Stantec Planning and Landscape Architecture, P.C.
226 Causeway Street 6th Floor, Boston MA 02114-2155

July 3, 2017
File: 21081375

Attention: Mr. Glenn R. Clancy, P.E.
Director of Community Development
Town of Belmont
19 Moore Street
Belmont, Massachusetts 02478-0900

Attention: Mr. Jeffrey Wheeler
Office of Community Development
Town of Belmont
Homer Municipal Building
19 Moore Street, 2nd Floor
Belmont, MA 02478

Reference: **Peer Review – Stormwater Management and Erosion Control**
Belmont Day School Barn and Entry Drive
Belmont, Massachusetts

Dear Mr. Clancy,

On behalf of the Belmont Day School, we submit this letter with response to the to the comments contained in the letter prepared by BSC Group to your office dated June 28, 2017. Original comments issued by the BSC Group are shown in italic and responses from Stantec are noted below each comment.

1. ***Comment:*** *In general, we find the project's plans and stormwater report to be well prepared and in general conformance with the Handbook, the Bylaw, and the Rules and Regulations.*

   Response: No response required.

2. ***Comment:*** *The existing conditions HydroCAD calculations (Appendix C of the Stormwater Report) are based on a total of 11.427 acres of land. The proposed conditions HydroCAD calculations (Appendix D) are based on a total of 11.404 acres. The calculations should be revised based on matching areas to ensure that the reductions in peak flow rate and volume are due to the stormwater management systems and not a reduction in area.*

   Response: We note that the difference in the areas represents approximately 1,000 square feet and a 0.2% difference between the existing conditions and proposed conditions areas. Upon review the calculations, it was noted that Subcatchment Area P6B needed adjustment and 1,000 s.f. of impervious area was added to this subcatchment. We have revised the calculations, and there is still a reduction in peak flows flow rates and volumes

Reference: **Peer Review – Stormwater Management and Erosion Control**
Belmont Day School Barn and Entry Drive
Belmont, Massachusetts

during all storm events. Revised table numbers 2.1, II.1, and 2.4 from the Stormwater Report Peak Discharge Rates, Peak Discharge Volumes and our Post-Development Conditions Drainage Area Summary are attached for reference. Changes to the tables from the original Stormwater Report are noted in **bold red**.

3. ***Comment:*** *Both the proposed underground infiltration system and porous asphalt pavement are designed, sized, and modeled in accordance with standard engineering design standards.*

   Response: No response required.

4. ***Comment:*** *While appropriate erosion and sedimentation controls are shown on the project plans, we recommend that the symbol used for catch basin silt sack protection be revised to stand out more. The current symbol used blends into the background and is easily missed.*

   Response: Acknowledged. The symbol on the Site Preparation Plans (Drawings L0.01 and L0.02) have been revised and the revised plans are attached.

5. ***Comment:*** *We recommend that the site preparation plan include notes requiring the contractor to maintain and remove all temporary controls during and at the conclusion of construction and that all strawbales used are guaranteed free of weed and invasive seeds.*

   Response: Acknowledged. We have added the suggested note to the Site Preparation Plan (Drawing L0.01), and the revised plan is attached.

6. ***Comment:*** *As both the proposed underground infiltration system and porous asphalt pavement will be located close to existing and new trees, we recommend that a vertical root barrier be installed between the trees and the new systems to prevent root intrusion.*

   Response: Acknowledged. We have added a vertical root barrier to the Utility Plan (Drawing L3.01), and the revised plan is attached.

7. ***Comment:*** *We recommend the use of a manifold system at the outlet of the underground infiltration system. A manifold system will allow for better flow out of the system and help prevent the system from backing up in larger storm events.*

   Response: Acknowledged. We have added a manifold to the Utility Plan (Drawing L3.01), and the revised plan is attached.

Reference: **Peer Review – Stormwater Management and Erosion Control**
Belmont Day School Barn and Entry Drive
Belmont, Massachusetts

8. ***Comment:*** *The project is proposing a 28-inch deep pavement structure (4-inches of porous asphalt pavement and a 24-inch reservoir course). During our June 22, 2017 conference call, BSC questioned why the applicant was only using a reservoir course section and not the section illustrated in the Handbook that includes a choker course, a filter course, and a reservoir course. Stantec explained that they have had discussions with both DEP and the UNH Stormwater Center (where the section from the Handbook was developed) about the Handbook section. Stantec has been informed by both DEP and UNH that the Handbook's section is based upon no separation from the bottom of the reservoir course to seasonal high groundwater. Therefore, this section requires the additional courses of differing soil types to provide the filtration and stormwater treatment. As the proposed driveway will have more than 2-feet of separation to seasonal high groundwater, the stormwater treatment and filtration will occur in the natural soils below the reservoir course. This treatment is similar to that of a septic system. We subsequently contacted Stantec requesting they provide any correspondence they may have from DEP and/or the UNH Stormwater Center on this matter for the record. Stantec stated this correspondence was verbal, and occurred approximately 8 years ago. BSC reviewed the most recent UNH Stormwater Center Design Specifications for Porous Asphalt Pavement and Infiltration Beds as well as other available porous asphalt designs. While UNH recommends these additional courses for better water quality treatment and in lieu of more detailed study of frost heave susceptibility, most other designs specify only a reservoir course below the asphalt, or a choker course to provide a more stable surface for paving. BSC finds the porous asphalt design acceptable and within standard industry practices.*

   Response: No response required.

9. ***Comment:*** *The use of a liner check dam as shown on the Porous Asphalt Pavement detail (Sheet L5.01) is appropriate as the driveway does include areas steeper than 5% grade. However, we recommend that the detail be revised to include the dimensions for these check dams.*

   Response: Acknowledged. We have added dimensions to detail 8 included on the Utility Details plan (Drawing L6.01) to indicate that the check dams should extend to within 3" of the bottom of pavement.

10. ***Comment:*** *Because of the quality of the underlying soils (Hydrologic Soil Group B), water is not expected to sit in the reservoir course and will therefore minimize the concern for frost infiltration and frost heaving.*

    Response: No response required.

Reference: **Peer Review – Stormwater Management and Erosion Control**
Belmont Day School Barn and Entry Drive
Belmont, Massachusetts

11. ***Comment:*** *The Utility Plan (Sheet L3.02) calls for an "impermeable barrier" at the end of the porous asphalt driveway where it meets Concord Avenue. However, the Porous Asphalt Pavement detail (sheet L5.01) calls for a geotextile fabric at the end of the driveway. We recommend that a truly impermeable barrier similar to the proposed check dams be placed at the end of the driveway.*

    Response: Acknowledged. The Utility Plan (Drawing L3.01) and detail 8 included on the Utility Details Plan (Drawing L6.01) have been revised to call for an impermeable barrier at the end of the driveway, at both limits of the porous pavement.

12. ***Comment:*** *We recommend that signs be installed identifying the limits of the porous asphalt. These signs should include prohibitions against the use of sand and of snow storage on the porous asphalt.*

    Response: Acknowledged. We have added a sign the Layout and Materials Plan (Drawing L1.02), to be located near the beginning of the driveway that will note that sand should not be used and that no storage on the porous pavement is allowed.

13. ***Comment:*** *As detailed in the Operations and Maintenance Plan, the porous asphalt will require regular maintenance with the use of a power washer and/or vacuum sweeper to remove sediment and prevent clogging. With proper maintenance, porous asphalt should have a similar life expectancy to that of regular asphalt pavement.*

    Response: No response required.

14. ***Comment:*** *The Operations and Maintenance Plan should be updated to include a description and delineation of public safety features and an estimated operations and maintenance budget as required by Section III.D. of the Rules and Regulations.*

    Response: Acknowledged. The Operations and Maintenance Plan has been updated as suggested, and a copy of the revised plan with edits highlighted is attached.

After your review, please email me or call me with any questions or comments. We look forward to discussing these comments and our responses at the next scheduled Planning Board hearing for the project on Monday, July 10th.

Reference: **Peer Review – Stormwater Management and Erosion Control**
Belmont Day School Barn and Entry Drive
Belmont, Massachusetts

Regards,

STANTEC PLANNING AND LANDSCAPE ARCHITECTURE, P.C.

Frank Holmes

Frank Holmes
Principal
Phone: (617) 654-6059
frank.holmes@stantec.com

Attachments: Summary Tables 2.1, II.1 and 2.4
Drawing L0.01, Site Preparation Plan, revised July 3, 2017 (Full size and ½ size)
Drawing L0.02, Site Preparation Plan, revised July 3, 2017 (Full size and ½ size)
Drawing L3.01, Utility Plan, revised July 3, 2017 (Full size and ½ size)
Drawing L6.01, Utility Details, revised July 3, 2017 (Full size and ½ size)
Drawing L1.02, Layout and Materials Plan, revised July 3, 2017 (Full size and ½ size)
Revised Operations and Maintenance Plan

c. Janine White, BSC Group
Kelly Durfee Cardoza, Avalon Consulting Group

kg v:\2108\active\210801375\design\permits\spr\peer review\let_2017-07-03_glenn clancy.docx

Table 2.1 – Peak Discharge Rates

Discharge Point	2-Year Storm		10-Year Storm	
	Pre - Dev. Peak Discharge Rate (cfs)	Post – Dev. Peak Discharge Rate (cfs)	Pre - Dev. Peak Discharge Rate (cfs)	Post – Dev. Peak Discharge Rate (cfs)
Offsite to Southwest (DP-A)	2.31	2.31	10.57	10.45
Offsite to Northwest (DP-B)	0.20	0.19	1.37	0.86
To Existing Stormwater Basin (DP-C)	3.58	3.53	7.46	7.37
Offsite to Concord Avenue (DP-D)	0.25	0.09	1.71	0.64
To CB #2 (DP-E)	1.21	1.21	2.20	2.20
To Day School Lane (DP-F)	0.83	0.83	1.48	1.48

Discharge Point	25-Year Storm		100-Year Storm	
	Pre - Dev. Peak Discharge Rate (cfs)	Post – Dev. Peak Discharge Rate (cfs)	Pre - Dev. Peak Discharge Rate (cfs)	Post – Dev. Peak Discharge Rate (cfs)
Offsite to Southwest (DP-A)	15.24	15.00	25.64	25.12
Offsite to Northwest (DP-B)	2.61	1.53	5.67	3.13
To Existing Stormwater Basin (DP-C)	10.87	10.75	18.46	18.28
Offsite to Concord Avenue (DP-D)	3.27	**1.69**	7.11	**6.57**
To CB #2 (DP-E)	2.99	2.99	4.61	4.61
To Day School Lane (DP-F)	2.00	2.00	3.06	3.06

Note: The area adjustments did not affect peak runoff rates for the 2-year or 10-year storm.

Table II.1 – Peak Discharge Volumes

Discharge Point	2-Year Storm		10-Year Storm	
	Pre - Dev. Peak Discharge Volume (af)	Post – Dev. Peak Discharge Volume (af)	Pre - Dev. Peak Discharge Volume (af)	Post – Dev. Peak Discharge Volume (af)
Offsite to Southwest (DP-A)	.208	.205	.586	.576
Offsite to Northwest (DP-B)	.035	.023	.117	.069
To Existing Stormwater Basin (DP-C)	.290	.285	.570	.563
Offsite to Concord Avenue (DP-D)	.044	.016	.146	**.060**
To CB #2 (DP-E)	.086	.086	.157	.157
To Day School Lane (DP-F)	.059	.059	.106	.106

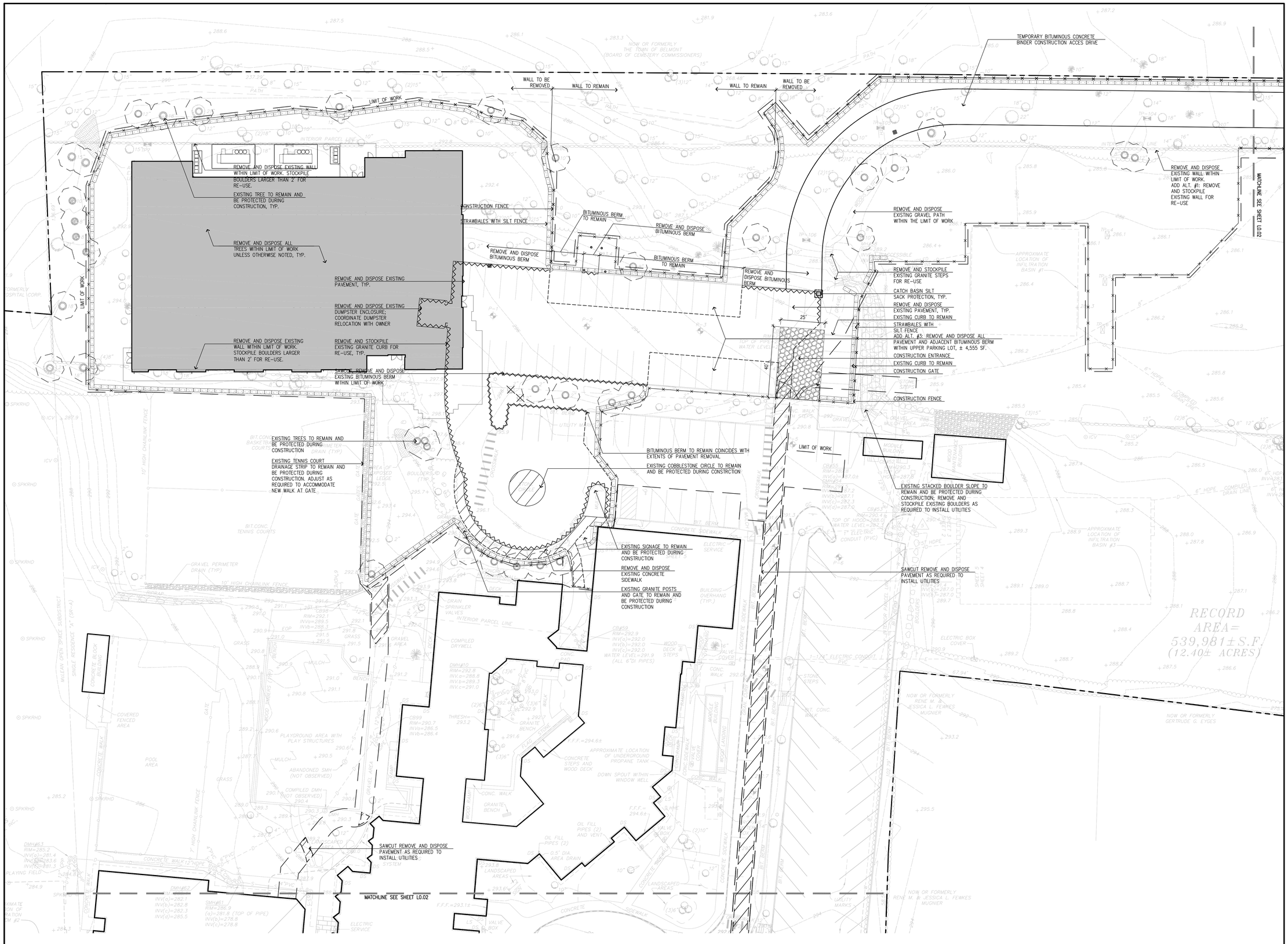
Discharge Point	25-Year Storm		100-Year Storm	
	Pre - Dev. Peak Discharge Volume (af)	Post – Dev. Peak Discharge Volume (af)	Pre - Dev. Peak Discharge Volume (af)	Post – Dev. Peak Discharge Volume (af)
Offsite to Southwest (DP-A)	.924	.906	1.681	1.645
Offsite to Northwest (DP-B)	.201	.114	.409	.224
To Existing Stormwater Basin (DP-C)	.819	.810	1.413	1.413
Offsite to Concord Avenue (DP-D)	.252	**.152**	.513	**.392**
To CB #2 (DP-E)	.217	.217	.342	.342
To Day School Lane (DP-F)	.145	.145	.228	.228

Note: The area adjustments did not affect peak runoff volume for the 2-year storm.

Table 2.4 – Post-Development Conditions Drainage Area Summary

Drainage Area	Area (s.f.)	Curve Number	Time of Concentration (min.)[1]
P1	87,531	60	6
P2	84,214	89	6
P3	29,480	60	6
P4A	11,312	96	6
P4B	24,468	96	6
P5	47,597	92	6
P6A	13,091	80	6
P6B	**44,813**	**69**	6
P6C	30,383	56	6
P7	82,759	61	6
P8	25,445	85	6
P9	16,682	86	6

[1] Section 2.3.3



BELMONT DAY SCHOOL BARN

PROJECT

BELMONT DAY SCHOOL

55 DAY SCHOOL LN
BELMONT, MA 02478

OWNER

utile
ARCHITECTURE + URBAN DESIGN

115 KINGSTON ST
BOSTON, MA 02110
P 617 423.7200 F 617 423.1414
utiledesign.com

ARCHITECT

SIMPSON GUMPERTZ AND HEGER, INC.
41 SEYON STREET BUILDING 1
SUITE 500, WALTHAM, MA 02453
P 781 907.9000 F 781 907.9009

STRUCTURAL

STANTEC

226 CAUSEWAY STREET
BOSTON, MA 02114
P 617 234.3100

LANDSCAPE/CIVIL

RIST-FROST SHUMWAY ENGINEERING
71 WATER STREET
LACONIA, NH 03246
P 603 524.4647

MEP+FP

KEY PLAN

STAMP

DATE	REVISION
February 27, 2017	Site Plan Review Submission
July 3, 2017	Revisions per BSC Comment Letter dated 06/26/17

REVISIONS ON SHEET

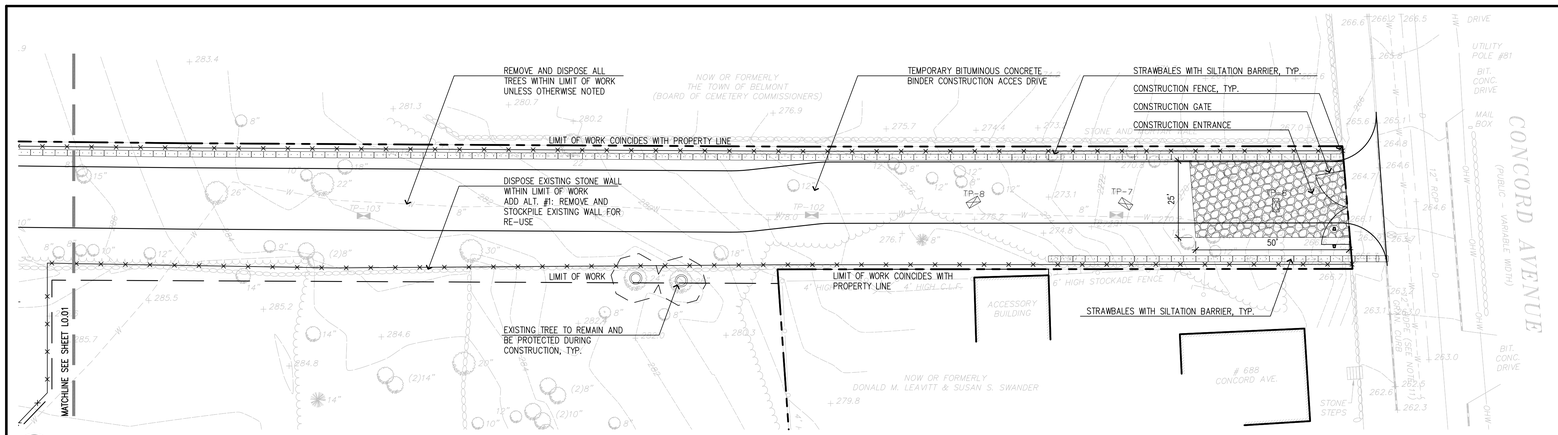
SCALE AS NOTED

UTILE PROJECT NUMBER 1637

SITE PREPARATION PLAN

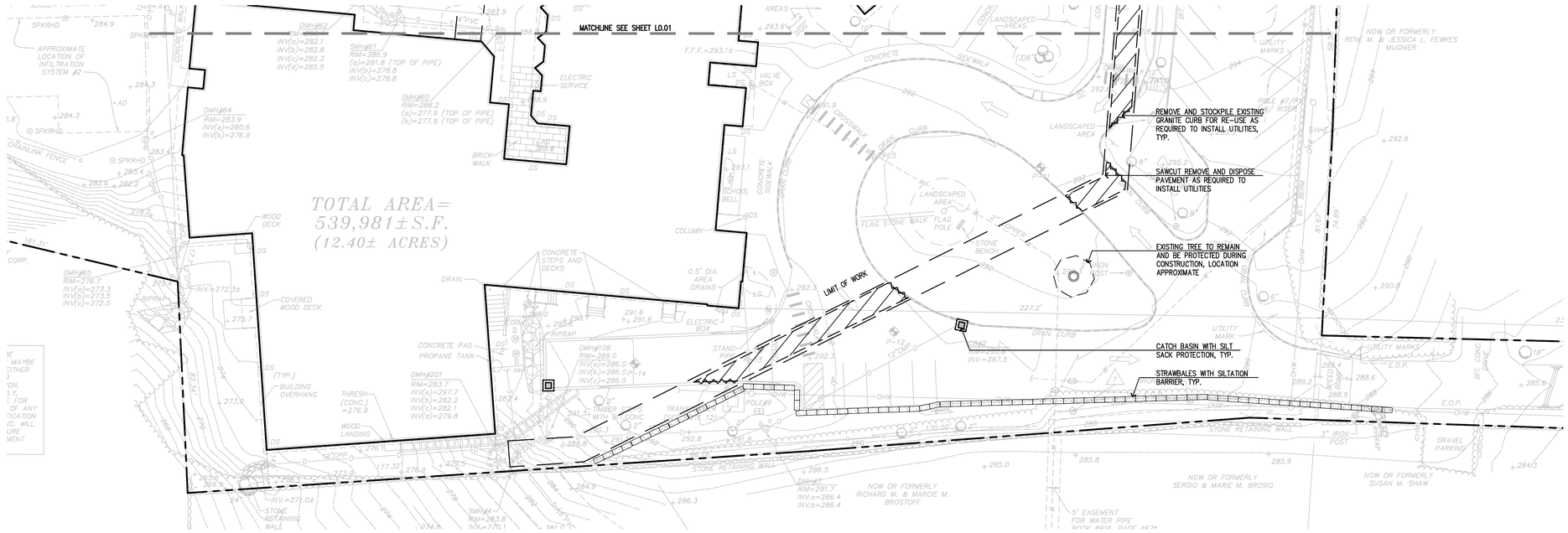
L0.01

1/2/2017 12:55:06 PM



SITE PREPARATION PLAN

1"=20'-0"

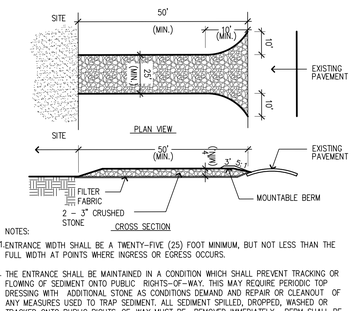


SITE PREPARATION PLAN

1"=20'-0"

SITE PREPARATION NOTES

1. EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY MERIDIAN ASSOCIATES OF BEVERLY, MASSACHUSETTS AND IS DATED 2 DECEMBER, 2016.
2. WITHIN THE LIMIT OF THE WORK LINE AS NOTED ON THE SITE PREPARATION PLANS, REMOVE AND DISCARD ALL CONCRETE PAVEMENT, BITUMINOUS CONCRETE PAVEMENT, BRICK PAVEMENT, TOP SOIL, MULCH, TRASH, DEAD TREES AND STUMPS, SHRUBBERY, CHAIN LINK FENCE POSTS, RAILS, FABRIC, GATES, FOOTINGS AND ALL APPURTENANCES, BOLLARDS, POSTS, CONCRETE FOOTINGS AND FOUNDATIONS, WALLS AND CURBS UNLESS OTHERWISE NOTED.
3. THE OWNER'S REPRESENTATIVE SHALL BE CONSULTED AND WILL REVIEW THE WORK ON SITE WITH THE CONTRACTOR BEFORE ANY WORK SHALL COMMENCE.
4. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES BETWEEN PLANS AND ACTUAL CONDITIONS TO THE OWNER'S REPRESENTATIVE PRIOR TO STARTING WORK.
5. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING CONDITIONS TO REMAIN THAT ARE DUE TO CONTRACTOR OPERATIONS.
6. ALL ITEMS TO BE REMOVED THAT ARE NOT STOCKPILED FOR LATER REUSE ON THE PROJECT OR DELIVERED TO THE OWNER SHALL BE LEGALLY DISPOSED OF OFF SITE BY THE CONTRACTOR.
7. THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ON THIS PLAN ARE BASED ON THE SURVEY REFERENCED ABOVE. THE CONTRACTOR SHALL CONTACT DIGSAFE AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS EFFORTS OF THE DEMOLITION WITH ALL TRADES.
9. THE CONTRACTOR SHALL COORDINATE ALL ADJUSTMENT OR ABANDONMENT OF UTILITIES WITH THE RESPECTIVE UTILITY COMPANY.
10. THE CONTRACTOR SHALL MAINTAIN OR ADJUST TO NEW FINISH GRADE AS NECESSARY ALL UTILITY AND SITE STRUCTURES SUCH AS LIGHT POLES, SIGN POLES, MAN HOLES, CATCH BASINS, HAND HOLES, WATER AND GAS GATES, HYDRANTS, ETC., FROM MAINTAINED UTILITY AND SITE SYSTEMS UNLESS OTHERWISE NOTED OR DIRECTED BY THE OWNER'S REPRESENTATIVE.
11. STRAW BALES SHALL BE GUARANTEED TO BE FREE OF WEEDS AND INVASIVE SEEDS.
12. CONTRACTOR TO MAINTAIN EROSION CONTROL THROUGHOUT CONSTRUCTION; AT SUBSTANTIAL COMPLETION, STRAW BALES AND SILTATION BARRIERS SHALL BE REMOVED; REGRADE AS REQUIRED FOR A SMOOTH TRANSITION BETWEEN LIMITS OF NEW CONSTRUCTION AND EXISTING CONDITION, LOAM AND SEED DISTURBED AREAS.

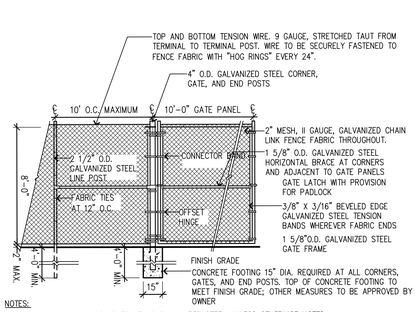


NOTES:

1. ENTRANCE WIDTH SHALL BE A TWENTY-FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. BERM SHALL BE PERMITTED. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.

1 STABILIZED CONSTRUCTION ENTANCE

NTS

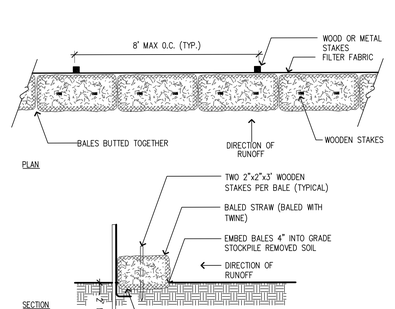


NOTES:

ALL MATERIALS SHALL BE SCHEDULE 40 GALVANIZED STEEL UNLESS OTHERWISE NOTED.

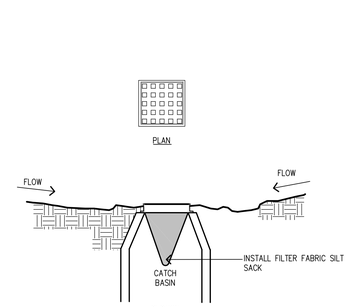
2 CONSTRUCTION CHAIN LINK FENCE AND GATE

NTS



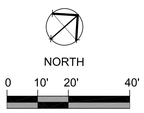
3 STRAWBALE WITH SILTATION BARRIER

NTS



4 CATCH BASIN WITH SILT SACK

NTS



KEY PLAN

LEGEND

- PROPERTY LINE
- LIMIT OF WORK LINE
- 8' CONSTRUCTION FENCE
- CONSTRUCTION ENTRANCE
- PAVEMENT TO BE REMOVED
- STRAWBALES WITH SILT FENCE
- CATCH BASIN WITH SILT SACK PROTECTION
- EXISTING TREE TO REMAIN
- REMOVE EXISTING CURB
- SAWCUT LINE

BELMONT DAY SCHOOL BARN

PROJECT

BELMONT DAY SCHOOL

55 DAY SCHOOL LN
BELMONT, MA 02478

OWNER

utile
ARCHITECTURE + URBAN DESIGN
115 KINGSTON ST
BOSTON, MA 02110
P 617 423.7200 F 617 423.1414
utiledesign.com
ARCHITECT

SIMPSON GUMPERTZ AND HEGER, INC.
41 SEYON STREET BUILDING 1
SUITE 500, WALTHAM, MA 02453
P 781 907.9000 F 781 907.9009
STRUCTURAL

STANTEC
226 CAUSEWAY STREET
BOSTON, MA 02114
P 617 234.3100
LANDSCAPE/CIVIL

RIST-FROST SHUMWAY ENGINEERING
71 WATER STREET
LACONIA, NH 03246
P 603 524.4647
MEP+FP

STAMP

DATE	REVISION
February 27, 2017	Site Plan Review Submission
July 3, 2017	Revisions per BSC Comment Letter dated 06/28/17

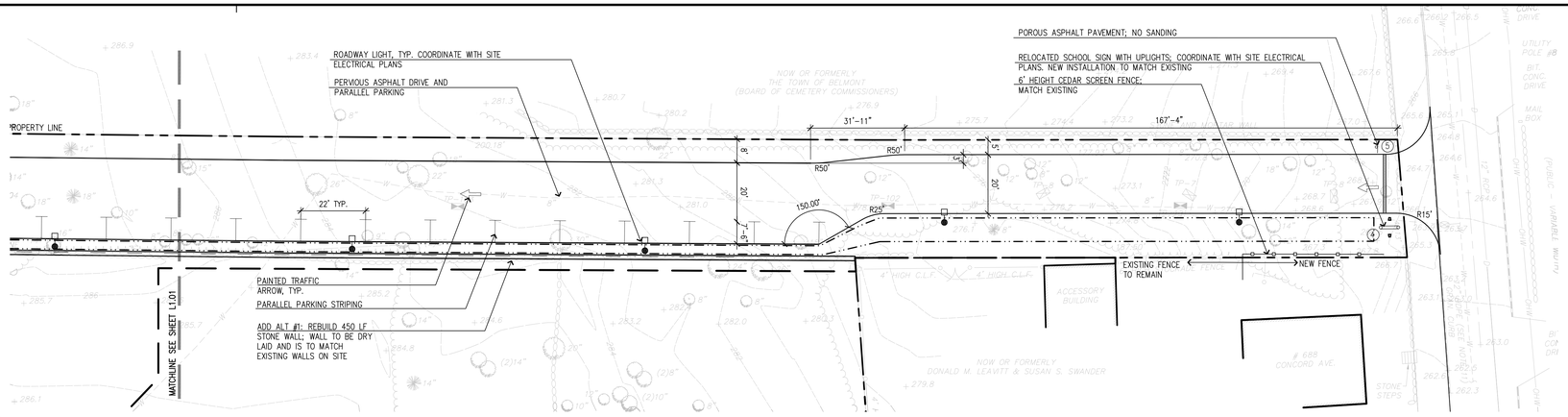
REVISIONS ON SHEET

SCALE	UTILE PROJECT NUMBER
AS NOTED	1637

SITE PREPARATION PLAN

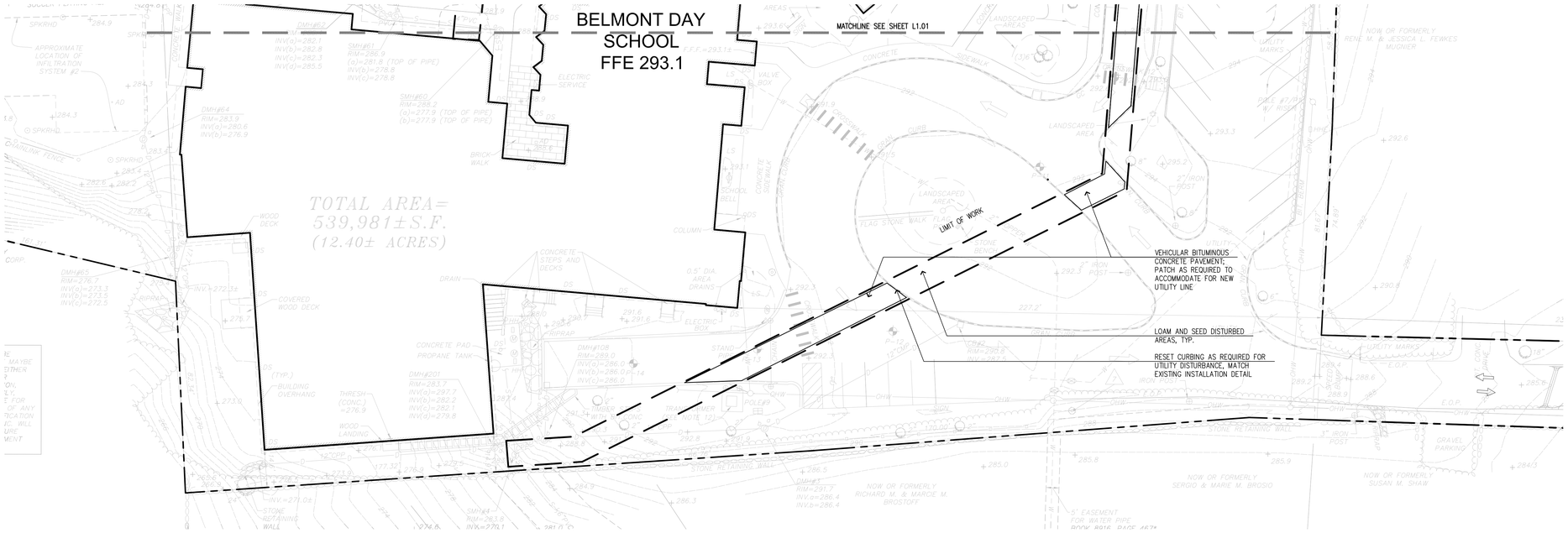
L0.02

1/2/2017 12:55:06 PM



LAYOUT AND MATERIALS PLAN

1"=20'-0"



LAYOUT AND MATERIALS PLAN

1"=20'-0"

LEGEND

- PROPERTY LINE
- LIMIT OF WORK LINE
- ROADWAY LIGHT
- PEDESTRIAN BOLLARD
- CEMENT CONCRETE PAVEMENT
- PRE-CAST CONCRETE CURB
- BCC — BITUMINOUS CONCRETE CURB
- CEDAR SCREEN FENCE
- T — TRANSFORMER
- D — DUMPSTER ENCLOSURE

LAYOUT AND MATERIAL NOTES

1. EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY MERIDIAN ASSOCIATES OF BEVERLY, MASSACHUSETTS AND IS DATED 2 DECEMBER, 2016.
2. THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ARE BASED ON THE SURVEY REFERENCED ABOVE. THE CONTRACTOR SHALL NOTIFY DIGSAFE AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
3. CONTRACTOR(S) SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL CONSTRUCTION DOCUMENTS, SPECIFICATIONS, AND SITE CONDITIONS PRIOR TO BIDDING AND PRIOR TO CONSTRUCTION.
4. ANY DISCREPANCIES BETWEEN DRAWINGS, SPECIFICATIONS, AND SITE CONDITIONS SHALL BE REPORTED IMMEDIATELY TO THE OWNER'S REPRESENTATIVE FOR CLARIFICATION AND RESOLUTION PRIOR TO BIDDING OR CONSTRUCTION.
5. ALL WORK CONDUCTED WITHIN PUBLIC RIGHT-OF-WAYS SHALL CONFORM TO THE REQUIREMENTS AND SPECIFICATIONS OF THE TOWN OF BELMONT AND THE MASSACHUSETTS HIGHWAY DEPARTMENT.
6. SEE ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND ALL DETAILS CONTIGUOUS TO THE BUILDING, INCLUDING SIDEWALKS, RAMPS, UTILITY ENTRANCE LOCATIONS, WALL PACKS, CONCRETE DOOR PADS, ROOF DRAINS, ETC.
7. ACCESSIBLE CURB RAMPS SHALL BE PER THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (AAB) AND THE AMERICANS WITH DISABILITIES ACT (ADA) ACCESSIBILITY GUIDELINES, WHICHEVER IS MORE STRINGENT.
8. THE FOLLOWING LAYOUT CRITERIA SHALL CONTROL UNLESS OTHERWISE NOTED ON THE PLAN: ALL DIMENSIONS ARE TO OUTSIDE FACE OF BUILDING. ALL DIMENSIONS ARE TO FACE OF CURB AT GUTTER LINE. ALL DIMENSIONS ARE TO CENTER OF PAVEMENT MARKINGS. ALL TIES TO PROPERTY LINES ARE PERPENDICULAR TO THE PROPERTY LINE UNLESS OTHERWISE NOTED.

   FOR LAYOUT AND DIMENSIONING OF BUILDINGS, SEE ARCHITECTURAL DRAWINGS.
9. SCREENED IMAGES SHOW EXISTING CONDITIONS. WHERE EXISTING CONDITIONS LIE UNDER OR ARE IMPINGED UPON BY PROPOSED BUILDINGS AND/OR SITE ELEMENTS, THE EXISTING CONDITION WILL BE REMOVED, ABANDONED AND/OR CAPPED OR DEMOLISHED AS REQUIRED.

SIGN SCHEDULE

SIGN NUMBER	DESCRIPTION	QUANTITY
1	STOP SIGN	2
2	DO NOT ENTER	1
3	ACCESSIBLE PARKING	2
4	RELOCATED BELMONT DAY SCHOOL SIGN	1

BELMONT DAY SCHOOL BARN

PROJECT

BELMONT DAY SCHOOL

55 DAY SCHOOL LN
BELMONT, MA 02478

OWNER

utile
ARCHITECTURE + URBAN DESIGN
115 KINGSTON ST
BOSTON, MA 02110
P 617 423.7200 F 617 423.1414
utiledesign.com
ARCHITECT

SIMPSON GUMPERTZ AND HEGER, INC.
41 SEYON STREET BUILDING 1
SUITE 500, WALTHAM, MA 02453
P 781 907.9000 F 781 907.9009
STRUCTURAL

STANTEC
226 CAUSEWAY STREET
BOSTON, MA 02114
P 617 234.3100
LANDSCAPE/CIVIL

RIST-FROST SHUMWAY ENGINEERING
71 WATER STREET
LACONIA, NH 03246
P 603 524.4647
MEP+FP

KEY PLAN

MASSACHUSETTS ROBERT R. COUGHLIN No. 993 REGISTERED LANDSCAPE ARCHITECT

STAMP

DATE	REVISION
February 27, 2017	Site Plan Review Submission

REVISIONS ON SHEET

SCALE AS NOTED

UTILE PROJECT NUMBER 1637

LAYOUT AND MATERIALS PLAN

L1.02

1/2/2017 12:55:06 PM

NOTE: SEE SHEET L3.02 FOR UTILITY LEGEND & NOTES.

PROPOSED
BELMONT BARN

110'± 6" PERFORATED HDPE IN CRUSHED STONE

INV= 293.20

8" HDPE
INV= 291.50

4" PVC SEWER
INV= 291.50
SEE PLUMBING PLANS

CONNECT DOWNSPOUTS TO ROOF DRAIN LINE WITH ZURN Z191 5"x4"x24" DOWNSPOUT BOOT (TYP.)

CLEANOUT (TYP.)
ROOF DRAIN TO BE COORDINATED WITH PLUMBING PLANS

WATER QUALITY UNIT (WQU-1)
RIM= 295.20
INV OUT= 291.40 (DMH-1)

HYDRANT WITH WATER GATE

DMH-2
RIM= 292.55
INV IN= 289.40 (DMH-1)
INV OUT= 289.40 (DMH-3)

DMH-1
RIM= 295.00
INV IN= 291.00 (WQU-1)
INV IN= 291.00 (ROOF)
INV OUT= 291.00 (DMH-2)

12" HDPE

2" COPPER DOMESTIC

6" DI FP

10' MIN. SEPARATION (TYP.)

4" DI FORCE MAIN

LIBERTY DUPLEX D3672LSG
ENGINEERED PUMP SYSTEM
RIM= 295.00
INV IN= 291.30
4" FORCE MAIN INV= 291.00

PROP. CATCH BASIN (CB-3)
RIM= 285.13
INV OUT= 282.90

BREAKOUT BARRIER
MILLER ENVIRONMENTAL MBE40M
TOP BARRIER= 284.04
BTM BARRIER= 282.00

ARRANGE CHAMBERS AROUND EXISTING TREES. IF CONFLICT IS ENCOUNTERED DURING CONSTRUCTION CONSULT SITE ENGINEER.

INV= 282.67

INV= 282.67 (TYP.)

12" HDPE
INV= 282.70

12"x6" TEE (TYP.)

12"x6" ELBOW (TYP.)

DMH-3
RIM= 287.00
INV IN= 284.00
INV OUT= 284.00

DMH-6
CONVERT EXISTING CB#57 TO DMH
RIM= 291.80
INV IN (NEW)= 287.80 (CB-2)
INV OUT (EXIST)= 284.3± (MH#58)

LIMIT OF POROUS PAVEMENT WITH MILLER ENVIRONMENTAL MBE40M IMPERMEABLE BARRIER
CB-2
RIM= 291.80
INV OUT= 288.30

CTE WITH CORPORATION STOP

CTE WITH 8"X 6" TEE

FORCE MAIN CLEAN OUT
RIM= 292.90
INV= 287.90

INV= 282.67

POND PB4B
270 CULTEC 100HD CHAMBERS
BTM STONE= 282.00
BTM CHAMBERS= 282.50
TOP CHAMBERS= 283.54
TOP STONE= 284.04
MIN. GRADE OVER SYSTEM= 285.6
ESHGW= 277.6

2 - 6" HDPE

CTE WITH COUPLING

DMH-4
RIM= 286.20
INV IN= 282.50
INV OUT= 284.50 (DMH-5)
INV OUT= 284.50 (DMH-5)

DMH-5
RIM= 286.0
INV IN (EXIST.)= 284.3±
INV IN (NEW)= 284.30
INV OUT (EXIST.)= 284.3±

AVOID AND PROTECT EXISTING WATER LINE DURING CONSTRUCTION (RECORD LOCATION SHOWN ON PLANS).
IF CONFLICT ARISES CONSULT SITE ENGINEER BEFORE PROCEEDING.

AVOID AND PROTECT EXISTING INFILTRATION BASIN DURING CONSTRUCTION (RECORD LOCATION SHOWN ON PLANS).
ENSURE THAT SYSTEM REMAINS CLEAR OF SILT AND DEBRIS. REMOVE SILT AND DEBRIS AFTER CONSTRUCTION.
IF CONFLICT ARISES CONSULT SITE ENGINEER BEFORE PROCEEDING.

MATCHLINE SEE SHEET L3.02

4" DI FORCE MAIN

PROP. SEWER MANHOLE
RIM= 292.8±
INV OUT (6" PVC)= 289.8

RECORD AREA= 539,981±S.F. (12.40± ACRES)

NORTH
0 10' 20' 40'

BELMONT DAY SCHOOL BARN

PROJECT

BELMONT DAY SCHOOL

55 DAY SCHOOL LN
BELMONT, MA 02478

OWNER

utile
ARCHITECTURE + URBAN DESIGN

115 KINGSTON ST
BOSTON, MA 02110
P 617 423.7200 F 617 423.1414
utiledesign.com

ARCHITECT

SIMPSON GUMPERTZ AND HEGER, INC.
41 SEYON STREET BUILDING 1
SUITE 500, WALTHAM, MA 02453
P 781 907.9000 F 781 907.9009

STRUCTURAL

STANTEC

226 CAUSEWAY STREET
BOSTON, MA 02114
P 617 234.3100

LANDSCAPE/CIVIL

RIST-FROST SHUMWAY ENGINEERING
71 WATER STREET
LACONIA, NH 03246
P 603 524.4647

MEP+FP

KEY PLAN

COMMONWEALTH OF MASSACHUSETTS
FRANK HOLMES
CIVIL
NO. 43268
REGISTERED PROFESSIONAL ENGINEER

STAMP

DATE	REVISION
February 27, 2017	Site Plan Review Submission
July 3, 2017	Revisions per BSC Comment Letter dated 06/28/17

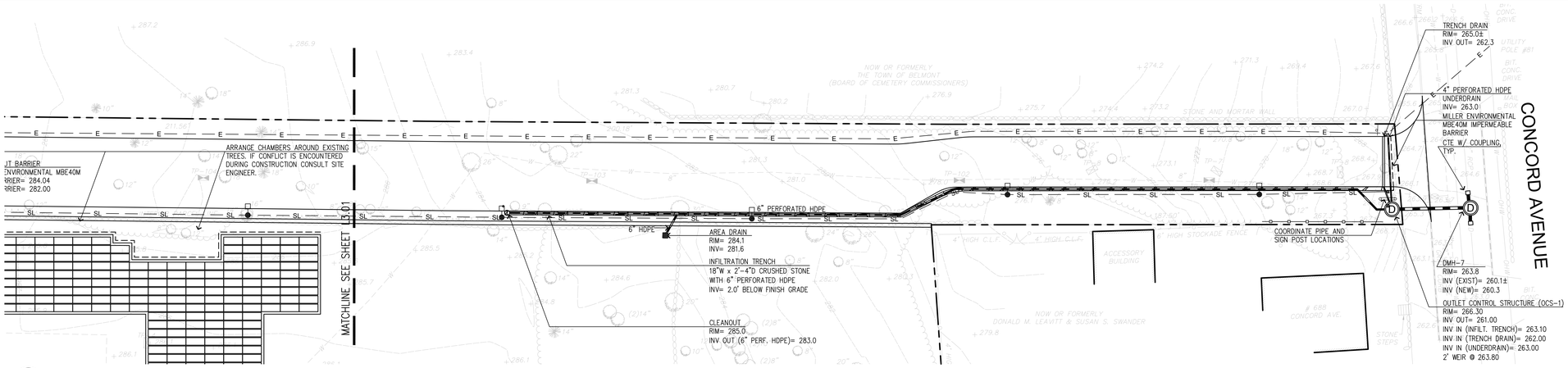
REVISIONS ON SHEET

SCALE: AS NOTED
UTILE PROJECT NUMBER: 1637

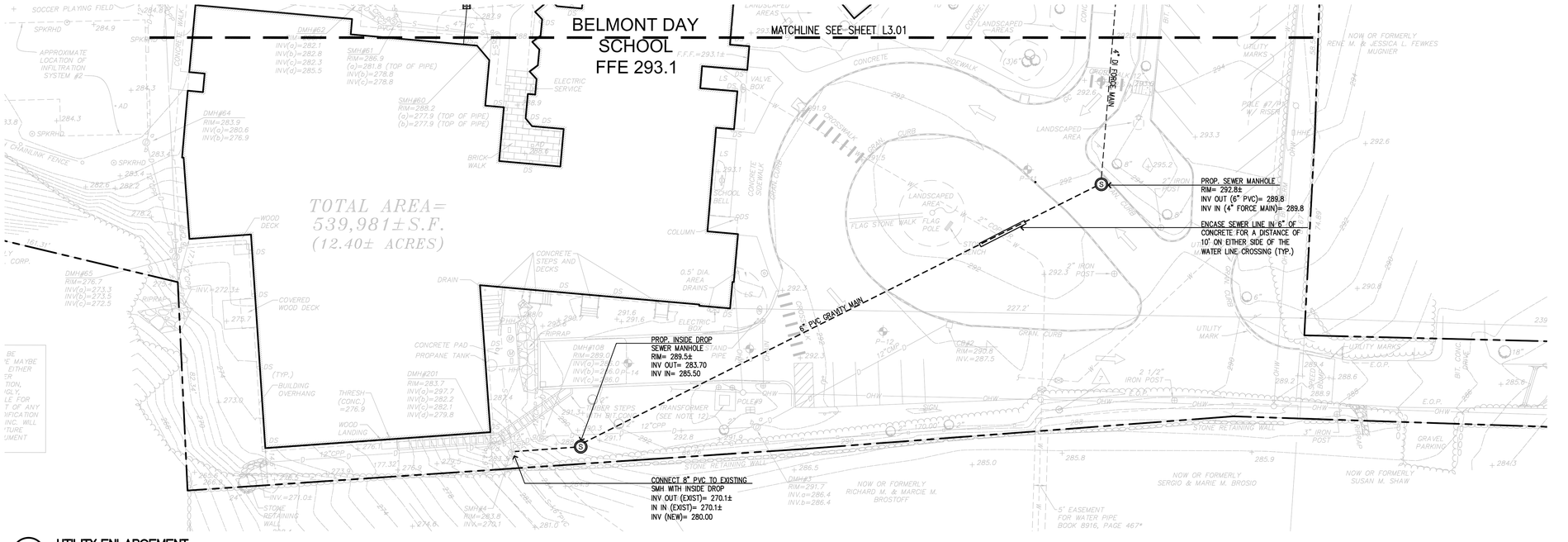
UTILITY PLAN

L3.01

1/2/2017 12:55:06 PM



1 UTILITY ENLARGEMENT
1"=20'-0"



2 UTILITY ENLARGEMENT
1"=20'-0"

LEGEND

- PROPERTY LINE
- STORM DRAIN LINE
- RD RD RD — ROOF DRAIN LINE
- CATCH BASIN
- DRAIN MANHOLE OR WATER QUALITY UNIT
- ROOF DRAIN CLEANOUT
- SEWER MAIN
- SEWER MANHOLE
- W W — WATER LINE
- CS — CORPORATION STOP
- WG — WATER GATE
- HYD — HYDRANT
- CTE — CONNECT TO EXISTING
- DS — DOWNSPOUT
- IP — INSPECTION PORT
- E E — UNDERGROUND PRIMARY POWER (SEE ELECTRICAL
- SL SL — UNDERGROUND LIGHTING (SEE ELECTRICAL SITE PL
- C C — UNDERGROUND COMMUNICATIONS (SEE ELECTRICAL
- HH — HAND HOLE (SEE ELECTRICAL SITE PLAN)

UTILITY NOTES

1. THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ARE BASED ON THE SURVEY. THE CONTRACTOR SHALL NOTIFY DIGSAFE AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR. PRIOR TO THE START OF ANY EXCAVATION FOR THE PROJECT, BOTH ON AND OFF THE SITE, THE CONTRACTOR SHALL NOTIFY DIGSAFE AND BE PROVIDED WITH A DIGSAFE NUMBER INDICATING THAT ALL EXISTING UTILITIES HAVE BEEN LOCATED AND MARKED.
2. CONTRACTOR TO ADJUST UTILITY ELEMENTS MEANT TO BE FLUSH WITH GRADE (CLEAN-OUTS, UTILITY MANHOLES, CATCH BASINS, INLETS, ETC.) THAT ARE AFFECTED BY SITE WORK OR GRADE CHANGES, WHETHER SPECIFICALLY NOTED ON PLANS OR NOT.
3. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MAY BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ALL UNDERGROUND UTILITIES.
4. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
5. THE CONTRACTOR SHALL ADJUST THE MASONRY OF THE TOP SECTION OF ALL EXISTING DRAINAGE STRUCTURES AS NECESSARY FOR CHANGES IN GRADE, AND RESET ALL WATER AND DRAINAGE FRAMES, GRATES, AND BOXES TO THE PROPOSED FINISH SURFACE GRADE.
6. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF ALL GAS, ELECTRIC, TELEPHONE, AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
7. CONTRACTOR SHALL MAINTAIN, OR ADJUST TO NEW FINISH GRADE, AS NECESSARY, ALL EXISTING UTILITY AND SITE STRUCTURES SUCH AS: LIGHT POLES, SIGN POLES, MANHOLES, CATCH BASINS, HAND HOLES, WATER AND GAS GATES, HYDRANTS, ETC., FROM MAINTAINED UTILITY AND SITE SYSTEMS, UNLESS OTHERWISE NOTED OR DIRECTED BY OWNER'S REPRESENTATIVE.
8. REFER TO ARCHITECTURAL PLANS FOR PROPOSED LOCATION OF UTILITY SERVICE STUBS AT BUILDING. THE LOCATION, SIZE, DEPTH, AND SPECIFICATIONS FOR CONSTRUCTION OF PRIVATE UTILITY SERVICES SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS PROVIDED BY, AND APPROVED BY, THE RESPECTIVE UTILITY COMPANY (GAS, TELEPHONE, ELECTRICAL, ETC)
9. SEE ARCHITECTURAL AND MECHANICAL, ELECTRICAL, PLUMBING (MEP) DRAWINGS FOR FINAL DESIGN AND LOCATIONS AT THE BUILDING. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE UTILITY CONNECTIONS WITH THE RESPECTIVE COMPANIES PRIOR TO ANY UTILITY CONSTRUCTION.
10. ALL WATER LINES SHALL HAVE A MINIMUM OF 5.0 FEET OF GROUND COVER AND A MINIMUM OF 10 FOOT SEPARATION FROM THE SEWER SYSTEM. AT WATER AND SEWER CROSSINGS, THE WATER LINE SHALL BE ENCASED IN SIX INCHES OF CONCRETE FOR A DISTANCE OF 10 FEET ON EITHER SIDE OF THE CROSSING. PROTECT AND MAINTAIN EXISTING ON-SITE UTILITY STRUCTURES AND PIPES UNLESS OTHERWISE NOTED.
11. THE CONTRACTOR SHALL PROTECT ALL STORMWATER INFRASTRUCTURE FROM EROSION AND SEDIMENT UNTIL THE PROJECT SITE HAS REACHED PERMANENT STABILIZATION BY THE OWNER'S REPRESENTATIVE. IN THE EVENT SEDIMENT DOES ENTER THE STORMWATER SYSTEM THE CONTRACTOR SHALL CLEAN AND REMOVE ALL SEDIMENT.
12. CONSTRUCTION SHALL COMPLY WITH TOWN OF BELMONT'S ENGINEERING DIVISION AND DPW MINIMUM REQUIREMENTS.
13. THE CONTRACTOR SHALL FIELD VERIFY ALL INVERTS OF EXISTING UTILITIES TO BE REUSED. THE CONTRACTOR SHALL PROVIDE FIELD VERIFICATION TO THE ENGINEER FOR REVIEW. THE CONTRACTOR SHALL NOT ORDER ANY UTILITY STRUCTURES UNTIL EXISTING INVERTS ARE FIELD VERIFIED AND REVIEWED BY THE ENGINEER. THE CONTRACTOR SHALL CLEAN ALL EXISTING UTILITIES TO BE REUSED, INCLUDING ALL DRAINAGE PIPING AND STRUCTURES.
14. THE CONTRACTOR SHALL CLEAN AND TV/VIDEO INSPECT THE EXISTING SANITARY SEWER AND STORM DRAIN LINES AT LOCATIONS OF PROPOSED CONNECTIONS. THE CONTRACTOR SHALL PROVIDE THE TV/VIDEO INSPECTION TO THE ENGINEER FOR REVIEW. THE CONTRACTOR SHALL NOT ORDER ANY STORM DRAIN OR SANITARY SEWER STRUCTURES UNTIL THE TV/VIDEO INSPECTION IS REVIEWED BY THE ENGINEER, AND THE EXISTING DRAIN AND SEWER LINES ARE DEEMED SUITABLE TO BE REUSED BY THE ENGINEER, AND THE INVERTS ARE VERIFIED.
15. EXISTING AND PROPOSED STORMWATER UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS. SIZE AND LOCATION OF EXISTING AND PROPOSED STORMWATER SYSTEMS AND FEATURES TO BE VERIFIED UPON COMPLETION OF ADDITIONAL FIELD INVESTIGATIONS, AS NECESSARY. STORMWATER STRUCTURES AND PIPING WILL BE INCLUDED AS NECESSARY AND INCORPORATED WITH FINAL PROPOSED LAYOUT AND GRADING DESIGN.

NORTH
0 10' 20' 40'

BELMONT DAY SCHOOL BARN

PROJECT

BELMONT DAY SCHOOL

55 DAY SCHOOL LN
BELMONT, MA 02478

OWNER

utile
ARCHITECTURE + URBAN DESIGN
115 KINGSTON ST
BOSTON, MA 02110
P 617 423.7200 F 617 423.1414
utiledesign.com
ARCHITECT

SIMPSON GUMPERTZ AND HEGER, INC.
41 SEYON STREET BUILDING 1
SUITE 500, WALTHAM, MA 02453
P 781 907.9000 F 781 907.9009
STRUCTURAL

STANTEC
226 CAUSEWAY STREET
BOSTON, MA 02114
P 617 234.3100
LANDSCAPE/CIVIL

RIST-FROST SHUMWAY ENGINEERING
71 WATER STREET
LACONIA, NH 03246
P 603 524.4647
MEP+FP

KEY PLAN

COMMONWEALTH OF MASSACHUSETTS
FRANK HOLMES
CIVIL
No. 43203
REGISTERED PROFESSIONAL ENGINEER

STAMP

DATE	REVISION
February 27, 2017	Site Plan Review Submission
June 9, 2017	Stormwater Revisions
July 3, 2017	Revisions per BSC Comment Letter dated 06/28/17

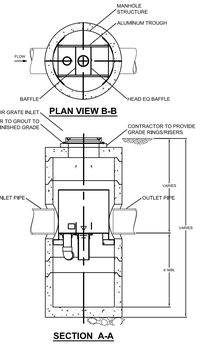
REVISIONS ON SHEET

SCALE: AS NOTED
UTILE PROJECT NUMBER: 1637

UTILITY PLAN

L3.02

1/2/2017 12:55:06 PM

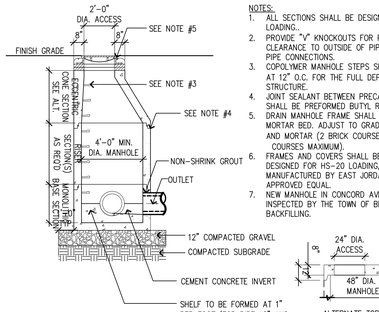


FRAME AND GRATE
(24" SQUARE)
N.T.S.

GENERAL NOTES:
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE, www.ContechES.com
4. VORTSENTRY HS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO H520 AND CASTINGS SHALL MEET AASHTO M306 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.

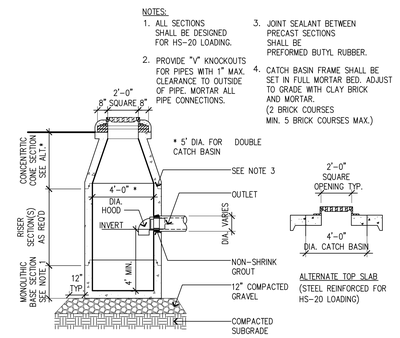
INSTALLATION NOTES:
1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE VORTSENTRY HS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
3. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
4. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
5. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

1 CONTECH CDS H536 WATER QUALITY UNIT
NTS



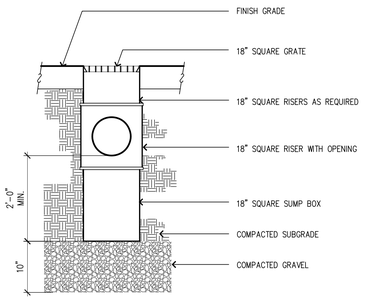
NOTES:
1. ALL SECTIONS SHALL BE DESIGNED FOR HS-25 LOADING.
2. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 1" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
3. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. DRAIN MANHOLE FRAME SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES MINIMUM 5 BRICK COURSES MAXIMUM).
6. FRAMES AND COVERS SHALL BE HEAVY DUTY AND DESIGNED FOR HS-20 LOADING, AND SHALL BE MANUFACTURED BY EAST JORDAN IRON WORKS, OR APPROVED EQUAL.
7. NEW MANHOLE IN CONCORD AVENUE SHALL BE INSPECTED BY THE TOWN OF BELMONT PRIOR TO BACKFILLING.

2 DRAIN MANHOLE
NTS

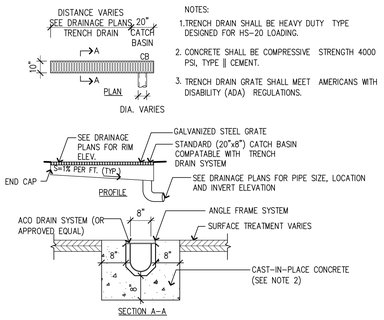


NOTES:
1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.
2. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 1" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
4. CATCH BASIN FRAME SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR. (2 BRICK COURSES MIN. 5 BRICK COURSES MAX.)

3 CATCH BASIN
NTS

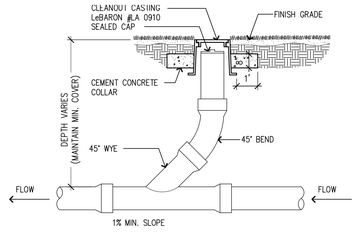


4 AREA DRAIN
NTS

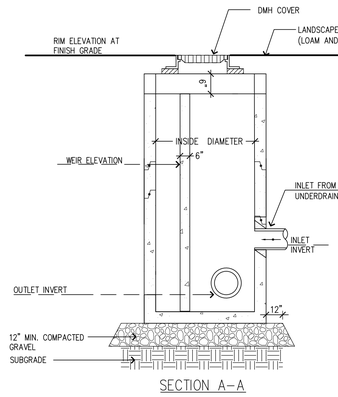


NOTES:
1. TRENCH DRAIN SHALL BE HEAVY DUTY TYPE DESIGNED FOR HS-20 LOADING.
2. CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI, TYPE II CEMENT.
3. TRENCH DRAIN GRATE SHALL MEET AMERICANS WITH DISABILITY (ADA) REGULATIONS.

5 8" TRENCH DRAIN
NTS

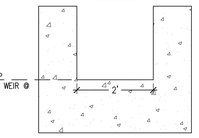


6 CLEANOUT
NTS



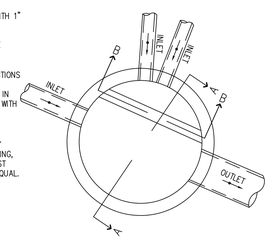
	OCS-1
RIM ELEVATION	266.30
INLET INVERT	SEE PLAN
INLET SIZE	4"ø & 6"ø
OUTLET INVERT	261.00
OUTLET SIZE	12"ø
ORIFICE EL.	N/A
ORIFICE SIZE	N/A
WEIR EL.	263.80
WEIR WIDTH	2'
STRUCTURE INSIDE DIA.	4'

OCS-1



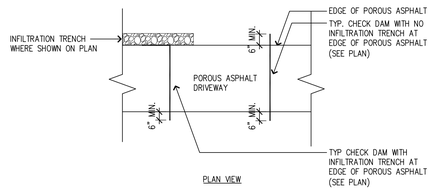
NOTES:
1. ALL SECTIONS SHALL BE DESIGNED FOR HS-25 LOADING.
2. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 1" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
3. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. DRAIN MANHOLE FRAME SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES MINIMUM 5 BRICK COURSES MAXIMUM).
6. FRAMES AND COVERS SHALL BE HEAVY DUTY AND DESIGNED FOR HS-20 LOADING, AND SHALL BE MANUFACTURED BY EAST JORDAN IRON WORKS, OR APPROVED EQUAL.

SECTION B-B



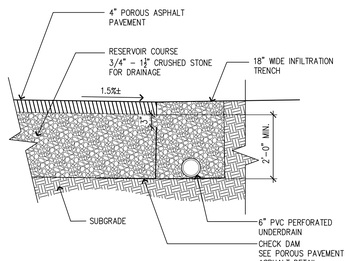
7 OUTLET CONTROL STRUCTURE
NTS

PROFILE VIEW

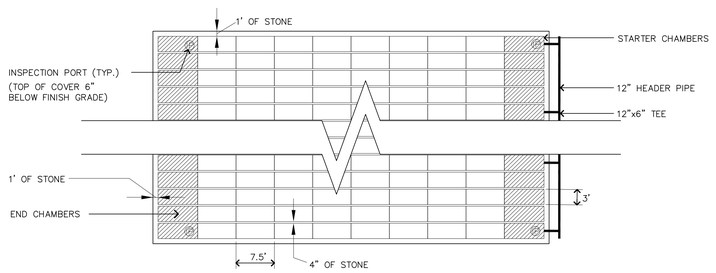


PLAN VIEW

8 POROUS ASPHALT PAVEMENT
NTS

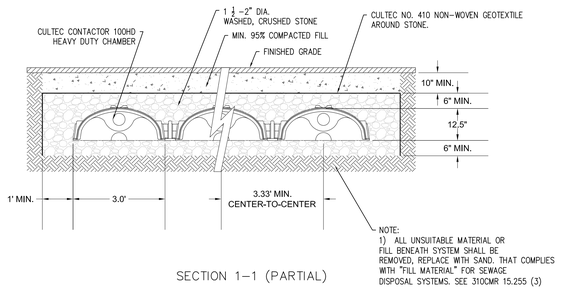


9 INFILTRATION TRENCH AT EDGE OF POROUS PAVEMENT
NTS

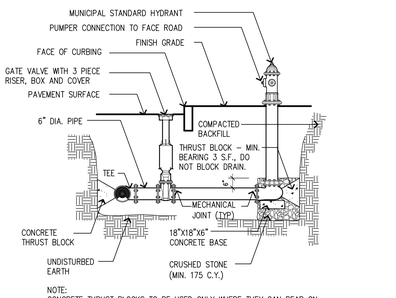


TYPICAL SUBSURFACE RECHARGE AREA (CULTEC 100HD) PLAN VIEW (INFILTRATION TO BE CULTEC OR APPROVED EQUAL)

10 CULTEC 100HD SUBSURFACE CHAMBERS
NTS

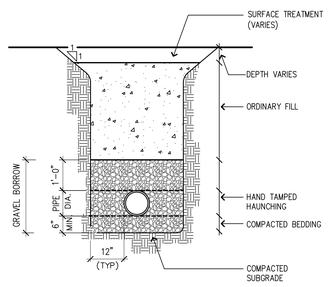


SECTION 1–1 (PARTIAL)



NOTE:
CONCRETE THRUST BLOCKS TO BE USED ONLY WHERE THEY CAN BEAR ON UNDISTURBED EARTH. USE CLAMPS AND TIE RODS OR OTHER ACCEPTABLE METHOD OF JOINT RESTRAINT WHERE SOIL CONDITIONS PROHIBIT THE USE OF THRUST BLOCKS.

11 HYDRANT
NTS



12 UTILITY TRENCH
NTS

BELMONT DAY SCHOOL BARN

PROJECT

BELMONT DAY SCHOOL

55 DAY SCHOOL LN
BELMONT, MA 02478

OWNER

utile
ARCHITECTURE + URBAN DESIGN

115 KINGSTON ST
BOSTON, MA 02110
P 617 423.7200 F 617 423.1414
utiledesign.com

ARCHITECT

SIMPSON GUMPERTZ AND HEGER, INC.
41 SEYON STREET BUILDING 1
SUITE 500, WALTHAM, MA 02453
P 781 907.9000 F 781 907.9009

STRUCTURAL

STANTEC

226 CAUSEWAY STREET
BOSTON, MA 02114
P 617 234.3100

LANDSCAPE/CIVIL

RIST-FROST SHUMWAY ENGINEERING
71 WATER STREET
LACONIA, NH 03246
P 603 524.4647

MEP+FP

KEY PLAN

COMMONWEALTH OF MASSACHUSETTS
FRANK HOLMES CIVIL NO. 43288
REGISTERED PROFESSIONAL ENGINEER

STAMP

DATE	REVISION
June 9, 2017	Add Utility Details Sheet
July 3, 2017	Revisions per BSC Comment Letter dated 06/28/17

REVISIONS ON SHEET

SCALE: AS NOTED
UTILE PROJECT NUMBER: 1637

UTILITY DETAILS

L5.01

1/2/2017 12:55:06 PM

9.0 Standard 9: Operation and Maintenance Plan

The goal of the operation and maintenance plan is not only to protect resources on-site or nearby, but also to protect resources in the region that may be affected by the activities at the site. Water quality treatment measures and the implementation of Best Management Practices (BMP's) for structural controls will result in the treatment of site stormwater and the removal of a minimum of 80 percent of the total suspended solids (TSS) load in runoff prior to discharge from the site, consistent with Massachusetts DEP's TSS removal standard.

The stormwater management system will be owned by the Belmont Day School. They will be responsible for operation and maintenance. An Operation and Maintenance Log has been prepared for this project and is included in this report as Appendix I.

9.1 STRUCTURAL POLLUTANT CONTROLS

The proposed stormwater management system is designed to protect runoff water quality through the removal of sediment and pollutants. Structural pollutant controls used to separate and capture stormwater pollutants are described below.

Proprietary Water Quality Units

Proprietary separators will be inspected and cleaned in strict accordance with the manufacturer's recommendations and requirements. The manufacturer's recommendations and requirements are included in Appendix J, Contech Water Quality Device Inspection.

Roof Drain Leaders

Roof runoff from the existing buildings and proposed building will be directed to underground piped drainage systems. Routine roof inspections will be performed. Roofs will be kept clean and free of debris, and the roof drainage systems will be kept clear. Gutters and downspouts connected to the drainage system will be cleaned at least twice per year, or more frequently as necessary.

Subsurface Detention/Infiltration Basins

The subsurface detention/infiltration basins at the proposed project site will be Cultec systems, as well as the three existing infiltration basins. They are used for infiltration and detention. The basins require maintenance to remain functional. Well maintained pretreatment BMP's (i.e. catch basins with deep sumps) will reduce the need for maintenance of the subsurface basins.

See Appendix K, Cultec Maintenance Guidelines for additional information.

Porous Asphalt Pavement

The proposed driveway consists of porous asphalt pavement. Porous asphalt pavement is a paved surface with a higher than normal percentage of air voids to allow water to pass through it and infiltrate into the underlying soil. Regular maintenance of the pavement is required to prevent clogging. After storms, monitor the surface to ensure that it is draining properly. As needed, clean the surface using a power washer to dislodge trapped particles and then vacuum sweep the area. The surface should be cleaned quarterly with a vacuum sweeping machine. Inspect the surface annually for deterioration. No winter sanding shall be conducted on the porous surface. Salt use shall be minimized during winter months. Do not reseal or repave with any impermeable material.

Catch Basins and Area Drains

All proposed catch basins at the site will be equipped with deep sumps and hooded outlets to trap debris, sediments, and floating contaminants, which are the largest constituents of urban runoff. The proper removal of sediments and associated pollutants and trash occurs only when catch basin inlets and sumps are cleaned out regularly. The more frequent the cleaning, the less likely sediments will be re-suspended and subsequently discharged. In addition, frequent cleaning also results in more volume available for future deposition and enhances overall performance.

Catch basins and area drains, both new and existing, will be cleaned a minimum of four times and inspected monthly for the first year to determine the sediment loading for the site. Any sand, sediment, or debris that collects (when it reaches a depth of more than ½ the sump depth, which is 2 feet for catch basins and area drains) will be removed as needed. After the first year, the frequency of the catch basin cleaning should be reviewed and revised based upon the sediment loading observed in the first year. Any structural damage or other indication of malfunction will be reported to the site manager. During colder periods, the catch basin grates will be kept free of snow and ice.

This practice, in coordination with minimal use of sand, and street sweeping comprises a multi-level source control approach that prevents sand/sediments and litter from exiting off-site and/or ultimately into the resource areas.

Trench Drains

All proposed trench drains will be inspected at least two times per year and cleaned as necessary. Sediment and/or floatable pollutants will be flushed from the trench drain. During colder periods, the trench drain grates will be kept free of snow and ice. During warmer periods, trench drain grates will be kept free of leaves, litter, sand, and debris.

Existing Dry Wells

Inspect dry well after every major storm in the first few months, and after construction to ensure proper stabilization and function. All dry wells will be inspected at least one time per year and cleaned as need.

Existing Stormwater Basin

At least twice annually, the inlet pipes and dry wells in the bottom of the stormwater basin shall be checked for debris and removed to ensure unobstructed flow of water through the pond. Following any rainfall event exceeding 2.5 inches in a 24 hour period, the basin shall be inspected for debris, settling, cracking, erosion, sediment accumulation, and health of the lawn area. Remove sediment annually. If standing water is observed for more than 72 hours following a storm event, retain a qualified professional to assess whether the system is adequately infiltrating and take corrective measures as necessary.

Vegetated Areas Maintenance

Although not a structural component of the drainage system, the maintenance of vegetated areas may affect the functioning of stormwater management practices. This includes the health/density of vegetative cover and activities such as the application and disposal of lawn and garden care products, disposal of leaves and yard trimmings.

Initial Post-Construction Inspection

During the initial period of vegetation establishment in disturbed areas pruning and weeding are required twice in first year by contractor or owner. Any dead vegetation/plantings found after the first year will be replaced. Proper mulching is mandatory and regular watering may be required initially to ensure proper establishment of new vegetation.

Long-Term Maintenance

Weeds and invasive plant species will be removed by hand. Leaf litter and other detritus shall be removed twice per year. If needed to maintain aesthetic appearance, perennial plantings may be trimmed at the end of the growing season. Trees and shrubs will be inspected twice per year to evaluate health and attended to as necessary. Seeded ground cover or grass areas shall not receive mulching. PH tests of the soils in the planting bed will occur annually. If the pH is below 5.2, limestone will be applied to increase it. If the pH is above 8.0, iron sulfate plus sulfur will be added accordingly.

9.2 LONG TERM POLLUTION PREVENTION PLAN

The following measures will be employed to control potential sources of contamination and prevent pollution at the project site:

Deicing

To prevent increased pollutant concentrations in stormwater discharges, the amount of road salt applied will be controlled. The amount of deicing materials used will be monitored with the goal of using only enough to make the drive aisle and walkways safe.

Fertilizer/Pesticide/Herbicide Application

The facility will require that landscaping maintenance contractors implement a program to test soils at the site annually and to limit the amount of fertilizer, pesticides and herbicides to only what is needed to maintain healthy plant materials and landscaped areas. PH tests of the soils in the planting bed will occur annually. If the pH is below 5.2, limestone will be applied to increase it. If the pH is above 8.0, iron sulfate plus sulfur will be added accordingly.

No pesticides or herbicides are to be used unless a single spot treatment is required for a specific control application.

Fertilizer usage will be avoided. If deemed necessary, slow release fertilizer will be used, and applied only in the minimum amounts recommended by the manufacturer. Once applied, the fertilizer will be worked into the soil to limit exposure to stormwater. Storage will be in a covered area; and the contents of any partially used bags will be transferred to a sealable, plastic bin to avoid spills.

Fertilizer will be used to begin the establishment of vegetation in bare or damaged areas, but will not be applied on a regular basis unless necessary.

Records of soil management, application dates, planting dates, preventive measures, treatments and other appropriate information should be kept. This information will be used as a reference when fertilizer/pesticide/herbicide management decisions in the future.

Materials Management/Housekeeping Practices

The following product-specific practices will be followed on-site. Recommendations are provided for petroleum products, fertilizers, solvents, paints, and other hazardous substances, and concrete.

Petroleum Products - No vehicle maintenance or handling of petroleum products will occur on site. Petroleum products will be stored in tightly sealed containers that are clearly labeled. Any asphalt substances used on-site will be applied according to manufacturer's recommendations.

Solvents, Paints, and other Hazardous Substances - All containers will be tightly sealed and stored indoors when not required for use. Excess materials will not be discharged to the storm sewer system, but will be properly disposed according to

manufacturer's instructions or state and local regulations. Outside storage on the property will be prohibited.

Spill Prevention Practices

The facility will implement a spill prevention program that will include storm water contamination assessment, flow diversion, record keeping, internal reporting, employee training, and preventive maintenance. The following specific practices will be followed for spill control, notification and cleanup.

- Manufacturer's recommended methods for spill cleanup for any chemicals used or stored on site will be clearly posted and site personnel will be informed 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 may include, as appropriate, shovels, wheel barrows, brooms, dust pans, mops, rags, gloves, goggles, kitty litter or Speedi-Dry, sand, sawdust, and plastic and metal trash containers specifically designated for this purpose.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear protective clothing to prevent injury from contact with a hazardous substance.
- Spills of toxic or hazardous material in excess of reportable quantities, as established in the Massachusetts Contingency Plan (MCP), will be reported to the Massachusetts Department of Environmental Protection Division of Hazardous Waste [(617) 292-5851 or (978) 661-7679].

9.3 PUBLIC SAFETY FEATURES

The implementation of the Operations and Maintenance Plan will utilize appropriate traffic and pedestrian safety features (traffic cones, advance signage, etc.) to protect school staff, students, and visitors to the campus when maintenance practices are being performed.

9.4 ESTIMATED OPERATIONS AND MAINTENANCE BUDGET

The attached table summarizes the estimate cost for annual implementation of the Operations and Maintenance Plan.

Belmont Day School – Stormwater Management System Operation and Maintenance Annual Budget

Structural Best Management Practice	Budget (Annual)
Catch Basin – Inspect monthly for the first year. Then inspect four times per year. Clean when the sump is half full (2 feet) of sediment.	$3,000 (first year) $1,000 (after first year)
Roof Leaders – Clean four times per year or more frequently as necessary	$250
Subsurface Detention/Infiltration Basins – Inspect the basin after each major rainstorm for the first service year of operation, and per manufactures recommendation, minimum.	$2,000 (first year) $250 (after first year)
Vegetated Areas Maintenance – Prune and weed twice per year, inspect trees and shrubs four times per year	$3,000
WQU (Contech) – Inspect annually, clean as required.	$500
Porous Pavement – Vacuum sweep quarterly, inspect annually for deterioration	$2,000
Dry Wells – Inspect annually, clean as required.	$250
Stormwater Basin – Inspect annually, clean sediment and debris.	$500
Trench Drains – Inspect twice per year, clean sediment and debris	$250
Total	**$11,750 (first year)** **$8,000 (after first year)**