling.~~
- ~~—2.— Section 2440. Two or more Principal Buildings.—~~
- ~~—3.— Section 2500. Intensity of Use Schedule (retaining wall over 6 feet inside the setback).—~~
- ~~—4.— Section 3500. Landscaping and screening.—~~
- ~~—5.— Section 3560. High Fences or Walls.—~~

~~Bourne Zoning Bylaw, Section 1230. Site Plan - Special Permit Approval.~~

~~Bourne Zoning Bylaw, Section 2200. Use Regulations.~~

Bourne Zoning Bylaw, Section 2440. Dimensional Regulations.

Bourne Zoning Bylaw, Section 2500. Intensity of Use Schedule.

Bourne Zoning Bylaw, Section 2600. Development Scheduling.

Bourne Zoning Bylaw, Section 3300. Parking Requirements.

Bourne Zoning Bylaw, Section 3340. Egress Standards.

Bourne Zoning Bylaw, Section 3500. Landscaping and screening.

Bourne Zoning Bylaw, Section 3560. High Fences or Walls.

Bourne Zoning Bylaw, Section 4400. Earth Removal.

Bourne General Bylaw, Section 3.7. Wetland and Natural Resource Protection

Bourne General Bylaw, Section 3.13. Development Mitigation

Bourne Wetland Regulations

Board of Health Bedroom Definition Regulation

Cape Cod Commission Enabling Regulations Governing Review of Developments of Regional Impact, and Minimum Performance Standards for Developments of Regional Impact

Bourne Subdivision Regulations

Decision of the Board of Appeals:

For all the reasons stated above and on the record before it, pursuant to G.L. c.40B, ss.20-23, the Board voted 4-0 (~~Lee Berger, Timothy Sawyer, Judith Riordan, and Wade Keene voting in favor~~) to grant GRANT WITH THE ABOVE NOTED CONDITIONS, ~~thean Amended~~ Comprehensive Permit ~~application of~~ Chase Developers, Inc., for real property located at 230 Sandwich Road, Bourne, Massachusetts, on the terms and conditions stated herein.

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Zoning Board of Appeals Bourne, Massachusetts

~~Lee Berger, Chairman Date: November 28, 2012~~ [SIGNATURE]—

Appeals of this decision may be made pursuant to Section 17 of Massachusetts General Laws, Chapter 40A and shall be filed within twenty (20) days after the date this decision is filed with the Bourne Town Clerk.

Chase Estates

Town of Bourne Comprehensive Permit #08-10
Notice of Project Change

Chase Developers, Inc.

Supplemental Proposed Edits to Comprehensive Permit:

Single Family Homes vs. Condominiums, and Fence to Prevent Access to Port-of-Call

Attached are supplemental proposed edits to the existing Comprehensive Permit for Chase Estates, addressing two changes:

1. Change from condominium to single family homes

The edits reflect the developer's intent to create single family homes rather than condominiums. A Homeowner's Association, rather than a Condominium Association, would be responsible for owning and maintaining roadways and other shared facilities, and for enforcing applicable restrictions.

2. Restoring the requirement for a barrier fence to prevent access to Port-of-Call

In response to concerns raised by abutters at the Board's August 21, 2019 meeting, Chase Developers is no longer requesting deletion of requirement for a barrier fence to prevent vehicular access between the development and the adjacent Port-of-Call subdivision (Section IX: Site Development Conditions, Paragraph 59). The proposed edits clarify that the barrier will consist of a fence, not a berm.

DECISION UPON APPLICATION OF CHASE DEVELOPERS, INC.

FOR A COMPREHENSIVE PERMIT UNDER MASSACHUSETTS GENERAL LAWS CHAPTER 40B, s.20-23

I. APPLICANT AND PUBLIC HEARING

...

The total Project shall include no more than ~~sixteentwenty~~ (1620) single family homes (“units”) ~~condominium units~~ with no more than three (3) bedrooms each (including the affordable units). ~~Four (4)~~ Five (5) of the ~~condominium~~ units, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be affordable to qualified purchasers, in perpetuity.

...

V. GENERAL CONDITIONS

9. Each condition in this Decision shall run with the land and shall, in accordance with its terms, be applicable to and binding on the Applicant and the Applicant’s successors and assigns; and reference to this Decision shall be incorporated in ~~the condominium Master Deed and in each Unit Deed~~ every deed recorded for the Project and for any dwelling unit in the Project.
13. The Project shall consist of no greater than ~~sixteentwenty~~ (1620) three (3)-bedroom single family homes (“units”) ~~condominium units~~, ~~four (4)~~ five (5) of which shall be affordable to low or moderate-income purchasers, in perpetuity, to households at or below 80% of area median income.

VI. AFFORDABLE HOUSING

30. ~~Four (4)~~ Five (5) ~~condominium~~ units, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be sold to low or moderate income qualified purchasers, ~~unless purchased by one of the entities listed in paragraph 14 of this decision~~. These dwelling units shall be located on an Affordable Units Location Plan. These dwelling units shall remain affordable pursuant to the terms and conditions of this Decision, in perpetuity or for the longest period allowed by law. NOTE: THIS IS ADDRESSED IN PARAGRAPH 33.

IX. SITE DEVELOPMENT CONDITIONS

11. Roads – The Applicant is responsible for the sweeping, removal of snow, and sanding of the internal roadways and driveways permitting access to residents, emergency vehicles, and others during construction and until the ~~Condominium~~ Homeowner Association has

been legally established. The final coat of pavement on the internal roadways shall be installed after the base course has endured a full winter season. The Applicant shall promptly clean any debris or dirt deposited on Bourne or state controlled streets and roads.

29. The principal site access roadways should be signed for “No Parking” (MUTCD R7-1) and parking restrictions should be enforceable by the ~~Condominium-Homeowner Association~~ Documents.

49. The Applicant shall prepare ~~Condominium Trust and Condominium-Homeowner Association~~ documents. The ~~Condominium Trust-Homeowner Association~~ shall be responsible for the ownership, maintenance and repair of the roadways, storm water management systems, ~~the wastewater treatment facilities including denitrification components~~, retention ponds, recharge facilities, retaining walls, the open space parcels, and other common amenities and services. ~~The Condominium Trust and Condominium Association documents shall contain provisions for “limited” or “exclusive” common areas associated with the town homes with the effect that each unit owner, with the exception of the three (3) dwelling units closest to Sandwich Road, shall be responsible for maintaining the open space area immediately adjacent to his or her units so that the cost of maintaining the same shall not be a common expense assessed against any affordable unit or any market unit.~~

~~The Condominium Trust and Condominium Association Documents shall disclose the fact that nearby land is used by a gun club as a shooting range and provide that, by virtue of accepting ownership of a unit, unit owners acknowledge that they have purchased their units with full knowledge and acceptance of extraordinary noise emanating from the nearby land.~~ The ~~Condominium Trust and Condominium-Homeowner Association~~ documents shall be subject to review and approval by the Board’s counsel to insure compliance with the terms of this Comprehensive Permit decision. Said documents shall contain restrictions on all units preventing any increase in the number of bedrooms. ~~The number of bedrooms in any unit shall be determined in accordance with the Town of Bourne Board of Health regulations.~~ Prior to the sale of any unit, the ~~Condominium Trust and Condominium-Homeowner Association~~ documents shall be filed with Barnstable County Registry of Deeds.

The calculation of the percent of ~~common~~ interest in the Homeowner Association ~~off~~ for each ~~condominium~~ unit shall be determined pursuant to relevant laws of the Commonwealth governing ~~condominium ownership~~ homeowner associations.

57. Prior to issuance of any Building Permits, a permanent barrier ~~fence, sufficient to prevent the passage of vehicles,~~ must be installed and maintained between Chase Estates at 230 Sandwich Road, Map 25, Parcel 9 and 14 Bosun Lane, Map 25, Parcel 15. ~~This barrier to be in the form of a fence and/or berm sufficient to prevent the passage of vehicles.~~ This barrier ~~fence~~ must be maintained by the Applicant until the last dwelling unit is sold, and thereafter by the ~~Homeowner Association.~~

X. MISCELLANEOUS LEGAL REQUIREMENTS

1. The Applicant shall establish a ~~condominium owners' association (the "Condo Association")~~ Homeowners Association for the Project in a form reviewed by the Board's counsel, and approved by the Subsidizing Agency and including provisions for ~~operating and replacement~~ reserves to be established and maintained ~~for repairs to, or replacement of, and maintenance of the wastewater disposal system(s).~~
4. In setting the beneficial interest in the ~~condominium common areas in the Condominium Master Deeds~~ Homeowner Association, the Applicant shall comply with all relevant laws of the Commonwealth governing ~~homeowner associations.~~

XI. APPLICANT'S REQUESTED WAIVERS

...

...The following waivers are granted:...

Bourne Zoning Bylaw, Section 2400. Dimensional Regulations.

...

Bourne Zoning Bylaw, Section 4260. Nonconforming Affordable Lots.

...

Date August 10, 2020
To Bourne Zoning Board of Appeals
From Mark S. Bartlett, PE
Thomas C. Houston, PE, AICP
Project Preliminary Site Plan, Chase Estates Subdivision at 230 Sandwich Road
Bourne, MA, Barnstable County, under Comprehensive Permit no. 08-18,
Plan Submittal as Insubstantial Change
Subject Peer Review of First Submission of the Preliminary Site Plans and the
Preliminary Drainage Report

Professional Services Corporation, PC (PSC) reviewed the “*Preliminary Site Plan, Chase Estates Subdivision at 230 Sandwich Road, Bourne, MA*” on behalf of the Bourne Zoning Board of Appeals.

Thomas C. Pappas (Applicant) proposes to create a 20-lot subdivision for single family homes each with 3-bedrooms, under Comprehensive Permit (MGL Ch. 40B) rules on a 4.06-acre parcel of land. The land appears to be upland area. Key subdivision features include a 1,090-foot dead-end street, 24-foot right-of-way, and 5,000 square feet minimum lot areas with all lots to be served by individual conventional septic systems.

The project will be served by municipal water service that will extend from Sandwich Road via an 8-inch water main to a watermain stub at the rear of the property. Three hydrants are indicated on the drawings. Gas and electric services will be extended into the site from Sandwich Road.

The Proposed Project requires Approval by the Bourne Zoning Board of Appeals under Comprehensive Permit (MGL Ch. 40B) rules.

In order to provide the Zoning Board of Appeals with information necessary to reach a Decision on the Comprehensive Permit, we expect that revised plans and a revised stormwater report will be submitted. Unless specifically designated to be deferred for inclusion in the Final Site Plans, all comments hereinafter should be addressed in the revised plans and revised stormwater report to be submitted prior to Decision.

In accordance with the draft Comprehensive Permit Decision §VII 1. a., “Final Site Plans” consisting of detailed construction drawings will be submitted prior to construction that are consistent with the Comprehensive Permit, local bylaws and regulations that are not waived, Cape Cod Commission



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regulations, and with state and federal laws and regulations. The Final Site Plans will bear the signature and seal of a Massachusetts Professional Land Surveyor (PLS) and a Massachusetts Civil Professional Engineer (PE). Responses to comments specifically designated for inclusion in the Final Site Plans, may be deferred until submittal of the Final Site Plans.

SUBMITTAL

- A. Plan set with six (6) subdivision drawings with title *"Preliminary Site Plan, Chase Estates Subdivision at Sandwich Road in Bourne Massachusetts"* dated September 24, 2019, revised through October 30, 2019, signed and sealed by a Professional Engineer. Evidence of a Registered Land Surveyor is not provided.
- B. One (1) *"Emergency Vehicle Turning Movements..."* plan dated October 28, 2019 signed and sealed by a Professional Engineer.
- C. Memorandum on *"Traffic Impact Assessment, Proposed Chase Estates Residential Development, 230 Sandwich Road, Bourne, Massachusetts"* prepared by Vanasse & Associates dated November 19, 2019.
- D. *"Preliminary Drainage Report 'Chase Estates' Residential Subdivision in Bourne, Massachusetts,"* prepared by Outback Engineering dated September 24, 2019 and revised October 30, 2019 including plans, revision date 10/30/2019 (12 pages)
- E. Proposed Amended Comprehensive Permit including Supplemental Changes dated 09/17/2019 (26 pages)
- F. Supplemental Proposed Edits to Comprehensive permit: Single Family Homes vs. Condominiums and Fence to Prevent Access to Port-Of-Call dates 9/17/2019 (4 pages)

REFERENCE

- A. *"Town of Bourne, Zoning Bylaw"*, amended October 2019, printed February 13, 2020, §3490. Stormwater Regulations.
- B. *"The Town of Bourne, MA, Planning Board, Subdivision Regulations"*, amended May 25, 2017.
- C. Department of Environmental Protection, Massachusetts Stormwater Handbook.
- D. MassDOT *"Transportation Impact Assessment (TIA) Guidelines"* (2014).



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STORMWATER

The Proposed Project is subject to “Section 3490, Stormwater” of the Bourne Zoning Bylaw which requires a Stormwater Management Plan to be submitted and such plan should meet the Massachusetts Stormwater Management Standards as defined in the DEP’s Massachusetts Stormwater Handbook (MASWH). Therefore, compliance with the state’s DEP Stormwater Management Standards and consistency with the Massachusetts Stormwater Handbook are required.

General Stormwater Status of the Proposed Project:

The Applicant’s current preliminary submittals in support of stormwater management do not incorporate all information required by applicable regulations. Certain additional information required to better indicate the feasibility of the stormwater management system should be provided prior to Decision while additional detailed information may be deferred until submittal of the Final Site Plans. The Applicant’s submitted plans and “Preliminary Drainage Report” do not provide adequate information on pre-existing conditions (e.g. topography, land cover, and hydrology) for comparison with proposed project conditions. We observed that the site has been cleared of trees and vegetation. The predevelopment runoff analysis should be based on conditions prior to site alteration (pre-existing). Therefore, submittal of plans or aerial photos that depict the existing conditions and pre-existing conditions would be helpful for full project impact assessment. Either way, the project will result in a substantial increase in impervious area, significant grading changes, and substantial changes in the quantity and quality of stormwater runoff at the Site, yet none of these changes are presented. In general, the Applicant must submit a Stormwater Management Plan that complies with the requirements of the Bourne Zoning Bylaw (Section 3490) and the Bourne Subdivision Regulations (Section 352). Even if waivers from local rules are requested, the Applicant’s Final Stormwater Management Plan should at a minimum comply with the Massachusetts Stormwater Handbook. The submittals do not document compliance with the standards set forth in the MASWH.

The “Preliminary Drainage Report” presents a tributary area plan for six (6) post-development sub-catchment areas, and HydroCAD calculations for runoff from a 100-year 24-hour storm event (7.10 inches) being routed to three (3) subsurface infiltration systems of apparent sufficient size. However, there is no narrative explanation of the basis for these calculations, no backup or comparison to existing conditions (topography, land cover and hydrology), and no information on the proposed water quality treatment to protect the long term effectiveness of the subsurface infiltration systems which the proposed system is entirely reliant upon.



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Bourne Zoning Bylaw Section 3490, Stormwater Regulations (ZBSR):

Engineering review of stormwater issues cannot advance in a substantive way until the Applicant submits a Stormwater Management Plan in compliance with ZBSR Section 3490 and the MASWH. Specifically, the following submittals are required by Bourne Zoning Bylaw Section 3490:

1. The Applicant's submittal should evaluate compliance with Bourne Stormwater Regulations, specifically the requirements stated in ZBSR Section 3492 including subsections A, B and C.
2. Present information to comply with ZBSR Sections 3493 A through G.
3. Present information to comply with ZBSR Sections 3494 A and B.
4. Present information to comply with ZBSR Section 3495 A.

For the information presented to date, we offer the following comments:

5. The locations of the six (6) Holmes & McGrath recharge testing points, and the eight (8) soil evaluation test pits should be shown on the Grading & Drainage Plan. Except for test points DTP #5 and DTP #6, the locations of these prior infiltration tests and soil evaluations do not match up with the proposed systems, and the depths of the infiltration tests (which vary from 14-inches to 30-inches below grade) do not represent testing at an elevation below the proposed systems as required.
6. Additional testing will be required to comply with the Massachusetts Stormwater Handbook which requires that field tests, including saturated hydraulic conductivity tests, be conducted at the location of each recharge system and at the depth below the bottom of the proposed infiltration system. Because this information is required to better indicate feasibility of the stormwater design, we recommend that these tests be taken prior to Decision. See the following excerpt from MASWH Vol.3, p.11 (emphasis added by underlined text):

Determine Site Conditions at Specific Location Where Recharge is Proposed

The following actions shall be performed to determine soil conditions at actual location on the site where recharge is proposed:

Conduct tests at the point where recharge is proposed. The tests are a field evaluation conducted in the actual location and soil layer where stormwater infiltration is proposed (e.g., if the O, A and B soil horizons are proposed to be removed, the tests need to be conducted in the C soil layer below the bottom elevation of the proposed recharge system).

The tests shall be conducted by the Competent Soils Professional. The tests shall evaluate the following:



- *Soil Textural Analysis using NRCS methods*
- *Depth to seasonal high groundwater*
- *When "Dynamic Field" Method is proposed for sizing a field-derived saturated hydraulic conductivity must be determined as part of the site investigation.*

7. The Applicant should conduct additional soil tests and provide soils logs (in addition to the 2008 preliminary test pits) for test pits performed at the specific locations of proposed subsurface structures, including but not limited to soil descriptions, depth to seasonal high groundwater¹ and depth to bedrock. Test pits should be performed by a Massachusetts Registered Soil Evaluator, or a Soil Scientist as this is a requirement of the Massachusetts Stormwater Handbook.
8. We recommend that the saturated hydraulic conductivities used for the three infiltration systems should be more conservative to account for expected long term decrease in recharge performance. The infiltration rate used to design an infiltration BMP must incorporate a safety correction factor that compensates for potential reductions in soil permeability due to compaction or smearing during construction, gradual accumulation of fine sediments over the lifespan of the BMP and uncertainty in measured values when less permeable soil horizons exist within 5-feet below the proposed bottom elevation of the BMP. After completing additional testing as recommended above, the Applicant should discuss the variation in test results, and perhaps use the lowest test value found on site and/or apply a suitable factor of safety to account to the issues noted above.
9. Because many problems with infiltration practices can be traced back to poor construction, the Final Site Plans should include construction notes, including a call-out to such notes on the plans for each proposed infiltration system, to describe the construction measures to be followed to protect and maintain (during construction) the infiltration capacity of the soil where the infiltration systems are proposed.
10. For the proposed infiltration systems, provide information on design methodologies and assumptions, the depth to, and elevation of seasonal high groundwater and bedrock under each infiltration system component; and, mounding analyses are recommended to demonstrate the cumulative impact (mounding) and performance of these concentrated

¹ Also see Cape Cod Commission's Water Resources Technical Bulletin, 2019, Appendix B.



points of recharge. Such analyses are particularly important given the small lot sizes and proximity to foundations, retaining walls and septic systems.

11. The three subsurface recharge systems are the only proposed method to store and dispose of stormwater at the project site. The Applicant should discuss options for providing emergency overflow features for these systems to prevent street flooding in the event that one or more of these systems should fail. Also see comment 23 below.
12. Present design calculations to demonstrate that 44% TSS removal can be provided as pre-treatment for the proposed infiltration systems. On this issue, we note that four (4) “water quality inlet” tanks are proposed, but the plans and details do not specify the individual sizes that are proposed. Calculations should be submitted on the sizing for each of these tanks to achieve the required pre-treatment prior to infiltration practices.
13. In addition, for the Final Site Plans, the water quality inlet tanks should be designed as off-line units, i.e. designed to capture and treat first-flush storm flows, and then bypass larger stormflows. This requires that a bypass feature be installed upstream of the treatment device to split and divert flows higher than water quality flow around the treatment device. Otherwise, flowing all storm events through these tanks will lead to flushing of TSS and pollutants from the tanks and into the subsurface recharge systems.
14. Provide an existing condition topographic plan and be sure that it extends beyond the current project limits to include the local watershed limits that contribute flow from off-site. The proposed grading and drainage plan should incorporate this extended topography view as well, to present the totality of on-site and off-site drainage that will flow toward the project and proposed street and impact drainage systems’ capacities.
15. The stormwater report should discuss their evaluation of the feasibility of employing Low Impact Development practices (rain gardens, etc.), including an evaluation of storing and reusing roof runoff per ZBSR 3492, C.3.d.ii.
16. To be consistent with Cape Cod Commission recommendations, the Stormwater hydrologic calculations should be revised based on rainfall distributions recommended by the Northeast Regional Climate Center (NRCC).² Also, Nitrogen loading calculations should be submitted for review consistent with Cape Cod Commission recommendations³.

² See Cape Cod Commission’s Water Resources Technical Bulletin, 2019, pp. WR-27 to WR-28

³ See Cape Cod Commission’s Water Resources Technical Bulletin, 2019, Appendix A



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17. The total volume of discharge as well as peak rate should be evaluated at each control point for various storm events. The HydroCAD model provides some of this data, however the stormwater report does not present a pre- to post- evaluation table to compare volumes and peak rates per ZBSR 3492, C.3.e.
18. The stormwater report should include an Operation and Maintenance Plan per ZBSR 3493, G.3.f.
19. The Final Site Plans should include a Sediment and Erosion Control Plan per ZBSR 3494, A & B.

Bourne Planning Board Subdivision Regulations (BSR) for Stormwater:

The submittal does not include an evaluation of compliance with Bourne Planning Board Subdivision Regulations (BSR) regarding stormwater management and road drainage.

20. We recommend that the stormwater report should present a complete point by point discussion of their compliance with the BSR and provide an *Environmental Information Report* as specified in BSR Section 264. In addition, we emphasize the following specific items of compliance as required within Section 352 *Stormwater Management*:
21. The velocity of gutter flow will be rapid due to the steep continuous downgrade on the project road. Therefore, the spacing of catchbasins should be limited to 150 ft. on center and the stormwater report should include calculations of gutter flows, spread and inlet capacity for the 25-year and 100-year storms (per BSR Section 352, A., 1, 2 and 3).
22. Drainage pipe and gutter flow calculations (per BSR Section 352.A.4) should be provided to demonstrate adequate capacity, and that storm flow velocities will be within the limits noted in BSR Section 352, A., 5.)
23. The applicant should demonstrate how the proposed infiltration systems will comply with BSR Section 353, B.,4.,d) which requires “*the SMS⁴ shall be designed and constructed so that operational failure of the infiltrative capacity of the SMS will be manifested by indicators that are readily visible.*”
24. The Final Site Plans should provide an Erosion Control Plan (per BSR Sections 261, b, 1. and 264, c).
25. The design plans and Stormwater Management Report (yet to be submitted) should demonstrate compliance with BSR Section D, and we note that this section requires

⁴ Stormwater Management System



subdivisions to meet Massachusetts Stormwater Design Requirements in Volume 3 of the aforementioned DEP Handbook with the following exceptions and additions:

- *Standard 4 - Water Quality: Water Quality Depth (Dwq) as described in Volume 3, Chapter 1, page 32, shall be 1.70 inches for all projects. Prior to discharge into all treatment SMSs, for compliance with Standard 2, the removal of a minimum of 44% TSS is required.*
- *Impervious Cover: Impervious cover is measured from the site plan and includes all impermeable surfaces and any other surfaces that are not vegetated (such as a gravel surface). Pervious pavers utilized for driveways, sidewalks, patios, when installed to infiltrate water beneath them into the native soil can be considered pervious.*
- *Prohibited Practices: The following practices are prohibited*
 - a) Pervious pavements for road surfaces.*
 - b) Below grade infiltration structures such as leaching catch basins for the treatment and/or control of road runoff for new subdivision roads.*

Massachusetts Stormwater Management Standards:

26. The Applicant should submit a final Stormwater Management Report which should include an evaluation of compliance with the ten (10) Stormwater Management Standards as presented in the Massachusetts Stormwater Handbook. Until such submittal is provided, we cannot offer additional peer review comments on proposed stormwater management compliance with MASWH.

Hydraulic Issues

27. We have a concern regarding the interconnected leaching galleys A through F. The total elevation difference between the top of galley F and the bottom of galley A is approximately 35 ft. Absent an emergency overflow, should all galleys reach saturation the system would create a head of approximately 35 ft. (15 psi) potentially causing soil instability. In any instance large storms would disproportionately impact Galley A and minor storms would disproportionately impact Galley F.

REVIEW OF PROJECT PLANS

Presented below is a sheet by sheet engineering commentary on the submitted plan set with six (6) subdivision drawings with title “*Preliminary Site Plan, Chase Estates Subdivision at Sandwich Road in*



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Bourne Massachusetts” dated September 24, 2019, revised through October 30, 2019, signed and sealed by a Professional Engineer.

28. A Massachusetts Professional Land Surveyor (PLS) is not provided for the project plans. A PLS must sign and seal the existing conditions sheet and the lotting sheet of the Final Site Plans.
29. As noted earlier, an Existing Conditions Plan is not submitted with this current plan set. When submitted, this additional plan should include references to original topographic survey and property lines and add notes on the location(s) of any private wells within 500 feet of the site, and the location(s) of the nearest wetland areas or other environmentally sensitive areas. If submittal is deferred to the Final Site Plans, changes shown on the detailed survey may require design revisions.
30. The design intent would be better established if an Erosion and Sedimentation Control Plan were submitted prior to Decision but may be deferred until submittal of the Final Site Plans. This plan should describe the erosion control measures to be employed to prevent erosion of exposed slopes, show a specified Limit of Disturbance at the Site perimeter, show limits of sedimentation control barriers internal to the Site, show proposed soil stockpile areas and proposed temporary stormwater management basins, and provide for a construction entrance design to prevent tracking of sediment and dust onto Sandwich Road. The plan should be consistent with the requirements of Zoning Bylaw Section 3494 A. and B., and a narrative version should be provided in a Stormwater Management Report to be submitted. In addition, this plan should note estimated total cuts and fills along with the net volume of cut/fill to be trucked on or off site and the anticipated number of off-site truck trips to transport this net cut/fill volume.⁵

Preliminary Site Plan (Sheet 1 of 6)

31. When incorporated in the Final Site Plans, the General Notes section of this sheet be expanded, or perhaps created as a separate sheet, to include, for example, comprehensive notes on site controls (vertical and horizontal datum and benchmarks), construction standards, construction sequencing, erosion and sedimentation control procedures, and environmental (noise, vibration, dust and sedimentation), and safety compliance.

⁵ The draft Comprehensive Permit Decision requires that “Final Site Plans” consisting of detailed construction drawings must be submitted prior to construction that are consistent with the Comprehensive Permit, local bylaws and regulations that are not waived, Cape Cod Commission regulations, and with state and federal laws and regulations. Revisions required to respond to the comment may be deferred until submission of the Final Site Plans.



32. We recommend that the zoning compliance table be revised to also present the Zoning Bylaw dimensional requirements for Non-Conforming lots per Table 2456 and to compare the various proposed non-conforming lots to such standards also.
33. Required and available stopping sight distances should be shown at the proposed road intersection with Sandwich Road.
34. Does MassDOT propose to install a sidewalk in Sandwich Road?
35. We recommend that the proposed area (square feet) of the house footprints be shown.
36. Proposed curbing should be noted in the legend. Given the steep grade of the street, we recommend that vertical curbing be specified to best control drainage flows at the gutter lines.
37. Is there a drainage system in Sandwich Road that could receive emergency overflow from the proposed subdivision system? If so, this system should be shown.
38. The Applicant should confer with the Bourne Fire Department and an approval letter should be obtained stating that the Department is satisfied with access, water supply, and all life safety requirements.
39. Proposed streetlights should be shown on the Final Site Plans, with maximum pole height per Town requirements, and light fixtures should be consistent with residential scale and style typically acceptable in the town and should comply with all dark-sky requirements of the Cape Cod Commission.⁵
40. A photometric plan should be provided with the final plans to demonstrate lighting levels at the street and at property lines.⁵
41. Given the density of the project and the steep centerline grades and to accommodate snow storage and visitor parking, the driveway width of 20 feet should be increased to 24 feet, which is also the Town standard for a *Minor Street: A Street with anticipated traffic equivalent to that generated by fewer than 50 dwelling units*. With a 20 ft. pavement width, on street parking could not be allowed to assure emergency vehicle access and thus additional and visitor parking could not be accommodated.
42. The dead-end length of 1,090 feet exceeds the Town's maximum safety standard. The Town adheres to a maximum 500 feet length for dead end roadways. Waiver of strict compliance is required.



43. One side of the primary on-site road should be posted as “No Parking” in order to ensure the passage of emergency vehicles in combination with the increased 24-ft. pavement width.

Preliminary Lotting Sheet (Sheet 2 of 6):

44. This lotting sheet with presentation of property descriptions (metes and bounds) should be included in the Final Site Plans and should be signed and sealed by a Massachusetts Professional Land Surveyor.
45. Notes should be added to the Final Site Plans on the need to comply with the lot bound requirements of the Bourne Subdivision Regulations; and, add a note if any proposed lots do not meet the Bourne lot shape factor requirements.

Preliminary Utility & Profile Sheet (Sheet 3 of 6):

46. The profile starts at the curb line of Sandwich Road. It would be preferable to show the station line for the new road extending to the centerline of Sandwich Road, and to show the station point of Sandwich Road at such connection based on record drawings. Also, surface topography for the intersection area is missing from plan view, so elevations shown at the beginning of the profile view may be inaccurate.
47. In addition to showing the proposed catch basins and drain manholes, we recommend adding the proposed drainage lines, water quality inlet tanks, and infiltration systems to the profile view including proposed depth of structures and depths to bottom of stone. Addition of this information prior to Decision is recommended and addition of this information for the Final Site Plans is required.
48. The feasibility of the design would be better established by adding the approximate invert elevations for the septic system leaching areas (as this is relevant to potential drainage system and infiltration system setbacks) to the Final Site Plans.⁵
49. The Final Site Plans should show proposed roof drain leader connections to the street drain system, if any.⁵
50. The final plans should identify the pipe material, approximate age, and condition of the water main in Sandwich Road, and provide the proposed material of the new water main, and a note to call for coordination with the correct Bourne water district, including names and contact information.⁵
51. The water main profile should be extended to include the hydrant at the terminus.



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August 10, 2020
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52. Fire flow test data should be submitted for the existing water main in Sandwich Road.
53. The project elevation at the rear of the site is about 80 feet above the entrance. The change in elevation will reduce available pressure at street level by approximately 35 psi. Calculations of deliverable fire flow including simultaneous domestic demand while maintaining a minimum residual pressure of 20 psi should be submitted.
54. To ensure water quality and adequate pressure it is preferable that the water system should be looped through to a location having adequate pressure and flow. Contact with abutting property owners should be documented. Currently about 1,090-feet of waterline is proposed as dead end.
55. The Final Site Plans should provide notes requiring advanced coordination with the utility service companies, including names and contact information, for the proposed gas, electric lines, and cable lines.⁵

Preliminary Grading & Drainage Plan (Sheet 4 of 6):

56. See comment 46 recommending additional topography at the Sandwich Road intersection; and, see comment 14 recommending an extended view of existing topography at the limit of watershed tributary to the project, to present the totality of on-site and off-site drainage that will flow toward the project and proposed street drainage system.
57. In several instances the setback of proposed septic system leaching areas is less than the 50-foot setback required by MASWP. Locations should be revised to correct this.
58. This plan indicates that fourteen (14) or more retaining walls will be required to achieve the desired site grades, and these walls vary in height up to 6-feet or more; and, there are several compound wall sets proposed. The design provided on the final plans will need to be designed by a Structural Engineer registered in the state of Massachusetts.⁵ Calculations for factor of safety against overturning, sliding and bearing capacity be required for any section over 4 feet in height, and the proximity of septic system and drainage recharge systems should be factored into the designs. Test holes should be required in the areas where the walls exceed 10 feet in height to determine soil type. Soil information can then be used to determine the factor of safety for bearing capacity. If the structural plans are provided by a wall manufacturer then the Board should require that the plans be based on site specific geotechnical information and should not accept plans that are qualified by requiring further determination of geotechnical conditions after issuance of the signed and sealed structural drawings.



59. The Final Site Plans should provide methods for sheeting, shoring, and bracing for taller wall segments adjacent to property lines to limit encroachment onto adjacent properties during excavation and backfill.⁵
60. The Final Site Plans should show safety fences as part of wall designs.⁵
61. The ZBA should require private maintenance of the proposed walls.
62. Given the density of this project and roadway lengths, snow storage is a concern. Snow storage areas should be designated on the plan outside paved or on adjacent grassed areas that maximize recharge. A note should be added to the plans calling for snow removal offsite if capacity is exceeded.
63. The Final Site Plans should provide more detailed grading information and it is possible that more retaining walls than those shown will be required.⁵

Preliminary Construction Detail Sheet (Sheet 5 of 6):

64. The system elevations of tanks and chambers, inlet and outlet drain lines, diversion structures (for off-line tank bypass flows) and locations of inlet and outlet cross connection pipes should be determined and included in the HydroCAD stormwater model. The flow sequence and operation of these systems should be clearly explained in a narrative which should be added to the Stormwater Management Report.
65. Notes and details should be added to this sheet (or another detail sheet) to fully explain the three infiltration system designs, including all structure and stone and pipe invert elevations. Assuming that these recharge systems will have cross connections to help distribute stormwater within the chamber systems, such cross connections including internal erosion controls and elevations should be designated.
66. Each infiltration system should be listed with the following reference elevations (top of stone, bottom of structure, and finished grade provided for galleys only):
 - i. seasonal high groundwater levels at each system area
 - ii. bottom of stone in each system
 - iii. bottom and top of chambers in each system
 - iv. top of stone in each system
 - v. elevations of all inlet and outlet pipes, and
 - vi. elevations of finished grades above the systems.



67. As noted earlier, the Final Site Plans must be based on design calculations for the 4 water quality inlet tanks (the pretreatment BMPs prior to the infiltration systems), specifically for sizing so that dimensions can be shown on this detail sheet, and following are required.⁵
- i. The tank sizes with backup calculations need to be shown and on the detail sheets. Each tank serves a different size tributary area so each design will be different. Tanks should be rated for structural highway loads.
 - ii. In addition to determining tank sizes for each area, the designs should determine the diversion weir height at each diversion manhole (and such manholes need to be added), and details of these diversion manholes should be provided on this detail sheet. The weir height at each diversion manhole should be based on hydraulic calculations to divert the “first-flush” stormflow (per town requirement in BSR Section D and comment 25 above concerning Water Quality Depth of 1.7-inches). Storm flows that exceed first flush flow should flow over the weir, to bypass the treatment tank and pass directly to the infiltration system. In this way, each tank will not be flushed or stressed by unnecessary excess flow.
68. Consistent with comment 48, it would be appropriate to add a table to this sheet that lists the approximate invert elevations for the various septic system leaching areas, including estimated seasonal high groundwater at each location (as this will be relevant to potential drainage system and infiltration system setback issues).

Preliminary Construction Detail Sheet (Sheet 6 of 6):

69. A detail is shown for cape cod berm. As recommended in comment 36, vertical curbing be should be specified, and a detail added to this sheet.
70. The width of sidewalk should be shown on the *Bituminous Concrete Sidewalk* detail (the Town specifies sidewalks to be 5-feet wide) with a cross slope of 3/8 in./ft. To ensure Architectural Access Board (AAB) compliance, a width of 5 ft. excluding curb width (5½-ft. with a 6-in wide curb) and a cross slope of 1½% should be provided.
71. The *Bituminous Concrete Pavement* detail should be revised to call for 2.5-inches of concrete binder course to provide a total pavement thickness of 4-inches per Town requirement. Also revise the *Typical Roadway Cross Section* detail to 2.5-inches of binder.
72. It is unclear why the *Precast Sewer Manhole* detail is provided on this sheet.
73. Cascade grates should be specified for all catch basins located on profile grades of 6% or greater. Inlet capacity calculations should be provided as noted in comment 21.



Professional Services
Corporation, PC

Memorandum

Date August 10, 2020
To Bourne Zoning Board of Appeals
From Thomas C. Houston, PE, AICP
Project Preliminary Site Plan, Chase Estates Subdivision at 230 Sandwich Road
Bourne, MA, Barnstable County, under Comprehensive Permit no. 08-18,
Plan Submittal as Insubstantial Change
Subject Peer Review of First Submission of the

Professional Services Corporation, PC reviewed the submitted Traffic Impact Assessment for Chase Estates¹. The submittal consisted of the text of the report only and did not include traffic count data, crash data, sight distance determinations, traffic volume calculations, or intersection operations analyses. We have requested that copies of the above technical data and analyses be submitted. We have deferred our detailed review until this information is submitted.

¹ Memorandum on "Traffic Impact Assessment, Proposed Chase Estates Residential Development, 230 Sandwich Road, Bourne, Massachusetts" prepared by Vanasse & Associates dated November 19, 2019

Ten Lincoln Road
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Foxboro, MA 02035-1387

Tel. 508.543.4243
Fax 508.543.7711

Chase Estates

Town of Bourne Comprehensive Permit #08-10
Notice of Project Change

Chase Developers, Inc.

Proposed Amended Comprehensive Permit Including Supplemental Changes

Attached is the proposed Amended Comprehensive Permit for Chase Estates. This is the same as previously submitted in advance of the Board's August 21, 2019 meeting, except for (i) the changes noted in the Supplemental Proposed Edits document filed simultaneously herewith, and (ii) formatting edits (alignment of paragraph numbers).

DECISION UPON APPLICATION OF CHASE DEVELOPERS, INC.

FOR A COMPREHENSIVE PERMIT UNDER MASSACHUSETTS GENERAL LAWS CHAPTER 40B, s.20-23

I. APPLICANT AND PUBLIC HEARING

[RECITE PROCEDURAL HISTORY OF ORIGINAL AND AMENDED PERMIT]

The total Project shall include no more than twenty (20) single family homes ("units") with no more than three (3) bedrooms each (including the affordable units). Five (5) of the units, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be affordable to qualified purchasers, in perpetuity.

The minutes and exhibits from the public hearing are available for public inspection in the office of the Town Clerk. A list of the exhibits is contained in the record and is appended hereto by reference.

II. NATURE OF APPLICATION; PROCEDURE REQUIRED BY STATUTE

In conducting its hearings in this matter, the ZBA is guided by G.L. c.40B, s.20-23 and applicable regulations.

III. GOVERNING LAW

The law governing this case is The Low and Moderate Income Housing Act, Massachusetts General Laws, Chapter 40B, §§ 20-23 (the "Act"), and the regulations promulgated by the Department of Housing and Community Development ("DHCD") Housing Appeals Committee, 760 CMR 56.00 (the "Regulations").

SUMMARY OF DECISION

The ZBA hereby approves with the conditions set forth below, a comprehensive permit for Chase Developer's Inc. for the Project depicted on the plans and materials identified in the record, specifically including twenty (20) dwelling units and consisting of five (5) units of low or moderate income housing pursuant to the terms, conditions and obligations imposed by G.L. 40B, s.20-23.

IV. THE RECORD BEFORE THE BOARD UPON WHICH THIS DECISION IS BASED.

1. C 1.1 Title Sheet, dated [date of revised plan], prepared by Outback Engineering

2. C2.1 Site Layout Plan, dated [date of revised plan], prepared by Outback Engineering
3. C3.1 Site Grading, Drainage and Utility Plan, dated [date of revised plan], prepared by Outback Engineering
4. C4.1 Site Erosion Control Plan, dated [date of revised plan], prepared by Outback Engineering
5. CS.I Site Landscape Plan, dated [date of revised plan], prepared by Outback Engineering
6. C6.1 Site Details, dated [date of revised plan], prepared by Outback Engineering
7. C6.2 Site Details, dated [date of revised plan], prepared by Outback Engineering
8. [Revised architectural drawings to be provided]
9. [Other documents entered into the record]

V. GENERAL CONDITIONS

1. The plans referenced above are the "Approved Plans."

The Applicant or its agents shall maintain a copy of the Approved Plans and this Decision at the Site during construction.

2. This Decision shall be noted on the Approved Plans and both this Decision and the initial site plan sheet of the Approved Plans shall be recorded at the Barnstable County Registry of Deeds. Proof of recording shall be forwarded to the Building Inspector prior to ~~construction~~issuance of a building permit.

3. The Applicant shall comply with all local bylaws, rules and regulations of the Town of Bourne and its boards and commissions in effect as of the date of this decision unless expressly waived herein or as otherwise addressed in these conditions.

4. The Applicant shall pay all fees of the Town of Bourne imposed generally with respect to construction projects and for the purposes of monitoring compliance of the construction and occupancy of the Project in accordance with this Comprehensive Permit, unless otherwise waived in this Decision; ~~provided, however, that the Applicant is not required to pay any fee for the Board or the Town to employ any outside consultant.~~

5. The Applicant shall copy the ZBA on all material submissions made by or on behalf of the Applicant for permits or approvals from any federal, state, county, or Town official, board or commission that concerns the design and/or conditions set forth in this Decision, including but not limited to all testing results, official filings and other permits issued for the Project.
6. The Applicant shall comply in all respects with the State Building Code and any local published regulations or published schedule of fees of the Building Inspector. The Applicant shall pay all required fees for all such building permits including any fees customarily charged for inspections and permits unless otherwise waived in this Decision.

7. Prior to the commencement of construction, site development, or clearing, the Applicant shall post with the Town Treasurer security for Site Stabilization and Restoration. Prior to issuance of a Building Permit, **vehicle access**, emergency vehicle access, **and utility service** shall be provided to the site of each building for which a building permit is sought **in accordance with a phasing plan approved by the Board**. Prior to issuance of any Certificate of Occupancy, the Core Site Improvements required to provide vital access and utility service to all dwelling units, or those dwelling units contained within a particular phase of the Project as shown on a Phasing Plan approved by the Board, shall be complete as determined by the Board. Prior to issuance of any Certificate of Occupancy the applicant shall post the Minimum Required Security with the Town Treasurer for the overall project or for a particular phase of the Project as shown on a Phasing Plan approved by the Board. Once posted, security shall remain in full force and effect until the work secured thereby is satisfactorily completed as determined by the Board. However, the instrument serving as security may be changed by the Applicant from time to time with the agreement of the Board as set forth hereinafter. Failure to maintain the Minimum Required Security in full force and effect shall constitute due cause for the Building Inspector to revoke Building Permits. The Board may increase the Minimum Required Security to be posted by the Applicant if the Board determines that the actual construction cost plus contingency to complete the Site Improvements is ten percent (10%) more than the posted security value. The Applicant shall post additional security within forty-five days following receipt of notice from the Board. Upon completion of the work or portions thereof for which security has been provided, the Applicant may petition in writing with a copy to the Town Clerk for reduction or release of the posted security pertaining to the work completed satisfactorily as determined by the Board. If the work has been completed to its satisfaction, the Board will reduce the Minimum Required Security. If the work has not been completed to its satisfaction, the Board will inform the Applicant of the nature of the deficiencies in the work and will forgo or limit the amount of security authorized for release. The Board's decision with respect to release of security will be rendered within 45 days following receipt of the petition. The instrument serving as security may consist of cash, a bankbook, a performance bond, or a trilateral agreement between a bank having a first mortgage on the property, the property owner, and the Town. The form of security shall be acceptable to the Board only if the language of the security agreement is acceptable to Town Counsel, both as to form, substance, and as to the financial stability of the bonding company or the bank that is party to any Trilateral Agreement. As used in this Decision, the term "Minimum Required Security" shall mean an amount established by the Board

that is based upon the anticipated cost to be incurred by the Town in the event the Town completes all remaining work in accordance with applicable public procurement practices plus a construction cost contingency of fifteen percent (15%), except that the amount of security required shall never fall below ten percent (10%) of the amount first posted until final acceptance of all work, and security for plant materials shall not be released until one year has passed following initial planting. The term "Site Improvements" shall mean all required clearing, earthwork, paving, utilities, storm-drain including water quality measures and retention or detention facilities, paving, curbing, walkways, lighting, site entrance, retaining walls, septic systems, landscaping, testing, erosion controls, cleanup, and as-built drawings and data in compliance with the approved plans and Conditions of Approval. For the purposes of determining the Minimum Required Security, site improvements shall not include residential structures or site improvements within 10 feet of residential structures being submitted for a Certificate of Occupancy. The term "Core Site Improvements" shall mean "Site Improvements" as defined above but excludes the top course of the sidewalk and main access roadway pavement and tree and shrub planting. The term "Site Stabilization and Restoration" shall mean stabilization of disturbed areas and shall include grading, placement of a 2 inch thick layer of "plantable soil borrow," hydroseeding or other acceptable erosion control measures and establishment of ground cover consisting of a "woody mix" of grass, wildflower, shrub, and tree seeds.

8. Nothing in this Decision shall be interpreted as relieving the Applicant of its burden to obtain easements, licenses or written permission from any abutting property owner if, during the course of construction, it becomes necessary to enter upon abutting land for construction or planting purposes.
9. Each condition in this Decision shall run with the land and shall, in accordance with its terms, be applicable to and binding on the Applicant and the Applicant's successors and assigns; and reference to this Decision shall be incorporated in every deed recorded for the Project and for any dwelling unit in the Project.
10. This Decision permits the construction, use, and occupancy of twenty (20) three (3) bedroom housing units on the Site. The construction and use of the Site shall be in conformity with the Plans as modified by the Approved Plans, and there shall be no creation of additional housing units or any other structures or infrastructure or any increase in the number of bedrooms, except that which is shown on the Approved Plan, without further approval of the ZBA in the form of amendment to this Decision.

11. Prior to the commencement of construction on the Site, the Applicant shall have obtained all necessary permits and approvals for access to Sandwich Road (Route 6A) from state or county agencies.
12. Intentionally omitted.
13. The Project shall consist of no greater than twenty (20) three (3)-bedroom single family homes ("units"), five (5) of which shall be affordable to low or moderate-income purchasers, in perpetuity, to households at or below 80% of area median income.
14. Intentionally omitted.
15. The development and dwelling units shall comply with any applicable laws or regulations regarding handicap access.
16. Intentionally omitted.
17. Intentionally omitted.
18. No dwelling unit shall contain more than three (3) bedrooms, as the term "bedroom" is defined in 310 CMR 15.000 (Title 5 regulations).
19. Intentionally omitted.
20. Intentionally omitted.
21. No internal roadways within the Project shall have a traveled way width of less than ~~twenty-~~
twenty-four (2024) feet in width exclusive of berms and curbs.
22. The number and location of the fire hydrants installed within the Project shall be as directed by the Fire Chief, and shall comply fully with applicable laws, codes, and requirements including without limitation NFPA and Bourne Water District requirements to be depicted on the Final Site Plans (as defined in Paragraph XIII.I, below).
23. ~~Four (4)~~
Five (5)-foot wide sidewalks, exclusive of the ~~Cape Cod berm~~
6-inch wide vertical separating the sidewalk from the road, shall be constructed along the entire road "going up the hill", and the width shall be increased in the area of any signs or other obstructions in order that there is at least a continuous 4 foot wide walking area throughout the entire sidewalk.
24. Intentionally omitted.

25. This Comprehensive Permit is conditioned upon the applicant obtaining an expanded ~~Access Permit from MassDOT foreurb-cut permit from Mass Highway for access to~~ the Project approved herein, regardless of whether or not obtaining said expanded permit triggers the Massachusetts Environmental Policy Act or other state or regional regulatory requirements. **The Access Permit from MassDOT shall be obtained and recorded in the Barnstable Registry of Deeds prior to construction.**
26. Intentionally omitted.
27. Intentionally omitted.
28. Intentionally omitted.
29. Intentionally omitted.

VI. AFFORDABLE HOUSING

1. Five (5) units, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be sold to low or moderate income qualified purchasers. These dwelling units shall be located on an Affordable Units Location Plan. These dwelling units shall remain affordable pursuant to the terms and conditions of this Decision, in perpetuity or for the longest period allowed by law.
2. Phasing-in of Affordable Units: No more than three certificates of occupancy shall be issued by the Building Inspector for units designated for sale at fair market prices (the "Market Rate Units") until at least one certificate of occupancy is issued for an Affordable Unit. The proportion of Market Rate Unit certificates of occupancy issued to Affordable Unit certificates of occupancy issued shall at no time exceed 3:1. The last unit sold shall be a Market Rate Unit. The Affordable Units shall be reasonably interspersed within the Project **and shall be shown on the site plans prior to Decision.**
3. The affordable units shall be sold to qualified households whose gross annual income is no greater than eighty percent (80%) of the median family income for Barnstable County, as published annually by the U.S. Department of Housing and Urban Development, adjusted for household size, and whose assets do not exceed the then current DHCD guidelines. The maximum sale price for the affordable units shall be the maximum purchase price affordable for a household with an income that does not exceed seventy percent (70%) of the median family income for Barnstable County, as published annually by the U.S. Department of Housing and Urban Development.
4. Each conveyance of an affordable unit shall include a Deed Rider or Affordable Housing Restriction, in the form approved by the subsidizing agency, which shall contain a restriction requiring that the unit remain affordable to an eligible buyer in perpetuity. The Deed Rider shall be recorded senior to any liens on the Premises to protect the continued

availability of and requirement for the affordable units in the event of any foreclosure, bankruptcy, refinancing, or sale. Prior to the sale of any unit, the unit owner or his/her agent shall submit to the Bourne Housing Partnership Committee (BHPC) for its approval written rules for the selection of buyers of affordable units (the Buyer Selection Rules).

The Buyer Selection Rules shall provide that all affordable units are to be sold through a lottery or buyer selection process, subject to the review and approval by the BHPC or its designee. Notwithstanding the foregoing, the restrictions and Buyer Selection Rules shall conform to the requirements of the subsidizing agency. The Applicant shall be responsible for all fees and expenses necessary to implement the initial buyer selection process, including all marketing and advertising costs; fees and expenses for subsequent re-sales shall be the responsibility of the seller

5. Unless disapproved by MassHousing, the Bourne Housing Partnership Committee (BHPC) or its designee shall monitor all sales and re-sales of affordable units in accordance with a Monitoring Agreement in the form required by MassHousing. The Monitoring Agreement shall be fully executed prior to the issuance of a building permit for any of the dwelling units permitted by this Decision.
6. Re-sales and Refinancing: Whenever an affordable unit is to be resold, the owner of such unit shall notify the BHPC or its designee, in accordance with the Regulatory Agreement and Deed Rider, and shall enter into a Monitoring Agreement, as approved by the Board's counsel, with either the BHPC or its designee, to monitor the re-sale to assure the continuous affordability of the unit and the purchase of the unit by an eligible buyer. The sale price shall be determined in the same manner as discussed above. The Monitoring Agreement shall require that the seller pay the cost of monitoring re-sales. Whenever an affordable unit is to be refinanced, the owner shall notify the BHPC or its designee, in accordance with the Regulatory Agreement and the Deed Rider, which shall state that the amount of all mortgages, home equity loans, and other loans secured by the affordable unit shall not exceed the maximum sales price calculated in accordance with this Decision. In addition to the foregoing, resale and refinancing arrangements shall conform to the requirements of the subsidizing agency.
7. All affordable units shall be indistinguishable from the exterior from the market rate units. The construction specifications for the affordable units shall be identical to the construction specifications of the market rate units. This condition shall not prohibit a market rate buyer from purchasing upgraded appliances, carpeting, countertops, or other interior amenities from the Applicant or its assigns.

VII. MARKETING/LOTTERY AFFORDABLE UNITS

The following conditions are imposed with respect to the issues of marketing, minority outreach, lottery, resale formula, perpetual affordability, and the deed rider as follows. The BHPC may direct the applicant to take additional steps to carry out the purposes of these conditions.

The selection of purchasers for the Affordable Units, including the administration of the Lottery, shall be administered by a consultant retained by the Applicant, subject to the Subsidizing Agency's approval. The Lottery shall be implemented pursuant to a Lottery Plan developed by the lottery consultant and approved by the Subsidizing Agency. If acceptable to the Subsidizing Agency, disputes concerning income or other qualification shall be resolved in the first instance by the Monitoring Agent and a party aggrieved by qualification-related decision of the Monitoring Agent may appeal the decision to the ZBA for a final determination.

The provisions of this section are intended to complement and not to override or supersede any applicable requirements of the Subsidizing Agency, fair marketing regulations of the Department of Housing and Community Development, the Massachusetts Commission Against Discrimination, MassHousing, or any authority with jurisdiction and like purpose, to provide low and/or moderate income housing.

1. A lottery will be held to locate buyers for each Phase of Development. Advertisements will be run in local area papers announcing the availability of homes, income guidelines, and contact information for obtaining applications. Mailings shall be sent to, and shall include but not be limited to, the Local Housing Partnership, the Bourne Town Hall, the Housing Assistance Cooperation of Hyannis, DHCD, local public libraries, local places of worship, and housing assistance organizations, as well as applicants for prior phases of previously approved comprehensive permit projects that were not chosen in the previous lotteries. Each group will receive a copy of the advertisement as well as some blank applications.
2. In addition to the local community papers, advertisements shall be sent for publication to minority publications such as the Bay State Banner; El Mundo, etc., and mailings will be sent to local/regional organizations, social service agencies that have connections to minority communities, such as the NAACP and the Wampanoag Tribal Council. Prior to each lottery, the marketing agent will contact DHCD for an updated list of suggested publications. The outreach/marketing program shall be for a period of at least sixty (60) days prior to the selection of buyers.
3. Applications received from the outreach program will be reviewed and pre-screened for qualifications. Follow-up information will be requested as necessary to ensure that all applications include information as to Down Payment availability, mortgage pre-approval, assets, and first time buyer status. Upon review and receipt of all information, lottery applications will be placed into a pool based upon family size for the one and two bedrooms homes in each phase. A random drawing will then be conducted to select the designated number of candidates for each phase. All Applicants will be notified after the lottery of their status. Notifications will include information as to whether or not they were included in the lottery. If not, an explanation will be provided. All Applicants that were included in the lottery will be notified as to whether or not they were chosen. Those that were chosen during the drawing will be notified of a tentative delivery date for their home and will be contacted for an individual appointment to process their purchase. Those that were not chosen will be notified and advised that they will be notified of and included in subsequent drawings in future phases if they so choose.

4. To the extent permissible by law, the lottery system shall provide for residential preference of the Town Percentage (hereinafter defined) of the affordable units, so that only "Town residents" and minority applicants shall be included in the pool for each lottery for up to 70% of the affordable units sold to an eligible household. Thereafter, the lottery pool shall include all applicants, including but not limited to "Town residents." A "Town resident" is defined to include an applicant who lives or has lived in Bourne, currently works in Bourne, or who has immediate family (grandparents, parents, children, or siblings) who live in Bourne.
5. Minority applicants, if any, shall be included in all lottery pools.
6. In each of the above scenarios the three bedroom units will be reserved for first time homebuyers (defined as not having owned a home within three (3) years prior to the purchase, or a family that has been displaced by a divorce, etc.) and agree to occupy the unit as a primary residence.
7. Eligibility shall be determined prior to each lottery by using the current year HUD Median Income figures for Barnstable County. In all cases total household income and current assets for the family will be used to determine eligibility.
8. The re-sale of all affordable units shall be governed by the Deed Rider and/or Affordable Housing Restriction prepared by the subsidizing agency and shall be considered incorporated within this Decision.
9. All homeownership affordable units shall be owner occupied, except as may be allowed by the applicable subsidizing agency Deed Rider or Affordable Housing Restriction.
10. The above conditions concerning eligibility, pricing, affordability in perpetuity, monitoring, and owner occupation shall be set forth in a Deed Rider attached to all affordable units. The Deed Rider shall be recorded immediately following the Deed and shall be senior to any liens on the Premises to protect the continued availability of and requirement for the affordable units in the event of any foreclosure, bankruptcy, refinancing or sale.
11. The Applicant shall obtain the Subsidizing Agency's approval of a Buyer Selection Plan for the sale of the Affordable Units prior to putting any of the Affordable Units on the market. Buyers shall be selected through a fair lottery process (the "Lottery"), acceptable to the Subsidizing Agency.

VIII. CONSTRUCTION AND SUBMISSION REQUIREMENTS

1. Pre-Construction Submissions: Before the Applicant commences any construction activities the Applicant shall have:
 - a. Submitted Final Site Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, **with Cape Cod Commission regulations**, and with state and federal codes. Copies of the detailed, approved construction drawings (the "Final Site Plans") should also be filed in hard copy (10 full-scale sets) and in digital form with the Building Inspector. The Final Site Plans shall bear the signature and seal of a Massachusetts Professional Land Surveyor (PLS) and a Civil Professional Engineer (PE). The Applicant must secure approval prior to construction pursuant to Paragraph VIII.4. The Final Site Plans shall contain the following:
 - i. An existing conditions plan of topographic, utility, and property information.
 - ii. **The Final Site Plans should include** stormwater management plans and improvements in accordance with applicable laws and regulations.
 - **An existing conditions plan signed and sealed by a Massachusetts Professional Land Surveyor.**
 - **A lotting sheet signed and sealed by a Massachusetts Professional Land Surveyor.**
 - **Construction notes for each proposed infiltration system describing construction requirements.**
 - **Revision of the stormwater system showing the water quality tanks as offline structures, emergency overflows for each subsurface structure, and roof drain connections if any.**
 - **A Sediment and Erosion Control Plan.**
 - **More detailed General Notes addressing site controls (vertical and horizontal datum and benchmarks), construction standards, construction sequencing, erosion and sedimentation control procedures, and environmental (noise, vibration, dust and sedimentation), and safety compliance.**
 -
 - **A note providing contact information, for the proposed gas, electric, and cable utilities.**
 - iii. Final landscaping plans prepared by a Massachusetts Registered Landscape Architect (RLA) to the detail required for use as on-site construction and planting drawings, improvements shall be consistent with the Approved Plans. Such plans shall include shade trees along the roadways and unit driveways and throughout the site, shrubs, and turf areas. Such plans shall indicate the specific types of active/passive recreational equipment to be installed within the open space and recreational areas located on the approved plans.

- iv. Final roadway plans and profiles for the main site roadway.
- v. Final utility plans and profiles including properly labeled drainage components and all site utilities including electric, gas, water supply lines, wastewater collection and disposal facilities, building service connections, and all system components and appurtenances. **The final roadway profile should extend to the centerline of Sandwich Road and showing proposed drainage lines, water quality inlet tanks, and infiltration systems to the profile view including proposed depth of structures and depths to bottom of stone.**
- vi. The location of electric, telephone, CATV, and gas lines and appurtenances shall be indicated on the drawings based upon final design of these systems by the utility company.
- vii. Final Site Lighting plan. **Fixtures must comply with all dark-sky requirements of the Cape Cod Commission.**
- viii. Final Photometric Drawing
- ix. **If approved by MassDOT, a Roadway Improvement Plan showing pavement markings and other improvements to Sandwich Road required to provide a left turn lane at the entrance to Chase Estates.**

- x. Final Site Entrance Plan in accord with MassDOT requirements.
 - xi. Size, location, legend, and illumination of entrance signage.
- b. Obtained any and all permits and approvals from the Bourne Conservation Commission or the DEP which may be required under any state statute, code, or rule and regulation under its jurisdiction, to the extent not otherwise expressly covered by this Decision, including a final Order of Conditions or Superseding Order of Conditions under the Wetlands Protection Act as to any portion of the Site subject to the Wetlands Protection Act that are required by applicable state law prior to such commencement;
 - c. Obtained a National Pollutant Discharge Elimination System ("NPDES") stormwater permit issued for the Project, if required by applicable law;
 - d. Obtained, if needed, a Certificate of the Secretary of Environmental Affairs of compliance pursuant to 301 CMR 11.08(8)(a);
 - e. Delivered to the ZBA with copies to the Building Inspector, Planning Board, Board of Health, Conservation Commission, Superintendent of the DPW, Fire Chief, and Police Chief a complete Construction Management Plan (CMP) as described in condition #3, below.
 - f. A geotechnical engineering design report shall be submitted for the areas that are proposed to be graded at one foot horizontal to one foot vertical (1:1). Signed, sealed slope stability calculations shall be provided by a geotechnical engineer that is based upon location specific subsurface testing.
 - g. Earthwork computations shall be provided for the volume of cut and fill and the net volume on/off site. The number of trucks required for off-site transport shall be calculated.
 - h. Final Drainage Calculations and Report must be submitted. The complete stormwater design package shall be signed and sealed by the civil engineer of record and shall conform to the methods and procedures set forth in the Massachusetts Stormwater Handbook. The design depicted on the plans currently on file is meant to demonstrate intent and not full construction level of detail.
 - i. Retaining walls exceeding ten (10) feet in height require a Building Permit and must be designed by a Massachusetts Structural Professional Engineer. **Final design of retaining walls must be based on location specific soil tests. Safety fencing must be shown. For walls adjacent to property lines, sheeting, shoring, and bracing preventing encroachment on adjacent property must be shown.**
2. Before the Applicant commences construction of any residential units, the Applicant shall have:

- a. Submitted Final Architectural Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, with the Massachusetts Building Code, and with all other state and federal codes. Copies of the detailed, approved architectural drawings (the "Final Architectural Plans") should also be filed in hard copy and in digital form. The Final Architectural Plans shall bear the signature and seal of a Massachusetts Registered Architect (RA). The Applicant must secure approval pursuant to Paragraph VIII.4 prior to beginning unit construction. The Final Plans shall include a Building Code review.

The number of bedrooms shown in the Final Architectural Plans shall not exceed three bedrooms per unit or a total of sixty (60) bedrooms on the site.

- b. Obtained any and all permits and approvals from the Bourne Board of Health and the DEP regarding disposal of wastewater generated by the Project that are required by applicable state laws prior to such commencement;
3. The Construction Management Plan shall address the following topics and items:
 - i. Construction Administration
 - Hours of construction **including equipment startup.**
 - Hours of construction delivery Truck routes
 - Trash and debris removal
 - ii. Construction Phasing and Schedule (critical path) timing and phasing of construction; site clearing; construction of roadways and utilities; buildings, etc. If the site is not expected to be completed in a single- phase, a detailed Construction Phasing Plan shall be submitted indicating access and utilities for each phase adequately addressing access and parking, emergency vehicle access, and utility services.
 - iii. Communications
 - iv. Noise and Dust Control
 - Tree removal (chipping, etc.) Public street cleaning and repair Dust
 - Noise
 - Rock crushing
 - v. Blasting
 - Blasting Plan
 - Identification of petitioner's blasting consultant

Selection of independent blasting consultant Selection of blasting contractor
Pre- and post-blast survey (scope and content) Insurance coverage
Blasting limits
Notification to abutters of blasting schedule Road closures (if necessary)
School bus conflicts (limits on hours)

vi. Erosion Control

Silt sacks, hay bales, silt fences, etc. Tree protection plan

Drainage infrastructure

vii. Identification of existing underground utilities

viii. Construction Staging

Staging areas

Site office trailers

Storage trailers/containers Open storage areas

Delivery truck holding areas

Paved rRefueling areas **with spill containment.**

ix. Traffic and Parking (during construction)

On-site locations

Off-site locations

Snow removal

Police details

Warning signs

x. Fire and Emergency

Temporary emergency access roadway

Emergency water supply throughout construction

Provision of a Knox padlock for construction fence gates

xi. Construction Specifications

The CMP shall be reviewed pursuant to Paragraph VIII.4. The scope of the review of the CMP shall be for completeness and for consistency with generally accepted construction practices and for compliance with all the conditions of this Decision.

4. Procedure for Review and Approval.

- a. When review and approval of a plan or document is required by any condition of this permit, the Applicant shall submit the plan or document to the Building Inspector and any other recipient specified by the permit condition. Upon such review and absent an objection by any of the specified recipients, within thirty (30) days of receipt, that such plan or document are inaccurate or inconsistent with or not in conformity with this Decision, the plan or document shall be deemed approved. If the submitted plan or document is required by state or federal law, rather than local regulations, it shall be deemed approved for purposes of this permit, but Town authorities may communicate any concerns to the applicable state or federal agency.
- b. In the event there is an objection that the plan or document is inaccurate or inconsistent or not in conformity with this Decision, the Applicant may submit the matter in question to the ZBA for its review for consistency; the ZBA shall hold a hearing within 45 days of the applicant's submission, and render a decision within 14 days after said hearing. Any matter related to this Decision to be reviewed and decided by the ZBA after this Decision is issued may be reviewed and decided by the members of the ZBA designated by the Chairman, even if those members did not sit on the hearings that led up to and resulted in this Decision. The Applicant may appeal any adverse ZBA decision to the Housing Appeals Committee.

IX. SITE DEVELOPMENT CONDITIONS

1. Prior to the commencement of any construction activities or any site development or site clearing, the Applicant shall meet with the Building Department, Police Chief or his representative, Fire Chief or his representative, the ZBA's Consulting Engineer (if any), and the Chair of the ZBA or his representative at a mutually convenient time and place during normal business hours to review the CMP, and to coordinate the Building Department's periodic inspections of the Project (the "Pre-Construction Meeting"). This meeting shall be open to the public.
2. At least two weeks prior to the commencement of any construction activities, the Applicant shall submit to the ZBA, with a copy to the Police Chief, the Fire Chief, and the Building Inspector, a Construction Schedule, indicating the anticipated start and end points for each significant phase of development (site grubbing, clearing, and fill; construction of roadways and related infrastructure, excavation and blasting for foundations, framing and interior construction, etc.). The Construction Schedule shall also include the anticipated daily vehicle trips per phase, and the anticipated hours of the day during which heavy equipment and construction vehicles are expected to enter and

exit the Site.

3. The Applicant shall ensure safe and convenient vehicular access to the Site during the entire duration of the Project.
4. The Applicant shall submit to the ZBA a construction and permitting schedule, prior to the commencement of any construction activities or any site development or clearing, and semi-annually thereafter to assist in project status update and review.
5. The Building Department or its appointed agents may, upon reasonable notice to the Applicant, conduct periodic inspections during the construction of the Project, to ensure compliance with the terms of this Decision and the state building code, and for consistency with generally-accepted construction and engineering practices for the installation of roadways, stormwater management facilities, utilities, and all development infrastructure.
6. The Applicant shall forward final architectural plans to the Building Inspector at the time of applying for building permits. All construction shall be inspected by the Building Inspector and shall be in compliance with all Massachusetts State Building Code requirements
7. The Applicant shall be responsible to ensure that nuisance conditions do not exist in and around the Site during the construction operations. The Applicant shall at all times use all reasonable means to minimize inconvenience to residents in the general area.
8. Dust - Methods of controlling dust shall meet all air pollutant standards as set forth by Federal and State regulatory agencies.
9. Noise - The Applicant shall implement measures to ensure that noise from project construction activities does not exceed acceptable levels, as set forth by Federal and State regulatory agencies.
10. Traffic - The Applicant shall implement necessary traffic safety controls to ensure a safe and convenient vehicular access in and around the Site. Any traffic problems that occur as a result of site operations and construction shall be mitigated immediately, at the expense of the Applicant.
11. Roads - The Applicant is responsible for the sweeping, removal of snow, and sanding of the internal roadways and driveways permitting access to residents, emergency vehicles,

and others during construction and until the Homeowner Association has been legally established. The final coat of pavement on the internal roadways shall be installed after the base course has endured a full winter season. The Applicant shall promptly clean any debris or dirt deposited on Bourne or state controlled streets and roads.

12. Burial of any stumps or solid debris onsite is expressly prohibited. Localized burial of stones and/or boulders is prohibited to prevent the creation of voids from soil settlement over time.
13. Intentionally omitted.
14. Utilities, including but not necessarily limited to electric, gas, water, cable, and telephone shall be located underground per utility company standards and applicable codes, and DIGSAFE standards. A final utility plan approved by the applicable public utilities shall be submitted to the Building Inspector prior to the commencement of any construction.
15. Stabilization Requirements -No disturbed areas that might contribute to erosion or sediment migration that are located onsite and under the applicant's control shall be left in an open, unstabilized condition longer than 30 days or as may be governed by the NPDES permit. Temporary stabilization shall be accomplished by hay bales, hay coverings, matting or other appropriate means. Final stabilization shall be accomplished by loaming and seeding exposed areas in accordance with the approved landscaping plans or site plan.
16. Blasting - Any rock blasting shall be performed by a licensed blasting professional, who shall first obtain all required permits from the Bourne Fire Department. All blasting and removal of debris shall be performed in accordance with state regulations and local fire department requirements and shall provide evidence thereof to the Fire Chief.
 - a. Selection of the Blasting Contractor. A blasting contractor, acceptable to both the Applicant and the Bourne Fire Department, shall be selected after review of the qualifications of such contractor by a qualified independent geotechnical-blasting consultant who shall also be acceptable to both the Applicant and the Bourne Fire Department.
 - b. Independent Blasting Consultant. An independent geotechnical-blasting consultant shall be selected and paid for by the Applicant, subject to the approval of the Bourne Fire Department. The consultant shall review the qualifications of the blasting contractor, and review the final blasting plan prepared by the blasting contractor, check the calibration of the seismograph monitors, approve the location and installation of the seismograph monitors, and, if required by the Bourne Fire Department, shall determine the blast limits

throughout the blast period and shall consult with the Bourne Fire Department on an as-needed basis throughout the blasting period.

- c. Pre-blast Survey. Before any blasting on the Site, the Applicant shall conduct a pre-blasting survey that shall include video-recording of the foundations of all direct abutters to the Revised Project, and shall provide a copy of that survey to the ZBA and Fire Chief.
 - d. Insurance Coverage. The blasting contractor shall carry comprehensive public liability insurance in the amount of not less than \$1,000,000 for property damage in respect of any one occurrence and \$2,000,000 aggregate. A certificate shall be submitted to the Bourne Fire Department by the contractor documenting that the required coverage will be in force for the duration of the blasting at the Site. If there is a general contractor or developer associated with the blasting, each shall carry a minimum of \$1 million of comprehensive liability insurance.
 - e. Blasting Limits. The Commonwealth of Massachusetts blasting limits shall be observed. However, if, based upon the recommendation of the independent blasting consultant, the Bourne Fire Department believes that a lower limit is necessary to protect the Site and the abutting property that lower limit shall be in effect.
 - f. Notification. Not less than one week prior to the commencement of any period of blasting, the Applicant shall notify the immediate abutters within 200 feet of the blast area, stating when the blasting period shall begin. Notification under this provision and under any other provision in the Comprehensive Permit shall be by the following three methods: (1) phone or in person; (2) by email; and (3) by letter. No perchlorate shall be used during blasting. Such notification shall include an explanation of the warning procedures for blasting including soundings. The Applicant shall send another letter notifying the same abutters that the blasting period has been completed. In addition, the Applicant shall notify the Fire Department 30 minutes prior to each blast, and a Fire Department detail is required for every blast, which shall be certified by the Fire Academy on the requirements of the state blasting regulation.
 - g. Post-blasting Survey. After the completion of all blasting, the Applicant shall conduct a post-blasting survey that shall include video-recording of the foundations of all direct abutters to the Project, and shall provide a copy of that survey to the ZBA, Fire Chief, and each abutter, respectively, upon request.
17. Safety Fencing: During construction of the Project, the Building Inspector shall have authority to require fencing of the site or portions of the site to the extent required and appropriate to enhance safety by controlling access. A Knox padlock shall be used for any construction fence gates.

18. As Built Plans: Prior to the occupancy or use of the final "market rate" dwelling unit constituting a part of the Project, the Applicant shall submit to the ZBA an "As Built Plan" in paper and CAD format, showing all pavement, buildings, stormwater management structures, and other infrastructure as they exist on the Site, above and below grade, including appropriate grades and elevations. The plans shall be signed by a registered land surveyor and civil engineer, certifying that the Project as built substantially conforms and complies with the conditions of this Comprehensive Permit.

19. Trees. Prior to the commencement of any construction activities or any site development or clearing, if required by the Board's Consulting Engineer, the Applicant shall erect a physical barrier such as a plastic fence to ensure that any existing trees on the locus be preserved to the extent consistent with the approved site plan and landscaping plans. If any such trees, having a caliper of four inches or greater at four feet from the ground, are destroyed or injured as a result of construction, the Applicant shall plant new trees in their place of a comparable species with a minimum height of nine feet at a ratio of 2 new trees for each destroyed tree. Such replanting shall be done by a qualified landscape professional.

20. Roadway Design: The surface course and binder course of the roadways, and the attendant shoulder widths and side slopes, shall conform to the Bourne Planning Board's Subdivision Rules and Regulations except as waived herein. Roadway design to be indicated on the Final Site Plans shall include the following:

- a. The maximum roadway grade shall not exceed twelve (12) percent.
- b. Intentionally omitted.
- c. Intentionally omitted.
- d. Install "No Parking Any Time" (UMTCD R7-1) signs for the **hammerhead** turnaround at the upper end of the principal on-site access drive.

21. Erosion control shall follow Best Management Practices and shall be maintained throughout the duration of the project.

Prior to the issuance of any certificate of occupancy, the applicant shall establish a maintenance plan for the stormwater system, which shall include but not be limited to scheduled inspections, thresholds for removal of sediments, and an educational program for residents for the continuing maintenance and protection of the stormwater system. The maintenance plan shall be reviewed pursuant to Paragraph VIII.4.

No sands or gravels may be removed from the site except those required to be removed to accomplish the conditions shown on the final site plan to be approved by the Board.

22. Stormwater Management:

- a. Catchbasin spacing shall be reduced to a maximum of 150 feet on grades exceeding 6 percent.
- b. Grate hydraulic calculations shall be submitted and double grate or cascade grate structures shall be added as appropriate to ensure that the design storm is captured.
- d. Invert elevations of the stormwater quality structures shall be maintained above the recharge systems. The Stormceptor units should not be permitted to surcharge. Tailwater elevations that extend above the structural outlets shall not be permitted.
- f. All subsurface structures shall support HS-20 loading in paved areas.

23. **Water Distribution:**

- a. The applicant shall submit a water connection application to the Board of Water Commissioners, together with engineered drawings and other information reasonably requested or required by said Commissioners, consistent with its usual practices and procedures. Only the Board of Water Commissioners has the right to approve a request for a water connection to the Bourne Water District system. If questions arise with regard to the project, the District's Engineer may be asked to review the plans and submit a finding.
- b. The Bourne Fire Dept requires that fire hydrants not exceed 500 feet of separation. Hydrant flow records and test data must demonstrate a deliverable fire flow including simultaneous domestic flow while maintaining a minimum residual pressure of 20 psi.

24. **Individual on lot septic systems are provided and m**~~Maintenance of septic system(s) and wastewater disposal infrastructure~~ **shall be the responsibility of each homeowner the Homeowners' Association.**

25. The on-site sidewalk shall comply with applicable laws and regulations regarding handicap access **including regulations of the Massachusetts Architectural Access Board.**

26. Temporary construction signage and permanent entrance signage at Sandwich Road should be indicated on the plans and details furnished with respect to sign legend, dimensions, materials, colors, means of illumination. Signs shall comply with the requirements of the Bourne Zoning By-Law. The signs should be located to avoid interference with sight distance for exiting vehicles. Peer review of the sight distance limitations may be required.

27. The applicant shall verify whether or not the Postmaster will require a common mailbox facility. If required, the mailbox facility and associated parking shall be indicated on the

site plan.

28. The sidewalk at Sandwich Road should be clearly indicated including the area intended to serve as a school bus waiting area.
29. The principal site access roadways should be signed for "No Parking" (MUTCD R7-1) **on one side** and parking restrictions should be enforceable by the Homeowner Association Documents.
30. A Site Lighting Plan shall be developed using a maximum pole height of 24 feet. Light fixtures should be consistent with residential scale and style typically acceptable in the town and should comply with all applicable laws and regulations.
31. Intentionally omitted.
32. During construction, the Applicant and his agents and employees shall conform to all local, state, and federal laws regarding noise, vibration, dust and use of Town roads and utilities. The Applicant shall at all times use all reasonable means to minimize inconvenience to residents in the general area. If any units have been constructed and occupied, construction shall not commence on any day Monday through Friday before 7:30 AM or on Saturday before 8:30 AM, and all exterior construction activities shall cease by 6:00 PM on all days, and no construction or activity whatsoever shall take place on Sundays or legal holidays except for the limited purpose of providing emergency health or safety measures or except as otherwise allowed by the Building Inspector. All construction shall follow Best Management Practices for erosion and sediment control.
33. Construction of all dwelling units, utilities, roads, drainage structures, and all related appurtenances shall be in accordance with all applicable zoning bylaws and all other applicable local, state, and federal regulations except as waived by this Decision.
34. Intentionally omitted.
35. All utilities shall be underground.
36. All area and roadway lighting shall be shielded or refracted as necessary in such a manner as to minimize light spill over to neighboring properties. **Light fixtures shall incorporate dark skies principals and shall avoid upward projection of light.**
37. All on-site storage of hazardous materials and hazardous wastes shall be on an impervious surface, with containment and access control, and all on-site vehicle fueling shall be conducted with industry recognized containment and access control. The CMP

shall identify a designated fueling area and shall construct an impervious surface to accommodate construction vehicles. Containment shall be provided for a minimum of 50 gallons of fuel.

38. Prior to digging on any public land, the applicant shall comply with all applicable federal, state, and local regulations and with all "dig safe" requirements.
39. Surety & Covenants: As security for the completion of the infrastructure related to the Project as shown on the Approved Plan, including, but not limited to, the binder coat of the roadway, sidewalks, ~~parking areas and common areas, recreational areas, sewage disposal system,~~ drainage facilities, utilities, landscaping, and any other specific infrastructure shown on the "Approved Plan" (the "Infrastructure"), the release of occupancy permits for all housing units and the sale of all housing units in the Project shall be subject to the following restrictions:
 - a. No occupancy permit for a unit in any building shall be issued, and no sale of any unit shall be permitted, until: (1) the base and binder course for the roadway, parking areas, and relevant unit driveways shown on the Approved Plan has been installed; and (2) all Infrastructure described herein and as shown on the Plan has been constructed or installed so as to adequately serve said building unless a phasing plan is submitted for review and approval by the ZBA.
 - b. No occupancy permit for a unit in any building shall be issued, and no sale of any unit shall be permitted, until the Approved Plan has been recorded with the Registry of Deeds. This Comprehensive Permit shall be referenced on the Approved Plan prior to recording
40. The Applicant and its successors and assigns shall comply with the regulatory/ affordable housing restrictions, deed rider, monitoring agreements, and all other conditions applicable to the project approved by this Decision.
41. Nothing in this Decision shall be deemed to constitute a waiver of or from the jurisdiction of the Cape Cod Commission as granted that agency by the Cape Cod Commission Act.
42. If construction authorized by this Comprehensive Permit has not begun within three years of the date on which the permit becomes final, the permit shall lapse unless extended by the ZBA. The permit shall become final on the date that the written decision is filed in the office of the town clerk if no appeal is filed. Otherwise, it shall become final on the date the last appeal is decided or otherwise disposed of. The Project shall be completed expeditiously and, in any event, within five years of the date of the first building permit issued, unless extended by the ZBA.

43. The Board reserves the right, insofar as consistent with state law, to further review and amend this decision based upon any information that comes before the Board as a result of Applicant's future need to acquire permits from any local, county, state or federal authority, including but not limited to, the Cape Cod Commission.
44. Intentionally omitted.
45. No structure constructed under this Comprehensive Permit shall be altered, reconstructed, extended, or changed unless authorized by the ZBA by a special permit pursuant to the Zoning Bylaws and G.L. c. 40A, s.6, as may be amended. Upon such an application for special permit, the Board shall determine, in the first instance, whether such alteration, reconstruction, extension or change is "substantial" or "insubstantial." For all special permit applications for insubstantial changes, the ZBA shall employ the standards of review set forth under the Zoning Bylaw pertaining to changes to pre-existing, nonconforming structures, as may be amended. Requests for substantial changes shall be treated as requests to amend this Comprehensive Permit. This Paragraph (45) shall not apply to the original construction of structures developed pursuant to this Comprehensive Permit by the Applicant, but shall apply to subsequent alterations, extensions, and changes to such structures.
46. The terms alteration, reconstruction, extension, and change, shall have the same meaning under the Massachusetts Zoning Act, G.L. c. 40A, §6 and the Bourne Zoning Bylaws.
47. Intentionally omitted.
48. The Applicant acknowledges that prior to the start of construction, the Applicant must obtain all required approvals from any and all other governmental agencies, departments, or commissions whose approvals are necessary for this Project and such approvals must be consistent with this Decision.
49. The Applicant shall prepare Homeowner Association documents. The Homeowner Association shall be responsible for the ownership, maintenance and repair of the roadways, storm water management systems, , retention ponds, recharge facilities, retaining walls, the open space parcels, and other common amenities and services.

The Homeowner Association documents shall be subject to review and approval by the Board's counsel to insure compliance with the terms of this Comprehensive Permit decision. Said documents shall contain restrictions on all units preventing any increase in the number of bedrooms. Prior to the sale of any unit, the Homeowner Association documents shall be filed with Barnstable County Registry of Deeds.

The calculation of the percent of interest in the Homeowner Association for each unit shall be determined pursuant to relevant laws of the Commonwealth governing homeowner associations.

50. Intentionally omitted.
51. The final site plan is to be recorded at the Barnstable County Registry of Deeds and shall be recorded together with this Decision.
52. The Board requires that a note be placed on said final site plan stating that the Plan is the subject of a comprehensive permit under Mass. Gen. L. c.40B, sections 20-23.
53. The Town of Bourne shall be free of any liability arising out of the Board's approval of the site layout plan, and for any act, omission or negligence caused by the Applicant, its employees, agents, subcontractors, beneficiaries or trustees with relation to this Project.
54. Intentionally omitted.
55. Intentionally omitted.
56. Intentionally omitted.
57. Prior to issuance of any Building Permits, a permanent barrier fence, sufficient to prevent the passage of vehicles, must be installed and maintained between Chase Estates at 230 Sandwich Road, Map 25, Parcel 9 and 14 Bosun Lane, Map 25, Parcel 15. This barrier fence must be maintained by the Applicant until the last dwelling unit is sold, and thereafter by the Homeowner Association.

X. MISCELLANEOUS LEGAL REQUIREMENTS

1. The Applicant shall establish a Homeowners Association for the Project in a form reviewed by the Board's counsel, and approved by the Subsidizing Agency and including provisions for operating and replacement reserves to be established and maintained.
2. Any sale or transfer of rights or interest in all or any part of the Site shall include a condition that successors are bound to the terms and conditions of this Decision.
3. The Applicant and/or subsequent Owner(s) shall be bound by all conditions and requirements set forth in this Comprehensive Permit.
4. In setting the beneficial interest in the Homeowner Association, the Applicant shall comply with all relevant laws of the Commonwealth governing homeowner associations.

5. The principle site roadways, driveways, utilities, drainage systems, water supply and distribution infrastructure, wastewater disposal system, and all other infrastructure shown on the Approved Plans as serving the Project, shall remain private and the Town of Bourne shall not have, now or ever, any legal responsibility for the operation or maintenance of the roadways, driveways and infrastructure, including but not limited to snow removal, garbage pickup, the stormwater management system, the **on lot** wastewater disposal systems, and landscape maintenance.

XI. APPLICANT'S REQUESTED WAIVERS

The Applicant has requested waivers from the By-Laws of the Town of Bourne, the Town of Bourne Zoning Bylaws and other local rules and regulations. The Applicant's requested waivers are set forth in its Application and as supplemented through the public hearing process. The ZBA's grant of waivers shall be subject to the terms and conditions imposed by this Decision, and to the extent that any waiver is inconsistent with a term or condition set forth elsewhere in this Decision, such term or condition shall govern. No grant of any waiver shall be deemed to waive compliance with any condition of approval of this Decision. Any waiver not granted below or otherwise included within this Decision shall be deemed denied.

The following waivers are granted:

Bourne Zoning Bylaw, Section 1230. Site Plan - Special Permit Approval. Bourne Zoning Bylaw, Section 2200. Use Regulations.

Bourne Zoning Bylaw, Section 2400. Dimensional Regulations. Bourne Zoning Bylaw, Section 2500. Intensity of Use Schedule. Bourne Zoning Bylaw, Section 2600. Development Scheduling. Bourne Zoning Bylaw, Section 3300. Parking Requirements.

Bourne Zoning Bylaw, Section 3340. Egress Standards.

Bourne Zoning Bylaw, Section 3500. Landscaping and screening. Bourne Zoning Bylaw, Section 3560. High Fences or Walls.

Bourne Zoning Bylaw, Section 4260. Nonconforming Affordable Lots. Bourne Zoning Bylaw, Section 4400. Earth Removal.

Bourne General Bylaw, Section 3.7. Wetland and Natural Resource Protection Bourne General Bylaw, Section 3.13. Development Mitigation
Bourne Wetland Regulations

Board of Health Bedroom Definition Regulation

~~Cape Cod Commission Enabling Regulations Governing Review of Developments of Regional Impact, and Minimum Performance Standards for Developments of Regional Impact~~

Bourne Subdivision Regulations

Decision of the Board of Appeals:

For all the reasons stated above and on the record before it, pursuant to G.L. c.40B, ss. 20-23, the Board voted to grant an Amended Comprehensive Permit to Chase Developers, Inc., for real property located at 230 Sandwich Road, Bourne, Massachusetts, on the terms and conditions stated herein.

Zoning Board of Appeals Bourne, Massachusetts [SIGNATURE]

Appeals of this decision may be made pursuant to Section 17 of Massachusetts General Laws, Chapter 40A and shall be filed within twenty (20) days after the date this decision is filed with the Bourne Town Clerk.



June 28, 2021

Bourne Zoning Board of Appeals
c/o James E. Beyer, Chairman
24 Perry Ave
Bourne, MA 02532

RE: Response to Peer Review Comments
Chase Estates at 230 Sandwich Road, MGL Ch. 40B- Comp permit No. 08-18

Dear Chairman,

On behalf of the applicant, Chase Developers, we are submitting updated Final Site Plans dated May 18, 2021 in response to the peer review comment letter from Professional Services Corporation, PC dated August 10, 2020. Our responses to each of PSC's comments are attached hereto.

Should you have any comments or questions or need further information, please do not hesitate to contact me at (508) 946-9231 or email me at jpavlik@outback-eng.com.

Sincerely,
OUTBACK ENGINEERING, INC.

Chris J. VanDenBerghe

Chris Vandenberghe, P.E.
Project Engineer

cc : Thomas Pappas, Chase Developers

Responses to Professional Services Corporation comments letter dated August 10, 2020

STORMWATER

“The Proposed Project is subject to “Section 3490, Stormwater” of the Bourne Zoning Bylaw which requires a Stormwater Management Plan to be submitted and such plan should meet the Massachusetts Stormwater Management Standards as defined in the DEP’s Massachusetts Stormwater Handbook (MASWH). Therefore, compliance with the state’s DEP Stormwater Management Standards and consistency with the Massachusetts Stormwater Handbook are required.”

Response: “The project complies with the MASWH and a stormwater management plan has been submitted.

General Stormwater Status of the Proposed Project:

“The Applicant’s current preliminary submittals in support of stormwater management do not incorporate all information required by applicable regulations. Certain additional information required to better indicate the feasibility of the stormwater management system should be provided prior to Decision while additional detailed information may be deferred until submittal of the Final Site Plans. The Applicant’s submitted plans and “Preliminary Drainage Report” do not provide adequate information on pre-existing conditions (e.g. topography, land cover, and hydrology) for comparison with proposed project conditions. We observed that the site has been cleared of trees and vegetation. The predevelopment runoff analysis should be based on conditions prior to site alteration (pre-existing). Therefore, submittal of plans or aerial photos that depict the existing conditions and pre-existing conditions would be helpful for full project impact assessment.”

Response: The Final plans and “Drainage Report” reflect current existing conditions. Sheet 3 of the Final Plan set depicts the current exiting conditions (January 2021 survey) and the old existing conditions (July 2007 survey) The “Drainage Report” reflects predevelopment runoff analysis based on conditions prior to site alteration utilizing the July 2007 Holmes and McGrath survey.

“Either way, the project will result in a substantial increase in impervious area, significant grading changes, and substantial changes in the quantity and quality of stormwater runoff at the Site, yet none of these changes are presented. In general, the Applicant must submit a Stormwater Management Plan that complies with the requirements of the Bourne Zoning Bylaw (Section 3490) and the Bourne Subdivision Regulations (Section 352). Even if waivers from local rules are requested, the Applicant’s Final Stormwater Management Plan should at a minimum comply with the Massachusetts Stormwater Handbook. The submittals do not document compliance with the standards set forth in the MASWH.”

Response: The project complies with the MASWH, as required by the existing and proposed comprehensive permit for the project. A waiver list has been provided including waivers from specific sections of the Bourne Zoning Bylaw that prescribe different standards or requirements than the MASWH (e.g., Section 3491, 3492(C), 3493).

“The ‘Preliminary Drainage Report’ presents a tributary area plan for six (6) post-development sub-catchment areas, and HydroCAD calculations for runoff from a 100-year 24-hour storm event (7.10 inches) being routed to three (3) subsurface infiltration systems of apparent sufficient size. However, there is no narrative explanation of the basis for these calculations, no backup or comparison to existing conditions (topography, land cover and hydrology), and no information on the proposed water quality treatment to protect the long term effectiveness of the subsurface infiltration systems which the proposed system is entirely reliant upon.”

Response: A full “Drainage Report” dated May 18, 2021 has been provided and includes an updated tributary area plan for the six (6) updated post-development sub-catchment areas, and HydroCAD calculations for runoff from the 100-year 24-hour storm event being routed to an infiltration basin, and 2 underground leach pits. See the “Drainage report” for complete narrative on the basis for these calculations, comparative to existing conditions, and the proposed water quality treatment to protect the long-term effectiveness of the subsurface infiltration systems which the proposed system is entirely reliant upon.

Bourne Zoning Bylaw Section 3490, Stormwater Regulations (ZBSR):

“Engineering review of stormwater issues cannot advance in a substantive way until the Applicant submits a Stormwater Management Plan in compliance with ZBSR Section 3490 and the MASWH.”

Response: A full drainage report has been compiled to comply with the MASWH. A waiver list has been provided including waivers from specific sections of the Bourne Zoning Bylaw that prescribe different standards or requirements than the MASWH (e.g., Section 3491, 3492(C), 3493).

Specifically, the following submittals are required by Bourne Zoning Bylaw Section 3490:

- 1. The Applicant’s submittal should evaluate compliance with Bourne Stormwater Regulations, specifically the requirements stated in ZBSR Section 3492 including subsections A, B and C.*
- 2. Present information to comply with ZBSR Sections 3493 A through G.*
- 3. Present information to comply with ZBSR Sections 3494 A and B.*
- 4. Present information to comply with ZBSR Section 3495 A.*

Response: “The project complies with the MASWH. A waiver has been requested from *Section 3490, Stormwater*, requiring A Stormwater Management Plan; Sheet 5 (Grading & Drainage) of the Final Plans along with the provided Drainage Report dated May 18, 2021 demonstrates generally what is required for the Stormwater Management Plan. A waiver list has been provided including waivers from specific sections of the Bourne Zoning Bylaw that prescribe different standards or requirements than the MASWH (e.g., Section 3491, 3492(C), 3493).

Comment 5. *“The locations of the six (6) Holmes & McGrath recharge testing points, and the eight (8) soil evaluation test pits should be shown on the Grading & Drainage Plan. Except for test points DTP #5 and DTP #6, the locations of these prior infiltration tests and soil evaluations do not match up with the proposed systems, and the depths of the infiltration tests (which vary from 14-inches to 30-inches below grade) do not represent testing at an elevation below the proposed systems as required.”*

Response: The 14 test pit locations were shown on the October 2019 grading plan, and are shown on Sheet 5 of the Final Site plans dated May 18, 2021. Stormwater evaluation and calculations for the project comply with the MASWH. Additional test pit evaluations will be conducted as necessary, in consultation with the peer reviewer. The test pits shown have been adjusted to the existing grade elevations based on the January 2021 survey (NAVD88).

Comment 6. *Additional testing will be required to comply with the Massachusetts Stormwater Handbook which requires that field tests, including saturated hydraulic conductivity tests, be conducted at the location of each recharge system and at the depth below the bottom of the proposed infiltration system. Because this information is required to better indicate feasibility of the stormwater design, we recommend that these tests be taken prior to Decision. See the following excerpt from MASWH Vol.3, p.11 (emphasis added by underlined text):*

Determine Site Conditions at Specific Location Where Recharge is Proposed

The following actions shall be performed to determine soil conditions at actual location on the site where recharge is proposed:

Conduct tests at the point where recharge is proposed. The tests are a field evaluation conducted in the actual location and soil layer where stormwater infiltration is proposed (e.g., if the O, A and B soil horizons are proposed to be removed, the tests need to be conducted in the C soil layer below the bottom elevation of the proposed recharge system). The tests shall be conducted by the Competent Soils Professional. The tests shall evaluate the following:

- ☐ *Soil Textural Analysis using NRCS methods*
- ☐ *Depth to seasonal high groundwater*
- ☐ *When "Dynamic Field" Method is proposed for sizing a field-derived saturated hydraulic conductivity must be determined as part of the site investigation.*

Response: The stormwater evaluation and calculations for the project, including soil testing, will comply with the MASWH. Where applicable the test pits shown from Holmes and McGrath were used to determine soil conditions at the proposed locations of each of the recharge systems. Where test pits are not shown at these locations, soil observations test shall be conducted to be in conformance with MASWH Vol.3, p.11.

Comment 7. “The Applicant should conduct additional soil tests and provide soils logs (in addition to the 2008 preliminary test pits) for test pits performed at the specific locations of proposed subsurface structures, including but not limited to soil descriptions, depth to seasonal high groundwater¹ and depth to bedrock. Test pits should be performed by a Massachusetts Registered Soil Evaluator, or a Soil Scientist as this is a requirement of the Massachusetts Stormwater Handbook.”

Response: See response above regarding additional soil tests

Comment 8. “We recommend that the saturated hydraulic conductivities used for the three infiltration systems should be more conservative to account for expected long term decrease in recharge performance. The infiltration rate used to design an infiltration BMP must incorporate a safety correction factor that compensates for potential reductions in soil permeability due to compaction or smearing during construction, gradual accumulation of fine sediments over the lifespan of the BMP and uncertainty in measured values when less permeable soil horizons exist within 5-feet below the proposed bottom elevation of the BMP. After completing additional testing as recommended above, the Applicant should discuss the variation in test results, and perhaps use the lowest test value found on site and/or apply a suitable factor of safety to account to the issues noted above.”

Response: The infiltration rate of 8.27 in/hr was used in all 3 locations where recharge is proposed including the infiltration basin and the 2 leach pits. See “Drainage Report” dated May 8, 2021 for details. The drainage report has been compiled to comply with the MASWH.

¹ Also see Cape Cod Commission’s Water Resources Technical Bulletin, 2019, Appendix B.

Comment 9. *“Because many problems with infiltration practices can be traced back to poor construction, the Final Site Plans should include construction notes, including a call-out to such notes on the plans for each proposed infiltration system, to describe the construction measures to be followed to protect and maintain (during construction) the infiltration capacity of the soil where the infiltration systems are proposed.”*

Response: The Final Plan set includes an Erosion and Sedimentation Control plan that includes notes pertaining to erosion and sediment and control measures during construction. Sheet 2 of the Final Plan set includes additional construction notes.

Comment 10. *“For the proposed infiltration systems, provide information on design methodologies and assumptions, the depth to, and elevation of seasonal high groundwater and bedrock under each infiltration system component; and, mounding analyses are recommended to demonstrate the cumulative impact (mounding) and performance of these concentrated points of recharge. Such analyses are particularly important given the small lot sizes and proximity to foundations, retaining walls and septic systems.”*

Response: The “Drainage report” describes the infiltration systems and the design methodology. Where test pits are not shown at these locations, soil observations test shall be conducted to be in conformance with MASWH Vol.3, p.11. Currently groundwater mounding is not necessary for the infiltration basin, but may be necessary pending test pits at the other infiltration system locations.

Comment 11. *“The three subsurface recharge systems are the only proposed method to store and dispose of stormwater at the project site. The Applicant should discuss options for providing emergency overflow features for these systems to prevent street flooding in the event that one or more of these systems should fail. Also see comment 23 below.”*

Response: The “Drainage Report” shows all the proposed infiltration systems. The current infiltration systems control the 100-year storm without any flow off-site. See the ‘Drainage report’ for details pertaining to these infiltration systems

Comment 12. *“Present design calculations to demonstrate that 44% TSS removal can be provided as pre-treatment for the proposed infiltration systems. On this issue, we note that four (4) “water quality inlet” tanks are proposed, but the plans and details do not specify the individual sizes that are proposed. Calculations should be submitted on the sizing for each of these tanks to achieve the required pre-treatment prior to infiltration practices.”*

Response: The requested calculations are shown in Appendix F-2 in the “Drainage Report”. Water quality tank sizing is shown on Sheet 9 of the Final plans as well as Appendix F-4 in the “Drainage Report”.

Comment 13. *“In addition, for the Final Site Plans, the water quality inlet tanks should be designed as off-line units, i.e. designed to capture and treat first-flush storm flows, and then bypass larger stormflows. This requires that a bypass feature be installed upstream of the treatment device to split and divert flows higher than water quality flow around the treatment device. Otherwise, flowing all storm events through these tanks will lead to flushing of TSS and pollutants from the tanks and into the subsurface recharge systems.”*

Response: A water quality tank detail has been added to Detail sheet 9 of the Final Plan set. The water quality tanks have been designed to capture and treat first-flush storm flows, and then bypass larger stormflows (See Appendix F-4 in the “Drainage Report”)

Comment 14. *“Provide an existing condition topographic plan and be sure that it extends beyond the current project limits to include the local watershed limits that contribute flow from off-site. The proposed grading and drainage plan should incorporate this extended topography view as well, to present the totality of on-site and off-site drainage that will flow toward the project and proposed street and impact drainage systems’ capacities.”*

Response: Sheet 2 of the Final Plan set shows existing topography that extend beyond the current project limits. Appendix K of the “Drainage report” shows the totality of on-site and off-site drainage that will flow toward the project and proposed street and how that impacts the drainage systems.

Comment 15. *“The stormwater report should discuss their evaluation of the feasibility of employing Low Impact Development practices (rain gardens, etc.), including an evaluation of storing and reusing roof runoff per ZBSR 3492, C.3.d.ii.”*

Response: A waiver has been requested from ZBSR Section 3492(~~A-C~~).

Comment 16. *“To be consistent with Cape Cod Commission recommendations, the Stormwater hydrologic calculations should be revised based on rainfall distributions recommended by the Northeast Regional Climate Center (NRCC).² Also, Nitrogen loading calculations should be submitted for review consistent with Cape Cod Commission recommendations³.”*

Response: Cape Cod Commission standards do not apply to the project, because the project is not a Development of Regional Impact; no waivers as needed. Rainfall data and methodologies consistent with that outlined by DEP in the MASWH were used.

Comment 17. *“The total volume of discharge as well as peak rate should be evaluated at each control point for various storm events. The HydroCAD model provides some of this data, however the stormwater report does not present a pre- to post- evaluation table to compare volumes and peak rates per ZBSR 3492, C.3.e.”*

Response: The ‘Drainage report’ complies with the MASWH, and includes a table comparing pre and post rates and volume information for the applicable storms at each control point. Waivers have been requested from local regulations (ZBSR § 3490 and BSR § 352) where more stringent substantive or procedural requirements than those in the MASWH are present. All stormwater runoff from the project is collected and infiltrated on site.

Comment 18. *“The stormwater report should include an Operation and Maintenance Plan per ZBSR 3493, G.3.f.”*

Response: The Long-term Operation and Maintenance plan is shown in Appendix J of the “Drainage report”

Comment 19. *“The Final Site Plans should include a Sediment and Erosion Control Plan per ZBSR 3494, A & B.”*

Response: A Sediment and Erosion Control Plan has been added to the Final plan set as Sheet 8. Additional erosion and sedimentation notes are also shown on Sheet 2 of the Final plans.

Bourne Planning Board Subdivision Regulations (BSR) for Stormwater:

Comment 20. *“We recommend that the stormwater report should present a complete point by point discussion of their compliance with the BSR and provide an Environmental Information Report as specified in BSR Section 264. In addition, we emphasize the following specific items of compliance as required within Section 352 Stormwater Management:*

Response: See waiver list submitted for waivers requested. A waiver has been requested from BSR section 264.

² See Cape Cod Commission’s Water Resources Technical Bulletin, 2019, pp. WR-27 to WR-28

³ See Cape Cod Commission’s Water Resources Technical Bulletin, 2019, Appendix A

Comment 21. *“The velocity of gutter flow will be rapid due to the steep continuous downgrade on the project road. Therefore, the spacing of catchbasins should be limited to 150 ft. on center and the stormwater report should include calculations of gutter flows, spread and inlet capacity for the 25-year and 100-year storms (per BSR Section 352, A., 1, 2 and 3).”*

Response: A 150-foot spacing limit for catch basins on slopes over 6% is provided in the existing and proposed Comprehensive Permit. Gutter flow calculations have been provided in the ‘Drainage report’ shown in Appendix I. See Appendix H for pipe calculations.

Comment 22. *“Drainage pipe and gutter flow calculations (per BSR Section 352.A.4) should be provided to demonstrate adequate capacity, and that storm flow velocities will be within the limits noted in BSR Section 352,A.,5.)”*

Response: See response to comment 21 above.

Comment 23. *“The applicant should demonstrate how the proposed infiltration systems will comply with BSR Section 353, B.,4.,d) which requires “the SMS shall be designed and constructed so that operational failure of the infiltrative capacity of the SMS will be manifested by indicators that are readily visible.”*

Response: Since the infiltration basin is open, if operational failure of the infiltrative capacity of the infiltration basin should occur indication of such failure will be readily visible by overtopping of the basin. Since the leach pits are subsurface, failure of the infiltration capacity of these will not be readily visible; however, inspection ports to grade shall be will be provided for inspection. See the Long-term Operation and Maintenance in Appendix J for maintenance of the Infiltration Basin and the 2 leaching pits.

Comment 24. *“The Final Site Plans should provide an Erosion Control Plan (per BSR Sections 261, b, 1. and 264, c).”*

Response: See response to comment 19. A waiver has been requested from BSR section 264.

Comment 25. *“The design plans and Stormwater Management Report (yet to be submitted) should demonstrate compliance with BSR Section D, and we note that this section requires subdivisions to meet Massachusetts Stormwater Design Requirements in Volume 3 of the aforementioned DEP Handbook with the following exceptions and additions:*

- *Standard 4 - Water Quality: Water Quality Depth (Dwq) as described in Volume 3, Chapter 1, page 32, shall be 1.70 inches for all projects. Prior to discharge into all treatment SMSs, for compliance with Standard 2, the removal of a minimum of 44% TSS is required.*
- *Impervious Cover: Impervious cover is measured from the site plan and includes all impermeable surfaces and any other surfaces that are not vegetated (such as a gravel surface). Pervious pavers utilized for driveways, sidewalks, patios, when installed to infiltrate water beneath them into the native soil can be considered pervious.*
- *Prohibited Practices: The following practices are prohibited*
 - a) Pervious pavements for road surfaces.*
 - b) Below grade infiltration structures such as leaching catch basins for the treatment and/or control of road runoff for new subdivision roads.*

Response: The project complies with the MASWH, as required by the existing and proposed comprehensive permit for the project.

Comment 26. *“The Applicant should submit a final Stormwater Management Report which should include an evaluation of compliance with the ten (10) Stormwater Management Standards as presented in the Massachusetts Stormwater Handbook. Until such submittal is provided, we cannot offer additional peer review comments on proposed stormwater management compliance with MASWH.”*

Response: The “Drainage report” dated May 18, 2021 complies with the MASWH. This drainage report documents evaluation of compliance with the (10) Stormwater Management Standards as presented in the Massachusetts Stormwater Handbook. Sheet 5 (Grading & Drainage) of the Final Plans along with the “Drainage Report” dated May 18, 2021 demonstrates generally what is required for the Stormwater Management Plan.

Hydraulic Issues

Comment 27. *“We have a concern regarding the interconnected leaching galleys A through F. The total elevation difference between the top of galley F and the bottom of galley A is approximately 35 ft. Absent an emergency overflow, should all galleys reach saturation the system would create a head of approximately 35 ft. (15 psi) potentially causing soil instability. In any instance large storms would disproportionately impact Galley A and minor storms would disproportionately impact Galley F.”*

Response: The Galleys have been eliminated from the drainage design.

REVIEW OF PROJECT PLANS

Comment 28. *“A Massachusetts Professional Land Surveyor (PLS) is not provided for the project plans. A PLS must sign and seal the existing conditions sheet and the lotting sheet of the Final Site Plans.”*

Response: A PLS signature and stamp will be provided on the Existing Conditions sheet and Lotting Sheet of the Final plan set.

Comment 29. *“As noted earlier, an Existing Conditions Plan is not submitted with this current plan set. When submitted, this additional plan should include references to original topographic survey and property lines and add notes on the location(s) of any private wells within 500 feet of the site, and the location(s) of the nearest wetland areas or other environmentally sensitive areas. If submittal is deferred to the Final Site Plans, changes shown on the detailed survey may require design revisions”.*

Response: Sheet 3 of the Final Plan set depicts the current existing conditions (January 2021 survey) and the old existing conditions (July 2007 survey) The “Drainage Report” reflects predevelopment runoff analysis based on conditions prior to site alteration utilizing the July 2007 Holmes and McGrath survey.

Comment 30. *“The design intent would be better established if an Erosion and Sedimentation Control Plan were submitted prior to Decision but may be deferred until submittal of the Final Site Plans. This plan should describe the erosion control measures to be employed to prevent erosion of exposed slopes, show a specified Limit of Disturbance at the Site perimeter, show limits of sedimentation control barriers internal to the Site, show proposed*

soil stockpile areas and proposed temporary stormwater management basins, and provide for a construction entrance design to prevent tracking of sediment and dust onto Sandwich Road. The plan should be consistent with the requirements of Zoning Bylaw Section 3494 A. and B., and a narrative version should be provided in a Stormwater Management Report to be submitted. In addition, this plan should note estimated total cuts and fills along with the net volume of cut/fill to be trucked on or off site and the anticipated number of off-site truck trips to transport this net cut/fill volume.⁴

Response: An Erosion and Sedimentation Control Plan has been added to the Final Plan set that describes erosion control measures during construction. Additional erosion and sedimentation notes are also shown on Sheet 2 of the Final plans.

Preliminary Site Plan (Sheet 1 of 6)

Comment 31. *“When incorporated in the Final Site Plans, the General Notes section of this sheet be expanded, or perhaps created as a separate sheet, to include, for example, comprehensive notes on site controls (vertical and horizontal datum and benchmarks), construction standards, construction sequencing, erosion and sedimentation control procedures, and environmental (noise, vibration, dust and sedimentation), and safety compliance.”*

Response: Sheet 2 of the Final Plan set has notes on project execution, maintenance, storm drain and utility notes, pavement and curbing notes, and post-construction operation and maintenance.

Comment 32. *“We recommend that the zoning compliance table be revised to also present the Zoning Bylaw dimensional requirements for Non-Conforming lots per Table 2456 and to compare the various proposed non-conforming lots to such standards also.”*

Response: A zoning compliance table has been added to Sheet 4 (Lotting Sheet) of the Final plan set.

Comment 33. *“Required and available stopping sight distances should be shown at the proposed road intersection with Sandwich Road.”*

Response: A traffic study has been submitted to comply with this comment

Comment 34. *“Does MassDOT propose to install a sidewalk in Sandwich Road?”*

Response: An access permit plan has been submitted to MassDOT for their review. Any changes that they require will be reflected on the Final Plan set. MassDOT has not requested installation of a sidewalk in Sandwich Road.

Comment 35. *“We recommend that the proposed area (square feet) of the house footprints be shown.”*

Response: The square footage of the proposed duplex units has been added to Sheet 8 (Layout & Materials plan) of the Final Plan set.

Comment 36. *“Proposed curbing should be noted in the legend. Given the steep grade of the street, we recommend that vertical curbing be specified to best control drainage flows at the gutter lines.”*

Response: Curbing has been noted on Sheet 8 (Layout & Materials plan) of the Final Plan set. Proposed cape cod berm shall have a 4” reveal. Gutter flow calculations have been added to the “Drainage Report” as Appendix I to document compliance with BSR 352.A.5. The Applicant is proposing Cape Cod berms, not vertical curbing.

Comment 37. *“Is there a drainage system in Sandwich Road that could receive emergency overflow from the proposed subdivision system? If so, this system should be shown.”*

Response: There is no structured drainage infrastructure (catch basins, etc.) in Sandwich Road.

Comment 38. *“The Applicant should confer with the Bourne Fire Department and an approval letter should be obtained stating that the Department is satisfied with access, water supply, and all life safety requirements.”*

Response: Plans have been submitted to the Bourne Fire Department and are currently being reviewed.

Comment 39. *“Proposed streetlights should be shown on the Final Site Plans, with maximum pole height per Town requirements, and light fixtures should be consistent with residential scale and style typically acceptable in the town and should comply with all dark-sky requirements of the Cape Cod Commission.”*

Response: Proposed Streetlights will be shown on the Final Plans, and heights will comply with Town requirements. The project is not subject to Cape Cod Commission requirements, as it is not a Development of Regional Impact.

Comment 40. *“A photometric plan should be provided with the final plans to demonstrate lighting levels at the street and at property lines.”*

Response: The specified information will be provided on the Final Plans.

Comment 41. *“Given the density of the project and the steep centerline grades and to accommodate snow storage and visitor parking, the driveway width of 20 feet should be increased to 24 feet, which is also the Town standard for a Minor Street: A Street with anticipated traffic equivalent to that generated by fewer than 50 dwelling units. With a 20 ft. pavement width, on street parking could not be allowed to assure emergency vehicle access and thus additional and visitor parking could not be accommodated.”*

Response: The current Comprehensive Permit specifies a 20-foot road, which is consistent with the Town subdivision regulations that were in effect at the time of original permit issuance. The access drive is wide enough to accommodate emergency vehicles traveling in both directions simultaneously. If cars were parked on one side of the street, there would still be sufficient room for emergency vehicles to pass; adding 4 feet would not make a difference in that regard.

Comment 42. *“The dead-end length of 1,090 feet exceeds the Town’s maximum safety standard. The Town adheres to a maximum 500 feet length for dead end roadways. Waiver of strict compliance is required.”*

Response: A waiver from the 500 foot limit on dead end roadways has been requested. The current Comprehensive Permit allows a dead-end road of similar length to the one proposed. The Fire Department has reviewed this layout and raised no objection regarding the length of the road.

Comment 43. *“One side of the primary on-site road should be posted as “No Parking” in order to ensure the passage of emergency vehicles in combination with the increased 24-ft. pavement width.”*

Response: “No Parking” signs have been added to Sheet 7 (Layout & Materials) of the Final plan set.

Preliminary Lotting Sheet (Sheet 2 of 6):

Comment 44. *“This lotting sheet with presentation of property descriptions (metes and bounds) should be included in the Final Site Plans and should be signed and sealed by a Massachusetts Professional Land Surveyor.”*

Response: The lotting sheet is included in the Final plan set and will be stamped by a Massachusetts Professional Land Surveyor.

Comment 45. *“Notes should be added to the Final Site Plans on the need to comply with the lot bound requirements of the Bourne Subdivision Regulations; and, add a note if any proposed lots do not meet the Bourne lot shape factor requirements.”*

Response: A zoning analysis table has been added to Sheet 4 (Lotting Sheet) of the Final plan set that documents the required and provided dimensional requirements for the project.

Preliminary Utility & Profile Sheet (Sheet 3 of 6):

Comment 46. *“The profile starts at the curb line of Sandwich Road. It would be preferable to show the station line for the new road extending to the centerline of Sandwich Road, and to show the station point of Sandwich Road at such connection based on record drawings. Also, surface topography for the intersection area is missing from plan view, so elevations shown at the beginning of the profile view may be inaccurate.”*

Response: A zoning analysis table has been added to Sheet 4 (Lotting Sheet) of the Final plan set that documents the required and provided dimensional requirements for the project.

Response: The stationing for the proposed roadway has been extend to start at the centerline of Sandwich Road. Existing topography in this area of Sandwich Road can now be seen on Sheet 2 (Existing Conditions plan) of the Final Plan set.

Comment 47. *“In addition to showing the proposed catch basins and drain manholes, we recommend adding the proposed drainage lines, water quality inlet tanks, and infiltration systems to the profile view including proposed depth of structures and depths to bottom of stone. Addition of this information prior to Decision is recommended and addition of this information for the Final Site Plans is required.”*

Response: The proposed drainage lines, water quality tanks and infiltration systems have been added to the profile view. Additional details including elevations the water quality tank, Infiltration basin and Leaching Pits are shown on the Details Sheets.

Comment 48. *"The feasibility of the design would be better established by adding the approximate invert elevations for the septic system leaching areas (as this is relevant to potential drainage system and infiltration system setbacks) to the Final Site Plans."*

Response. A draft Septic design plan has been set up for Lot 1. Note that the Final plans take into consideration all septic and related component have being laid out with the required minimum setback to drainage facilitates in mind per Title V.

Comment 49. *"The Final Site Plans should show proposed roof drain leader connections to the street drain system, if any."*

Response. Roof drains shall leader connections will not be tied to the street drain systems.

Comment 50. *" The final plans should identify the pipe material, approximate age, and condition of the water main in Sandwich Road, and provide the proposed material of the new water main, and a note to call for coordination with the correct Bourne water district, including names and contact information."*

Response. Notes regarding pipe material, approx. age, have been added to Sheet 2 (Existing Condition plan) of the Final plan set. The material of the proposed water main has been called out on the Final plans. Contact information for the Bourne Water District has been added to the Index plan on the Final Plan set. Note 1 on Sheet 6 (Layout and Profile) dictates to coordinate with the Bourne Water District prior to construction.

Comment 51. *"The water main profile should be extended to include the hydrant at the terminus."*

Response. The water main has been designed in accordance with the Bourne Water District. The Water main shall tie into the existing main in Bosuns Lane. See Sheet 5 of the Final Plans for details.

Comment 52. *"Fire flow test data should be submitted for the existing water main in Sandwich Road."*

Response. Fire flow test shall be completed prior to project commencement.

Comment 53. *"The project elevation at the rear of the site is about 80 feet above the entrance. The change in elevation will reduce available pressure at street level by approximately 35 psi. Calculations of deliverable fire flow including simultaneous domestic demand while maintaining a minimum residual pressure of 20 psi should be." submitted."*

Response. Calculations will be provided, demonstrating adequate water pressure, determined in consultation with the Bourne Water District.

Comment 54. *"To ensure water quality and adequate pressure it is preferable that the water system should be looped through to a location having adequate pressure and flow. Contact with abutting property owners should be documented. Currently about 1,090-feet of waterline is proposed as dead end."*

Response. The current layout of the water system is now looped with the proposed water main now connecting to the existing water main in Bosuns Lane. See Sheet 5 (Grading & Drainage Plan) for details.

Comment 55. *“The Final Site Plans should provide notes requiring advanced coordination with the utility service companies, including names and contact information, for the proposed gas, electric lines, and cable lines.”*

Response. Notes for coordination with utility service companies can be found on Sheet 2 of the Final Plans. Names and contact information for the Bourne Town Government/ Utility contacts have been added to Sheet 1 of the Final plans.

Preliminary Grading & Drainage Plan (Sheet 4 of 6):

Comment 56. *“See comment 46 recommending additional topography at the Sandwich Road intersection; and, see comment 14 recommending an extended view of existing topography at the limit of watershed tributary to the project, to present the totality of on-site and off-site drainage that will flow toward the project and proposed street drainage system.”*

Response. See response to comment 14.

Comment 57. *“In several instances the setback of proposed septic system leaching areas is less than the 50-foot setback required by MASWP. Locations should be revised to correct this.”*

Response. All proposed septic system leaching areas are less than the 50’ setback requirement required by MASWH and the 25’ minimum setback to drywells is met per Title V.

Comment 58. *“This plan indicates that fourteen (14) or more retaining walls will be required to achieve the desired site grades, and these walls vary in height up to 6-feet or more; and, there are several compound wall sets proposed. The design provided on the final plans will need to be designed by a Structural Engineer registered in the state of Massachusetts.”*

Response. All retaining walls onsite have been design to be 4’ in height or less. See Sheet 5 (Grading & Drainage).

Comment 59. *“The Final Site Plans should provide methods for sheeting, shoring, and bracing for taller wall segments adjacent to property lines to limit encroachment onto adjacent properties during excavation and backfill.”*

Response. See response above regarding retaining walls.

Comment 60. *“The Final Site Plans should show safety fences as part of wall designs.”*

Response. All walls on site are expected to be 4’ in height or less. The proposed wall in back of lots 6 and 7 shall have a 6’ high stockade fence placed on top of retaining wall. All other walls on site are less than 4’ in height.

Comment 61. *“The ZBA should require private maintenance of the proposed walls.”*

Response. The Homeowners Association will be responsible for maintenance of the proposed walls. The proposed permit will be revised accordingly, as necessary.

Comment 62. *“Given the density of this project and roadway lengths, snow storage is a concern. Snow storage areas should be designated on the plan outside paved or on adjacent grassed areas that maximize recharge. A note should be added to the plans calling for snow removal offsite if capacity is exceeded.”*

Response. Designated snow areas are shown on Sheet 7 (Layout & Materials) of the Final Plan set. See Appendix J, Long Term Operation and Maintenance plan, In Drainage report for additional snow storage notes.

Comment 63. *“The Final Site Plans should provide more detailed grading information and it is possible that more retaining walls than those show will be required.”*

Response. Top of wall and bottom wall elevations are shown at each location of the proposed retaining walls. Proposed site grading reflects these top and bottom of wall elevations.

Preliminary Construction Detail Sheet (Sheet 5 of 6):

Comment 64. *“The system elevations of tanks and chambers, inlet and outlet drain lines, diversion structures (for off-line tank bypass flows) and locations of inlet and outlet cross connection pipes should be determined and included in the HydroCAD stormwater model. The flow sequence and operation of these systems should be clearly explained in a narrative which should be added to the Stormwater Management Report.”*

Response. Elevations for the water quality tanks can be found on Detail sheet 9 of the Final Plans. All drainage structures rims and inverts can be found on Sheet 6 (Utility plan & Road Profile). Appendix F-4 in the Drainage report documents the flow sequence and operation of the water quality tanks and by-pass flow feature.

Comment 65. *“Notes and details should be added to this sheet (or another detail sheet) to fully explain the three infiltration system designs, including all structure and stone and pipe invert elevations. Assuming that these recharge systems will have cross connections to help distribute stormwater within the chamber systems, such cross connections including internal erosion controls and elevations should be designated.”*

Response. Details for the Infiltration basin and the 2 Leaching Pits have been added to the Detail sheets. Stone and pipe invert elevations have been added. Cross connection pipes size and type have been added to these details as necessary.

Comment 66. *“Each infiltration system should be listed with the following reference elevations (top of stone, bottom of structure, and finished grade provided for galleys only):*

- i. *seasonal high groundwater levels at each system area*
- ii. *bottom of stone in each system*
- iii. *bottom and top of chambers in each system*
- iv. *top of stone in each system*
- v. *elevations of all inlet and outlet pipes, and*
- vi. *elevations of finished grades above the systems.*

Response. See response to comment 65 above.

Comment 67. *“As noted earlier, the Final Site Plans must be based on design calculations for the 4 water quality inlet tanks (the pretreatment BMPs prior to the infiltration systems), specifically for sizing so that dimensions can be shown on this detail sheet, and following are required.*

- i. *The tank sizes with backup calculations need to be shown and on the detail sheets. Each tank serves a different size tributary area so each design will be different. Tanks should be rated for structural highway loads.*
- ii. *In addition to determining tank sizes for each area, the designs should determine the diversion weir height at each diversion manhole (and such manholes need to be added), and details of these diversion manholes should be provided on this detail sheet. The weir height at each diversion manhole should be based on hydraulic calculations to divert the “first-flush” stormflow (per town requirement in BSR Section D and comment 25 above concerning Water Quality Depth of 1.7-inches). Storm flows that exceed first flush flow should flow over the weir, to bypass the treatment tank and pass directly to the infiltration system. In this way, each tank will not be flushed or stressed by unnecessary excess flow.”*

Response. See response to comment 12.

Comment 68. *“Consistent with comment 48, it would be appropriate to add a table to this sheet that lists the approximate invert elevations for the various septic system leaching areas, including estimated seasonal high groundwater at each location (as this will be relevant to potential drainage system and infiltration system setback issues).”*

Response. A draft septic design plan has been set up for Lot 1. Note that the Final plans take into consideration all septic and related component have being laid out with the required minimum setback to drainage facilitates in mind per Title V.

Preliminary Construction Detail Sheet (Sheet 6 of 6):

Comment 69. *“A detail is shown for cape cod berm. As recommended in comment 36, vertical curbing be should be specified, and a detail added to this sheet.”*

Response. The Applicant is proposing Cape Cod berms, not vertical curbing. Gutter flow calculations have been added to the “Drainage Report” as Appendix I to document compliance with BSR 352.A.5.

Comment 70. *“The width of sidewalk should be shown on the Bituminous Concrete Sidewalk detail (the Town specifies sidewalks to be 5-feet wide) with a cross slope of 3/8 in./ft. To ensure Architectural Access Board (AAB) compliance, a width of 5 ft. excluding curb width (5½-ft. with a 6-in wide curb) and a cross slope of 1½% should be provided.”*

Response. The project is not subject to Architectural Access Board requirements, which apply to public buildings. However, the proposed sidewalks are consistent with AAB regulations (521 CMR 22.2, 22.3.1), which require 4-foot sidewalks with a maximum cross-slope of 2%. A waiver from the 5-foot requirement in town subdivision regulations has been requested; requiring a wider sidewalk is inconsistent with the goal of minimizing the volume of stormwater runoff.

Comment 71. *“The Bituminous Concrete Pavement detail should be revised to call for 2.5-inches of concrete binder course to provide a total pavement thickness of 4-inches per Town requirement. Also revise the Typical Roadway Cross Section detail to 2.5-inches of binder.”*

Response. The Bourne Subdivision regulation section 326.e calls for a type I-1 bituminous concrete pavement applied with a 2-3/4” base course and a 1-1/4” finish course. This is what was used for the detail.

Comment 72. *“It is unclear why the Precast Sewer Manhole detail is provided on this sheet.”*

Response. This detail has been removed from the Final plans.

Comment 73. *“Cascade grates should be specified for all catch basins located on profile grades of 6% or greater. Inlet capacity calculations should be provided as noted in comment 21.”*

Response. A note has been added to the Single Grate catch Basin Detail on Detail Sheet 9 relating to cascade grate requirements. Gutter flow calculations have been provided in the ‘Drainage report’ shown in Appendix I. See Appendix H for pipe calculations.

Chase Estates

Town of Bourne Comprehensive Permit #08-10
Notice of Project Change

Chase Developers, Inc.

Proposed Amended Comprehensive Permit Including Supplemental Changes

Attached is the proposed Amended Comprehensive Permit for Chase Estates. This is the same as previously submitted in advance of the Board's August 21, 2019 meeting, except for (i) the changes noted in the Supplemental Proposed Edits document filed simultaneously herewith, and (ii) formatting edits (alignment of paragraph numbers).

DECISION UPON APPLICATION OF CHASE DEVELOPERS, INC.

FOR A COMPREHENSIVE PERMIT UNDER MASSACHUSETTS GENERAL LAWS CHAPTER 40B, s.20-23

I. APPLICANT AND PUBLIC HEARING

[RECITE PROCEDURAL HISTORY OF ORIGINAL AND AMENDED PERMIT]

The total Project shall include no more than twenty (20) single family homes ("units") with no more than three (3) bedrooms each (including the affordable units). Five (5) of the units, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be affordable to qualified purchasers, in perpetuity.

The minutes and exhibits from the public hearing are available for public inspection in the office of the Town Clerk. A list of the exhibits is contained in the record and is appended hereto by reference.

II. NATURE OF APPLICATION; PROCEDURE REQUIRED BY STATUTE

In conducting its hearings in this matter, the ZBA is guided by G.L. c.40B, s.20-23 and applicable regulations.

III. GOVERNING LAW

The law governing this case is The Low and Moderate Income Housing Act, Massachusetts General Laws, Chapter 40B, §§ 20-23 (the "Act"), and the regulations promulgated by the Department of Housing and Community Development ("DHCD") Housing Appeals Committee, 760 CMR 56.00 (the "Regulations").

SUMMARY OF DECISION

The ZBA hereby approves with the conditions set forth below, a comprehensive permit for Chase Developer's Inc. for the Project depicted on the plans and materials identified in the record, specifically including twenty (20) dwelling units and consisting of five (5) units of low or moderate income housing pursuant to the terms, conditions and obligations imposed by G.L. 40B, s.20-23.

IV. THE RECORD BEFORE THE BOARD UPON WHICH THIS DECISION IS BASED.

1. C 1.1 Title Sheet, dated [date of revised plan], prepared by Outback Engineering

2. C2.1 Site Layout Plan, dated [date of revised plan], prepared by Outback Engineering
3. C3.1 Site Grading, Drainage and Utility Plan, dated [date of revised plan], prepared by Outback Engineering
4. C4.1 Site Erosion Control Plan, dated [date of revised plan], prepared by Outback Engineering
5. CS.I Site Landscape Plan, dated [date of revised plan], prepared by Outback Engineering
6. C6.1 Site Details, dated [date of revised plan], prepared by Outback Engineering
7. C6.2 Site Details, dated [date of revised plan], prepared by Outback Engineering
8. [Revised architectural drawings to be provided]
9. [Other documents entered into the record]

V. GENERAL CONDITIONS

1. The plans referenced above are the "Approved Plans."

The Applicant or its agents shall maintain a copy of the Approved Plans and this Decision at the Site during construction.

2. This Decision shall be noted on the Approved Plans and both this Decision and the initial site plan sheet of the Approved Plans shall be recorded at the Barnstable County Registry of Deeds. Proof of recording shall be forwarded to the Building Inspector prior to ~~construction~~issuance of a building permit.

Revision accepted

3. The Applicant shall comply with all local bylaws, rules and regulations of the Town of Bourne and its boards and commissions in effect as of the date of this decision unless expressly waived herein or as otherwise addressed in these conditions.

4. The Applicant shall pay all fees of the Town of Bourne imposed generally with respect to construction projects and for the purposes of monitoring compliance of the construction and occupancy of the Project in accordance with this Comprehensive Permit, unless otherwise waived in this Decision; ~~provided, however, that the Applicant is not required to pay any fee for the Board or the Town to employ any outside consultant.~~

Revision accepted

5. The Applicant shall copy the ZBA on all material submissions made by or on behalf of the Applicant for permits or approvals from any federal, state, county, or Town official, board or commission that concerns the design and/or conditions set forth in this Decision, including but not limited to all testing results, official filings and other permits issued for the Project.
6. The Applicant shall comply in all respects with the State Building Code and any local published regulations or published schedule of fees of the Building Inspector. The Applicant shall pay all required fees for all such building permits including any fees customarily charged for inspections and permits unless otherwise waived in this Decision.

7. Prior to the commencement of construction, site development, or clearing, the Applicant shall post with the Town Treasurer security for Site Stabilization and Restoration. Prior to issuance of a Building Permit, **vehicle access**, emergency vehicle access, **and utility service** shall be provided to the site of each building for which a building permit is sought **in accordance with a phasing plan approved by the Board**. Prior to issuance of any Certificate of Occupancy, the Core Site Improvements required to provide vital access and utility service to all dwelling units, or those dwelling units contained within a particular phase of the Project as shown on a Phasing Plan approved by the Board, shall be complete as determined by the Board. Prior to issuance of any Certificate of Occupancy the applicant shall post the Minimum Required Security with the Town Treasurer for the overall project or for a particular phase of the Project as shown on a Phasing Plan approved by the Board. Once posted, security shall remain in full force and effect until the work secured thereby is satisfactorily completed as determined by the Board. However, the instrument serving as security may be changed by the Applicant from time to time with the agreement of the Board as set forth hereinafter. Failure to maintain the Minimum Required Security in full force and effect shall constitute due cause for the Building Inspector to revoke Building Permits. The Board may increase the Minimum Required Security to be posted by the Applicant if the Board determines that the actual construction cost plus contingency to complete the Site Improvements is ten percent (10%) more than the posted security value. The Applicant shall post additional security within forty-five days following receipt of notice from the Board. Upon completion of the work or portions thereof for which security has been provided, the Applicant may petition in writing with a copy to the Town Clerk for reduction or release of the posted security pertaining to the work completed satisfactorily as determined by the Board. If the work has been completed to its satisfaction, the Board will reduce the Minimum Required Security. If the work has not been completed to its satisfaction, the Board will inform the Applicant of the nature of the deficiencies in the work and will forgo or limit the amount of security authorized for release. The Board's decision with respect to release of security will be rendered within 45 days following receipt of the petition. The instrument serving as security may consist of cash, a bankbook, a performance bond, or a trilateral agreement between a bank having a first mortgage on the property, the property owner, and the Town. The form of security shall be acceptable to the Board only if the language of the security agreement is acceptable to Town Counsel, both as to form, substance, and as to the financial stability of the bonding company or the bank that is party to any Trilateral Agreement. As used in this Decision, the term "Minimum Required Security" shall mean an amount established by the Board

Revision accepted

that is based upon the anticipated cost to be incurred by the Town in the event the Town completes all remaining work in accordance with applicable public procurement practices plus a construction cost contingency of fifteen percent (15%), except that the amount of security required shall never fall below ten percent (10%) of the amount first posted until final acceptance of all work, and security for plant materials shall not be released until one year has passed following initial planting. The term "Site Improvements" shall mean all required clearing, earthwork, paving, utilities, storm-drain including water quality measures and retention or detention facilities, paving, curbing, walkways, lighting, site entrance, retaining walls, septic systems, landscaping, testing, erosion controls, cleanup, and as-built drawings and data in compliance with the approved plans and Conditions of Approval. For the purposes of determining the Minimum Required Security, site improvements shall not include residential structures or site improvements within 10 feet of residential structures being submitted for a Certificate of Occupancy. The term "Core Site Improvements" shall mean "Site Improvements" as defined above but excludes the top course of the sidewalk and main access roadway pavement and tree and shrub planting. The term "Site Stabilization and Restoration" shall mean stabilization of disturbed areas and shall include grading, placement of a 2 inch thick layer of "plantable soil borrow," hydroseeding or other acceptable erosion control measures and establishment of ground cover consisting of a "woody mix" of grass, wildflower, shrub, and tree seeds.

8. Nothing in this Decision shall be interpreted as relieving the Applicant of its burden to obtain easements, licenses or written permission from any abutting property owner if, during the course of construction, it becomes necessary to enter upon abutting land for construction or planting purposes.
9. Each condition in this Decision shall run with the land and shall, in accordance with its terms, be applicable to and binding on the Applicant and the Applicant's successors and assigns; and reference to this Decision shall be incorporated in every deed recorded for the Project and for any dwelling unit in the Project.
10. This Decision permits the construction, use, and occupancy of twenty (20) three (3) bedroom housing units on the Site. The construction and use of the Site shall be in conformity with the Plans as modified by the Approved Plans, and there shall be no creation of additional housing units or any other structures or infrastructure or any increase in the number of bedrooms, except that which is shown on the Approved Plan, without further approval of the ZBA in the form of amendment to this Decision.

11. Prior to the commencement of construction on the Site, the Applicant shall have obtained all necessary permits and approvals for access to Sandwich Road (Route 6A) from state or county agencies.
12. Intentionally omitted.
13. The Project shall consist of no greater than twenty (20) three (3)-bedroom single family homes ("units"), five (5) of which shall be affordable to low or moderate-income purchasers, in perpetuity, to households at or below 80% of area median income.
14. Intentionally omitted.
15. The development and dwelling units shall comply with any applicable laws or regulations regarding handicap access.
16. Intentionally omitted.
17. Intentionally omitted.
18. No dwelling unit shall contain more than three (3) bedrooms, as the term "bedroom" is defined in 310 CMR 15.000 (Title 5 regulations).
19. Intentionally omitted.
20. Intentionally omitted.
21. No internal roadways within the Project shall have a traveled way width of less than ~~twenty-~~
twenty-four (2024) feet in width exclusive of berms and curbs.
22. The number and location of the fire hydrants installed within the Project shall be as directed by the Fire Chief, and shall comply fully with applicable laws, codes, and requirements including without limitation NFPA and Bourne Water District requirements to be depicted on the Final Site Plans (as defined in Paragraph XIII.I, below).
23. ~~Four (4)~~**Five (5)**-foot wide sidewalks, exclusive of the ~~Cape Cod berm~~
6-inch wide vertical separating the sidewalk from the road, shall be constructed along the entire road "going up the hill", and the width shall be increased in the area of any signs or other obstructions in order that there is at least a continuous 4 foot wide walking area throughout the entire sidewalk.
24. Intentionally omitted.

Revisions
not
accepted -
Applicant is
proposing
a 20-foot
road width
and 4-foot
sidewalk
with Cape
Cod berm.

25. This Comprehensive Permit is conditioned upon the applicant obtaining an expanded ~~Access Permit from MassDOT foreurb-cut permit from Mass Highway for access to~~ the Project approved herein, regardless of whether or not obtaining said expanded permit triggers the Massachusetts Environmental Policy Act or other state or regional regulatory requirements. **The Access Permit from MassDOT shall be obtained and recorded in the Barnstable Registry of Deeds prior to construction.**

Revision
accepted

26. Intentionally omitted.

27. Intentionally omitted.

28. Intentionally omitted.

29. Intentionally omitted.

VI. AFFORDABLE HOUSING

1. Five (5) units, being no less than twenty-five (25%) percent of the total number of dwelling units approved for this Project, shall be sold to low or moderate income qualified purchasers. These dwelling units shall be located on an Affordable Units Location Plan. These dwelling units shall remain affordable pursuant to the terms and conditions of this Decision, in perpetuity or for the longest period allowed by law.
2. Phasing-in of Affordable Units: No more than three certificates of occupancy shall be issued by the Building Inspector for units designated for sale at fair market prices (the "Market Rate Units") until at least one certificate of occupancy is issued for an Affordable Unit. The proportion of Market Rate Unit certificates of occupancy issued to Affordable Unit certificates of occupancy issued shall at no time exceed 3:1. The last unit sold shall be a Market Rate Unit. The Affordable Units shall be reasonably interspersed within the Project **and shall be shown on the site plans prior to Decision.**
3. The affordable units shall be sold to qualified households whose gross annual income is no greater than eighty percent (80%) of the median family income for Barnstable County, as published annually by the U.S. Department of Housing and Urban Development, adjusted for household size, and whose assets do not exceed the then current DHCD guidelines. The maximum sale price for the affordable units shall be the maximum purchase price affordable for a household with an income that does not exceed seventy percent (70%) of the median family income for Barnstable County, as published annually by the U.S. Department of Housing and Urban Development.
4. Each conveyance of an affordable unit shall include a Deed Rider or Affordable Housing Restriction, in the form approved by the subsidizing agency, which shall contain a restriction requiring that the unit remain affordable to an eligible buyer in perpetuity. The Deed Rider shall be recorded senior to any liens on the Premises to protect the continued

Revision accepted

availability of and requirement for the affordable units in the event of any foreclosure, bankruptcy, refinancing, or sale. Prior to the sale of any unit, the unit owner or his/her agent shall submit to the Bourne Housing Partnership Committee (BHPC) for its approval written rules for the selection of buyers of affordable units (the Buyer Selection Rules).

The Buyer Selection Rules shall provide that all affordable units are to be sold through a lottery or buyer selection process, subject to the review and approval by the BHPC or its designee. Notwithstanding the foregoing, the restrictions and Buyer Selection Rules shall conform to the requirements of the subsidizing agency. The Applicant shall be responsible for all fees and expenses necessary to implement the initial buyer selection process, including all marketing and advertising costs; fees and expenses for subsequent re-sales shall be the responsibility of the seller

5. Unless disapproved by MassHousing, the Bourne Housing Partnership Committee (BHPC) or its designee shall monitor all sales and re-sales of affordable units in accordance with a Monitoring Agreement in the form required by MassHousing. The Monitoring Agreement shall be fully executed prior to the issuance of a building permit for any of the dwelling units permitted by this Decision.
6. Re-sales and Refinancing: Whenever an affordable unit is to be resold, the owner of such unit shall notify the BHPC or its designee, in accordance with the Regulatory Agreement and Deed Rider, and shall enter into a Monitoring Agreement, as approved by the Board's counsel, with either the BHPC or its designee, to monitor the re-sale to assure the continuous affordability of the unit and the purchase of the unit by an eligible buyer. The sale price shall be determined in the same manner as discussed above. The Monitoring Agreement shall require that the seller pay the cost of monitoring re-sales. Whenever an affordable unit is to be refinanced, the owner shall notify the BHPC or its designee, in accordance with the Regulatory Agreement and the Deed Rider, which shall state that the amount of all mortgages, home equity loans, and other loans secured by the affordable unit shall not exceed the maximum sales price calculated in accordance with this Decision. In addition to the foregoing, resale and refinancing arrangements shall conform to the requirements of the subsidizing agency.
7. All affordable units shall be indistinguishable from the exterior from the market rate units. The construction specifications for the affordable units shall be identical to the construction specifications of the market rate units. This condition shall not prohibit a market rate buyer from purchasing upgraded appliances, carpeting, countertops, or other interior amenities from the Applicant or its assigns.

VII. MARKETING/LOTTERY AFFORDABLE UNITS

The following conditions are imposed with respect to the issues of marketing, minority outreach, lottery, resale formula, perpetual affordability, and the deed rider as follows. The BHPC may direct the applicant to take additional steps to carry out the purposes of these conditions.

The selection of purchasers for the Affordable Units, including the administration of the Lottery, shall be administered by a consultant retained by the Applicant, subject to the Subsidizing Agency's approval. The Lottery shall be implemented pursuant to a Lottery Plan developed by the lottery consultant and approved by the Subsidizing Agency. If acceptable to the Subsidizing Agency, disputes concerning income or other qualification shall be resolved in the first instance by the Monitoring Agent and a party aggrieved by qualification-related decision of the Monitoring Agent may appeal the decision to the ZBA for a final determination.

The provisions of this section are intended to complement and not to override or supersede any applicable requirements of the Subsidizing Agency, fair marketing regulations of the Department of Housing and Community Development, the Massachusetts Commission Against Discrimination, MassHousing, or any authority with jurisdiction and like purpose, to provide low and/or moderate income housing.

1. A lottery will be held to locate buyers for each Phase of Development. Advertisements will be run in local area papers announcing the availability of homes, income guidelines, and contact information for obtaining applications. Mailings shall be sent to, and shall include but not be limited to, the Local Housing Partnership, the Bourne Town Hall, the Housing Assistance Cooperation of Hyannis, DHCD, local public libraries, local places of worship, and housing assistance organizations, as well as applicants for prior phases of previously approved comprehensive permit projects that were not chosen in the previous lotteries. Each group will receive a copy of the advertisement as well as some blank applications.
2. In addition to the local community papers, advertisements shall be sent for publication to minority publications such as the Bay State Banner; El Mundo, etc., and mailings will be sent to local/regional organizations, social service agencies that have connections to minority communities, such as the NAACP and the Wampanoag Tribal Council. Prior to each lottery, the marketing agent will contact DHCD for an updated list of suggested publications. The outreach/marketing program shall be for a period of at least sixty (60) days prior to the selection of buyers.
3. Applications received from the outreach program will be reviewed and pre-screened for qualifications. Follow-up information will be requested as necessary to ensure that all applications include information as to Down Payment availability, mortgage pre-approval, assets, and first time buyer status. Upon review and receipt of all information, lottery applications will be placed into a pool based upon family size for the one and two bedrooms homes in each phase. A random drawing will then be conducted to select the designated number of candidates for each phase. All Applicants will be notified after the lottery of their status. Notifications will include information as to whether or not they were included in the lottery. If not, an explanation will be provided. All Applicants that were included in the lottery will be notified as to whether or not they were chosen. Those that were chosen during the drawing will be notified of a tentative delivery date for their home and will be contacted for an individual appointment to process their purchase. Those that were not chosen will be notified and advised that they will be notified of and included in subsequent drawings in future phases if they so choose.

4. To the extent permissible by law, the lottery system shall provide for residential preference of the Town Percentage (hereinafter defined) of the affordable units, so that only "Town residents" and minority applicants shall be included in the pool for each lottery for up to 70% of the affordable units sold to an eligible household. Thereafter, the lottery pool shall include all applicants, including but not limited to "Town residents." A "Town resident" is defined to include an applicant who lives or has lived in Bourne, currently works in Bourne, or who has immediate family (grandparents, parents, children, or siblings) who live in Bourne.
5. Minority applicants, if any, shall be included in all lottery pools.
6. In each of the above scenarios the three bedroom units will be reserved for first time homebuyers (defined as not having owned a home within three (3) years prior to the purchase, or a family that has been displaced by a divorce, etc.) and agree to occupy the unit as a primary residence.
7. Eligibility shall be determined prior to each lottery by using the current year HUD Median Income figures for Barnstable County. In all cases total household income and current assets for the family will be used to determine eligibility.
8. The re-sale of all affordable units shall be governed by the Deed Rider and/or Affordable Housing Restriction prepared by the subsidizing agency and shall be considered incorporated within this Decision.
9. All homeownership affordable units shall be owner occupied, except as may be allowed by the applicable subsidizing agency Deed Rider or Affordable Housing Restriction.
10. The above conditions concerning eligibility, pricing, affordability in perpetuity, monitoring, and owner occupation shall be set forth in a Deed Rider attached to all affordable units. The Deed Rider shall be recorded immediately following the Deed and shall be senior to any liens on the Premises to protect the continued availability of and requirement for the affordable units in the event of any foreclosure, bankruptcy, refinancing or sale.
11. The Applicant shall obtain the Subsidizing Agency's approval of a Buyer Selection Plan for the sale of the Affordable Units prior to putting any of the Affordable Units on the market. Buyers shall be selected through a fair lottery process (the "Lottery"), acceptable to the Subsidizing Agency.

VIII. CONSTRUCTION AND SUBMISSION REQUIREMENTS

1. Pre-Construction Submissions: Before the Applicant commences any construction activities the Applicant shall have:

Revision not accepted - project is not a Development of Regional Impact and is not subject to CCC regulations.

- a. Submitted Final Site Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, **with Cape Cod Commission regulations**, and with state and federal codes. Copies of the detailed, approved construction drawings (the "Final Site Plans") should also be filed in hard copy (10 full-scale sets) and in digital form with the Building Inspector. The Final Site Plans shall bear the signature and seal of a Massachusetts Professional Land Surveyor (PLS) and a Civil Professional Engineer (PE). The Applicant must secure approval prior to construction pursuant to Paragraph VIII.4. The Final Site Plans shall contain the following:

- i. An existing conditions plan of topographic, utility, and property information.

- ii. **The Final Site Plans should include** stormwater management plans and improvements in accordance with applicable laws and regulations.

- o **An existing conditions plan signed and sealed by a Massachusetts Professional Land Surveyor.**
- o **A lotting sheet signed and sealed by a Massachusetts Professional Land Surveyor.**
- o **Construction notes for each proposed infiltration system describing construction requirements.**
- o **Revision of the stormwater system showing the water quality tanks as offline structures, emergency overflows for each subsurface structure, and roof drain connections if any.**
- o **A Sediment and Erosion Control Plan.**
- o **More detailed General Notes addressing site controls (vertical and horizontal datum and benchmarks), construction standards, construction sequencing, erosion and sedimentation control procedures, and environmental (noise, vibration, dust and sedimentation), and safety compliance.**
- o
- o **A note providing contact information, for the proposed gas, electric, and cable utilities.**

Revisions accepted

- iii. Final landscaping plans prepared by a Massachusetts Registered Landscape Architect (RLA) to the detail required for use as on-site construction and planting drawings, improvements shall be consistent with the Approved Plans. Such plans shall include shade trees along the roadways and unit driveways and throughout the site, shrubs, and turf areas. Such plans shall indicate the specific types of active/passive recreational equipment to be installed within the open space and recreational areas located on the approved plans.

- iv. Final roadway plans and profiles for the main site roadway.
- v. Final utility plans and profiles including properly labeled drainage components and all site utilities including electric, gas, water supply lines, wastewater collection and disposal facilities, building service connections, and all system components and appurtenances. **The final roadway profile should extend to the centerline of Sandwich Road and showing proposed drainage lines, water quality inlet tanks, and infiltration systems to the profile view including proposed depth of structures and depths to bottom of stone.** Revision accepted
- vi. The location of electric, telephone, CATV, and gas lines and appurtenances shall be indicated on the drawings based upon final design of these systems by the utility company.
- vii. Final Site Lighting plan. **Fixtures must comply with all dark-sky requirements of the Cape Cod Commission.** Revision not accepted - project is not a Development of Regional Impact and is not subject to CCC regulations. But Applicant agrees to incorporate dark sky principals and avoid upward-facing fixtures. See paragraph XI.36 below.
- viii. Final Photometric Drawing
- ix. **If approved by MassDOT, a Roadway Improvement Plan showing pavement markings and other improvements to Sandwich Road required to provide a left turn lane at the entrance to Chase Estates.** Revision accepted

- x. Final Site Entrance Plan in accord with MassDOT requirements.
 - xi. Size, location, legend, and illumination of entrance signage.
- b. Obtained any and all permits and approvals from the Bourne Conservation Commission or the DEP which may be required under any state statute, code, or rule and regulation under its jurisdiction, to the extent not otherwise expressly covered by this Decision, including a final Order of Conditions or Superseding Order of Conditions under the Wetlands Protection Act as to any portion of the Site subject to the Wetlands Protection Act that are required by applicable state law prior to such commencement;
 - c. Obtained a National Pollutant Discharge Elimination System ("NPDES") stormwater permit issued for the Project, if required by applicable law;
 - d. Obtained, if needed, a Certificate of the Secretary of Environmental Affairs of compliance pursuant to 301 CMR 11.08(8)(a);
 - e. Delivered to the ZBA with copies to the Building Inspector, Planning Board, Board of Health, Conservation Commission, Superintendent of the DPW, Fire Chief, and Police Chief a complete Construction Management Plan (CMP) as described in condition #3, below.
 - f. A geotechnical engineering design report shall be submitted for the areas that are proposed to be graded at one foot horizontal to one foot vertical (1:1). Signed, sealed slope stability calculations shall be provided by a geotechnical engineer that is based upon location specific subsurface testing.
 - g. Earthwork computations shall be provided for the volume of cut and fill and the net volume on/off site. The number of trucks required for off-site transport shall be calculated.
 - h. Final Drainage Calculations and Report must be submitted. The complete stormwater design package shall be signed and sealed by the civil engineer of record and shall conform to the methods and procedures set forth in the Massachusetts Stormwater Handbook. The design depicted on the plans currently on file is meant to demonstrate intent and not full construction level of detail.
 - i. Retaining walls exceeding ten (10) feet in height require a Building Permit and must be designed by a Massachusetts Structural Professional Engineer. **Final design of retaining walls must be based on location specific soil tests. Safety fencing must be shown. For walls adjacent to property lines, sheeting, shoring, and barding preventing encroachment on adjacent property must be shown.**
2. Before the Applicant commences construction of any residential units, the Applicant shall have:

Revision accepted

- a. Submitted Final Architectural Plans consisting of detailed construction drawings that are consistent with this Permit, with local requirements not waived in the Permit, with the Massachusetts Building Code, and with all other state and federal codes. Copies of the detailed, approved architectural drawings (the "Final Architectural Plans") should also be filed in hard copy and in digital form. The Final Architectural Plans shall bear the signature and seal of a Massachusetts Registered Architect (RA). The Applicant must secure approval pursuant to Paragraph VIII.4 prior to beginning unit construction. The Final Plans shall include a Building Code review.

The number of bedrooms shown in the Final Architectural Plans shall not exceed three bedrooms per unit or a total of sixty (60) bedrooms on the site.

- b. Obtained any and all permits and approvals from the Bourne Board of Health and the DEP regarding disposal of wastewater generated by the Project that are required by applicable state laws prior to such commencement;

3. The Construction Management Plan shall address the following topics and items:

i. Construction Administration

Hours of construction **including equipment startup.**

Hours of construction delivery Truck routes

Trash and debris removal

Revision accepted

- ii. Construction Phasing and Schedule (critical path) timing and phasing of construction; site clearing; construction of roadways and utilities; buildings, etc. If the site is not expected to be completed in a single- phase, a detailed Construction Phasing Plan shall be submitted indicating access and utilities for each phase adequately addressing access and parking, emergency vehicle access, and utility services.

iii. Communications

iv. Noise and Dust Control

Tree removal (chipping, etc.) Public street cleaning and repair Dust

Noise

Rock crushing

v. Blasting

Blasting Plan

Identification of petitioner's blasting consultant

Selection of independent blasting consultant Selection of blasting contractor
Pre- and post-blast survey (scope and content) Insurance coverage
Blasting limits
Notification to abutters of blasting schedule Road closures (if necessary)
School bus conflicts (limits on hours)

vi. Erosion Control

Silt sacks, hay bales, silt fences, etc. Tree protection plan

Drainage infrastructure

vii. Identification of existing underground utilities

viii. Construction Staging

Staging areas

Site office trailers

Storage trailers/containers Open storage areas

Delivery truck holding areas

Paved rRefueling areas **with spill containment.**

Revision accepted

ix. Traffic and Parking (during construction)

On-site locations

Off-site locations

Snow removal

Police details

Warning signs

x. Fire and Emergency

Temporary emergency access roadway

Emergency water supply throughout construction

Provision of a Knox padlock for construction fence gates

xi. Construction Specifications

The CMP shall be reviewed pursuant to Paragraph VIII.4. The scope of the review of the CMP shall be for completeness and for consistency with generally accepted construction practices and for compliance with all the conditions of this Decision.

4. Procedure for Review and Approval.

- a. When review and approval of a plan or document is required by any condition of this permit, the Applicant shall submit the plan or document to the Building Inspector and any other recipient specified by the permit condition. Upon such review and absent an objection by any of the specified recipients, within thirty (30) days of receipt, that such plan or document are inaccurate or inconsistent with or not in conformity with this Decision, the plan or document shall be deemed approved. If the submitted plan or document is required by state or federal law, rather than local regulations, it shall be deemed approved for purposes of this permit, but Town authorities may communicate any concerns to the applicable state or federal agency.
- b. In the event there is an objection that the plan or document is inaccurate or inconsistent or not in conformity with this Decision, the Applicant may submit the matter in question to the ZBA for its review for consistency; the ZBA shall hold a hearing within 45 days of the applicant's submission, and render a decision within 14 days after said hearing. Any matter related to this Decision to be reviewed and decided by the ZBA after this Decision is issued may be reviewed and decided by the members of the ZBA designated by the Chairman, even if those members did not sit on the hearings that led up to and resulted in this Decision. The Applicant may appeal any adverse ZBA decision to the Housing Appeals Committee.

IX. SITE DEVELOPMENT CONDITIONS

1. Prior to the commencement of any construction activities or any site development or site clearing, the Applicant shall meet with the Building Department, Police Chief or his representative, Fire Chief or his representative, the ZBA's Consulting Engineer (if any), and the Chair of the ZBA or his representative at a mutually convenient time and place during normal business hours to review the CMP, and to coordinate the Building Department's periodic inspections of the Project (the "Pre-Construction Meeting"). This meeting shall be open to the public.
2. At least two weeks prior to the commencement of any construction activities, the Applicant shall submit to the ZBA, with a copy to the Police Chief, the Fire Chief, and the Building Inspector, a Construction Schedule, indicating the anticipated start and end points for each significant phase of development (site grubbing, clearing, and fill; construction of roadways and related infrastructure, excavation and blasting for foundations, framing and interior construction, etc.). The Construction Schedule shall also include the anticipated daily vehicle trips per phase, and the anticipated hours of the day during which heavy equipment and construction vehicles are expected to enter and

exit the Site.

3. The Applicant shall ensure safe and convenient vehicular access to the Site during the entire duration of the Project.
4. The Applicant shall submit to the ZBA a construction and permitting schedule, prior to the commencement of any construction activities or any site development or clearing, and semi-annually thereafter to assist in project status update and review.
5. The Building Department or its appointed agents may, upon reasonable notice to the Applicant, conduct periodic inspections during the construction of the Project, to ensure compliance with the terms of this Decision and the state building code, and for consistency with generally-accepted construction and engineering practices for the installation of roadways, stormwater management facilities, utilities, and all development infrastructure.
6. The Applicant shall forward final architectural plans to the Building Inspector at the time of applying for building permits. All construction shall be inspected by the Building Inspector and shall be in compliance with all Massachusetts State Building Code requirements
7. The Applicant shall be responsible to ensure that nuisance conditions do not exist in and around the Site during the construction operations. The Applicant shall at all times use all reasonable means to minimize inconvenience to residents in the general area.
8. Dust - Methods of controlling dust shall meet all air pollutant standards as set forth by Federal and State regulatory agencies.
9. Noise - The Applicant shall implement measures to ensure that noise from project construction activities does not exceed acceptable levels, as set forth by Federal and State regulatory agencies.
10. Traffic - The Applicant shall implement necessary traffic safety controls to ensure a safe and convenient vehicular access in and around the Site. Any traffic problems that occur as a result of site operations and construction shall be mitigated immediately, at the expense of the Applicant.
11. Roads - The Applicant is responsible for the sweeping, removal of snow, and sanding of the internal roadways and driveways permitting access to residents, emergency vehicles,

and others during construction and until the Homeowner Association has been legally established. The final coat of pavement on the internal roadways shall be installed after the base course has endured a full winter season. The Applicant shall promptly clean any debris or dirt deposited on Bourne or state controlled streets and roads.

12. Burial of any stumps or solid debris onsite is expressly prohibited. Localized burial of stones and/or boulders is prohibited to prevent the creation of voids from soil settlement over time.
13. Intentionally omitted.
14. Utilities, including but not necessarily limited to electric, gas, water, cable, and telephone shall be located underground per utility company standards and applicable codes, and DIGSAFE standards. A final utility plan approved by the applicable public utilities shall be submitted to the Building Inspector prior to the commencement of any construction.
15. Stabilization Requirements -No disturbed areas that might contribute to erosion or sediment migration that are located onsite and under the applicant's control shall be left in an open, unstabilized condition longer than 30 days or as may be governed by the NPDES permit. Temporary stabilization shall be accomplished by hay bales, hay coverings, matting or other appropriate means. Final stabilization shall be accomplished by loaming and seeding exposed areas in accordance with the approved landscaping plans or site plan.
16. Blasting - Any rock blasting shall be performed by a licensed blasting professional, who shall first obtain all required permits from the Bourne Fire Department. All blasting and removal of debris shall be performed in accordance with state regulations and local fire department requirements and shall provide evidence thereof to the Fire Chief.
 - a. Selection of the Blasting Contractor. A blasting contractor, acceptable to both the Applicant and the Bourne Fire Department, shall be selected after review of the qualifications of such contractor by a qualified independent geotechnical-blasting consultant who shall also be acceptable to both the Applicant and the Bourne Fire Department.
 - b. Independent Blasting Consultant. An independent geotechnical-blasting consultant shall be selected and paid for by the Applicant, subject to the approval of the Bourne Fire Department. The consultant shall review the qualifications of the blasting contractor, and review the final blasting plan prepared by the blasting contractor, check the calibration of the seismograph monitors, approve the location and installation of the seismograph monitors, and, if required by the Bourne Fire Department, shall determine the blast limits

throughout the blast period and shall consult with the Bourne Fire Department on an as-needed basis throughout the blasting period.

- c. Pre-blast Survey. Before any blasting on the Site, the Applicant shall conduct a pre-blasting survey that shall include video-recording of the foundations of all direct abutters to the Revised Project, and shall provide a copy of that survey to the ZBA and Fire Chief.
 - d. Insurance Coverage. The blasting contractor shall carry comprehensive public liability insurance in the amount of not less than \$1,000,000 for property damage in respect of any one occurrence and \$2,000,000 aggregate. A certificate shall be submitted to the Bourne Fire Department by the contractor documenting that the required coverage will be in force for the duration of the blasting at the Site. If there is a general contractor or developer associated with the blasting, each shall carry a minimum of \$1 million of comprehensive liability insurance.
 - e. Blasting Limits. The Commonwealth of Massachusetts blasting limits shall be observed. However, if, based upon the recommendation of the independent blasting consultant, the Bourne Fire Department believes that a lower limit is necessary to protect the Site and the abutting property that lower limit shall be in effect.
 - f. Notification. Not less than one week prior to the commencement of any period of blasting, the Applicant shall notify the immediate abutters within 200 feet of the blast area, stating when the blasting period shall begin. Notification under this provision and under any other provision in the Comprehensive Permit shall be by the following three methods: (1) phone or in person; (2) by email; and (3) by letter. No perchlorate shall be used during blasting. Such notification shall include an explanation of the warning procedures for blasting including soundings. The Applicant shall send another letter notifying the same abutters that the blasting period has been completed. In addition, the Applicant shall notify the Fire Department 30 minutes prior to each blast, and a Fire Department detail is required for every blast, which shall be certified by the Fire Academy on the requirements of the state blasting regulation.
 - g. Post-blasting Survey. After the completion of all blasting, the Applicant shall conduct a post-blasting survey that shall include video-recording of the foundations of all direct abutters to the Project, and shall provide a copy of that survey to the ZBA, Fire Chief, and each abutter, respectively, upon request.
17. Safety Fencing: During construction of the Project, the Building Inspector shall have authority to require fencing of the site or portions of the site to the extent required and appropriate to enhance safety by controlling access. A Knox padlock shall be used for any construction fence gates.

18. As Built Plans: Prior to the occupancy or use of the final "market rate" dwelling unit constituting a part of the Project, the Applicant shall submit to the ZBA an "As Built Plan" in paper and CAD format, showing all pavement, buildings, stormwater management structures, and other infrastructure as they exist on the Site, above and below grade, including appropriate grades and elevations. The plans shall be signed by a registered land surveyor and civil engineer, certifying that the Project as built substantially conforms and complies with the conditions of this Comprehensive Permit.

19. Trees. Prior to the commencement of any construction activities or any site development or clearing, if required by the Board's Consulting Engineer, the Applicant shall erect a physical barrier such as a plastic fence to ensure that any existing trees on the locus be preserved to the extent consistent with the approved site plan and landscaping plans. If any such trees, having a caliper of four inches or greater at four feet from the ground, are destroyed or injured as a result of construction, the Applicant shall plant new trees in their place of a comparable species with a minimum height of nine feet at a ratio of 2 new trees for each destroyed tree. Such replanting shall be done by a qualified landscape professional.

20. Roadway Design: The surface course and binder course of the roadways, and the attendant shoulder widths and side slopes, shall conform to the Bourne Planning Board's Subdivision Rules and Regulations except as waived herein. Roadway design to be indicated on the Final Site Plans shall include the following:

- a. The maximum roadway grade shall not exceed twelve (12) percent.
- b. Intentionally omitted.
- c. Intentionally omitted.
- d. Install "No Parking Any Time" (UMTCD R7-1) signs for the **hammerhead** turnaround at the upper end of the principal on-site access drive.

Revision accepted

21. Erosion control shall follow Best Management Practices and shall be maintained throughout the duration of the project.

Prior to the issuance of any certificate of occupancy, the applicant shall establish a maintenance plan for the stormwater system, which shall include but not be limited to scheduled inspections, thresholds for removal of sediments, and an educational program for residents for the continuing maintenance and protection of the stormwater system. The maintenance plan shall be reviewed pursuant to Paragraph VIII.4.

No sands or gravels may be removed from the site except those required to be removed to accomplish the conditions shown on the final site plan to be approved by the Board.

22. Stormwater Management:

- a. Catchbasin spacing shall be reduced to a maximum of 150 feet on grades exceeding 6 percent.
- b. Grate hydraulic calculations shall be submitted and double grate or cascade grate structures shall be added as appropriate to ensure that the design storm is captured.
- d. Invert elevations of the stormwater quality structures shall be maintained above the recharge systems. The Stormceptor units should not be permitted to surcharge. Tailwater elevations that extend above the structural outlets shall not be permitted.
- f. All subsurface structures shall support HS-20 loading in paved areas.

23. **Water Distribution:**

Revision accepted

- a. The applicant shall submit a water connection application to the Board of Water Commissioners, together with engineered drawings and other information reasonably requested or required by said Commissioners, consistent with its usual practices and procedures. Only the Board of Water Commissioners has the right to approve a request for a water connection to the Bourne Water District system. If questions arise with regard to the project, the District's Engineer may be asked to review the plans and submit a finding.
- b. The Bourne Fire Dept requires that fire hydrants not exceed 500 feet of separation. Hydrant flow records and test data must demonstrate a deliverable fire flow including simultaneous domestic flow while maintaining a minimum residual pressure of 20 psi.

24. **Individual on lot septic systems are provided and m**~~Maintenance of septic system(s) and wastewater disposal infrastructure~~ **shall be the responsibility of each homeownerthe Homeowners' Association.**

Revision accepted in part; see revised draft permit.

25. The on-site sidewalk shall comply with applicable laws and regulations regarding handicap access **including regulations of the Massachusetts Architectural Access Board.**

26. Temporary construction signage and permanent entrance signage at Sandwich Road should be indicated on the plans and details furnished with respect to sign legend, dimensions, materials, colors, means of illumination. Signs shall comply with the requirements of the Bourne Zoning By-Law. The signs should be located to avoid interference with sight distance for exiting vehicles. Peer review of the sight distance limitations may be required.

Revision not accepted; AAB regulations do not apply.

27. The applicant shall verify whether or not the Postmaster will require a common mailbox facility. If required, the mailbox facility and associated parking shall be indicated on the

site plan.

28. The sidewalk at Sandwich Road should be clearly indicated including the area intended to serve as a school bus waiting area.
29. The principal site access roadways should be signed for "No Parking" (MUTCD R7-1) **on one side** and parking restrictions should be enforceable by the Homeowner Association Documents. Revision accepted
30. A Site Lighting Plan shall be developed using a maximum pole height of 24 feet. Light fixtures should be consistent with residential scale and style typically acceptable in the town and should comply with all applicable laws and regulations.
31. Intentionally omitted.
32. During construction, the Applicant and his agents and employees shall conform to all local, state, and federal laws regarding noise, vibration, dust and use of Town roads and utilities. The Applicant shall at all times use all reasonable means to minimize inconvenience to residents in the general area. If any units have been constructed and occupied, construction shall not commence on any day Monday through Friday before 7:30 AM or on Saturday before 8:30 AM, and all exterior construction activities shall cease by 6:00 PM on all days, and no construction or activity whatsoever shall take place on Sundays or legal holidays except for the limited purpose of providing emergency health or safety measures or except as otherwise allowed by the Building Inspector. All construction shall follow Best Management Practices for erosion and sediment control.
33. Construction of all dwelling units, utilities, roads, drainage structures, and all related appurtenances shall be in accordance with all applicable zoning bylaws and all other applicable local, state, and federal regulations except as waived by this Decision.
34. Intentionally omitted.
35. All utilities shall be underground.
36. All area and roadway lighting shall be shielded or refracted as necessary in such a manner as to minimize light spill over to neighboring properties. **Light fixtures shall incorporate dark skies principals and shall avoid upward projection of light.** Revision accepted
37. All on-site storage of hazardous materials and hazardous wastes shall be on an impervious surface, with containment and access control, and all on-site vehicle fueling shall be conducted with industry recognized containment and access control. The CMP

shall identify a designated fueling area and shall construct an impervious surface to accommodate construction vehicles. Containment shall be provided for a minimum of 50 gallons of fuel.

38. Prior to digging on any public land, the applicant shall comply with all applicable federal, state, and local regulations and with all "dig safe" requirements.
39. Surety & Covenants: As security for the completion of the infrastructure related to the Project as shown on the Approved Plan, including, but not limited to, the binder coat of the roadway, sidewalks, ~~parking areas and common areas, recreational areas, sewage disposal system,~~ drainage facilities, utilities, landscaping, and any other specific infrastructure shown on the "Approved Plan" (the "Infrastructure"), the release of occupancy permits for all housing units and the sale of all housing units in the Project shall be subject to the following restrictions:
 - a. No occupancy permit for a unit in any building shall be issued, and no sale of any unit shall be permitted, until: (1) the base and binder course for the roadway, parking areas, and relevant unit driveways shown on the Approved Plan has been installed; and (2) all Infrastructure described herein and as shown on the Plan has been constructed or installed so as to adequately serve said building unless a phasing plan is submitted for review and approval by the ZBA.
 - b. No occupancy permit for a unit in any building shall be issued, and no sale of any unit shall be permitted, until the Approved Plan has been recorded with the Registry of Deeds. This Comprehensive Permit shall be referenced on the Approved Plan prior to recording
40. The Applicant and its successors and assigns shall comply with the regulatory/ affordable housing restrictions, deed rider, monitoring agreements, and all other conditions applicable to the project approved by this Decision.
41. Nothing in this Decision shall be deemed to constitute a waiver of or from the jurisdiction of the Cape Cod Commission as granted that agency by the Cape Cod Commission Act.
42. If construction authorized by this Comprehensive Permit has not begun within three years of the date on which the permit becomes final, the permit shall lapse unless extended by the ZBA. The permit shall become final on the date that the written decision is filed in the office of the town clerk if no appeal is filed. Otherwise, it shall become final on the date the last appeal is decided or otherwise disposed of. The Project shall be completed expeditiously and, in any event, within five years of the date of the first building permit issued, unless extended by the ZBA.

Revision accepted

43. The Board reserves the right, insofar as consistent with state law, to further review and amend this decision based upon any information that comes before the Board as a result of Applicant's future need to acquire permits from any local, county, state or federal authority, including but not limited to, the Cape Cod Commission.
44. Intentionally omitted.
45. No structure constructed under this Comprehensive Permit shall be altered, reconstructed, extended, or changed unless authorized by the ZBA by a special permit pursuant to the Zoning Bylaws and G.L. c. 40A, s.6, as may be amended. Upon such an application for special permit, the Board shall determine, in the first instance, whether such alteration, reconstruction, extension or change is "substantial" or "insubstantial." For all special permit applications for insubstantial changes, the ZBA shall employ the standards of review set forth under the Zoning Bylaw pertaining to changes to pre-existing, nonconforming structures, as may be amended. Requests for substantial changes shall be treated as requests to amend this Comprehensive Permit. This Paragraph (45) shall not apply to the original construction of structures developed pursuant to this Comprehensive Permit by the Applicant, but shall apply to subsequent alterations, extensions, and changes to such structures.
46. The terms alteration, reconstruction, extension, and change, shall have the same meaning under the Massachusetts Zoning Act, G.L. c. 40A, §6 and the Bourne Zoning Bylaws.
47. Intentionally omitted.
48. The Applicant acknowledges that prior to the start of construction, the Applicant must obtain all required approvals from any and all other governmental agencies, departments, or commissions whose approvals are necessary for this Project and such approvals must be consistent with this Decision.
49. The Applicant shall prepare Homeowner Association documents. The Homeowner Association shall be responsible for the ownership, maintenance and repair of the roadways, storm water management systems, , retention ponds, recharge facilities, retaining walls, the open space parcels, and other common amenities and services.

The Homeowner Association documents shall be subject to review and approval by the Board's counsel to insure compliance with the terms of this Comprehensive Permit decision. Said documents shall contain restrictions on all units preventing any increase in the number of bedrooms. Prior to the sale of any unit, the Homeowner Association documents shall be filed with Barnstable County Registry of Deeds.

The calculation of the percent of interest in the Homeowner Association for each unit shall be determined pursuant to relevant laws of the Commonwealth governing homeowner associations.

50. Intentionally omitted.
51. The final site plan is to be recorded at the Barnstable County Registry of Deeds and shall be recorded together with this Decision.
52. The Board requires that a note be placed on said final site plan stating that the Plan is the subject of a comprehensive permit under Mass. Gen. L. c.40B, sections 20-23.
53. The Town of Bourne shall be free of any liability arising out of the Board's approval of the site layout plan, and for any act, omission or negligence caused by the Applicant, its employees, agents, subcontractors, beneficiaries or trustees with relation to this Project.
54. Intentionally omitted.
55. Intentionally omitted.
56. Intentionally omitted.
57. Prior to issuance of any Building Permits, a permanent barrier fence, sufficient to prevent the passage of vehicles, must be installed and maintained between Chase Estates at 230 Sandwich Road, Map 25, Parcel 9 and 14 Bosun Lane, Map 25, Parcel 15. This barrier fence must be maintained by the Applicant until the last dwelling unit is sold, and thereafter by the Homeowner Association.

X. MISCELLANEOUS LEGAL REQUIREMENTS

1. The Applicant shall establish a Homeowners Association for the Project in a form reviewed by the Board's counsel, and approved by the Subsidizing Agency and including provisions for operating and replacement reserves to be established and maintained.
2. Any sale or transfer of rights or interest in all or any part of the Site shall include a condition that successors are bound to the terms and conditions of this Decision.
3. The Applicant and/or subsequent Owner(s) shall be bound by all conditions and requirements set forth in this Comprehensive Permit.
4. In setting the beneficial interest in the Homeowner Association, the Applicant shall comply with all relevant laws of the Commonwealth governing homeowner associations.

5. The principle site roadways, driveways, utilities, drainage systems, water supply and distribution infrastructure, wastewater disposal system, and all other infrastructure shown on the Approved Plans as serving the Project, shall remain private and the Town of Bourne shall not have, now or ever, any legal responsibility for the operation or maintenance of the roadways, driveways and infrastructure, including but not limited to snow removal, garbage pickup, the stormwater management system, the **on lot** wastewater disposal systems, and landscape maintenance.

Revision accepted

XI. APPLICANT'S REQUESTED WAIVERS

The Applicant has requested waivers from the By-Laws of the Town of Bourne, the Town of Bourne Zoning Bylaws and other local rules and regulations. The Applicant's requested waivers are set forth in its Application and as supplemented through the public hearing process. The ZBA's grant of waivers shall be subject to the terms and conditions imposed by this Decision, and to the extent that any waiver is inconsistent with a term or condition set forth elsewhere in this Decision, such term or condition shall govern. No grant of any waiver shall be deemed to waive compliance with any condition of approval of this Decision. Any waiver not granted below or otherwise included within this Decision shall be deemed denied.

The following waivers are granted:

Bourne Zoning Bylaw, Section 1230. Site Plan - Special Permit Approval. Bourne Zoning Bylaw, Section 2200. Use Regulations.

Bourne Zoning Bylaw, Section 2400. Dimensional Regulations. Bourne Zoning Bylaw, Section 2500. Intensity of Use Schedule. Bourne Zoning Bylaw, Section 2600. Development Scheduling. Bourne Zoning Bylaw, Section 3300. Parking Requirements.

Bourne Zoning Bylaw, Section 3340. Egress Standards.

Bourne Zoning Bylaw, Section 3500. Landscaping and screening. Bourne Zoning Bylaw, Section 3560. High Fences or Walls.

Bourne Zoning Bylaw, Section 4260. Nonconforming Affordable Lots. Bourne Zoning Bylaw, Section 4400. Earth Removal.

Bourne General Bylaw, Section 3.7. Wetland and Natural Resource Protection Bourne General
Bylaw, Section 3.13. Development Mitigation
Bourne Wetland Regulations

Board of Health Bedroom Definition Regulation

~~Cape Cod Commission Enabling Regulations Governing Review of Developments of Regional
Impact, and Minimum Performance Standards for Developments of Regional Impact~~

Bourne Subdivision Regulations

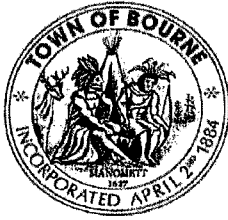
Revision not accepted - CCC regulations do not apply
because project is not a Development of Regional
Impact; Applicant requests confirmation of same, or
precautionary waiver.

Decision of the Board of Appeals:

For all the reasons stated above and on the record before it, pursuant to G.L. c.40B, ss. 20-23,
the Board voted to grant an Amended Comprehensive Permit to Chase Developers, Inc., for real
property located at 230 Sandwich Road, Bourne, Massachusetts, on the terms and conditions
stated herein.

Zoning Board of Appeals Bourne, Massachusetts [SIGNATURE]

Appeals of this decision may be made pursuant to Section 17 of Massachusetts General Laws,
Chapter 40A and shall be filed within twenty (20) days after the date this decision is filed with
the Bourne Town Clerk.



**TOWN OF BOURNE
BOARD OF APPEALS
24 PERRY AVENUE
BUZZARDS BAY, MA 02532
TEL. 508-759-0615 EXT. 21
FAX 508-759-0611**



REVISION TO COMPREHENSIVE PERMIT FINAL DECISION

PETITION NUMBER: 08-18

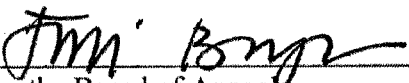
**NAME OF APPLICANT/CURRENT PROPERTY OWNER: CHASE DEVELOPERS,
INC. AND THOMAS C. PAPPAS, TRUSTEE OF 230 SANDWICH ROAD REALTY TRUST
PROPERTY ADDRESS: 230 SANDWICH ROAD**

REGISTRY OF DEEDS TITLE REFERENCE: TOWN MAP #25, PARCEL #36.0

On December 16, 2020, the Board of Appeals voted to Deny Without Prejudice a proposed Revision to a previously granted Comprehensive Permit, in accordance with Massachusetts General Laws Chapter 40B, Section 21, and Section 1320 of the Bourne Zoning Bylaws, for the property located at 230 Sandwich Road, as shown on assessor's map # 25, parcel # 36.

The Board of Appeals certifies that the decision attached hereto is a true and correct copy of its decision to Deny Without Prejudice a Revision to a Comprehensive Permit and that copies of said decision, and all plans referred to in the decision, have been filed with the Town Clerk.

Any person aggrieved by this decision may appeal to the Superior Court or Land Court as provided in M.G.L. Chapter 40A, Section 17 (as referenced in Section 40B, Section 21, Sentence 9), and by filing a NOTICE OF ACTION AND COMPLAINT with the Town Clerk within twenty (20) days of the date of filing of this decision or by filing an appeal pursuant to G.L. c.40B, ss. 20-23 as may be relevant.


For the Board of Appeals

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TOWN CLERK BOURNE

DECISION - REVISION TO COMPREHENSIVE PERMIT

I - PROCEDURAL HISTORY:

1. On or about September 17, 2019, the Applicant submitted a petition to modify a comprehensive permit issued by the Board of Appeals on or about November 28, 2012.
2. Proper notice was given and the public hearing was continued from October 21, 2020 (previously continued nine times since originally being opened on August 19, 2019).
3. The purpose of this hearing was for the applicant to present a comprehensive response to a peer review of the design of the applicant's project at 230 Sandwich Road, herein referred to as Chase Estates.
4. The applicant had provided the following materials for this hearing:
 - a) Cover letter for Chase Estates Peer Review Response dated December 11, 2020 (from Mr. Drew Hoyt to Mr. James Beyer – 3 pages);
 - b) Response Memorandum to PSC Peer Review dated December 11, 2020 (from Jim Pavlik, PE, Outback Engineering Inc. to the Board of Zoning Appeals – 17 pages).
5. The following materials, previously submitted by the applicant on August 10, 2020, were relevant:
 - a) Comments by PSC (peer review consultant) on Chase Developers, Inc. proposed Amended Comprehensive Permit Including Supplemental Changes dated 8/10/2020 (27 pages);
 - b) Memorandum dated August 10, 2020, from Mark Bartlett, PE and Thomas C. Houston, PE, AICP, to the Bourne Board of Zoning Appeals regarding a Peer Review of First Submission of the Preliminary Site Plans and the Preliminary Drainage Report (14 pages);
 - c) Memorandum dated August 10, 2020, from Thomas C. Houston, PE, AICP to the Bourne Board of Zoning Appeals regarding a Peer Review of First Submission of the Preliminary Traffic Impact Analysis (1 page).
6. Based on the Board's review of the materials referenced in Items #4 and #5 above, Mr. James Beyer, Chairman, commented:
 - a) The last time this Board convened to hear this matter, on October 21, 2020, it specifically requested that this applicant provide a *comprehensive response* to the peer review that was provided on August 10, 2020. Now it is December 16, more than four months since the peer review report was made available to the applicant, and the Board still does not have that response.
 - b) There is a point-by-point response to the parts of the peer review that deal with drainage and site planning, but only a vague promise that a new stormwater system design, site

- layout plan and stormwater management plan, which would reflect the reviewers' concerns, will be forthcoming at some unidentified future date.
- c) There is no response at all provided to the review of the Traffic Impact Analysis, presumably because this was never completed, despite a request from the peer reviewer (also dated August 10, 2020) for the applicant to provide technical backup for the Traffic Impact Assessment prior to its review of same (Item #5.c) above refers).
 - d) The Board had hoped that it would be able to debate at this meeting the technical points raised by the peer reviewer and move quickly toward revising the language in the Comprehensive Permit. This is not possible because no current proposed markup of the language in the Comprehensive Permit has been provided. There is no revised list of waivers to be sought and no complete list of architectural drawings and other relevant documents that are to be included in that permit.
 - e) This Board has been conducting public hearings on this matter for well over a year, and it is frustrated with the lack of progress in that time. The Board is not required to meet continually and simply hope that the applicant shows up with the necessary material. It requires an honest, thorough and good faith effort be undertaken to compile and submit the information required to fairly and efficiently evaluate the project. The burden of that effort falls upon the applicant, not upon the Board.
7. The Chairman stated that he intended to entertain a motion to Deny, Without Prejudice, 230 Sandwich Road, Chase Estates Comprehensive Permit #08-10, Notice of Project Change. He noted that such a denial would permit the applicant to reapply without a two-year waiting period, hopefully at such time as the applicant has assembled the complete requisite information for the Board's consideration. Prior to hearing the motion, the Chairman asked for comments from the applicant and members of the public.
8. Mr. Drew Hoyt, attorney for the applicant, made the following comments:
- a) Chase Estates had responded to Board's requests, and therefore the proposed action was not reasonable;
 - b) He was not aware of an annotated version of the Comprehensive Permit (referred to in Item #5.a) above);
 - c) Chase Estates has no problem providing the requested backup materials and analysis for the Traffic Impact Analysis;
 - d) He requested that the Board consider a continuance of the matter until its first meeting in March, at which time the missing information and revised design would be provided;
 - e) He stated that the proposed denial would allow the applicant the opportunity to consider an appeal to the Housing Appeals Committee;
 - f) He thanked the Board for not taking a hostile stance toward this project and noted that he appreciated their fair response to the applicant's submissions.
9. Two abutters, Sean Scully of 8 Bosuns Lane and Brian Jensen of 10 Bosuns Lane, commented to the Board. Both expressed frustration at the lengthy hearing process and the number of continuations because of missing information requested by the Board. Mr. Jensen noted that the Board had been very clear in its request at the October 21 hearing that the applicant should return to this hearing with a complete response as requested by the Board.

10. Responses by the Board to Mr. Hoyt's public comments are provided as part of **SECTION II** below.
11. Upon a motion by Mr. John O'Brien and a second by Mr. Chris Pine it was voted unanimously to close the public hearing.

II - FINDINGS:

1. After hearing and due deliberation, on a motion made by Mr. Christopher Pine and seconded by Mr. John O'Brien, it was voted to Deny Without Prejudice a Revision to Comprehensive Permit #08-18 for the property located at 230 Sandwich Road, Map # 25, Parcel # 36. with any advisories, conditions, safeguards, and limitations that may be contained in paragraph # 7 of this Decision, and further to incorporate as the reasons therefore, that the Board of Appeals has made the findings of fact set forth in following paragraphs # 2, # 3, #4, #5 and # 6 of this Decision.
2. It was clearly stated at the October 21 hearing that a complete response to the peer review (which should in fact have been provided for that October 21 hearing) was required on December 16, and that no further continuances would be granted. Indeed, the Board allowed Mr. Hoyt to choose the date of the continuance granted on October 21 so that he could be ready as requested. Further, the entire agenda for this December 16, 2020, hearing had been cleared in anticipation of a lengthy discussion of that response. The lack of a complete response at either hearing is evidence of an ongoing problem with the applicant providing what is required for review and approval by the Board.
3. In a subsequent phone call from Mr. Hoyt to Mr. Beyer on December 18, 2020, Mr. Hoyt admitted that Chase Estates did have an annotated copy of the Comprehensive Permit as referred to in Item 4.a) of **SECTION I** above, and he apologized to the Board for stating otherwise.
4. If the applicant had no problem with providing the additional information and analysis underlying the Traffic Impact Study requested by the peer reviewer, such information should have been provided in a timely manner and a response to the peer reviewer's comments should have been included in material submitted for the Board's review prior to the December 16 hearing; along with all other information requested by the peer reviewer (including but not limited to the the area of the housing units and other related information omissions).
5. Given the applicant's past performance in responding incompletely to the Board's requests (see Item #2 of this Section above), there is no assurance that a continuation to March, 2021, would result in a complete submission any more than any previous continuances have done, and would almost certainly result in more continuances beyond that date.
6. The Board is aware that the applicant is able to resubmit to the Board for approval of the project, or, at its discretion, to appeal to the Housing Appeals Committee. However, the

Board notes that it has voted for the denial *without prejudice*. The applicant is entitled to a fair hearing on the merits of this project based on a full submission. In that sense a denial without prejudice is actually of benefit to the applicant insofar as it will provide a reset and an opportunity to concentrate on assembling a substantive and comprehensive submission for the Board's consideration.

7. Advisories, Conditions, Safeguards, and Limitations:

- a) In the interest of the applicant providing a substantive and comprehensive resubmission for the Board's review, the following is a list of the minimum submission requirements, each consistent with 760 CMR 56.00 et seq. and the Board's Comprehensive Permit Rules and Regulations:
 - i) Existing Conditions Report showing location plan, topography, vegetation, physical structures, nearby roadways and driveways, fire hydrants, buried and overhead cables, underground piping etc.
 - ii) Preliminary Subdivision Plan showing individual lots and common areas
 - iii) Preliminary Site Development and Utility Plans, Sections and Details showing grading and topography, stormwater management, drainage, main utility connections, culverts, retaining walls, roads, curbs, fences, site layout, roadway layout and construction, profiles etc. (Note these exhibits should include a cross section cut through both sides of the proposed street that shows all retaining walls, and identifies the leach field for each septic tank on each lot)
 - iv) Preliminary Architectural Plans, Elevations Sections and Details showing the scope and character of the development
 - v) Preliminary Architectural Outline Specifications describing basic materials and design approach
 - vi) Preliminary Development Analysis showing number and type of residential units, size, area, number of bedrooms
 - vii) Preliminary Drainage Report and Stormwater Management Report
 - viii) Preliminary Traffic Impact Analysis
 - ix) List of specific Waivers required
 - x) Preliminary List of Local Boards and Officials to be consulted, along with required letters of approval from other governmental agencies (including but not limited to the Fire Department, the Water District, the Department of Transportation, the Bourne Housing Partnership, etc.)
 - xi) Annotated Comprehensive Permit showing proposed changes to the wording of the conditions and/or content of the applicant's existing Comprehensive Permit as well as a specific list of exhibits to be attached to the Revised Comprehensive Permit
 - xii) Proposed Review and Approval process
 - xiii) PE Letter
- b) The Board accepts that a peer review for the project has been completed, and in the case of a resubmission will not have to be redone as long as the resubmission is based on a project substantially the same as the revised project herein denied. As the applicant

responds to peer reviewer comments and/or the Board deems necessary, additional peer review may be required.

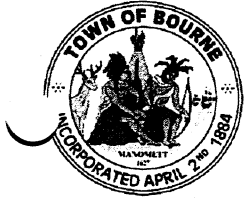
8. Voting in favor of the Motion to Deny Without Prejudice a revision to Comprehensive Permit #08-18 for the property located at 230 Sandwich Road, Map # 25, Parcel # 36, 230 Sandwich Road, Chase Estates Comprehensive Permit #08-10, Notice of Project Change:

- a) Mr. Chris Pine
- b) Ms. Pat Nemeth
- c) Mr. Wade Keene
- d) Mr. John O'Brien
- e) Mr. James Beyer

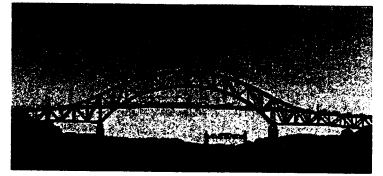
Voting in Opposition to the Motion: None

Other Members Present: None


For the Board of Appeals



TOWN OF BOURNE
Board of Assessors
24 Perry Avenue
Buzzards Bay, MA 02532
(508) 759-0600 Ext. 1510 ♦ Fax (508) 759-8026



Michael Leitzel, Chairperson
Ellen Doyle Sullivan, Clerk
Donna Barakauskas, Member

Rui Pereira, MAA
Director of Assessing

June 1, 2021

Thomas Pappas
14 Bosuns Lane
Bourne, MA 02532

Reference: Abutters List for Map 25 Parcels 9 & 36
Subject Property: 0 & 230 Sandwich Road

Pursuant to the provisions of Massachusetts General Laws Chapter 40A, Section 11, as amended, this is to certify that the attached list of names and addresses constitutes all of the abutters to abutters within 300 feet of the property on the most recent tax list of the Town of Bourne. The purpose of the abutters list is for an application of a Special Permit from the Zoning Board of Appeals.

Abutting properties are Map 16 Parcel 14; Map 21 Parcel 12; Map 25 Parcels 1, 7, 12, 13, 14, 15 & 16.

Your payment of \$10.00 has been received by the Assessor's Office.

Please be advised that this abutters list is only good for 30 days from the date on this letter. Expired abutters list can be recertified for an additional filing fee.

See enclosed Data Base Inquiry Forms for abutters mailing addresses.

Board of Assessors

List Enclosed

Ellen Doyle Sullivan
Donna Barakauskas
Michael Leitzel

Extract:
Database:
Filter:
Sort:

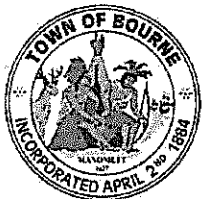
1 Abutters List
LIVE
Key IN 3059,15987,5196,5202,16842,16843,16844,16845,16846

Report #24: Owner Listing Report
Fiscal Year 2022

Bourne MA

Key	Parcel ID	Owner	Location	LC/CI	Bk-Pg(Cert) /Dt	Mailing Street	Mailing City	ST	Zip Cd/County
3059	16.0-14-0	UNITED STATES OF AMERICA U S ARMY CORP OF ENGINEERS	231 SANDWICH RD	N 9000	00453/0287	PO BOX 1555	BUZZARDS BAY	MA	02532-1555
15987	21.0-12-0	SCHOONER PASS CONDO ASSOCIATIO	250 SANDWICH RD	Y 1020	C-18/453-115 11/21/1974	C/O BRISTOL SOUTH MANAGEMENT PO BOX 77	RAYNHAM	MA	02767
5196	25.0-1-0	UPPER CAPE COD REGIONAL VOCATIONAL TECHNICAL SCHOOL	220 SANDWICH RD	N 9340	01354/0156	24 PERRY AVE	BUZZARDS BAY	MA	02532
5202	25.0-7-0	BOURNE RECREATION AUTHORITY	0 SANDWICH RD	N 9300	2001/105 2/7/1974	24 PERRY AVE	BUZZARDS BAY	MA	02532
16842	25.0-12-0	SCULLY SEAN M ETUX LORI A SCULLY	8 BOSUNS LN	Y 1010	183734 7/27/2007	8 BOSUNS LANE	BOURNE	MA	02532
16843	25.0-13-0	DIOTTE JEFFREY F ETUX KRISTEN DIOTTE	10 BOSUNS LN	Y 1010	209379 4/29/2016	10 BOSUNS LN	BOURNE	MA	02532
16844	25.0-14-0	DOWNEY STEVEN M & MAUREEN M DOWNEY TR SMJD REALTY TRUST	12 BOSUNS LN	Y 1010	191823 6/29/2010	12 BOSUNS LN	BOURNE	MA	02532
16845	25.0-15-0	PAPPAS THOMAS C	14 BOSUNS LN	Y 1010	184001 8/30/2007	14 BOSUNS LN	BOURNE	MA	02532
16846	25.0-16-0	SEVEN HILLS COMMUNITY SVC INC	15 BOSUNS LN	Y 9590	188394 4/23/2009	81 HOPE AVE	WORCESTER	MA	01603

Total Records 9



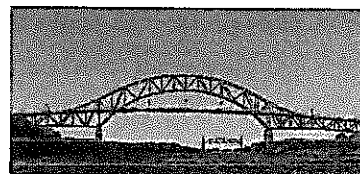
TOWN OF BOURNE

Board of Assessors

24 Perry Avenue

Buzzards Bay, MA 02532

(508) 759-0600 Ext. 1510 ♦ Fax (508) 759-8026



Michael Leitzel, Chairperson
Ellen Doyle Sullivan, Clerk
Donna Barakauskas, Member

Rui Pereira, MAA
Director of Assessing

August 5, 2021

Drew Hoyt
9 Ovimet Ln
Foxboro, MA 02035

Reference: Abutters List for Map 25 Parcels 9 & 36
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Board of Assessors

List Enclosed

Ellen Doyle Sullivan
Donna Barakauskas
Michael Leitzel

Report #24: Owner Listing Report Fiscal Year 2022

1 Abutters List
LIVE
Key IN 3059,15987,5196,5202,16842,16843,16844,16845,16846

Extract:
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Bourne MA

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