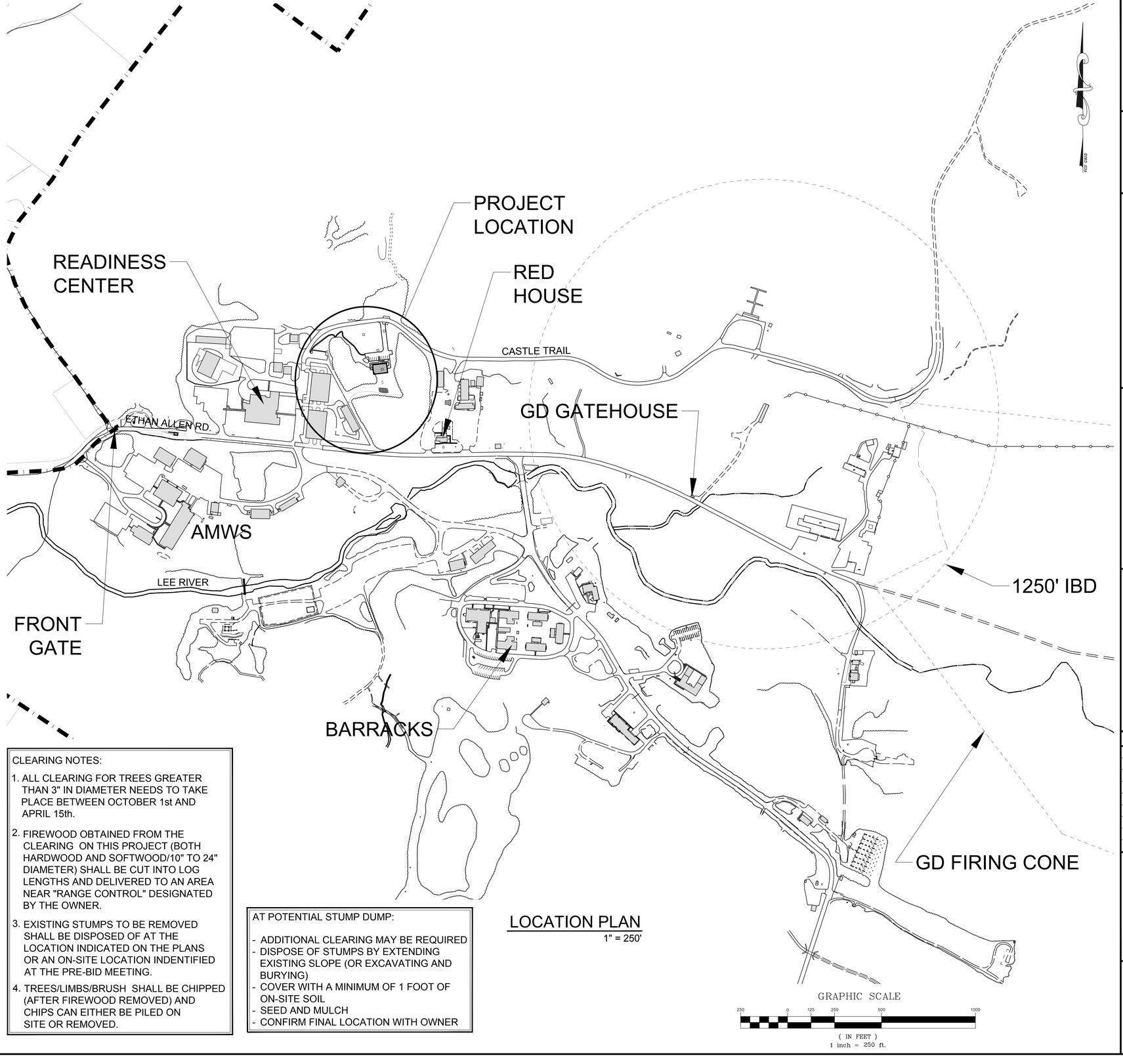
## GENERAL NOTES:

1. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON UTILITY EVIDENCE VISIBLE AT GROUND SURFACE AND ARE SUBJECT TO FIELD VERIFICATION BY EXCAVATION. UTILITIES SHOWN DO NOT PURPORT TO CONSTITUTE OR REPRESENT ALL UTILITIES LOCATED UPON OR ADJACENT TO THE SURVEYED PREMISES. ALL DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER. THE CONTRACTOR SHALL CONTACT DIG SAFE (888-344-7233) PRIOR TO ANY CONSTRUCTION. IN ADDITION, THE CONTRACTOR SHALL HIRE A PRIVATE UTILITY LOCATING FIRM TO LOCATE OWNER OWNED UNDERGROUND UTILITIES PRIOR TO START OF ANY EXCAVATION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMING TO ALL OSHA (STATE/FEDERAL) REGULATIONS INCLUDING TRENCHING AND CONFINED SPACE REQUIREMENTS.
3. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL ITEMS AND MATERIALS INCORPORATED INTO THE SITE WORK. WORK SHALL NOT BEGIN ON ANY ITEM UNTIL SHOP DRAWING APPROVAL IS GRANTED.
4. ALL EXISTING UTILITIES NOT INCORPORATED INTO THE FINAL DESIGN SHALL BE REMOVED OR ABANDONED AS INDICATED ON THE PLANS OR DIRECTED BY THE ENGINEER.
5. THE CONTRACTOR SHALL BE MAINTAIN AS-BUILT PLANS (WITH TIES) FOR ALL UNDERGROUND UTILITIES. THOSE PLANS SHALL BE SUBMITTED TO THE OWNER AT THE COMPLETION OF THE PROJECT.
6. THE CONTRACTOR SHALL REPAIR/RESTORE ALL DISTURBED AREAS (ON OR OFF THE SITE) AS A DIRECT OR INDIRECT RESULT OF THE CONSTRUCTION.
7. ALL GRASSED AREAS SHALL BE MAINTAINED UNTIL FULL VEGETATION IS ESTABLISHED.
8. MAINTAIN ALL TREES OUTSIDE THE CONSTRUCTION LIMITS.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK NECESSARY FOR COMPLETE AND OPERABLE FACILITIES AND UTILITIES.
10. IN ADDITION TO THE REQUIREMENTS SET IN THESE PLANS AND SPECIFICATIONS, THE CONTRACTOR SHALL COMPLETE THE WORK IN ACCORDANCE WITH ALL PERMIT CONDITIONS.
11. THE TOLERANCE FOR FINISH GRADES FOR ALL GRAVEL SURFACES SHALL BE 0.1 FEET.
12. ANY DEWATERING NECESSARY FOR THE COMPLETION OF THE SITEWORK SHALL BE CONSIDERED AS PART OF THE CONTRACT AND SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
13. EXISTING PAVEMENT TO BE REMOVED SHALL BE DISPOSED OF AT AN APPROVED OFF-SITE LOCATION. EXISTING EXCAVATED MATERIAL TO BE REMOVED SHALL BE DISPOSED OF AT A DESIGNATED ON-SITE LOCATION. CONTRACTOR IS RESPONSIBLE FOR STOCKPILING EXCAVATED MATERIAL FROM TRUCKS AT THE DESIGNATED WASTE AREA.
14. IF THERE ARE ANY CONFLICTS OR INCONSISTENCIES WITH THE PLANS OR SPECIFICATIONS, THE CONTRACTOR SHALL CONTACT THE ENGINEER FOR VERIFICATION BEFORE WORK CONTINUES ON THE ITEM IN QUESTION.
15. HORIZONTAL AND VERTICAL DATUM BASED ON VCS NAD 83 AND NAVD 88 RESPECTIVELY AND ARE CALCULATED BASED UPON GPS OBSERVATIONS PERFORMED ON SITE DURING THE TIME OF SURVEY.
16. EXISTING STONE WALLS AND FOUNDATIONS SHALL NOT BE DISTURBED EXCEPT AS SHOWN ON THE PLANS.
17. ALL CONSTRUCTION PERSONNEL WILL BE REQUIRED TO ATTEND AN ORIENTATION AND ORDNANCE IDENTIFICATION SESSION THAT THE EOD UNIT WILL PROVIDE, PRIOR TO ENTERING THE PROJECT SITE. SUBSEQUENT NEW FIELD EMPLOYEES ARE ALSO REQUIRED TO ATTEND THE SAFETY COURSE. THE ORDNANCE SESSION WILL COVER IDENTIFICATION OF VARIOUS ORDNANCE WITH MAY BE ENCOUNTERED AND PROCEDURES FOR NOTIFICATION OF EOD PERSONNEL.
18. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING TESTING AND INSPECTION SERVICES INDICATED IN THE CONTRACT DOCUMENTS, TYPICAL FOR CONCRETE AND SOIL TESTING.
19. THE CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT AND FIELD ENGINEERING REQUIRED FOR COMPLETION OF THE PROJECT. CIVIL ENGINEERING ASSOCIATES WILL PROVIDE AN AUTOCAD FILE WHERE APPLICABLE.
20. CURRENTLY, BACKGROUND CHECKS ARE NOT REQUIRED FOR CEATS AND THE SECURITY OFFICE IS FINALIZING THE BADGING PROCESS, BUT MOST LIKELY WILL NOT REQUIRE CONTRACTORS TO SURRENDER THEIR LICENSE UPON ENTRY TO CEATS IN EXCHANGE FOR A VISITOR BADGE.
21. EXISTING ROADS: MAINTAIN EXISTING ROADS AREAS ADEQUATE FOR CONSTRUCTION OPERATIONS. AT A MINIMUM, ALL EXISTING ROADS SHALL BE MAINTAINED/REPAIRED TO THE PRECONSTRUCTION CONDITION.
    - RECONDITION BASE AFTER USE, INCLUDING REMOVING CONTAMINATED MATERIAL, ADDING SUBBASE MATERIAL, REGRADING, PROOFROLLING AND COMPACTING.




LOCATION PLAN
1" = 250'

CLEARING NOTES:

1. ALL CLEARING FOR TREES GREATER THAN 3" IN DIAMETER NEEDS TO TAKE PLACE BETWEEN OCTOBER 1st AND APRIL 15th.
2. FIREWOOD OBTAINED FROM THE CLEARING ON THIS PROJECT (BOTH HARDWOOD AND SOFTWOOD/10" TO 24" DIAMETER) SHALL BE CUT INTO LOG LENGTHS AND DELIVERED TO AN AREA NEAR "RANGE CONTROL" DESIGNATED BY THE OWNER.
3. EXISTING STUMPS TO BE REMOVED SHALL BE DISPOSED OF AT THE LOCATION INDICATED ON THE PLANS OR AN ON-SITE LOCATION INDENTIFIED AT THE PRE-BID MEETING.
4. TREES/LIMBS/BRUSH SHALL BE CHIPPED (AFTER FIREWOOD REMOVED) AND CHIPS CAN EITHER BE PILED ON SITE OR REMOVED.

AT POTENTIAL STUMP DUMP:

- ADDITIONAL CLEARING MAY BE REQUIRED
- DISPOSE OF STUMPS BY EXTENDING EXISTING SLOPE (OR EXCAVATING AND BURYING)
- COVER WITH A MINIMUM OF 1 FOOT OF ON-SITE SOIL
- SEED AND MULCH
- CONFIRM FINAL LOCATION WITH OWNER

GRAPHIC SCALE

250 0 125 250 500 1000

( IN FEET )
1 inch = 250 ft.

SITE ENGINEER:

CIVIL ENGINEERING ASSOCIATES, INC.
10 MANSFIELD VIEW LANE, SOUTH BURLINGTON, VT 05403
P: 802-864-2323 FAX: 802-864-2271 web: www.cea-vt.com

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CHECKED: BCE
APPROVED: BCE

OWNER:

VERMONT NATIONAL GUARD

VERMONT ARMY NATIONAL GUARD

CAMP JOHNSON
COLCHESTER, VERMONT

PROJECT:

CASTLE TRAIL
FIELD
CLASSROOM

CAMP ETHAN ALLEN
TRAINING SITE
JERICHO, VT

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/23/18 | BCE | BID DOCUMENTS |

PROJECT LOCATION PLAN

DATE: 8/23/2018
SCALE: 1" = 250'
PROJ. NO.: 18100.08

DRAWING NUMBER: L-1

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## LEGEND

- APPROXIMATE PROPERTY LINE
- EXISTING CONTOUR
- EXISTING FENCE
- EXISTING GRAVEL
- EXISTING PAVEMENT
- EXISTING GUARD RAIL
- EXISTING ELECTRIC
- EXISTING FORCEMAIN
- EXISTING GAS
- EXISTING STORM
- EXISTING GRAVITY SEWER
- EXISTING TELEPHONE
- EXISTING WATER
- EXISTING SWALE
- EXISTING WELL
- EXISTING UTILITY POLE
- EXISTING GUY WIRE/POLE
- EXISTING SIGN
- EXISTING DECIDUOUS TREE
- EXISTING CONIFEROUS TREE
- EDGE OF BRUSH/WOODS
- TEST PIT
- PERCOLATION TEST
- PROJECT BENCHMARK
- **PROPOSED CONTOUR**
- **PROPOSED GRAVEL**
- **PROPOSED GAS**
- **PROPOSED STORM**
- **PROPOSED GRAVITY SEWER**
- **PROPOSED WATER**
- **PROPOSED SWALE**
- **PROPOSED WELL**
- **PROPOSED EDGE OF BRUSH/WOODS**

POTENTIAL FUTURE ROAD

PHASE II GRAVEL DRIVE & PARKING

PROPOSED GRAVEL PATH

PROPOSED WASTEWATER SYSTEM

PROPOSED CLEARING LIMITS, TYP.

PROPOSED GRAVEL DRIVE & PARKING

PROPOSED CLASSROOM

PROPOSED POWER/ COMMUNICATIONS ROUTE

PROPOSED WATER SERVICE

PROPOSED CLEARING LIMITS, TYP.

REPLACE EXISTING POLE FOR NEW POWER/COMMUNICATIONS (COORD. w/ELECTRICAL SITE PLAN)

SEE WATER SERVICE CONNECTION DETAIL

APPROX. RIVER CORRIDOR LIMIT

EXISTING BUILDING

EXISTING BUILDING F.F.E.=668.2

EXISTING BUILDING 4-6 F.F.E.=666.5

EXISTING BUILDING 4 F.F.E. = 665.4

EXISTING BUILDING 4-4 F.F.E. = 665.9

SALT SHED

EXISTING SHED

RED HOUSE

BUILDING #10

BUILDING #9

RANGE CONTROL

READINESS CENTER

LEDGE

WOODS

6" C900 PVC

GRAPHIC SCALE

50 0 25 50 100 200

( IN FEET )
1 inch = 50 ft.

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APPROVED: BCE

OWNER:

VERMONT NATIONAL GUARD

# VERMONT ARMY NATIONAL GUARD

CAMP JOHNSON
COLCHESTER, VERMONT

PROJECT:

# CASTLE TRAIL FIELD CLASSROOM

CAMP ETHAN ALLEN
TRAINING SITE
JERICHO, VT

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/23/18 | BCE | BID DOCUMENTS |

## OVERALL SITE PLAN

DATE: 8/23/2018
SCALE: 1" = 50'
PROJ. NO.: 16100.39

DRAWING NUMBER: C1.0

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## LEGEND

- APPROXIMATE PROPERTY LINE
- 722 EXISTING CONTOUR
- EXISTING FENCE
- EXISTING GRAVEL
- EXISTING PAVEMENT
- EXISTING GUARD RAIL
- EXISTING ELECTRIC
- FM EXISTING FORCEMAIN
- G EXISTING GAS
- ST EXISTING STORM
- S EXISTING GRAVITY SEWER
- T EXISTING TELEPHONE
- W EXISTING WATER
- EXISTING SWALE
- EXISTING WELL
- EXISTING UTILITY POLE
- EXISTING GUY WIRE/POLE
- EXISTING SIGN
- EXISTING DECIDUOUS TREE
- EXISTING CONIFEROUS TREE
- EDGE OF BRUSH/WOODS
- TP TEST PIT
- PERCOLATION TEST
- PROJECT BENCHMARK
- 722 **PROPOSED CONTOUR**
- **PROPOSED GRAVEL**
- G **PROPOSED GAS**
- ST **PROPOSED STORM**
- **PROPOSED GRAVITY SEWER**
- W **PROPOSED WATER**
- **PROPOSED SWALE**
- **PROPOSED WELL**
- **PROPOSED EDGE OF BRUSH/WOODS**

WOODS

POTENTIAL FUTURE ROAD

EXISTING DISPOSAL FIELD AREA FOR READINESS CENTER AND SURROUNDING FACILITIES

PROPOSED STORM MANHOLE RIM = 710.0 INV. = 703.9

WOODS

6' WIDE BENCH @ ELEVATION = 704

10' WIDE EMERGENCY SPILLWAY @ELEVATION = 703.0

INV. = 702.0

OUTLET STRUCTURE RIM = 702.8 INV. = 699.8 SEE DETAIL

INV. 15" PP PIPE = 696.0

EX. STONE LINED DITCH (TYP.)

MATCH EX. ROAD

CASTLE TRAIL (R.A.P.)

TO RANGE CONTROL/ READINESS CENTER

EX. CONCRETE PAD (TYP.) (TO BE REMOVED)

PROPOSED 18" PP CULVERT

PROPOSED 18" PP PIPE

PROPOSED 4'Ø CATCH BASIN #4 RIM = 710.0 INV. = 704.1

EX. 24" HDPE INV.= 675.1

DIVERT UPSLOPE WATER TO EX. 24" CULVERT

PROPOSED 2x2 CATCH BASIN #2 RIM = 710.0 INV. = 705.0

BLEND TO EXISTING STONE

50' WETLAND BUFFER

VTARNG MAPPED WETLANDS (TYPICAL)

EXISTING BUILDING

DMH RIM=667.2 INV=

6' WIDE SPILLWAY @ ELEVATION = 671.0

PROPOSED GRAVEL PATH

PROPOSED GRAVEL DRIVE & PARKING

PROPOSED 15" PP PIPE

PROPOSED 2x2 CATCH BASIN #1 RIM = 710.0 INV. = 705.5

12" APPLE (MAINTAIN)

PROPOSED 12" PP PIPE

PROPOSED 2x2 CATCH BASIN #3 RIM = 709.5 INV. = 705.5

INV. 12" PP PIPE = 671.5

INV. 12" PP PIPE = 670.5

PROPOSED 1,000 GAL. UNDERGROUND PROPANE TANK w/4 BOLLARDS (COORD. w/MECH. PLANS)

PROPOSED GRAVEL WALKS

MEP PAD

APPLE (MULTIPLE)

PROPOSED MOUND SYSTEM THREE 4' WIDE x 115' LONG DISPOSAL TRENCHES SEE PIPING LAYOUT DETAIL FOR LATERAL AND ORIFICE SIZING

INV. = 708.0

PROPOSED CLASSROOM BUILDING F.F.E. = 714.25

PROPOSED 4" SCH 40 (or SDR 35) PVC SERVICE LINES MIN. SLOPE = ¼"/FT

PROPOSED 2,500 GALLON SEPTIC TANK

PROPOSED 2,000 GALLON PUMP STATION

SOLID 4" SDR 35 PVC FROM DRIP EDGE TO DAYLIGHT - PLACE FLAT STONE @ OUTLET FOR EROSION

DRIP EDGE AT BUILDING (SEE DETAIL)

PROPOSED CLEARING LIMITS, TYP.

PROPOSED 2" SCH 40 or SDR 26 FORCE MAIN

32" PINE

8" MAPLE

18" MAPLE

EX. BOULDER

14" APPLE

EX. CHAIN LINK FENCE

10' (MIN.) TYPICAL

8" PINE

LEDGE

ABANDONED UTILITY

EX. UTILITY PEDESTAL

EX. TELEPHONE PEDESTAL

PROPOSED 1½" CTS PE (200 psi) WATER SERVICE LINE

36" PINE

RECLAIMED ASPHALT

48" HDPE INV.=668.1

30" HDPE INV.=667.7

EXISTING BUILDING F.F.E.=668.2

GATE

GRAVEL

ABOVE GROUND PROPANE

OIL/WATER SEPARATOR

WOOD FENCE

### SITE IMPROVEMENTS HATCH LEGEND

- IMPROVEMENTS PER TYPICAL GRAVEL SECTION
- GRAVEL PATH PER TYPICAL PATH SECTION
- PROPOSED STONE FILL

### PROPANE SUPPLY NOTE:

1. Propane supply will be needed as follows:
   - Contractor to coordinate installation of the propane supply with the Range propane provider.
   - Provide all piping necessary for a complete installation from the new buried tank to the buildings (coordinate with Mechanical plans)
   - Contractor shall establish an account with the propane provider for the Contractor's use during construction. Propane supply will be metered from existing tank or from a temporary tank at the Contractor's discretion.
   - Contractor to include new buried propane tank (purchase of tank and installation.), tank slab and tank shall be filled @ end of construction
   - Coordinate w/ Mechanical Plan/Notes.

### DISTURBED AREA MAINTENANCE

- All disturbed areas shall be finished per the Landscape Grading & Seeding specification sections, including removal of individual stones so areas are mowable.
- Topsoil for this project shall be obtained from an off-site source
- Maintenance of disturbed areas shall include at least mowing of the grass around the new facilities

**NOTE:**
**REMOVAL OF THE (4) EXISTING CONCRETE PADS TO BE A SEPARATE LINE ITEM ON THE SCHEDULE OF VALUES**

GRAPHIC SCALE

30 0 15 30 60 120

( IN FEET )
1 inch = 30 ft.


SITE ENGINEER:

CIVIL ENGINEERING ASSOCIATES, INC.
10 MANSFIELD VIEW LANE, SOUTH BURLINGTON, VT 05403
P: 802-864-2323 FAX: 802-864-2271 web: www.cea-vt.com



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OWNER:

VERMONT NATIONAL GUARD

VERMONT ARMY NATIONAL GUARD

CAMP JOHNSON
COLCHESTER, VERMONT

PROJECT:

# CASTLE TRAIL FIELD CLASSROOM

CAMP ETHAN ALLEN
TRAINING SITE
JERICHO, VT

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/23/18 | BCE | BID DOCUMENTS |

## PROPOSED CONDITIONS PLAN

DATE 8/23/2018
SCALE 1" = 30'
PROJ. NO. 18100.08

DRAWING NUMBER C1.1

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## Project Test Pitting

July 28, 2017
Clark Elliott Matt (VTARNG)

**TP #30**
0"-8" Dark Brown Fine Sandy Loam - Friable
8"-36" Light Brown Sandy Loam (reduces to 24" West)
36"-54+" Gray Fine Sandy Loam - Firm
Dry

**TP #31**
0"-8" Dark Brown Fine Sandy Loam - Friable
8"-27" Light Brown Sandy Loam
27"-60+" Gray Fine Sandy Loam - Firm
Dry

**TP #32**
0"-6" Dark Brown Fine Sandy Loam - Friable
6"-12" Light Brown Sandy Loam
12"-54+" Gray Fine Sandy Loam - Firm
Dry

**TP #33**
0"-6" Dark Brown Fine Sandy Loam - Friable
6"-12" Light Brown Sandy Loam
12"-24" Gray Fine Sandy Loam - Firm
24" Refusal

**TP #34**
0"-8" Dark Brown Fine Sandy Loam - Friable
8"-30" Light Brown Medium Sand - Friable
30"-40" Light Brown Sand - Loose
40"-48" Gray Brown Fine Sandy Loam - Friable
48"-7"+ Gray Fine Sandy Loam - Firm

**TP #35**
0"-4" Dark Brown Fine Sandy Loam - Friable
4"-60"+ Gray Fine Sandy Loam - Silt, Firm

**TP #36**
0"-6" Dark Brown Fine Sandy Loam - Friable
6"-44" Light Brown Medium Sand - Loose
44"-50"+ Gray Silt Loam - Firm

**TP#37**
0"-4" Dark Brown Fine Sandy Loam - Friable
4"-12" Red Brown Medium Sand - Loose
12"-24" Light Brown Fine Sand - Loose
24"-30"+ Gray Silt Loam - Firm

**TP#38**
0"-8" Dark Brown Fine Sandy Loam - Friable
8"-24" Red Brown Medium Sand
24"-60"+ Medium Sand - Loose, saturated
Water @ 4'

**TP#39**
0"-18" Gray Fine Sandy Loam W/mottles
18"-36"+ Gray Silt Loam

**TP#40**
0"-4" Dark Brown Fine Sandy Loam - Friable
4"-36" Gray Sandy Loam - Friable
36"-4'+ Gray Silt Loam - Firm

**TP#41**
0"-4" Dark Brown Fine Sandy Loam - Friable
4"-36" Gray Sandy Loam - Friable
36"-6'+ Gray Silt Loam - Firm
Dry

**TP#42**
0"-4" Dark Brown Medium Sand - Loose
4"-4'+ Gray Medium Sand - Loose
Dry

**TP#43**
0"-12" Dark Brown Fine Sandy Loam
12"-36" Gray Sandy Loam
36"-6'+ Gray Fine Sandy Loam - Firm

## LEGEND

- APPROXIMATE PROPERTY LINE
- 754 EXISTING CONTOUR
- EXISTING FENCE
- EXISTING GRAVEL
- EXISTING PAVEMENT
- EXISTING GUARD RAIL
- EXISTING ELECTRIC
- FM EXISTING FORCEMAIN
- G EXISTING GAS
- ST EXISTING STORM
- S EXISTING GRAVITY SEWER
- T EXISTING TELEPHONE
- W EXISTING WATER
- EXISTING SWALE
- EXISTING WELL
- EXISTING UTILITY POLE
- EXISTING GUY WIRE/POLE
- EXISTING SIGN
- EXISTING DECIDUOUS TREE
- EXISTING CONIFEROUS TREE
- EDGE OF BRUSH/WOODS
- TP TEST PIT
- PT PERCOLATION TEST
- PROJECT BENCHMARK

NORTH

WOODS
Glover-Vershire complex soils 15-35% Very rocky
EXISTING DISPOSAL FIELD AREA FOR READINESS CENTER AND SURROUNDING FACILITIES
EX. STONE LINED DITCH (TYP.)
CASTLE TRAIL (R.A.P.)
TO RANGE CONTROL/ READINESS CENTER
EX. 24" HDPE INV.= 675.1
24" HDPE
EX. CONCRETE PAD (TYP.)
CONTROL POINT ELEV. = 713.4
Agawam fsl 15-20%
12" APPLE
Ninigret fsl 3-8%
APPLE (MULTIPLE)
Agawam fsl 15-25%
8" APPLE
CONTROL POINT ELEV. = 712.5
32" PINE
8" MAPLE
18" MAPLE
EX. BOULDER
LEDGE
14" APPLE
8" PINE
CONTROL POINT ELEV. = 695.0
ABANDONED UTILITY
EX. UTILITY PEDESTAL
Glover-Vershire complex soils 15-35% Very rocky
36" PINE
Urban Land Udorthents and Udipsaments 0-8%
BUILDING #10
EX. CHAIN LINK FENCE
EX. TELEPHONE PEDESTAL
50' WETLAND BUFFER
VTARNG MAPPED WETLANDS (TYPICAL)
RECLAIMED ASPHALT
Belgrade sil 3-8%
48" HDPE INV.=668.1
30" HDPE INV.=667.7
EXISTING BUILDING F.F.E.=668.2
GATE
GRAVEL
ABOVE GROUND PROPANE
OIL/WATER SEPARATOR
WOOD FENCE
TP #30, #31, #33, #34, #35, #36, #37, #38, #39, #40, #41, #42, #43

GRAPHIC SCALE
30 0 15 30 60 120
( IN FEET )
1 inch = 30 ft.

SITE ENGINEER:

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CAMP JOHNSON
COLCHESTER, VERMONT

PROJECT:

# CASTLE TRAIL FIELD CLASSROOM

CAMP ETHAN ALLEN
TRAINING SITE
JERICHO, VT

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/23/18 | BCE | BID DOCUMENTS |

# EXISTING CONDITIONS and SOILS PLAN

DATE 8/23/2018
SCALE 1" = 30'
PROJ. NO. 16100.39

DRAWING NUMBER C1.2

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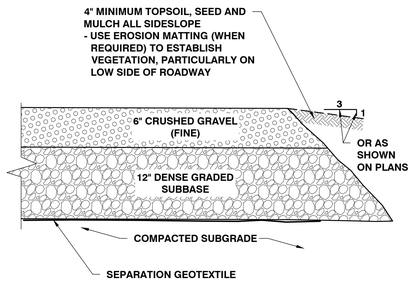
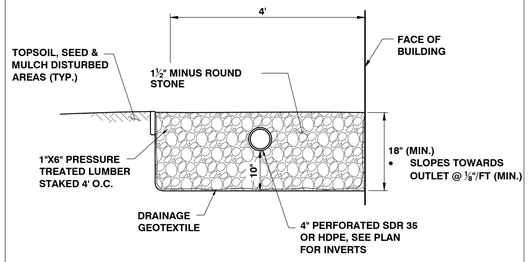



## TYPICAL GRAVEL SURFACE SECTION

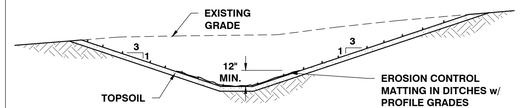
N.T.S.

S-004 REVISED 11/10/2014




## DRIP EDGE DETAIL AT BUILDING

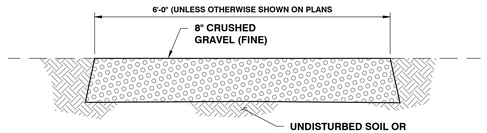
N.T.S.




## GRASS LINED DITCH

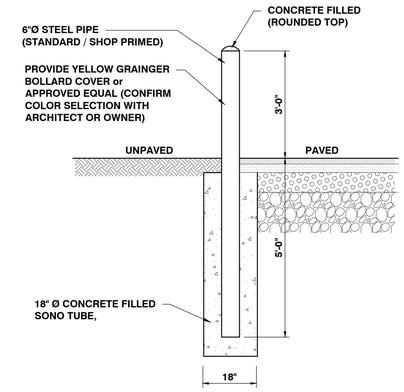
N.T.S.

ST-014 REVISED 08/01/2014




## GRAVEL SIDEWALK/PATH DETAIL

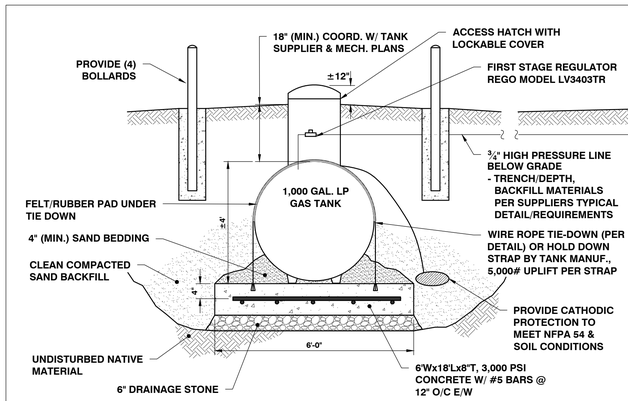
N.T.S.




## BOLLARD DETAIL

N.T.S.

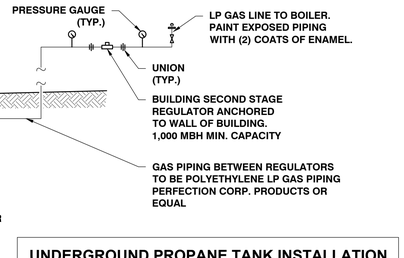
S-011 REVISED 05/08/2015




## UNDERGROUND PROPANE TANK

N.T.S.

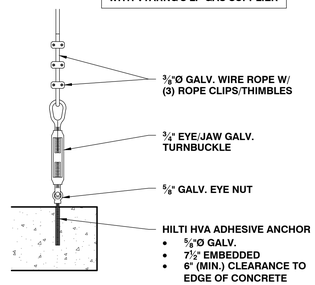
M-014 REVISED 8/11/2017




### UNDERGROUND PROPANE TANK INSTALLATION NOTES:

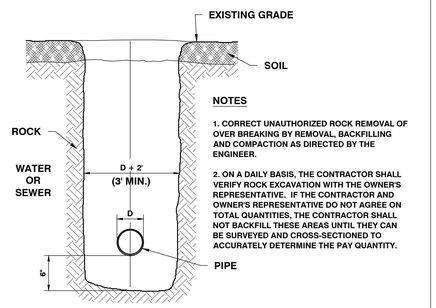
1. Install tank to meet NFPA58 Requirements.
2. Contractor to coordinate installation of the propane supply with the site propane provider.
3. Provide all piping necessary for a complete installation from the new buried tank to gas burner at boiler. (coordinate with Mechanical plans)
4. Contractor shall establish an account with the propane provider for the Contractor's use during construction. Propane supply will be metered from existing tank or from a temporary tank at the Contractor's discretion.
5. Contractor to include new buried propane tank (purchase of tank and installation.), tank slab and tank shall be filled @ end of construction.
6. This tank is to become the property of the Owner and not to be a leased tank.

COORDINATE LP TANK, COMPONENTS AND INSTALLATION WITH VTARNG'S LP GAS SUPPLIER




## TANK TIE-DOWN

(OR APPROVED ALTERNATE) N.T.S.



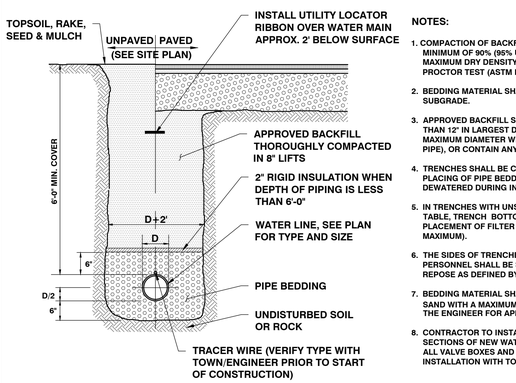

### NOTES

1. CORRECT UNAUTHORIZED ROCK REMOVAL OF OVER BREAKING BY REMOVAL, BACKFILLING AND COMPACTION AS DIRECTED BY THE ENGINEER.
2. ON A DAILY BASIS, THE CONTRACTOR SHALL VERIFY ROCK EXCAVATION WITH THE OWNER'S REPRESENTATIVE. IF THE CONTRACTOR AND OWNER'S REPRESENTATIVE DO NOT AGREE ON TOTAL QUANTITIES, THE CONTRACTOR SHALL NOT BACKFILL THESE AREAS UNTIL THEY CAN BE SURVEYED AND CROSS-SECTIONED TO ACCURATELY DETERMINE THE PAY QUANTITY.

## TRENCH ROCK EXCAVATION PAY LIMITS

N.T.S.

M-001 REVISED 06/12/2015



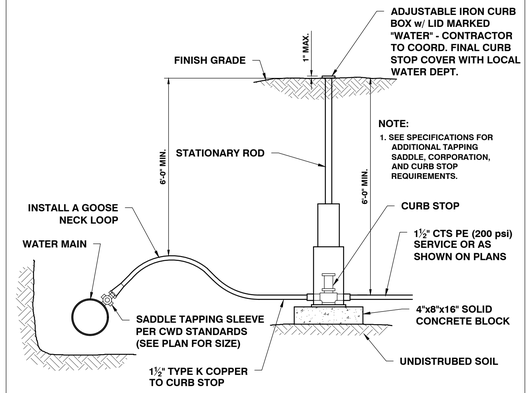

### NOTES:

1. COMPACTION OF BACKFILL AND BEDDING SHALL BE A MINIMUM OF 90% (95% UNDER ROADWAY SURFACES) OF MAXIMUM DRY DENSITY DETERMINED IN THE STANDARD PROCTOR TEST (ASTM D698).
2. BEDDING MATERIAL SHALL NOT BE PLACED ON FROZEN SUBGRADE.
3. APPROVED BACKFILL SHALL NOT CONTAIN ANY STONES MORE THAN 12" IN LARGEST DIMENSION (6" IN ROADWAYS, 1 1/2"" MAXIMUM DIAMETER WITHIN 24" OF THE OUTSIDE OF THE PIPE), OR CONTAIN ANY FROZEN, WET, OR ORGANIC MATERIAL.
4. TRENCHES SHALL BE COMPLETELY DEWATERED PRIOR TO PLACING OF PIPE BEDDING MATERIAL AND KEPT DEWATERED DURING INSTALLATION OF PIPE AND BACKFILL.
5. IN TRENCHES WITH UNSTABLE MATERIALS OR HIGH WATER TABLE, TRENCH BOTTOM SHALL FIRST BE STABILIZED BY PLACEMENT OF FILTER FABRIC THEN CRUSHED STONE (3/4" MAXIMUM).
6. THE SIDES OF TRENCHES 4' OR MORE IN DEPTH ENTERED BY PERSONNEL SHALL BE SHEETED OR SLOPED TO THE ANGLE OF REPOSE AS DEFINED BY O.S.H.A. STANDARDS.
7. BEDDING MATERIAL SHALL CONSIST OF CRUSHED STONE, OR SAND WITH A MAXIMUM SIZE OF ¾". SUBMIT A SAMPLE TO THE ENGINEER FOR APPROVAL.
8. CONTRACTOR TO INSTALL TRACER WIRE ALONG ALL SECTIONS OF NEW WATER LINE. TERMINATE TRACER WIRE AT ALL VALVE BOXES AND HYDRANTS. COORDINATE INSTALLATION WITH TOWN AND ENGINEER.

## TYPICAL WATER TRENCH DETAIL

N.T.S.

W-001 REVISED 12/08/2016

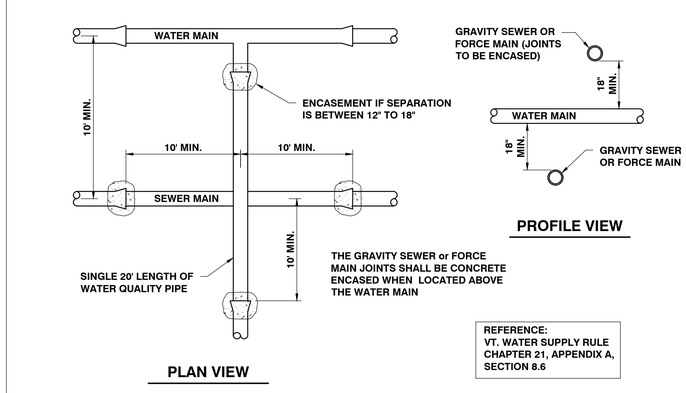



NOTE:
1. SEE SPECIFICATIONS FOR ADDITIONAL TAPPING SADDLE, CORPORATION, AND CURB STOP REQUIREMENTS.

## WATER SERVICE CONNECTION

N.T.S.

W-006




PROFILE VIEW

PLAN VIEW

REFERENCE:
VT. WATER SUPPLY RULE CHAPTER 21, APPENDIX A, SECTION 8.6

## WATER/SEWER CROSSING

N.T.S.

W-007 REVISED 6/15/2015

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PROJECT:

*CASTLE TRAIL FIELD CLASSROOM*

*CAMP ETHAN ALLEN TRAINING SITE*
*JERICHO, VT*

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|---|---|---|
| 8/23/18 | BCE | BID DOCUMENTS |

*SITE DETAILS*

DATE: 8/23/2018
SCALE: AS SHOWN
PROJ. NO.: 18100.08

DRAWING NUMBER: C2.0

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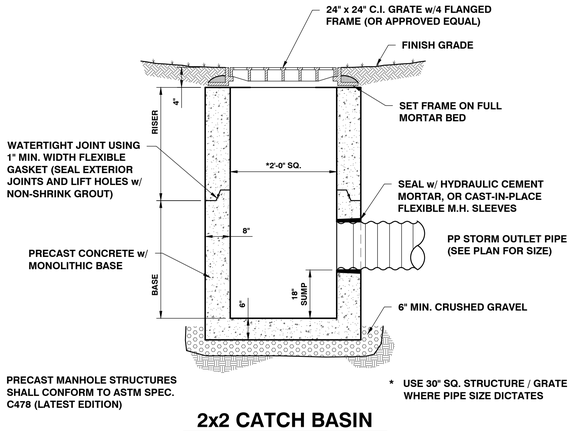
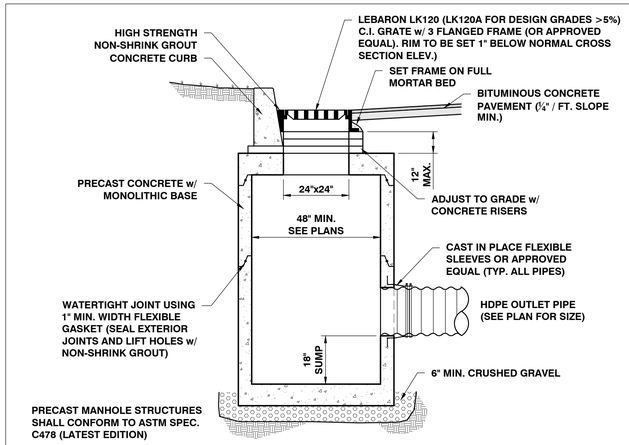



## 2x2 CATCH BASIN

N.T.S.

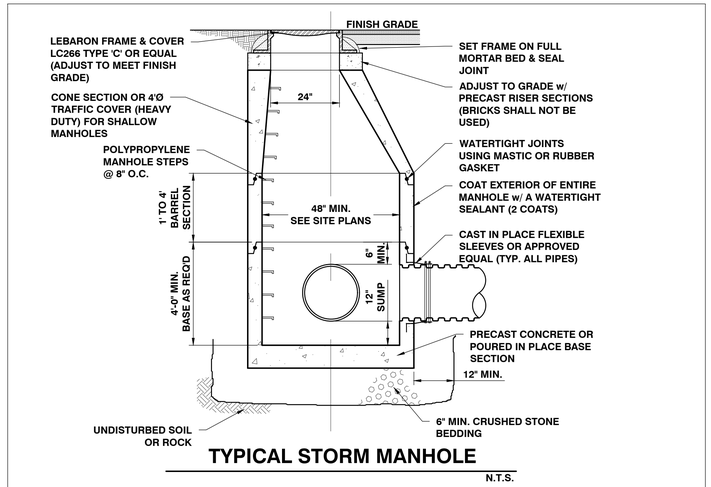
ST-002b REVISED 7/25/2014




## TYPICAL CATCH BASIN @ CURB

(SIMILAR WITHOUT CURB) N.T.S.

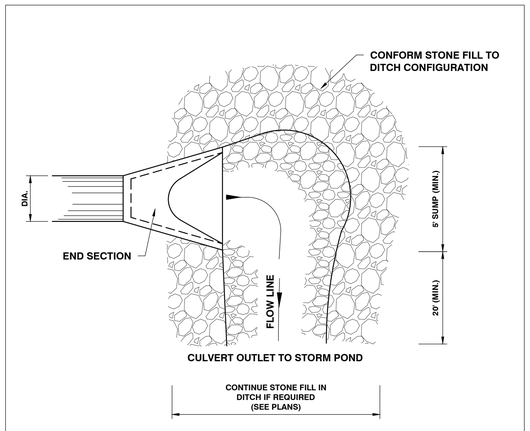
ST-002 REVISED 4/2/2018

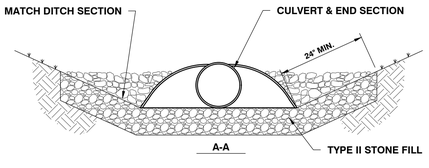


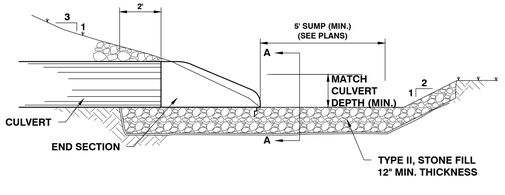

## TYPICAL STORM MANHOLE

N.T.S.

ST-001 REVISED 4/2/2018



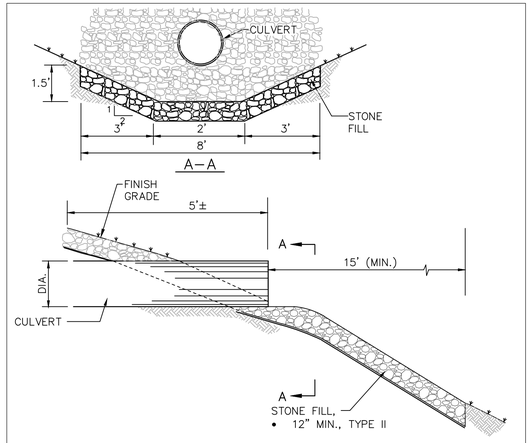




## END SECTION DETAIL w/ STONE FILL @ INLET

N.T.S.

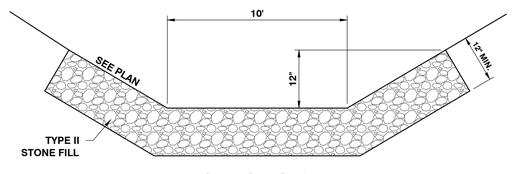
NOTES:
- DRAINAGE PIPES 15"Ø AND SMALLER TO HAVE AN END SECTION & STONE FILL @ THE INLET
- DRAINAGE PIPES LARGER THAN 15"Ø HAVE JUST STONE FILL @ THE INLET

ST-015



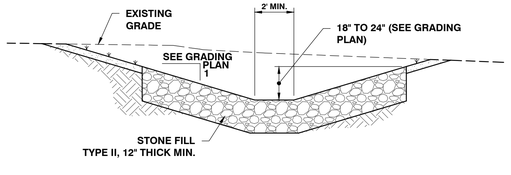

## STONE FILL @ CULVERT OUTLET

ALL DRAINAGE PIPE TO HAVE STONE FILL @ CULVERT OUTLETS N.T.S.



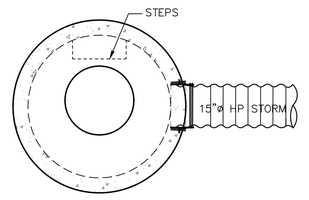

## EMERGENCY SPILLWAY

N.T.S.

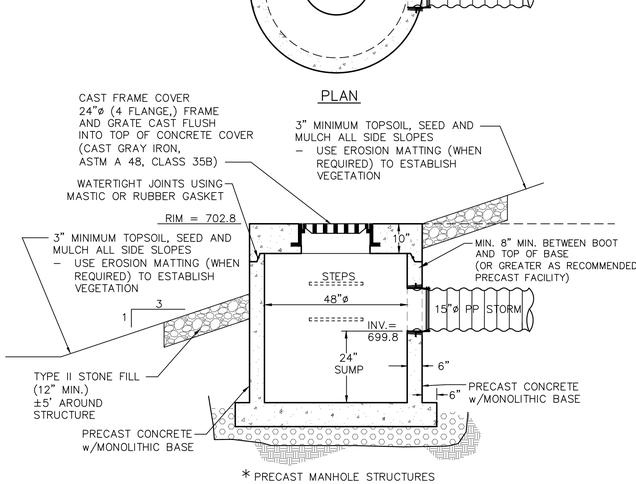



## STONE LINED DITCH

N.T.S.

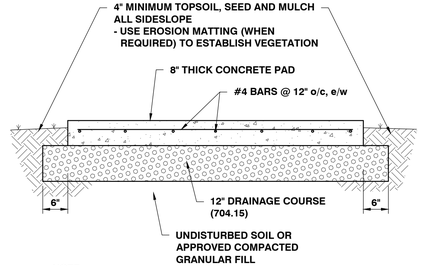



PLAN




## OUTLET STRUCTURE

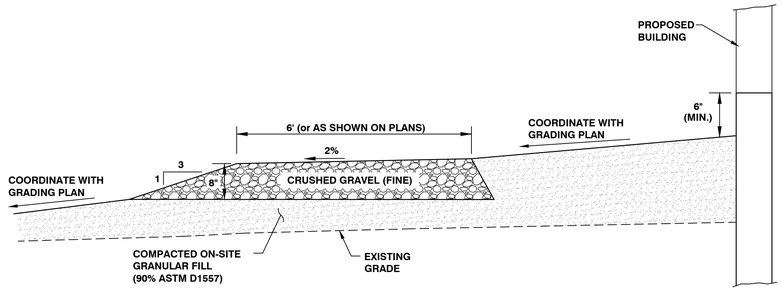
N.T.S.




NOTE:
COORDINATE REQUIRED SIZE AND LOCATIONS WITH MEP PLANS AND SHOP DRAWINGS

## MEP SITE PAD DETAIL

N.T.S.




## TYPICAL PATH SECTION ADJACENT TO BUILDINGS

N.T.S.

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| DATE | CHECKED | REVISION |
|---|---|---|
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*SITE DETAILS*

DATE: 8/23/2018
SCALE: AS SHOWN
PROJ. NO.: 18100.08
DRAWING NUMBER: C2.1

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## 2017 Vermont Stormwater Management Manual Rule and Design Guidance

– Post–Construction Soil Depth and Quality Feasibility

**Required Elements:**

- The Post–Construction Soil Depth and Quality Standard shall apply to all disturbed areas within the limits of the site which are not covered by an impervious surface, incorporated into a structural stormwater treatment practice, or engineered as structural fill once development is complete.
- Undisturbed areas where the duff layer and native topsoil are retained meet the intent of this Standard and shall not be subject to disturbance solely for the purpose of soil amendment.
- This practice shall not be required on soil slopes greater than 33 percent.
- The practice standard of 4 inches shall apply on sites with fill soils that have replaced native soils, and sites where native topsoil was removed, regardless of whether or not existing soils have less than 4 inches of topsoil.

### Post–Construction Soil Depth and Quality Treatment

**Required Elements:**

**Soil retention.** Retain, in an undisturbed state, the duff layer and native topsoil to the maximum extent practicable.

**Soil quality.** All areas subject to the Standard shall demonstrate the following:

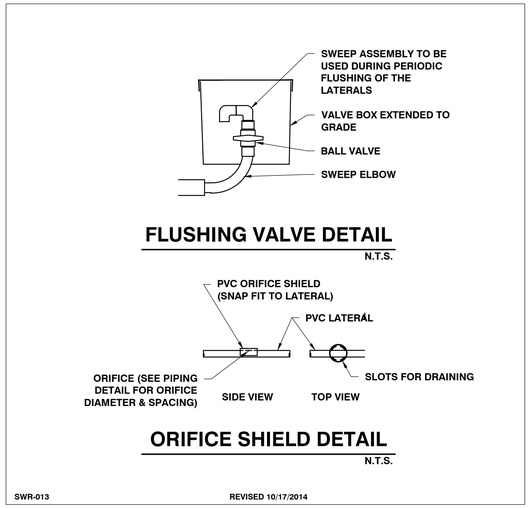
- A topsoil layer with a minimum organic matter content of 4% dry weight in planting beds and turf areas. The topsoil layer shall have a minimum depth of 4 inches, except where tree roots limit the depth of incorporation of amendments needed to meet the criteria or where native mapped soils indicate less than 4 inches of naturally occurring topsoil on an NRCS Official Soil Series Description. In those cases in which native mapped soils indicate less than 4 inches of naturally occurring topsoil, restored top soil depth shall match that indicated on the NRCS Official Soil Series Description.
- Compost and other materials shall be used that meet the following requirements:
  - o The compost or other materials shall have a carbon to nitrogen ratio below 25:1.
  - o Compost shall meet the definition of "compost" in the Agency's Solid Waste Management Rules or shall meet the contaminant standards in the Vermont Solid Waste Management Rules §6–1104(g)(6–7), §6–1105(e)(8–9), and §6–1106(e)(7–9). Compost or other organic materials may be amended to meet the foregoing requirements.
  - o Exceptional Quality biosolids (EQ biosolids) may be used as a soil amendment, at a maximum proportion of 35% of the total soil volume, and shall be well mixed with existing soil before or during application.
- The resulting soil shall be conducive to the type of vegetation to be established.
- The soil quality requirements shall be met by using one or a combination of the following methods:
  - o Option 1: Leave undisturbed native vegetation and soil, and protect from compaction during construction. Identify areas of the site that will not be stripped, logged, graded, or driven on, and fence off those areas to prevent impacts during construction.

    **FAILURE TO ESTABLISH AND MAINTAIN EXCLUSIONARY CONTROLS AROUND THESE AREAS DURING THE CONSTRUCTION PHASE MAY TRIGGER THE REQUIREMENT TO RESTORE SOILS PER ONE OF THE FOLLOWING OPTIONS.**
  - o Option 2: Amend existing site topsoil or subsoil in place.
    - Scarify or till subsoils to 4 inches of depth or to depth needed to achieve a total depth of 8 inches of uncompacted soil after calculated amount of amendment is added. Except for within the drip line of existing trees, the entire surface shall be disturbed by scarification;
    - Amend soil to meet organic content requirements:
    - PRE–APPROVED RATE: Place 1 inch of composted material with an organic matter content between 40 and 65% and rototill into 3 inches of soil, or
    - CALCULATED RATE: Place calculated amount of composted material or approved organic material and rototill into depth of soil needed to achieve 4 inches of settled soil at 4% organic content;
    - Rake beds to smooth and remove surface rocks larger than 2 inches in diameter; and
    - Water or roll to compact soil in turf areas to 85% of maximum dry density.
  - o Option 3: Remove and stockpile existing topsoil during grading.
    - Stockpile soil on site in a designated controlled area, at least 50 feet from surface waters, wetlands, floodplains, or other critical resource areas;
    - Scarify or till subgrade to a depth of 4 inches. Except for within the drip line of existing trees, the entire surface shall be disturbed by scarification;
    - Stockpiled topsoil shall also be amended, if needed, to meet the organic content requirements:
      - PRE–APPROVED RATE: Compost shall be incorporated with an organic matter content between 40 and 65% into the topsoil at a ratio 1:3, or
      - CALCULATED RATE: Incorporate composted material or approved organic material at a calculated rate to achieve 4 inches of settled soil at 4% organic content;
    - Replace stockpiled topsoil prior to planting; and
    - Rake to level, and remove surface rocks larger than 2 inches in diameter.
  - o Option 4: Import topsoil mix, or other materials for mixing, including compost, of sufficient organic content and depth.
    - Scarify or till subgrade to a depth of 4 inches. Except for within the drip line of existing trees, the entire surface shall be disturbed by scarification;
    - Place 4 inches of imported topsoil mix on surface. The imported topsoil mix shall contain 4% organic matter. Soils used in the mix shall be sand or sandy loam as defined by the USDA;
    - Rake beds to smooth and remove surface rocks larger than 2 inches in diameter; and
    - Water or roll to compact soil in turf areas to 85% of maximum dry density.

### Post–Construction Soil Depth and Quality Vegetation and Landscaping

**Required Elements:**

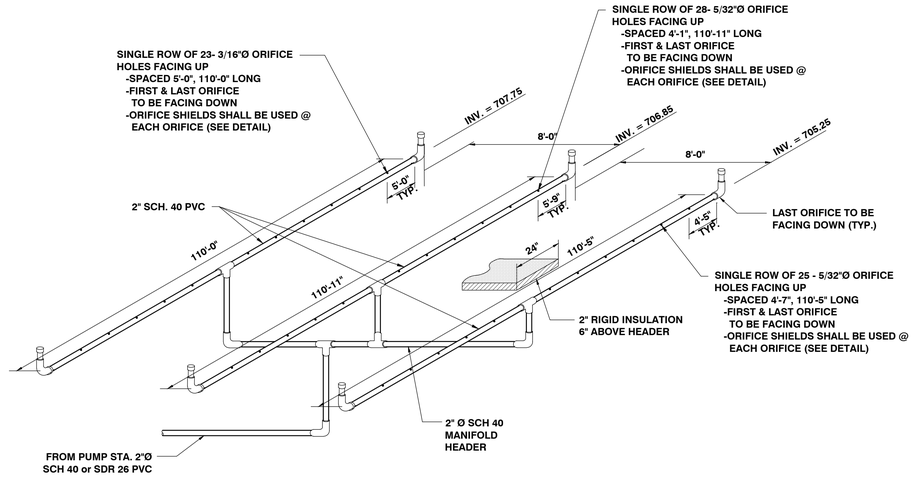
- Soil depth and quality shall be established towards the end of construction and once established, protected from compaction, such as from large machinery, vehicle traffic, and from erosion; and
- Includes instructions for contractor verification of the Standard, including a sampling scheme, for verification by the contractor, that includes nine 8–inch deep test holes per acre of area subject to Standard. Test holes shall be excavated using only a shovel driven solely by inspector's weight and shall be at least 50 feet apart from each other.
- A dense and vigorous vegetative cover shall be established over turf areas.



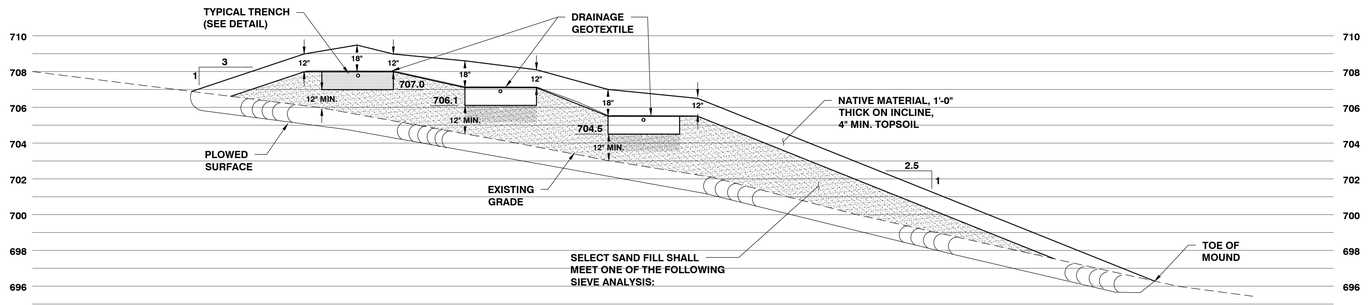

**FLUSHING VALVE DETAIL**
N.T.S.

**ORIFICE SHIELD DETAIL**
N.T.S.

SWR-013 REVISED 10/17/2014




**MOUND PIPING DETAIL**
N.T.S.




| SIEVE # | % PASSING |
|---|---|
| 3/8 | 85–100 |
| 40 | 25–75 |
| 60 | 0–30 |
| 100 | 0–10 |
| 200 | 0–5 |

| SIEVE # | % PASSING |
|---|---|
| 4 | 95–100 |
| 8 | 80–100 |
| 16 | 50–85 |
| 30 | 25–60 |
| 50 | 10–30 |
| 100 | 2–10 |

| SIEVE # | % PASSING |
|---|---|
| 3/8 | 85–100 |
| 40 | 30–50 |
| 200 | 0–10 |

**MOUND SECTION**
1/4" = 1'-0"

### DISPOSAL FIELDS & FORCE MAINS

PART 1 – GENERAL

1.01 Summary

A. Section includes:

1. Wastewater Disposal Field
2. Force Main Materials

1.02 References

A. All work shall be done in accordance with the State of Vermont Environmental Protection Rules effective September 29, 2007.

PART 2 – PRODUCTS

2.01 General

A. Disposal Fields: Schedule 40 PVC pipe meeting the requirements of the latest revision of ASTM Specification D–1785. Fittings used in the disposal fields shall be compatible with distribution lines material.

B. Force Mains: PVC pipe shall conform in all respects to the latest revisions of ASTM Specifications D–2241. All pipe fittings shall be SDR 26 (or SCH 40) clearly marked as follows:

– Manufacturer's Name and Trademark
– Nominal Pipe Size (as shown on plans)
– Material Designation

Joints shall be push–on type using elastomeric gaskets factory installed conforming to ASTM Specification D–3212.

C. Crushed stone shall be clean, durable and no smaller than 3/4" or larger than 1 1/2 inches in diameter.

PART 3 – EXECUTION

3.01 Disposal Field Installation Procedure

A. The wastewater system shall be inspected during critical stages of construction by a qualified consultant. This shall include at a minimum the staking of the disposal field, the trenches after the initial 12 inches of stone and distribution piping is placed, and a final inspection of the entire system. The Contractor will be responsible for contacting the Engineer to set up the inspection schedule.

B. Construction of the system shall not take place when the soil moisture is high in the system area. If the soil at 6 inches below grade can be rolled into the shape of a wire, the soil moisture content is too high for construction to begin.

C. When the trench has been excavated, the sides and bottom shall be raked to scarify any smeared soil surfaces. Construction equipment not needed to construct the system should be kept off the area to be utilized for the absorption trench system to prevent undesirable compaction of the soils.

D. At least 12 inches of washed stone shall be placed in the bottom of the trench.

E. The pressure distribution pipe should be laid level on top of the stone and flushing valves installed at the ends of the pipe. Upon completion of the distribution piping, the qualified consultant shall test the system with clean water. The test shall show that a minimum pressure of three feet of head is present at the ends of the pipe and that the difference in discharge rate between the two orifices with the greatest difference in discharge rates is not greater than 15 percent. After connecting the distribution pipe to the force main, the distribution pipe shall be covered with at least two inches of clean stone aggregate. The stone aggregate shall be covered completely with filter fabric.

F. The distribution pipe shall be covered with at least 3 inches of clean stone aggregate. The stone aggregate shall be covered completely with filter fabric.

G. The filter fabric shall be covered with a minimum of 12 inches of soil but not more than 18 inches, with the upper 4 to 6 inches of soil being loam and the remainder of the fill being of a fine sandy loam to medium sand texture. A vegetated cover free of large brush and trees shall be maintained over the system.

H. The area surrounding the disposal field shall be graded to provide diversion of surface run–off waters if required.

3.02 Testing Report

A. Testing of pressure distribution shall be done in the Engineer's presence. Pressure shall be measured to insure a minimum of 1 psi.

B. The distribution line shall then be carefully placed on the bedding with no slope, orifice shields snapped into place, and covered with at least 2" of crushed stone.

C. All work shall be done in accordance with the State of Vermont Environmental Protection Rules.

D. Force Main

1. General: All force mains shall pass the hydrostatic pressure test and leakage test described herein. Prior to testing, all anchors and braces shall be installed. All concrete thrust blocks and restraints shall be in place and cured at least seven days. All buried pipe shall be backfilled. Suitable test plugs shall be installed and air release valves shall be installed at the high points.
2. Hydrostatic Test: The following procedure shall be used:
   a. All air release valves shall be opened and the pipe shall be filled with water at a rate not to exceed the venting capacity of the air release valves.
   b. The water pressure shall be raised to 150 percent of the designed operating pressure or 60 psi minimum at the highest point.
   c. Failure to hold the designated pressure within 5 psi of the specified test pressure for the two hour period constitutes a failure of the section tested.
3. Leakage Test: The following procedure shall be used:
   a. Leakage shall be defined as the quantity of water that must be supplied into the pipe being tested to maintain pressure within 5 psi of the specified test pressure.
   b. No pipe installation shall be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{ND(P)^{0.5}}{7{,}400} \qquad L = \frac{SD(P)^{0.5}}{133{,}100}$$

Whichever is less

S = Length of Pipe Testing
L = Allowable Leakage in Gal/Hr
D = Nominal Diameter of Pipe (")
P = Average Test Pressure (psi)
N = Number of Joints in the Pipeline Tested

All testing shall be conducted in accordance with AWWA C600–87 or latest revision.

E. Prior to use of the system, the qualified consultant shall submit a written report to the Owner stating that the system has been installed according to the approved plans and permit. The report shall specifically address the inspection of the site preparations and include numerical results of the orifice discharge rate comparison.

SWR - 102


SITE ENGINEER:

CIVIL ENGINEERING ASSOCIATES, INC.
10 MANSFIELD VIEW LANE, SOUTH BURLINGTON, VT 05403
P: 802-864-2323 FAX: 802-864-2271 web: www.cea-vt.com



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CHECKED BCE
APPROVED BCE

OWNER:

VERMONT NATIONAL GUARD

*VERMONT ARMY NATIONAL GUARD*

*CAMP JOHNSON*
*COLCHESTER, VERMONT*

PROJECT:

*CASTLE TRAIL FIELD CLASSROOM*

*CAMP ETHAN ALLEN TRAINING SITE*
*JERICHO, VT*

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/23/18 | BCE | BID DOCUMENTS |

*STORMWATER NOTES, WASTEWATER DETAILS and NOTES*

DATE 8/23/2018
SCALE AS SHOWN
PROJ. NO. 18100.08

DRAWING NUMBER C2.3

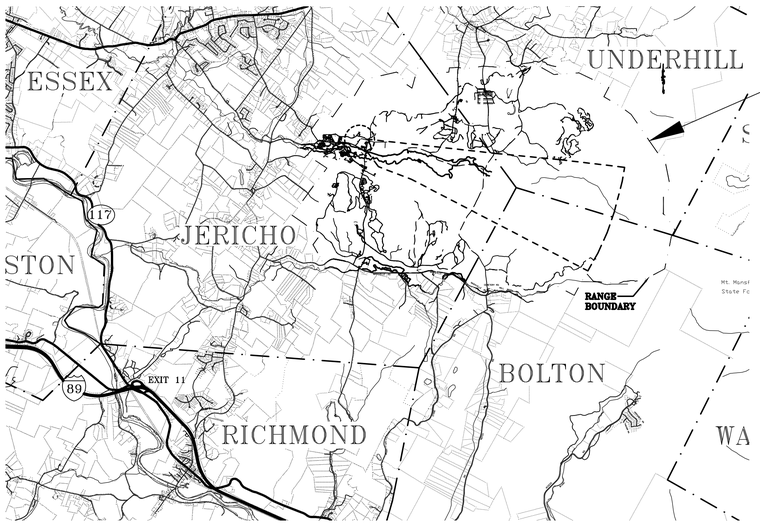
P:\AutoCADD Projects\2018\18100.08\1-CADD Files - Castle Trail Classroom\dwg\18100.08 - Details-Specs.dwg, 8/23/2018 10:41:59 AM, pmead

# STATE OF VERMONT

## VTARNG - Entry Improvements
## Camp Ethan Allen Training Site

STATE OF VERMONT MILITARY DEPARTMENT
BUILDING #5, CAMP JOHNSON
789 VERMONT NATIONAL GUARD RD
COLCHESTER, VT 05448-3099

AUGUST 2017




CAMP ETHAN ALLEN TRAINING SITE
SCALE: 1" = 6000'

PROJECT LOCATION:
Camp Ethan Allen Training Site - Jericho, VT


INDEX OF SHEETS

GENERAL NOTES:

1. Underground utilities shown hereon are based on utility evidence visible at ground surface and are subject to field verification by excavation. Utilities shown do not purport to constitute or represent all utilities located upon or adjacent to the surveyed premises. All discrepancies shall be reported to the Engineer. The Contractor shall contact Dig Safe (888-344-7233) prior to any construction. In addition, the Contractor shall hire a private utility locating firm to locate Owner owned underground utilities prior to start of any excavation.
2. The Contractor shall be responsible for conforming to all OSHA (State/Federal) regulations including trenching and confined space requirements.
3. The Contractor shall submit shop drawings for all items and materials incorporated into the site work. Work shall not begin on any item until shop drawing approval is granted.
4. All existing utilities not incorporated into the final design shall be removed or abandoned as indicated on the plans or directed by the Engineer.
5. The Contractor shall be maintain as-built plans (with ties) for all underground utilities. Those plans shall be submitted to the Owner at the completion of the project.
6. The Contractor shall repair/restore all disturbed areas (on or off the site) as a direct or indirect result of the construction.
7. All grassed areas shall be maintained until full vegetation is established.
8. Maintain all trees outside the construction limits.
9. The Contractor shall be responsible for all work necessary for complete and operable facilities and utilities.
10. In addition to the requirements set in these plans and specifications, the Contractor shall complete the work in accordance with all permit conditions.
11. The tolerance for finish grades for all gravel surfaces shall be 0.1 feet.
12. Any dewatering necessary for the completion of the sitework shall be considered as part of the contract and shall be the Contractor's responsibility.
13. Existing pavement to be removed shall be disposed of at an approved off-site location. Existing excavated material to be removed shall be disposed of at a designated on-site location. Contractor is responsible for stockpiling excavated material from trucks at the designated waste area.
14. If there are any conflicts or inconsistencies with the plans or specifications, the Contractor shall contact the Engineer for verification before work continues on the item in question.
15. Horizontal and vertical datum based on VCS NAD 83 and NAVD 88 respectively and are calculated based upon GPS observations performed on site during the time of survey.
16. Existing stone walls and foundations shall not be disturbed except as shown on the plans.
17. All construction personnel will be required to attend an orientation and ordnance identification session that the EOD unit will provide, prior to entering the project site. Subsequent new field employees are also required to attend the safety course. The ordnance session will cover identification of various ordnance with may be encountered and procedures for notification of EOD personnel.
18. The Contractor is responsible for obtaining testing and inspection services indicated in the Contract documents, typical for concrete and soil testing.
19. The Contractor is responsible for all layout and Field Engineering required for completion of the project. Civil Engineering Associates will provide an AutoCAD file where applicable.
20. Prior to starting work the Contractor shall provide background checks on all crew foremen including sub-contractors and the job superintendent.
21. Existing roads: Maintain existing roads areas adequate for construction operations. At a minimum, all existing roads shall be maintained/repaired to the preconstruction condition.
    - recondition base after use, including removing contaminated material, adding subbase material, regrading, proofrolling and compacting.

PAVING NOTES:

1. The pavement wearing course shall be type III or type IV as shown on details. All asphalt used in the bituminous concrete paving shall be PG 58-28 (or VTrans approved mix) unless otherwise noted.
2. Emulsified asphalt shall be applied on existing pavement surfaces, between all courses of pavement, and on cold planed surfaces.
3. Bituminous concrete pavement tolerance = ±1/4 inches.
4. Cold planing to be completed according to the typical or as noted otherwise on the plans. A full depth butt joint shall be constructed where shown on plans.
5. All edges of pavement shall be backed up full height with cold plane grindings or aggregate shoulder material.
6. Grass growing adjacent to pavement, or through cracks in the pavement, which may hamper the placement of new bituminous concrete, shall be removed by the Contractor.
7. Existing pavement/concrete to be removed shall be recycled at an approved facility.
8. All pavement cuts shall be made with a pavement saw.

F□□□ □□T□:

T□□□□ A□□ □□ □□□□□□ A□□AS □D□□T□F□□D □□ T□□ P□A□S F□□ T□□S P□□□ □□CT. A□□ S□□□MAT□□□A□S □□□ □□□□D F□□ T□□S P□□□□CT A□□ T□ □□ □□TA□□□D □FFS□T□ □□□, □□CA□AT□D MAT□□□A□S MA□ □□ □S□D F□□ □AC□F□□□□F □T M□□TS T□□ SP□C□F□CAT□□ □S F□□ □AC□F□□□□.

C□□A□□□□ □□T□S:

1. A□□ C□□A□□□□ F□□ T□□□S □□□AT□□ T□A□ 3" □□ D□AM□T□□ □□□D T□ TA□□ P□AC□ □□T□ □□□ □CT□□□□ 15t□A□D AP□□□ 15t□.
2. F□□□□ □□D □□TA□□□D F□□M T□□ C□□A□□□□ □□ T□□S P□□□□CT S□A□□ □□ D□SP□S□D □F AT A□ □FF-S□T□ □□CAT□□□
3. □□ST□□□ ST□MPS T□ □□ □□M□□□D S□A□□ □□ D□SP□S□D □F AT T□□ □□CAT□□□ □□D□CAT□D □□ T□□ P□A□S □□ A□ □□-S□T□ □□CAT□□□ □□D□□T□F□□D AT T□□ P□□-□D M□□T□□□.
4. T□□□S/□M□S/□□□S□ S□A□□ □□ C□PP□D □AFT□□ F□□□□ □□D □□M□□□D□A□D D□SP□S□D □F AT A□ □FF-S□T□ □□CAT□□□.

□□CAT□□□ P□A□

1" □ 150□

GRAPHIC SCALE

150 0 75 150 300 600

( IN FEET )
1 inch = 150 ft.

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OWNER:

VERMONT NATIONAL GUARD

VERMONT ARMY NATIONAL GUARD

CAMP JOHNSON
COLCHESTER, VERMONT

PROJECT:

CAMP ETHAN ALLEN TRAINING SITE

ENTRY IMPROVEMENTS

CAMP ETHAN ALLEN
TRAINING SITE
UNDERHILL, VT

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/30/2017 | BCE | BID DOCUMENTS |

LOCATION PLAN

DATE: 8/30/2017
SCALE: 1" = 150'
PROJ. NO.: 17100.05

DRAWING NUMBER: L-1

P:\AutoCADD Projects\2017\17100.05\1-CADD Files - C:\ATS Guard Housel\Dwg\17100.05 - Cover.dwg, 8/28/2017 12:12:20 PM, pmead

EXISTING 18" HDPE INV.=652.8
EXISTING GUARD RAIL
EXISTING 18" HDPE INV.=652.6
EXISTING WATER METER PIT
PROJECT BENCHMARK RAIL ROAD SPIKE IN POLE ELEV.=655.1
EX. SIGN
EXISTING GRAVEL
EX. GUARD RAIL
EX. VALVE
EX. 6" ? C900 PVC WATER
EXISTING 18" HDPE INV.=652.3
EX. VALVE(S)
EX. EDGE OF PAVEMENT
EXISTING 18" HDPE INV.=651.9
EXISTING STONE LINED SWALE
(2) GUY WIRE (TYP.)
EXISTING CONCRETE CURBED ISLAND
- INBOUND & OUTBOUND DROP ARM GATE
- CAMERA/INTERCOM
- HIGH/LOW SWIPE
POLE MOUNTED REAR PLATE CAMERA
EXISTING DUAL HEAD POLE MOUNTED LIGHT FIXTURE
(2) EX. UTILITY VAULTS
- 2'x3'x3' DEEP
- TYP. (4) LOCATIONS
4" COND.
4" C900 PVC WATER
EXISTING EDGE OF PAVEMENT
LEE RIVER ROAD
EX. 4" WHITE DASHED LINE
EX. WHITE "CONVOY LANE" MARKINGS
EX. 4" WHITE LINE
36" HDPE
EX. FIRE DANGER SIGN TO REMAIN
EX. UTILITY VAULTS
POLE MOUNTED REAR PLATE CAMERA
EXISTING PINE TREE TO BE REMOVED (TYP. AS SHOWN)
EX. 1" COPPER SERVICE
EX. BURIED PROPANE TANK
APPROX. LOCATION EX. SEPTIC TANK
STORAGE BUILDING
DRILL HALL
SERVICE LANE
CONVOY STAGING
DELIVERY VEHICLES
VAULT
WARNING
GOVERNMENT INSTALLATION
ALL VEHICLES & PERSONS ARE SUBJECT TO SEARCH
CAMERAS IN USE
SPEED LIMIT 25
RANGE CONTROL FREQUENCY 4□.925
1/2 M□□ T□ F□□S□
"□" T□□□ F□□ □□□□CT□□□ □A□□
D□ □□T P□□□C□□D □□T□□ □□□□C□□ □□ F□□□T □F □□□ □AS C□□A□□D
ALL EXISTING SIGNS & POSTS TO BE REMOVED/RETAINED PER THE FOLLOWING:
R=REMOVE
R&S=REMOVE & SALVAGE
RET=RETAIN
(RETURN ALL REMOVED SIGNS TO OWNER)

GRAPHIC SCALE
20 0 10 20 40 80
( IN FEET )
1 inch = 20 ft.


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OWNER:
VERMONT NATIONAL GUARD

# VERMONT ARMY NATIONAL GUARD

CAMP JOHNSON
COLCHESTER, VERMONT

PROJECT:

# CAMP ETHAN ALLEN TRAINING SITE

## ENTRY IMPROVEMENTS

CAMP ETHAN ALLEN
TRAINING SITE
UNDERHILL, VT

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/30/2017 | BCE | BID DOCUMENTS |

## EXISTING CONDITIONS PLAN

DATE: 8/28/2017
SCALE: 1" = 20'
PROJ. NO.: 17100.05
DRAWING NUMBER: C1.0

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DRY SWALE OUTLET
- SEE TIMBER WEIR DETAIL

DRY SWALE
- 3' WIDE x 1.5' DEEP
- 2:1 SIDE SLOPES

FOREBAY
- 5' WIDE, 12' LONG x 2' DEEP
- SEE TIMBER WEIR DETAIL

EXISTING STONE LINED SWALE

EXISTING 18" HDPE INV.=652.8

EXISTING GUARD RAIL

EXISTING 18" HDPE INV.=652.6

EXISTING WATER METER PIT

PROJECT BENCHMARK
RAIL ROAD SPIKE IN POLE
ELEV.=655.1

EXISTING GRAVEL

EX. GUARD RAIL

EXISTING CONCRETE CURBED ISLAND
- INBOUND & OUTBOUND
- DROP ARM GATE
- CAMERA/INTERCOM
- HIGH/LOW SWIPE

(2) GUY WIRE (TYP.)

ALTERNATE #1
- ALL WORK ON THE NORTH SIDE OF LEE RIVER ROAD (ie. THE REJECTION LANE)

REMOVE EXISTING GUARD RAIL

POLE MOUNTED REAR PLATE CAMERA

(2) EX. UTILITY VAULTS
- 2'x3'x3' DEEP
- TYP. (4) LOCATIONS

REPLACE EXISTING PAVEMENT

REMOVE EXISTING GUARD RAIL

REPLACE EXISTING PAVEMENT

MAINTAIN EXISTING PAVEMENT

EX. VALVE

EX. 6" ? C900 PVC WATER

EXISTING 18" HDPE INV.=652.3

EX. VALVE(S)

EX. EDGE OF PAVEMENT

BOLLARDS

EXISTING DUAL HEAD POLE MOUNTED LIGHT FIXTURE

4' WIDE CONCRETE SIDEWALK SURROUNDING BUILDING w/12" CONCRETE CURBING

GUARD VEHICLE PARKING

4" C900 PVC WATER

EXISTING 18" HDPE INV.=651.9

EXISTING EDGE OF PAVEMENT

LEE RIVER ROAD

EX. 4" WHITE DASHED LINE

36" HDPE

EX. WHITE "CONVOY LANE" MARKINGS

EX. 4" WHITE LINE

RAISE EX. CLEAN OUT TO NEW FINISH GRADE

VEHICLE INSPECTION PULL-OFF

REMOVE & RESET EXISTING GUARD RAIL

NEW EDGE OF PAVEMENT

SIMPLE DISCONNECTION AREA

REMOVE & RESET EX. PRE-CAST CAMERA POLE BASE
- 24'0 x 7' LONG, SET ±6" REVEAL
- PLACE ON 12" THICK BASE OF ¾" CRUSHED STONE

POLE MOUNTED REAR PLATE CAMERA

EX. UTILITY VAULTS

NEW 8'x14' PRE-FABRICATED BOOTH ON CONCRETE FOUNDATION

EXISTING PINE TREE TO BE REMOVED (TYP. AS SHOWN)

NEW UTILITY VAULT LOCATION

NEW ¾" WATER SERVICE

NEW 4" SDR 35 PVC SEWER SERVICE TO EXISTING SEPTIC TANK

EX. BURIED PROPANE TANK

APPROX. LOCATION EX. SEPTIC TANK

EX. 1" COPPER SERVICE

VAULT

STORAGE BUILDING

DRILL HALL

LOOP DETECTOR NOTE:
EXISTING LOOP DETECTORS WILL NOT BE REPLACED AT THIS TIME

UTILITY VAULT NOTE:
- REMOVE (2) EX. EASTERLY UTILITY VAULTS AND REPLACE
- RELOCATE (2) EX. WESTERLY UTILITY VAULTS
- EXTEND CONDUIT TO NEW VAULT LOCATIONS
- COORDINATE WITH ELECTRICAL SITE PLAN

SERVICES NOTE:
EXISTING WATER, SANITARY SEWER, ELECTRIC, AND COMMUNICATIONS SERVICES TO BE EXTENDED TO NEW GUARD HOUSE
- FINAL SERVICE LOCATIONS WILL NEED TO BE COORDINATED WITH PRE-FABRICATED BOOTH PLANS

GRAPHIC SCALE
20 0 10 20 40 80
( IN FEET )
1 inch = 20 ft.


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CAMP JOHNSON
COLCHESTER, VERMONT

PROJECT:

CAMP ETHAN ALLEN TRAINING SITE

ENTRY IMPROVEMENTS

CAMP ETHAN ALLEN
TRAINING SITE
UNDERHILL, VT

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/30/2017 | BCE | BID DOCUMENTS |

PROPOSED CONDITIONS PLAN

DATE: 8/28/2017
SCALE: 1" = 20'
PROJ. NO.: 17100.05

DRAWING NUMBER: C1.1

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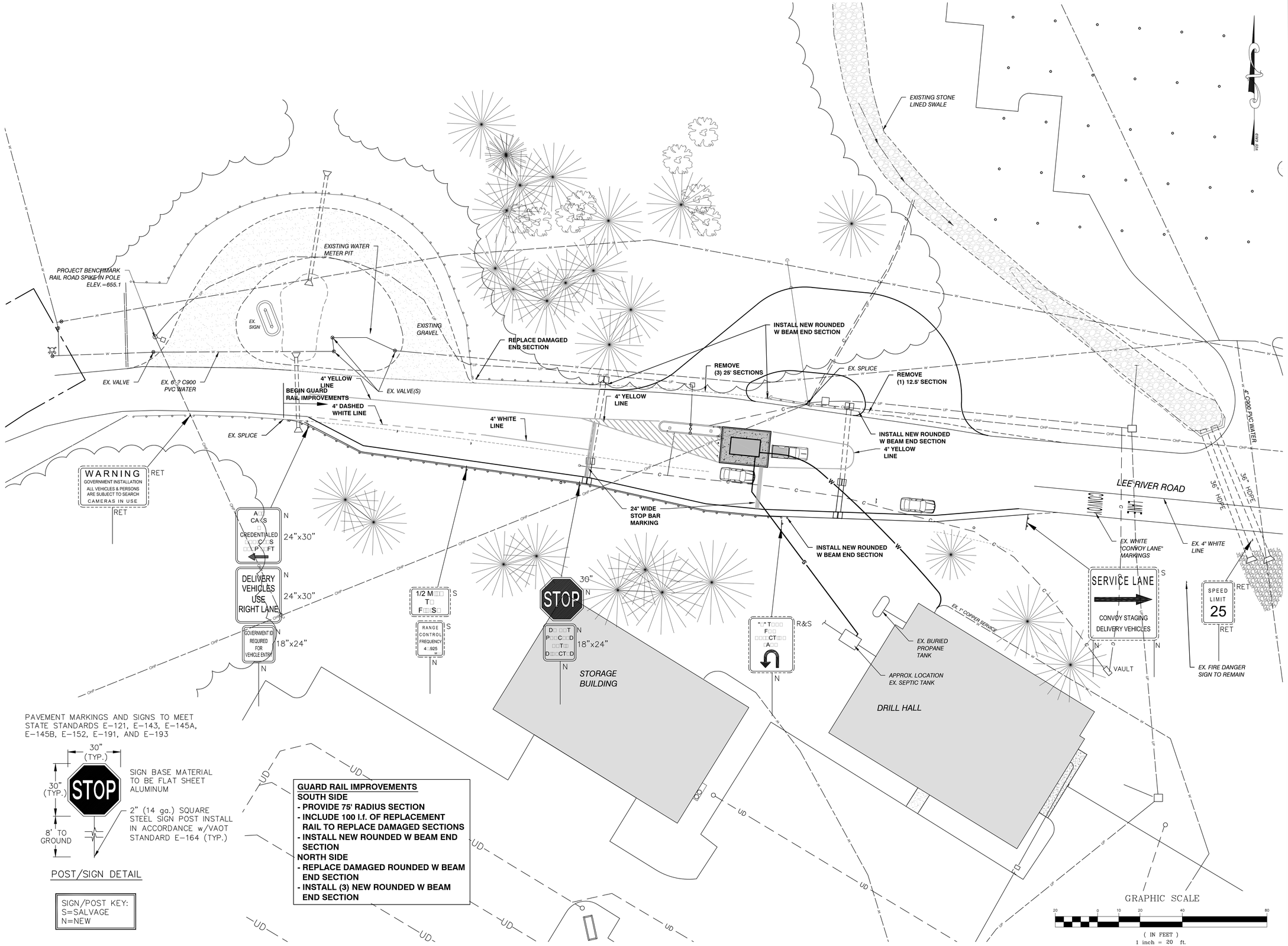


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OWNER:

VERMONT NATIONAL GUARD

VERMONT ARMY NATIONAL GUARD

CAMP JOHNSON
COLCHESTER, VERMONT

PROJECT:

# CAMP ETHAN ALLEN TRAINING SITE

## ENTRY IMPROVEMENTS

CAMP ETHAN ALLEN TRAINING SITE
UNDERHILL, VT

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/30/2017 | BCE | BID DOCUMENTS |

## PROPOSED SIGN, STRIPING, and GUARD RAIL IMPROVEMENTS PLAN

DATE: 8/28/2017
SCALE: 1" = 20'
PROJ. NO.: 17100.05

DRAWING NUMBER: C1.2

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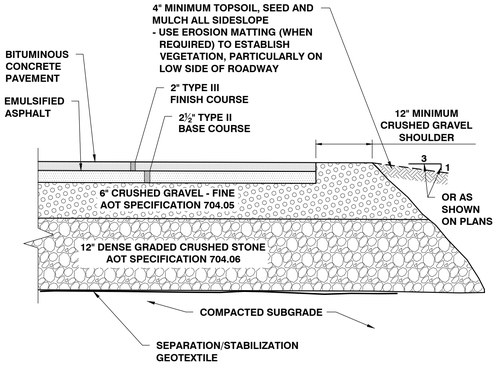
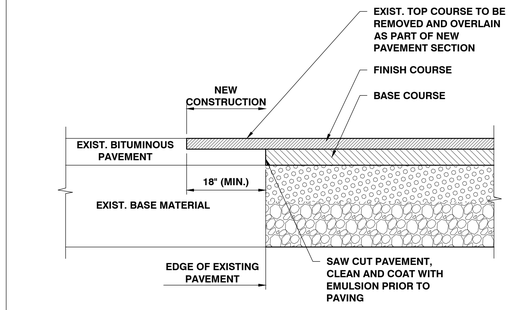



## TYPICAL PAVEMENT SECTION

(FULL DEPTH CONSTRUCTION SECTION) N.T.S.

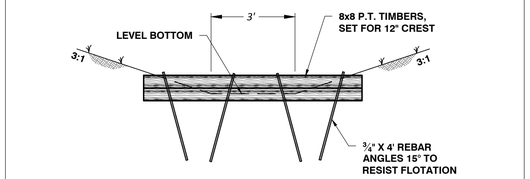
S-003 REVISED 11/10/2014




## TRANSITION FROM NEW PAVEMENT TO EXISTING PAVEMENT

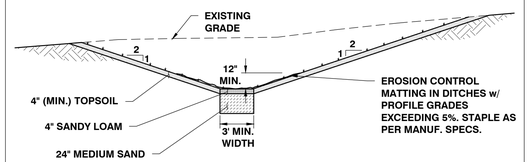
N.T.S.

S-014 REVISED 6/15/2017



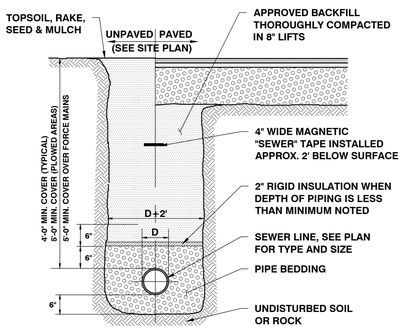

## TIMBER WEIR DETAIL

N.T.S.




## DRY SWALE

N.T.S.



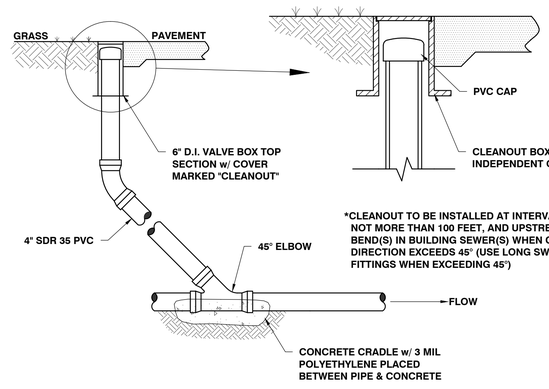

NOTES:

1. COMPACTION OF BACKFILL AND BEDDING SHALL BE A MINIMUM OF 90% (95% UNDER ROADWAY SURFACES) OF MAXIMUM DRY DENSITY DETERMINED IN THE STANDARD PROCTOR TEST (ASTM D698).
2. BEDDING MATERIAL SHALL NOT BE PLACED ON FROZEN SUBGRADE.
3. APPROVED BACKFILL SHALL NOT CONTAIN ANY STONES MORE THAN 12" IN LARGEST DIMENSION (6" IN ROADWAYS, 1 1/2"" MAXIMUM DIAMETER WITHIN 24" OF THE OUTSIDE OF THE PIPE), OR CONTAIN ANY FROZEN, WET, OR ORGANIC MATERIAL.
4. TRENCHES SHALL BE COMPLETELY DEWATERED PRIOR TO PLACING OF PIPE BEDDING MATERIAL AND KEPT DEWATERED DURING INSTALLATION OF PIPE AND BACKFILL.
5. IN TRENCHES WITH UNSTABLE MATERIALS OR HIGH WATER TABLE, TRENCH BOTTOM SHALL FIRST BE STABILIZED BY PLACEMENT OF FILTER FABRIC THEN CRUSHED STONE (3/4" MAXIMUM).
6. THE SIDES OF TRENCHES 4' OR MORE IN DEPTH ENTERED BY PERSONNEL SHALL BE SHEETED OR SLOPED TO THE ANGLE OF REPOSE AS DEFINED BY O.S.H.A. STANDARDS.
7. BEDDING MATERIAL FOR WASTEWATER LINES SHALL CONSIST OF CRUSHED STONE, GRAVEL, OR SAND WITH A MAXIMUM SIZE OF ¾". SUBMIT A SAMPLE TO THE ENGINEER FOR APPROVAL.
8. ALL JOINTS TO BE INSPECTED BY OWNER/ENGINEER/TOWN PRIOR TO BACKFILL.

## TYPICAL SEWER TRENCH DETAIL

N.T.S.

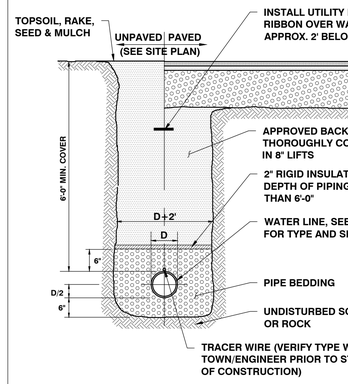
SWR-001 REVISED 12/08/2016




## TYPICAL CLEANOUT DETAIL

N.T.S.

SWR-007B REVISED 8/28/2017




NOTES:

1. COMPACTION OF BACKFILL AND BEDDING SHALL BE A MINIMUM OF 90% (95% UNDER ROADWAY SURFACES) OF MAXIMUM DRY DENSITY DETERMINED IN THE STANDARD PROCTOR TEST (ASTM D698).
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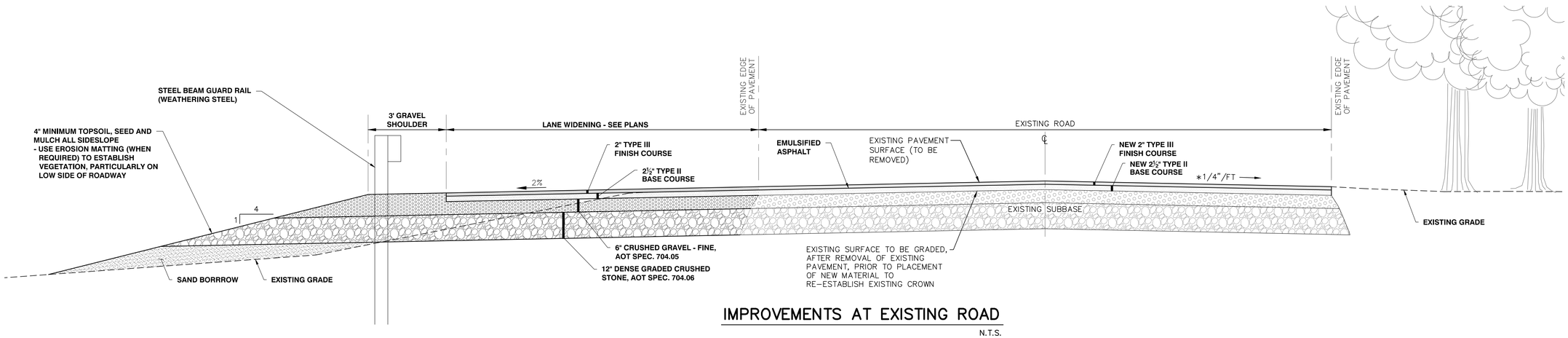
6. THE SIDES OF TRENCHES 4' OR MORE IN DEPTH ENTERED BY PERSONNEL SHALL BE SHEETED OR SLOPED TO THE ANGLE OF REPOSE AS DEFINED BY O.S.H.A. STANDARDS.
7. BEDDING MATERIAL SHALL CONSIST OF CRUSHED STONE, OR SAND WITH A MAXIMUM SIZE OF ¾". SUBMIT A SAMPLE TO THE ENGINEER FOR APPROVAL.
8. CONTRACTOR TO INSTALL TRACER WIRE ALONG ALL SECTIONS OF NEW WATER LINE. TERMINATE TRACER WIRE AT ALL VALVE BOXES AND HYDRANTS. COORDINATE INSTALLATION WITH TOWN AND ENGINEER.

## TYPICAL WATER TRENCH DETAIL

N.T.S.

W-001 REVISED 12/08/2016




## IMPROVEMENTS AT EXISTING ROAD

N.T.S.

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CIVIL ENGINEERING ASSOCIATES, INC.
10 MANSFIELD VIEW LANE, SOUTH BURLINGTON, VT 05403
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OWNER:

VERMONT NATIONAL GUARD

VERMONT ARMY NATIONAL GUARD

CAMP JOHNSON
COLCHESTER, VERMONT

PROJECT:

CAMP ETHAN ALLEN TRAINING SITE

ENTRY IMPROVEMENTS

CAMP ETHAN ALLEN TRAINING SITE
UNDERHILL, VT

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/30/2017 | BCE | BID DOCUMENTS |

SITE DETAILS

DATE 8/30/2017
SCALE AS SHOWN
PROJ. NO. 17100.05

DRAWING NUMBER C2.0

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**Introduction**

This project is subject to the terms and conditions of the authorization from the State of Vermont to discharge construction related storm water runoff.

Coverage under the State Construction General Permit 3-9020 is required for any construction activity that disturbs 1 or more acres of land, or is part of a larger development plan that will disturb 1 or more acres.

This project has been deemed to qualify as a Low Risk Site which is subject to the erosion prevention and sediment control (EPSC) standards set for in the State of Vermont's
**Low Risk Site Handbook for Erosion Prevention and Sediment Control**

The following narrative and implementation requirements represent the minimum standard for which this site is required to be maintained as regulated by the State of Vermont.

Any best management practices (BMP's) depicted on the project's EPSC Site plan which go beyond the Handbook requirements are considered to be integral to the management of the site and represent components of the municipal EPSC approval for the project which shall be implemented.

The EPSC plan depicts one snap shot in time of the site. All construction sites are fluid in their day to day exposures and risks as it relates to minimizing sediment loss from the site. **It is the responsibility of the Contractor to implement the necessary BMP's to comply with the Low Risk Handbook standards outlined on this sheet based on the interim site disturbance conditions which may or may not be shown on the EPSC Site Plan.**

Specific BMP's which are critical to allowing the project to be considered a Low risk site include the items checked below:

- Limit the amount of disturbed earth to two acres or less at any one time.
- There shall be a maximum of 7 consecutive days of disturbed earth exposure in any location before temporary or final stabilization is implemented.

1. Mark Site Boundaries

**Purpose:**
Mark the site boundaries to identify the limits of construction. Delineating your site will help to limit the area of disturbance, preserve existing vegetation and limit erosion potential on the site.

**How to comply:**
Before beginning construction, walk the site boundaries and flag trees, post signs, or install orange safety fence. Fence is required on any boundary within 50 feet of a stream, lake, pond or wetland, unless the area is already developed (existing roads, buildings, etc.)

2. Limit Disturbance Area

**Purpose:**
Limit the amount of soil exposed at one time to reduce the potential erosion on site.

**Requirements:**
The permitted disturbance area is specified on the site's written authorization to discharge. Only the acreage listed on the authorization form may be exposed at any given time.

**How to comply:**
Plan ahead and phase the construction activities to ensure that no more than the permitted acreage is disturbed at one time. Be sure to properly stabilize exposed soil with seed and mulch or erosion control matting before beginning work in a new section of the site.

3. Stabilize Construction Entrance

**Purpose:**
A stabilized construction entrance helps remove mud from vehicle wheels to prevent tracking onto streets.

**Requirements:**
If there will be any vehicle traffic off of the construction site, you must install a stabilized construction entrance before construction begins.

**How to install**
**Rock Size:** Use a mix of 1 to 4 inch stone
**Depth:** 8 inches minimum
**Width:** 12 feet minimum
**Length:** 40 feet minimum (or length of driveway, if shorter)
**Geotextile:** Place filter cloth under entire gravel bed

**Maintenance:**
Redress with clean stone as required to keep sediment from tracking onto the street.

4. Install Silt Fence

**Purpose:**
Silt fences intercept runoff and allow suspended sediment to settle out.

**Requirements:**
Silt fence must be installed:
- on the downhill side of the construction activities
- between any ditch, swale, storm sewer inlet, or waters of the State and the disturbed soil

** Hay bales must not be used as sediment barriers due to their tendency to degrade and fall apart.*

**Where to place:**
- Place silt fence on the downhill edge of bare soil. At the bottom of slopes, place fence 10 feet downhill from the end of the slope (if space is available).
- Ensure the silt fence catches all runoff from bare soil.
- Maximum drainage area is ¼ acre for 100 feet of silt fence.
- Install silt fence across the slope (not up and down hills!)
- Install multiple rows of silt fence on long hills to break up flow.
- Do not install silt fence across ditches, channels, or streams or in stream buffers.

**How to install silt fence:**
- Dig a trench 6 inches deep across the slope
- Unroll silt fence along the trench
- Ensure stakes are on the downhill side of the fence
- Join fencing by rolling the end stakes together
- Drive stakes in against downhill side of trench
- Drive stakes until 16 inches of fabric is in trench
- Push fabric into trench; spread along bottom
- Fill trench with soil and pack down

**Maintenance:**
- Remove accumulated sediment before it is halfway up the fence.
- Ensure that silt fence is trenched in ground and there are no gaps.

5. Divert Upland Runoff

**Purpose:**
Diversion berms intercept runoff from above the construction site and direct it around the disturbed area. This prevents clean water from becoming muddied with soil from the construction site.

**Requirements:**
If storm water runs onto your site from upslope areas and your site meets the following two conditions, you must install a diversion berm before disturbing any soil.
1. You plan to have one or more acres of soil exposed at any one time (excluding roads).
2. Average slope of the disturbed area is 20% or steeper.

**How to install:**
1. Compact the berm with a shovel or earth-moving equipment.
2. Seed and mulch berm or cover with erosion control matting immediately after installation.
3. Stabilize the flow channel with seed and straw mulch or erosion control matting. Line the channel with 4 inch stone if the channel slope is greater than 20%.
4. Ensure the berm drains to an outlet stabilized with riprap. Ensure that there is no erosion at the outlet.
5. The diversion berm shall remain in place until the disturbed areas are completely stabilized.

6. Slow Down Channelized Runoff

**Purpose:**
Stone check dams reduce erosion in drainage channels by slowing down the storm water flow.

**Requirements:**
If there is a concentrated flow (e.g. in a ditch or channel) of storm water on your site, then you must install stone check dams. Hay bales must not be used as check dams.

**How to install:**
**Height:** No greater than 2 feet. Center of dam should be 9 inches lower than the side elevation
**Side slopes:** 2:1 or flatter
**Stone size:** Use a mixture of 2 to 9 inch stone
**Width:** Dams should span the width of the channel and extend up the sides of the banks
**Spacing:** Space the dams so that the bottom (toe) of the upstream dam is at the elevation of the top (crest) of the downstream dam. This spacing is equal to the height of the check dam divided by the channel slope.
Spacing (in feet) = Height of check dam (in feet)/Slope in channel (ft/ft)

**Maintenance:**
Remove sediment accumulated behind the dam as needed to allow channel to drain through the stone check dam and prevent large flows from carrying sediment over the dam. If significant erosion occurs between check dams, a liner of stone should be installed.

7. Construct Permanent Controls

**Purpose:**
Permanent storm water treatment practices are constructed to maintain water quality, ensure groundwater flows, and prevent downstream flooding. Practices include detention ponds and wetlands, infiltration basins, and storm water filters.

**Requirements:**
If the total impervious* area on your site, or within the common plan of development, will be 1 or more acres, you must apply for a State Storm water Discharge Permit and construct permanent storm water treatment practices on your site. These practices must be installed before the construction of any impervious surfaces.

**How to comply:**
Contact the Vermont Storm water Program and follow the requirements in the Vermont Storm water Management Manual. The Storm water Management Manual is available at:
www.vtwaterquality.org/stormwater.htm
*An impervious surface is a manmade surface, including, but not limited to, paved and unpaved roads, parking areas, roofs, driveways, and walkways, from which precipitation runs off rather than infiltrates.

8. Stabilize Exposed Soil

**Purpose:**
Seeding and mulching, applying erosion control matting, and hydroseeding are all methods to stabilize exposed soil. Mulches and matting protect the soil surface while grass is establishing.

**Requirements:**
All areas of disturbance must have temporary or permanent stabilization within 7, 14, or 21 days of initial disturbance, as stated in the project authorization. After this time, any disturbance in the area must be stabilized at the end of each work day.

The following exceptions apply:

- Stabilization is not required if earthwork is to continue in the area within the next 24 hours and there is no precipitation forecast for the next 24 hours.
- Stabilization is not required if the work is occurring in a self-contained excavation (i.e. no outlet) with a depth of 2 feet or greater (e.g. house foundation excavation, utility trenches).

All areas of disturbance must have permanent stabilization within 48 hours of reaching final grade.

**How to comply:**
Prepare bare soil for seeding by grading the top 3 to 6 inches of soil and removing any large rocks or debris.

Seeding Rates for Temporary Stabilization
April 15 - Sept. 15 --- Ryegrass (annual or perennial: 20 lbs/acre)
Sept. 15 - April 15 --- Winter rye: 120 lbs/acre

Seeding Rates for Final Stabilization:Choose

| Seeding Rates for Final Stabilization: | | | |
|---|---|---|---|
| Choose from: | Variety | lbs./acre | lbs./1000 sq.ft. |
| Birds foot trefoil | Empire/Pardee | 51 | 0.1 |
| or | | | |
| Common white clover | Common | 8 | 0.2 |
| plus | | | |
| Tall Fescue | KY-31/Rebel | 10 | 0.25 |
| plus | | | |
| Redtop | Common | 2 | |
| or | | | |
| Ryegrass (perennial) | Pennfine/Linn | 5 | 0.1 |

1- Mix 2.5 each of Empire and Pardee OR 2.5 lbs. of Birds foot and 2.5 lbs. white clover per acre

Mulching Rates
April 15 - Sept.15 -- Hay or Straw: 1 inch deep (1-2 bales/1000 s.f.)
Sept.15 - April 15 -- Hay or Straw: 2 in. deep (2-4 bales/1000 s.f.)

Erosion Control Matting
As per manufacturer's instructions

Hydroseed
As per manufacturer's instructions

9. Winter Stabilization

**Purpose:**
Managing construction sites to minimize erosion and prevent sediment loading of waters is a year-round challenge. In Vermont, this challenge becomes even greater during the late fall, winter, and early spring months.
'Winter construction' as discussed here, describes the period between October 15 and April 15, when erosion prevention and sediment control is significantly more difficult.
Rains in late fall, thaws throughout the winter, and spring melt and rains can produce significant flows over frozen and saturated ground, greatly increasing the potential for erosion.

**Requirements for Winter Shutdown:**
For those projects that will complete earth disturbance activities prior to the winter period (October 15), the following requirements must be adhered to:
1. For areas to be stabilized by vegetation, seeding shall be completed no later than September 15 to ensure adequate growth and cover.
2. If seeding is not completed by September 15, additional non-vegetative protection must be used to stabilize the site for the winter period. This includes use of Erosion Control Matting or netting of a heavy mulch layer. Seeding with winter rye is recommended to allow for early germination during wet spring conditions.
3. Where mulch is specified, apply roughly 2 inches with an 80-90% cover. Mulch should be tracked in or stabilized with netting in open areas vulnerable to wind.

**Requirements for Winter Construction**
If construction activities involving earth disturbance continue past October 15 or begin before April 15, the following requirements must be adhered to:
1. Enlarged access points, stabilized to provide for snow stockpiling.
2. Limits of disturbance moved or replaced to reflect boundary of winter work.
3. A snow management plan prepared with adequate storage and control of meltwater, requiring cleared snow to be stored down slope of all areas of disturbance and out of storm water treatment structures.
4. A minimum 25 foot buffer shall be maintained from perimeter controls such as silt fence.
5. In areas of disturbance that drain to a water body within 100 feet, two rows of silt fence must be installed along the contour.
6. Drainage structures must be kept open and free of snow and ice dams.
7. Silt fence and other practices requiring earth disturbance must be installed ahead of frozen ground.
8. Mulch used for temporary stabilization must be applied at double the standard rate, or a minimum of 3 inches with an 80-90% cover.
9. To ensure cover of disturbed soil in advance of a melt event, areas of disturbed soil must be stabilized at the end of each work day, with the following exceptions:
   - If no precipitation within 24 hours is forecast and work will resume in the same disturbed area within 24 hours, daily stabilization is not necessary.
   - Disturbed areas that collect and retain runoff, such as house foundations or open utility trenches.
10. Prior to stabilization, snow or ice must be removed to less than 1 inch thickness.
11. Use stone to stabilize areas such as the perimeter of buildings under construction or where construction vehicle traffic is anticipated. Stone paths should be 10 to 20 feet wide to accommodate vehicular traffic.

10. Stabilize Soil at Final Grade

**Purpose:**
Stabilizing the site with seed and mulch or erosion control matting when it reaches final grade is the best way to prevent erosion while construction continues.

**Requirements:**
Within 48 hours of final grading, the exposed soil must be seeded and mulched or covered with erosion control matting.

**How to comply:**
Bring the site or sections of the site to final grade as soon as possible after construction is completed. This will reduce the need for additional sediment and erosion control measures and will reduce the total disturbed area.
For seeding and mulching rates, follow the specifications under Rule 8, Stabilizing Exposed Soil.

11. Dewatering Activities

**Purpose:**
Treat water pumped from dewatering activities so that it is clear when leaving the construction site.

**Requirements:**
Water from dewatering activities that flows off of the construction site must be clear. Water must not be pumped into storm sewers, lakes, or wetlands unless the water is clear.

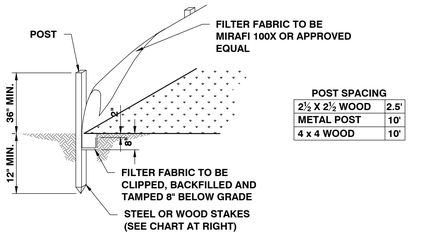
**How to comply:**
Using sock filters or sediment filter bags on dewatering discharge hoses or pipes, discharge water into silt fence enclosures installed in vegetated areas away from waterways. Remove accumulated sediment after the water has dispersed and stabilize the area with seed and mulch.

12. Inspect Your Site

**Purpose:**
Perform site inspections to ensure that all sediment and erosion control practices are functioning properly. Regular inspections and maintenance of practices will help to reduce costs and protect water quality.

**Requirements:**
Inspect the site at least once every 7 days and after every rainfall or snow melt that results in a discharge from the site. Perform maintenance to ensure that practices are functioning according to the specifications outlined in this handbook.

In the event of a noticeable sediment discharge from the construction site, you must take immediate action to inspect and maintain existing erosion prevention and sediment control practices. Any visibly discolored storm water runoff to waters of the State must be reported. Forms for reporting discharges are available at:
www.vtwaterquality.org/stormwater.htm




| POST SPACING | |
|---|---|
| 2½ X 2½ WOOD | 2.5' |
| METAL POST | 10' |
| 4 x 4 WOOD | 10' |

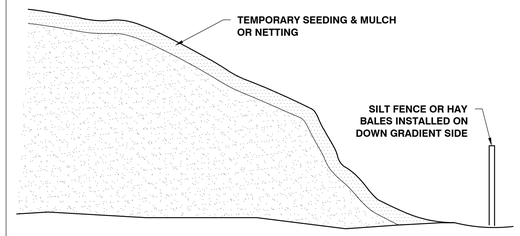
NOTES:

1. INSTALL MIRIFI ENVIROFENCE, OR APPROVED EQUAL OR AS DETAILED HEREIN.
2. INSTALL SILT FENCES AT TOES OF ALL UNPROTECTED SLOPES AND AS PARALLEL TO CONTOURS AS POSSIBLE. THIS INCLUDES ALL FILLED OR UNPROTECTED SLOPES CREATED DURING CONSTRUCTION, NOT NECESSARILY REFLECTED ON THE FINAL PLANS. CURVE THE ENDS OF THE FENCE UP INTO THE SLOPE. REMOVE SEDIMENT WHEN ACCUMULATED TO HALF THE HEIGHT OF THE FENCE. SILT FENCES ARE TO BE MAINTAINED UNTIL SLOPES ARE STABILIZED.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6", FOLDED AND STAPLED.

## SILT FENCE DETAIL

N.T.S.

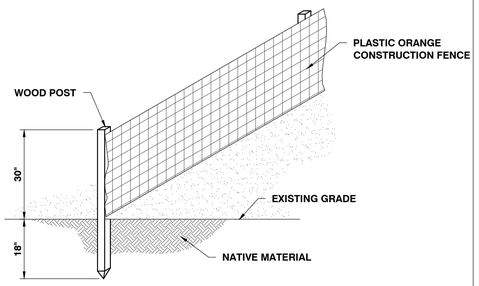
E-003 REVISED 08/01/2014




## TEMPORARY STOCKPILE DETAIL

*N.T.S.*

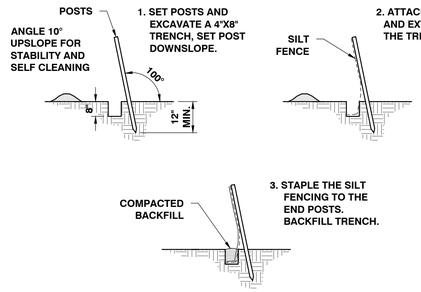
E-005 REVISED 08/01/2014




## CONSTRUCTION FENCE DETAIL

N.T.S.

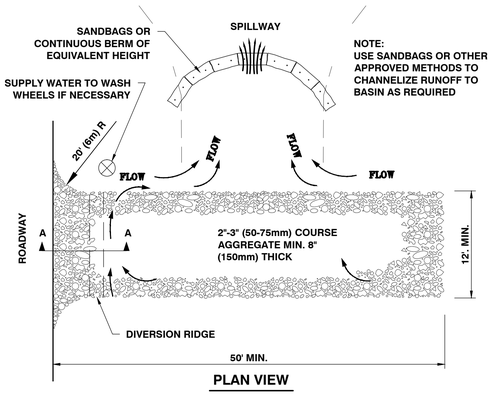
E-002 REVISED 08/01/2014




## SILT FENCE CONSTRUCTION DETAIL

N.T.S.

E-007 REVISED 08/01/2014




## PLAN VIEW


## SECTION A-A

NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

## STABILIZED CONSTRUCTION ENTRANCE

N.T.S.

E-004 REVISED 08/01/2014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VERMONT NATIONAL GUARD

*VERMONT ARMY NATIONAL GUARD*

*CAMP JOHNSON COLCHESTER, VERMONT*

PROJECT:

*CAMP ETHAN ALLEN TRAINING SITE*

*ENTRY IMPROVEMENTS*

*CAMP ETHAN ALLEN TRAINING SITE UNDERHILL, VT*

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/30/2017 | BCE | BID DOCUMENTS |

# *EROSION CONTROL DETAILS & SPECIFICATIONS*

DATE 8/30/2017
SCALE AS SHOWN
PROJ. NO. 17100.05
DRAWING NUMBER C3.0


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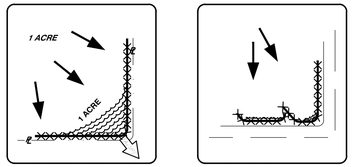
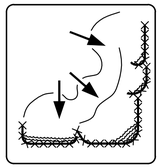
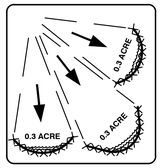



Incorrect - Do Not layout "perimeter control" silt fences along property lines. All sediment laden runoff will concentrate and overwhelm the system.



Correct - Install J-hooks



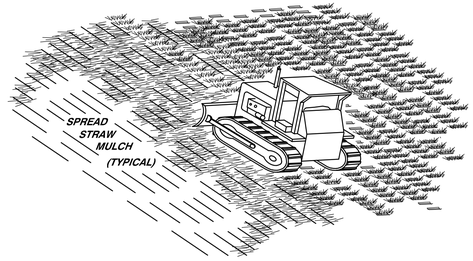



Discreet segments of silt fence, installed with J-hooks or `smiles' will be much more effective.

## SILT FENCE PLACEMENT FOR PERIMETER CONTROL

N.T.S.

E-010 REVISED 12/19/2014




'TRACKING' WITH MACHINERY ON SANDY SOIL PROVIDES ROUGHENING WITHOUT UNDUE COMPACTION.

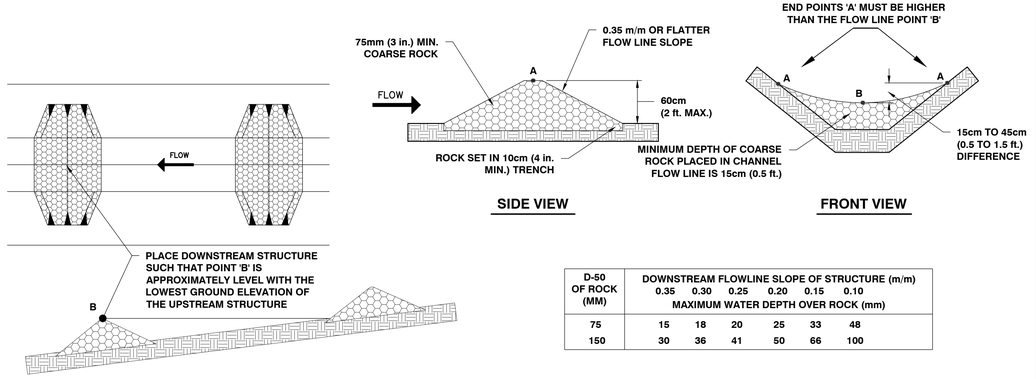
NOTES:

1. ROUGHEN SLOPE WITH BULLDOZER.
2. BROADCAST SEED AND FERTILIZER.
3. SPREAD STRAW MULCH 3" (2½ TONS PER ACRE)
4. PUNCH STRAW MULCH INTO SLOPE BY RUNNING BULLDOZER UP AND DOWN SLOPE.

## STRAW ANCHORING

N.T.S.

E-012 REVISED 12/19/2014

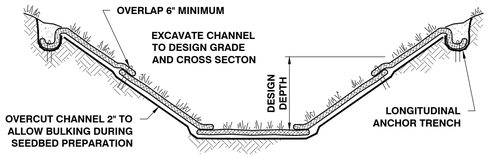


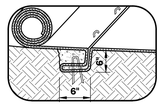

| D-50 OF ROCK (MM) | DOWNSTREAM FLOWLINE SLOPE OF STRUCTURE (m/m) 0.35 | 0.30 | 0.25 | 0.20 | 0.15 | 0.10 |
|---|---|---|---|---|---|---|
| | MAXIMUM WATER DEPTH OVER ROCK (mm) | | | | | |
| 75 | 15 | 18 | 20 | 25 | 33 | 48 |
| 150 | 30 | 36 | 41 | 50 | 66 | 100 |

## STONE CHECK DAM STRUCTURE

N.T.S.

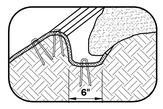
E-006 REVISED 08/01/2014



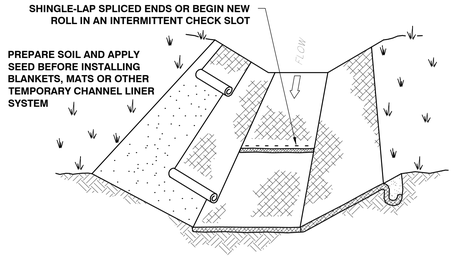




INTERMITTENT CHECK SLOT

TYPICAL INSTALLATION WITH EROSION CONTROL BLANKETS OR TURF REINFORCEMENT MATS




LONGITUDINAL ANCHOR TRENCH



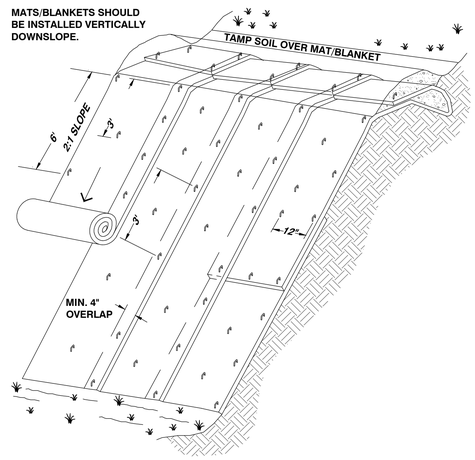

NOTES:

1. DESIGN VELOCITIES EXCEEDING 2 FT./SEC/ REQUIRE TEMPORARY BLANKETS, MATS OR SIMILAR LINERS TO PROTECT SEED AND SOIL UNTIL VEGETATION BECOMES ESTABLISHED.
2. GRASS-LINED CHANNELS WITH DESIGN VELOCITIES EXCEEDING 6 FT./SEC. SHOULD INCLUDE TURF REINFORCEMENT MATS.

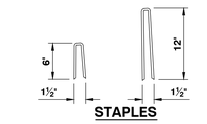
## GRASS-LINED CHANNEL TYPICAL INSTALLATION

N.T.S.

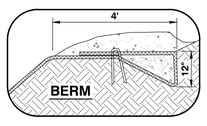
E-011 REVISED 12/19/2014




ISOMETRIC VIEW




STAPLES




BERM

TYPICAL SLOPE SOIL STABILIZATION

NOTES:

1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

## EROSION BLANKETS & TURF REINFORCEMENT MATS SLOPE INSTALLATION

N.T.S.

E-009 REVISED 08/01/2014

### LANDSCAPE GRADING

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:

1. Finish grading; bring rough grade in areas to design elevations as shown on the drawings.
2. Topsoil: Work shall consist of furnishing, placing and shaping topsoil, and placing, spreading, and shaping topsoil form stockpiles or stripped areas.

PART 2 – PRODUCTS

2.01 TOPSOIL

A. Topsoil shall be loose, friable, reasonably free of admixtures of subsoil, free from refuses, stumps, roots, brush, weeds, rocks, and stones 1 1/4 inch in overall dimensions. The topsoil shall also be free from any material that will prevent the formation of a suitable seedbed or prevent seed germination and plant growth. It shall contain not less than three (3) nor more than twenty (20) percent organic matter. Any material which has become mixed with undue amounts of subsoil during any operation at the source or during placing or spreading will be rejected and shall be replaced by the Contractor with acceptable material.

PART 3 – EXECUTION

3.01 SUBGRADE PREPARATION

A. Clean subgrade of all stumps, stones, roots, trash or other materials which might hinder proper tillage or spreading.

B. All surfaces on which topsoil is to be placed shall be graded to a reasonably true surface and scarified by raking, discing or other approved means to a minimum depth of two inches before placing topsoil.

3.03 PLACING TOPSOIL

A. Minimum final depth of topsoil shall be 4 inches.

B. Place topsoil when seeding operations can closely follow spreading operations. Use topsoil in relatively dry state.

C. Topsoil shall be spread and shaped to the lines and grades shown on the plans, or as directed by the Engineer. The depth stated in the contract to which the topsoil is to be placed is that required after final rolling of the material has taken place. All stones, roots and debris over 1¼ inch in diameter along with any sodding weeds and other undesirable material shall be removed.

D. After shaping and grading, all trucks and other equipment shall be excluded from the topsoiled area to prevent excessive compaction. The Contractor shall perform such work as required to provide a friable surface for seed germination and plant growth prior to seeding.

E. It shall be the Contractor's responsibility to restore to the line, grade and surface all eroded areas with approved material and to keep topsoiled areas in acceptable condition until the completion of the work.

### SEEDING

PART 1 – GENERAL

1.1 Section Includes:

A. Seeding.

1. Furnish all labor, materials and equipment to complete all seeding work as shown on the drawings and specified herein.
2. Except where otherwise shown or specified, the Contractor shall seed all areas where new contours are shown on the drawings and all areas where existing ground cover has been disturbed by the Contractor's operations.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 PROJECT CONDITIONS

Planting Restrictions: Seeding and initial fertilizing shall be done between May 1st and September 15th unless otherwise authorized. Seeding shall not be done during windy weather or when the ground is frozen, excessively wet, or otherwise untillable. If seeding is done during July or August, additional mulch material may be required. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion.

PART 2 – PRODUCTS

2.1 SEED

A. Conservation Seed Mix:

| Kind of Seed | Minimum Purity | Minimum Germination | Lbs/Acre |
|---|---|---|---|
| Creeping Red Fescue | 98% | 85% | 22.5 |
| Tall Fescue | 95% | 95% | 22.5 |
| Red Top | 95% | 90% | 3 |
| Birdsfoot Trefoil | 98% | 85% | 9 |
| Annual Ryegrass | 95% | 85% | 3 |
| | | TOTAL = | 60 |

2.2 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural limestone containing a minimum of 85 percent calcium carbonate equivalent and as follows:

1. Class: T, with a minimum of 99 percent passing through No. 8 sieve and a minimum of 75 percent passing through No. 60 sieve.

2.3 FERTILIZER

A. Commercial Fertilizer: Commercial–grade complete fertilizer of neutral character, consisting of fast– and slow–release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium.

B. Slow–Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water–insoluble nitrogen, phosphorus, and potassium.

2.4 MULCHES

A. Mulch: Provide air–dry, clean, mildew– and seed–free, hay or threshed straw of wheat, rye, oats, or barley.

B. Compost Mulch: Well–composted, stable, and weed–free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1–inch sieve; soluble salt content of 2 to 5 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.

PART 3 – EXECUTION .

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
2. Protect grade stakes set by others until directed to remove them.

B. Provide erosion–control measures to prevent erosion or displacement of soils and discharge of soil–bearing water runoff or airborne dust to adjacent properties and walkways.

C. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter.

1. Apply fertilizer directly to subgrade before loosening.
   a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
   b. Mix lime with dry soil before mixing fertilizer.

D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.

E. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

F. Before planting, restore areas if eroded or otherwise disturbed after finish grading.

3.2 APPLICATION RATES

A. When a soil test is not available, the following minimum amounts should be applied:

1. Agricultural limestone: 2 tons/acre.
2. Nitrogen (N): 50 lbs./acre.
3. Phosphate: 100 lbs./acre.
4. Potash: 100 lbs./acre.
   a. This is the equivalent of 500 lbs./acre of 10–20–20 fertilizer or 1,000 lbs./acre of 5–10–10.
5. Hay mulch: 2 tons/acre.

3.3 SEEDING

A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.

1. Do not use wet seed or seed that is moldy or otherwise damaged.
2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

B. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.

C. Protect seeded areas with slopes exceeding 1:3 with erosion–control blankets installed and stapled according to manufacturer's written instructions.

D. Protect seeded areas from hot, dry weather or drying winds by applying mulch within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a depth of 3/16 inch, and roll surface smooth.

3.4 HYDROSEEDING

A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with fiber–mulch manufacturer's recommended tackifier.
2. Apply slurry uniformly to all areas to be seeded in a one–step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500–lb/acre dry weight, and seed component is deposited at not less than the specified seed–sowing rate.

3.5 MAINTENANCE

A. Maintain and establish seeding by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn. Provide materials and installation the same as those used in the original installation.

1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
2. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
   a. Seeded Areas: 90 days from date of Substantial Completion.
   b. When initial maintenance period has not elapsed before end of planting season, or if seeding is not fully established, continue maintenance during next planting season.

3.6 SATISFACTORY CONDITIONS

A. Installations shall meet the following criteria as determined by Engineer/Owner:

1. Satisfactory Seeded Area: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.

B. Use specified materials to reestablish area that do not comply with requirements and continue maintenance until areas are satisfactory.

3.7 CLEANUP AND PROTECTION

A. Promptly remove soil and debris, created by work. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after lawn is established.

C. Remove nondegradable erosion–control measures after grass establishment period.

SITE ENGINEER:

CIVIL ENGINEERING ASSOCIATES, INC.
10 MANSFIELD VIEW LANE, SOUTH BURLINGTON, VT 05403
802-864-2323 FAX: 802-864-2271 web: www.cea-vt.com

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DRAWN MAB
CHECKED BCE
APPROVED BCE

OWNER:

VERMONT NATIONAL GUARD

VERMONT ARMY NATIONAL GUARD

CAMP JOHNSON
COLCHESTER, VERMONT

PROJECT:

CAMP ETHAN ALLEN TRAINING SITE

ENTRY IMPROVEMENTS

CAMP ETHAN ALLEN TRAINING SITE
UNDERHILL, VT

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/30/2017 | BCE | BID DOCUMENTS |

EROSION CONTROL DETAILS & SPECIFICATIONS

DATE 8/30/2017
SCALE AS SHOWN
PROJ. NO. 17100.05

DRAWING NUMBER C3.1

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## PROJECT COORDINATION

PART 1 – GENERAL

1.01 MEETINGS & PROJECT ACCESS

A. The Owner shall be notified five (5) days prior to commencement of Work by the Contractor.

B. The Contractor will coordinate with the Owner to arrange an on–site pre–construction meeting prior to commencement of any work. Job superintendents and subcontractors shall be included in this meeting.

C. The Contractor will coordinate all phases of the Work, so as not to interfere with the normal work procedures in the area.

D. The Contractor shall conduct his work in such a manner as to not interfere with or endanger work or traffic in areas adjacent to the construction area, except as permitted by the Owner. The Contractor shall so arrange his construction operations as to provide access for emergency vehicles and equipment to the work site at all times.

1.02 LABOR

A. The Contractor and subcontractors will employ mechanics skilled in their respective trades.

B. All labor will be performed in a neat and workmanlike manner.

1.03 PROTECTION OF PERSONS AND PROPERTY

A. The Contractor shall be responsible for initiating, maintaining, and supervising all O.S.H.A. safety precautions in connection with the Work.

B. Fire Protection: The Contractor shall take all necessary precautions to prevent fires adjacent to the Work and shall provide adequate facilities for extinguishing fires. The Contractor shall also prevent fires in project related buildings and shall prevent the spread of fires to areas outside the limits of the Work.

C. Safety Precautions: Prior to commencement of Work, the Contractor shall be familiar with all safety regulations and practices applicable with construction operations. No additional payments will be made for equipment and procedures necessitated by these safety precautions.

1.04 CORRECTION OF WORK

A. The Contractor shall promptly correct all Work rejected by the Owner as defective or as failing to conform to the Contract Documents. The Contractor shall bear all cost of correcting such rejected Work.

1.05 WEATHER CONDITIONS

A. No Work shall be done when, in the opinion of the Owner, the weather is unsuitable. No concrete, earth backfill, embankment, or paving shall be placed upon frozen material. If there is delay or interruption in the Work due to weather conditions, the necessary precautions must be taken to bond new Work to old.

B. Protection Against Water and Storm: The Contractor shall take all precautions to prevent damage to the Work by storms or by water entering the site of the Work directly or through the ground. In case of damage by storm or water, the Contractor, at his own expense, shall make repairs or replacements or rebuild such parts of the Work as the Engineer may require in order that the finished work may be completed as required by the Drawings and Specifications.

1.06 DISPOSAL OF DEBRIS

A. All debris and excess materials, other than that which is authorized to be reused, become the property of the Contractor and shall be promptly removed from the property. The Contractor shall receive title to all debris and/or excess material. The Owner will not be responsible for any loss or damage to debris or excess material owned by the Contractor.

1.07 PROJECT LAYOUT

A. The Contractor shall be responsible for providing all necessary survey staking.

1. Locate and protect control points before starting work on the site.

2. Preserve permanent reference points during progress of the Work.

3. Establish a minimum of two permanent benchmarks on the site, referenced to data established by survey control points.

a. Record locations, with horizontal and vertical data, on Project Record Documents.

1.08 TESTING

A. The Contractor is responsible for obtaining testing and inspection services.

## SITE CLEARING

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:

1. Remove surface debris.

2. Clear site of plant life and grass.

3. Remove trees and shrubs.

4. Remove root system of trees and shrubs.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.01 PROTECTION

A. Protect utilities that remain from damage.

B. Protect trees, plant growth, and features designated to remain as final landscaping.

C. Protect bench marks and existing structures from damage or displacement.

D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

E. Maintain access to the site at all times.

3.02 CLEARING

A. Clear areas required for access to site and execution of Work.

B. Remove trees and shrubs within marked areas. Remove stumps, roots and tap roots and other projections 1¢" or greater in diameter to 2'–0" below the excavated surfaces in cut areas and 2'–0" below the exposed subgrade in fill areas.

3.03 REMOVAL

A. Remove debris, rock, and extracted plant life from site.

B. The Contractor shall coordinate Work with the Engineer and Owner in establishing suitable areas within the property limits for depositing debris, rocks and extracted plant life. The Contractor shall be responsible for backfilling (capping) and grading all waste sites.

3.04 UTILITIES

A. Coordinate with utility companies and agencies as required.

## SITE EARTHWORK

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:

1. All excavation (unless covered in other sections of these specifications), removal and stockpile of topsoil, stabilization fabric, and other miscellaneous and appurtenant works.

2. Site filling.

3. Roadway structural sections.

1.02 PROTECTION

A. Protect bench marks and existing structures.

B. Protect above or below grade utilities which are to remain.

1.03 SUBMITTALS

A. Testing laboratory reports indicating that material for backfill meets requirements of this Section.

B. Field density test reports of site fill in place.

C. Field density test reports for roadway structural sections in place.

D. Stabilization Fabric: Submit copies of manufacturer's specifications and installation instructions.

PART 2 – PRODUCTS

2.01 STRUCTURAL FILL – CRUSHED GRAVEL (AOT SPEC. 704.05, FINE)

A. All materials shall be secured from approved sources. This gravel shall consist of angular and round fragments of hard durable rock of uniform quality throughout, reasonably free from thin elongated pieces, soft or disintegrated stone, dirt, organic or other objectionable matter. This material shall meet the following grading requirements:

| Sieve Designation | Percent by Weight Passing Square Mesh Sieve |
|---|---|
| 2" | 100 |
| 1 1/2" | 90 – 100 |
| No. 4 | 30 – 60 |
| No. 100 | 0 – 12 |
| No. 200 | 0 – 6 |

2.02 CRUSHED GRAVEL (AOT SPEC. 704.05, COARSE)

A. This material shall meet the following grading requirements:

| Sieve Designation | Percent by Weight Passing Square Mesh Sieve |
|---|---|
| 4" | 95 – 100 |
| No. 4 | 25 – 50 |
| No. 100 | 0 – 12 |
| No. 200 | 0 – 6 |

At least 50% by mass (weight) of the material coarser than the No. 4 sieve shall have at least one fractured face.

2.03 COMPACTED FILL/GRANULAR BORROW

A. This material shall be free of shale, clay, friable material, debris, and organic matter, graded in accordance with ANSI/ASTM C136 within the following limits:

| Sieve Designation | Percent by Weight Passing Square Mesh Sieve |
|---|---|
| 3" | 100 |
| ¾" | 75 – 100 |
| No. 4 | 20 – 100 |
| No. 100 | 0 – 20 |
| No. 200 | 0 – 6 |

2.04 DRAINAGE COURSE (AOT SPEC. 704.16)

A. Rock for drainage applications shall be produced from natural gravels or crushed quarried rock and shall consist of clean, hard, sound, and durable material. It shall be obtained from approved sources and shall meet the following grading requirements:

| Sieve Designation | Percent by Weight Passing Square Mesh Sieve |
|---|---|
| 1" | 100 |
| ¾" | 90 – 100 |
| ¼" | 20 – 55 |
| No. 4 | 0 – 10 |
| No. 8 | 0 – 10 |

2.05 DENSE GRADED CRUSHED STONE (AOT SPEC. 704.06)

A. Dense Graded Crushed Stone should consist of a well graded crushed run stone and should meet the requirements for Vermont AOT Standard Specifications Item 704.06 Dense Graded Crushed Stone for Subbase and the gradation requirements shown in Table 704.06A of the Vermont AOT Standard Specifications.

| Sieve Designation | Percent Finer by Weight |
|---|---|
| 3½" | 100 |
| 3" | 90 – 100 |
| 2" | 75 – 100 |
| 1" | 50 – 80 |
| ½" | 30 – 60 |
| No. 4 | 15 – 40 |
| No. 200 | 0 – 6 |

2.06 RECYCLED ASPHALT PAVEMENT (RAP) 1½" MINUS CRUSHED ASPHALT

A. This material shall be free of Portland Cement and approved by the engineer prior to installation. This material shall not be mixed with gravel and shall meet the following grading requirements:

| Sieve Designation | Percent by Weight Passing Square Mesh Sieve |
|---|---|
| 2" | 100 |
| 1½" | 90 – 100 |
| No. 4 | 30 – 60 |
| No. 100 | 0 – 12 |
| No. 200 | 0 – 6 |

2.07 SAND BORROW AND CUSHION (AOT SPEC. 703.03)

A. Sand Borrow shall consist of material reasonably free from silt, loam, clay, or organic matter. It shall be obtained from approved sources and shall meet the requirements for Vermont AOT Standard Specifications and the gradation requirements shown in Table 703.03A of the Vermont AOT Standard Specifications.

| Sieve Designation | Percent Finer by Weight |
|---|---|
| 2" | 100 |
| 1½" | 90 – 100 |
| ½" | 70 – 100 |
| No. 4 | 60 – 100 |
| No. 100 | 0 – 20 |
| No. 200 | 0 – 8 |

2.08 GEOTEXTILE

A. Subsurface Drainage Geotextile: Nonwoven needle–punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 3; AASHTO M 288.

2. Grab Tensile Strength: 120 lbf; ASTM D 4632.

3. Tear Strength: 50 lbf; ASTM D 4533.

4. Apparent Opening Size: No. 70 sieve, maximum; ASTM D 4751.

5. Permittivity: 1.7 per second, minimum; ASTM D 4491.

6. UV Stability: 70 percent after 500 hours' exposure; ASTM D 4355.

B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 3; AASHTO M 288.

2. Grab Tensile Strength: 200 lbf; ASTM D 4632.

3. Sewn Seam Strength: 222 lbf; ASTM D 4632.

4. Tear Strength: 75 lbf; ASTM D 4533.

5. Puncture Strength: 90 lbf; ASTM D 4833.

6. Apparent Opening Size: No. 40 sieve, maximum; ASTM D 4751.

7. Permittivity: 0.02 per second, minimum; ASTM D 4491.

8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

9. Weight: 4.0 oz/yd² minimum.

PART 3 – EXECUTION

3.01 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Identify known below grade utilities. Stake and flag locations.

C. Maintain and protect existing utilities remaining which pass through work area.

D. Upon discovery of unknown utility or concealed conditions, discontinue affected work; notify Engineer.

3.02 EROSION CONTROL

A. Erosion control must be installed prior to beginning any earthwork operations.

3.03 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be excavated, re–landscaped or regraded and stockpile in areas designated on site or as directed by the Engineer.

B. Maintain the stockpile in a manner which will not obstruct the natural flow of drainage.

1. Maintain stockpile free from debris and trash.

2. Keep the topsoil damp to prevent dust and drying out.

3.04 SUBSOIL EXCAVATION

A. Excavate subsoil from areas to be regraded in accordance with plans.

B. Excavate subsoil required to accommodate site structures, construction operations, roads, and parking areas.

C. Grade top perimeter of excavation to prevent surface water from draining into excavation.

D. Notify engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

E. Correct areas over–excavated by error as directed by the Engineer.

3.05 DITCHES

A. Cut accurately to the cross–sections, grades, and elevations shown.

B. Maintain excavations free from detrimental quantities of leaves, sticks, trash, and other debris until completion of the work.

C. Dispose of excavated materials as shown on the drawings or directed by the Engineer; except do not, in any case, deposit materials less than three feet from the edge of a ditch.

3.06 ROADWAY EMBANKMENTS AND BERMS

A. When embankments are to be made on a hillside, the slope of the original ground on which the embankments are to be constructed shall be stepped and properly drained as the fill is constructed so that adverse movements of the slopes do not occur.

B. Any excavated rock, ledge, boulders, and stone, except where required in the construction of other items or otherwise directed, shall be used in the construction of embankments to the extent of the project requirements and generally shall be placed so as to form the base of an embankment.

C. Frozen material shall not be used in the construction of embankments, nor shall the embankments or successive layers of the embankments be placed upon frozen material. Placement of material other than rock shall stop when the sustained air temperature, below 32 degrees Fahrenheit, prohibits the obtaining of the required compaction. If the material is otherwise acceptable, it shall be stockpiled and reserved for future use when its condition is acceptable for use in embankments.

D. When an embankment is to be constructed across a swamp, muck, or areas of unstable soils, the unsuitable material shall be excavated to reach soils of adequate bearing capacity and the embankment begun. Alternative methods, such as use of a stabilization fabric in place of excavation and backfill, may be utilized only after approval of same by the Engineer.

E. Material being placed in embankments shall be placed in horizontal layers of uniform thickness across the full width of the embankment. Stumps, trees, rubbish, and other unsuitable material shall not be placed in embankments.

F. Embankment areas shall be placed in eight–inch maximum lifts. Effective spreading equipment shall be used on each layer to obtain uniform thickness prior to compaction. Each layer shall be kept crowned to shed water to the outside edge of embankment and continuous leveling and manipulating will be required to assure uniform density. The entire area of each layer shall be uniformly compacted to at least the required minimum density by use of compaction equipment consisting of rollers, compactors, or a combination thereof. Earth–moving and other equipment not specifically manufactured for compaction purposes will not be considered as compaction equipment.

G. All fill material shall be compacted at a moisture content suitable for obtaining the required density. In no case shall the moisture content in each layer under construction be more than three percent above the optimum moisture content and shall be less than that quantity that will cause the embankment to become unstable during compaction. Sponginess, shoving, or other displacement under heavy equipment shall be considered evidence for an engineering determination of lack of stability under this requirement, and further placement of material in the area affected shall be stopped or retarded to allow the material to stabilize.

H. When the moisture content of the material in the layer under construction is less than the amount necessary to obtain satisfactory compaction by mechanical compaction methods, water shall be added by pressure distributors or other approved equipment. Water may also be added in excavation or borrow pits. The water shall be uniformly and thoroughly incorporated into the soil by disc, harrowing, blading, or by other approved methods. This manipulation may be omitted for sands and gravel. When the moisture content of the material is in excess of three percent above optimum moisture content, dry material shall be thoroughly incorporated into the wet material, or the wet material shall be aerated by disking, harrowing, blading, rotary mixing, or by other approved methods; or compaction of the layer of wet material shall be deferred until the layer has dried to the required moisture content by evaporation.

3.07 COMPACTION REQUIREMENTS

A. All backfills and fills shall be compacted in even lifts (12" maximum) to attain the required densities as follows:

| Location | Modified Proctor ASTM D–1557 |
|---|---|
| Subgrade (8") and Gravel for Roads and Parking Lots | 95% |
| General Embankments | 90% |

## BITUMINOUS CONCRETE PAVING

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:

1. Base Courses

2. Leveling Course

3. Finish Course

B. General: This work shall consist of one or more courses of bituminous mixture, constructed on a prepared foundation in accordance with these Specifications and the type of surface being placed, and in conformity with the lines, grades, thicknesses and typical cross sections shown on the plans or established by the Engineer.

1.02 QUALITY ASSURANCE

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. All materials and installation shall be in accordance with The Asphalt Institute Manual (MS–4) and the VAOT Standard Specifications, (Latest Edition).

C. Mixing Plant: Conform to State of Vermont Standards.

D. Obtain materials from same source throughout.

1.03 PROJECT CONDITIONS

A. Bituminous concrete shall not be placed between November 1 and May 1. Material shall not be placed when the granular subbase is wet or when the air temperature at the paving site in the shade and away from artificial heat is as follows:

| Air Temperature Degrees Fahrenheit | Pavement Compacted Depth |
|---|---|
| 40 Degrees or below | 1 1/4" or Greater |
| 50 Degrees or below | Less than 1 1/4" |

PART 2 – PRODUCTS

2.01 MATERIALS

A. Materials shall be combined and graded to meet the criteria as defined in the VAOT Standard Specifications, Division 700 for bituminous concrete.

B. Gradation: Materials shall be combined and graded to meet composition limits specified in VAOT Standard Specification, Section 406.03, for the base course and finish course. Unless specifically shown on the Plans, all

1. Bituminous concrete pavement shall be designed in conformance with the design criteria for heavy duty bituminous concrete pavement. (75 blows/side)

2. All Asphalt Cement used in the bituminous concrete pavement shall be PG 58–28 (or VTrans approved mix) unless otherwise noted.

C. Thickness of paving for drives and parking lots shall be as shown on the plans, consisting of base course and finish course.

D. For pavement reconstruction areas due to trenching, the depth of each course shall be increased by 1/2". Pavement reconstruction caused by trench reopening due to improper placement or non–approved placement shall be performed at no additional cost to the Owner.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Install in accordance with VAOT Standard Specifications, Section 406.

3.02 EXAMINATION

A. Verify that compacted granular base is dry and ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

3.03 PREPARATION

A. Matching Surfaces: When a new pavement is to match an existing bituminous pavement for a roadway or trench, the Contractor shall vertically smooth cut the existing pavement, over the existing gravel base. The smooth cut shall be thoroughly cleaned and coated with Emulsified Asphalt, RS–1, just prior to paving.

3.04 PREPARATION – TACK COAT

A. When the bottom course of bituminous concrete pavement is left over the winter, or paving is to be made over an existing bituminous concrete pavement, the existing surface shall be cleaned and Emulsified Asphalt applied before the next course is applied.

B. Also apply to contact surfaces of curbs.

C. Coat surfaces of manhole and catch basin frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.

SITE ENGINEER:

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DRAWN MAB
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OWNER:

VERMONT NATIONAL GUARD

VERMONT ARMY NATIONAL GUARD

CAMP JOHNSON
COLCHESTER, VERMONT

PROJECT:

CAMP ETHAN ALLEN TRAINING SITE

ENTRY IMPROVEMENTS

CAMP ETHAN ALLEN TRAINING SITE
UNDERHILL, VT

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/30/2017 | BCE | BID DOCUMENTS |

SITE SPECIFICATIONS

DATE 8/30/2017
SCALE AS SHOWN
PROJ. NO. 17100.05

DRAWING NUMBER C4.0

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3.05 PLACING ASPHALT PAVEMENT

A. Place to compacted thickness identified on the plans.

B. Compact pavement by rolling. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

C. Develop rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.06 JOINTS

A. Joints between old and new pavements or between successive day's work shall be made so as to insure a thorough and continuous bond between the old and new mixtures. Whenever the spreading process is interrupted long enough for the mixture to attain its initial stability, the paver shall be removed from the mat and a joint constructed.

B. Butt joints shall be formed by cutting the pavement in a vertical plane at right angles to the centerline where the pavement has a true surface as determined by the use of a straight–edge. The butt joint shall be thoroughly coated with Emulsified Asphalt, Type RS–1, just prior to depositing the paving mixtures.

C. Longitudinal joints that have become cold shall be coated with Emulsified Asphalt, Type RS–1, before the adjacent mat is placed. If they have been exposed to traffic, they shall be cut back to a clean vertical edge prior to painting with the emulsion.

D. Unless otherwise directed, longitudinal joints shall be offset at least 6" from any joint in the lower courses of pavement. Transverse joints shall not be constructed nearer than one foot from the transverse joints constructed in lower courses.

3.07 TOLERANCES

A. The surface will be tested by the Engineer using a 16 foot straight–edge at selected locations parallel with the centerline. Any variations exceeding 3/16 of an inch between any two contacts shall be satisfactorily eliminated. A 10 foot straight–edge may be used on a vertical curve. The straight–edges shall be provided by the Contractor.

B. Scheduled Compacted Thickness: Within 1/4 inch.

C. Variation from True Elevation: Within 1/2 inch.

3.08 FIELD QUALITY CONTROL

A. Permit no vehicular traffic on surfaces until thoroughly cool and hard.

3.09 REPAIR OF SUBSIDENCE

A. Settlement – Should any pavement settle within one year of completion of the Contract, such pavement shall be repaired at the Contractor's expense. If the Contractor fails to make such repairs promptly upon receipt of notice to do so from the Owner, then the Owner may make such repairs as necessary and the Contractor shall pay the Owner for all costs incurred in making such repairs.

## DRAINAGE

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:

1. Culvert pipe and appurtenances.
2. Stone fill.
3. Drainage Structures

1.02 REFERENCES

A. Vermont Agency of Transportation Standard Specifications, Latest Edition.

1.03 SUBMITTALS

A. Manufacturer's technical data for:

1. Pipe and appurtenances.
2. Structures.

PART 2 – PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Furnish ells, tees, reducing tees, wyes, couplings, increasers, crosses, transitions and end caps of the same type and class of material as the conduit, or of material having equal or superior physical and chemical properties as acceptable to the Engineer.

B. All culverts and storm drains shall meet the requirements of Section 601 of the Standard Specifications.

2.02 DRAINAGE PIPE & PERFORATED PIPE

A. Culvert / Drainage Pipe

1. Corrugated Polyethylene pipe and fittings (smooth interior) meeting the requirements of AASHTO M–294 and M–252
2. for drainage piping installed by directional boring techniques, use PE 3408 high density polyethylene pipe meeting ASTM D3350 Standard (SDR 11 or better)

2.03 CONCRETE STRUCTURES

A. ASTM C478, sized as indicated.

2.04 METAL ACCESSORIES

A. Manhole frames and covers:

1. Grey cast iron, ASTM A48, as shown on plans.

2.05 STONE FILL

A. Stone for stone fill shall be approved, hard, blasted angular rock other than serpentine rock containing the fibrous variety chrysotile (asbestos). The least dimension of the stone shall be greater than 1/3 of the longest dimension. The stone fill shall be reasonably well graded from the smallest to the maximum size stone specified so as to form a compact mass when in place.

1. Type I – The longest dimension of the stone shall vary from 1 inch to 12 inches, and at least 50 percent of the volume of the stone in place shall have a dimension of 4 inches.
2. Type II – The longest dimension of the stone shall vary from 2 inches to 36 inches, and at least 50 percent of the volume of the stone in place shall have a least dimension of 12 inches.
3. Type III – The longest dimension of the stone shall vary from 3 inches to 48 inches and at least 50 percent of the volume of the stone in place shall have a least dimension of 16 inches.
4. Type IV – The longest dimension of the stone shall vary from 3 inches to 60 inches, and at least 50 percent of the volume of the stone in place shall have a least dimension of 20 inches.

PART 3 – EXECUTION

3.01 INSPECTION

A. Examine the areas and conditions under which storm sewer system work is to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.02 GENERAL

A. When existing underground utilities, which are not scheduled for removal or abandonment, are encountered in the excavation, they shall be adequately supported and protected from damage. Any damage to utilities shall be repaired promptly at no additional cost to the Owner.

3.03 PREPARATION

A. Hand trim excavation (where necessary) to required elevations. Correct over–excavations with fill material.

B. The slopes shall be graded to match the grade as shown on the plans. Where required, end sections shall be placed and backfilled to prevent undermining.

C. Remove large stones or other hard matter which could damage drainage structures or impede consistent backfilling or compaction.

3.04 INSTALLATION OF PIPE

A. All pipe and fittings shall be carefully examined for defects and no pipe or fittings shall be laid which are known to be defective. If any defective piece is discovered after laying, it shall be removed and replaced at the Contractor's expense. All pipes and fittings shall be cleaned before they are laid and shall be kept clean until accepted in the completed work.

B. The pipe shall be laid to conform to the lines and grades indicated on the drawings or given by the Engineer. Each pipe shall be laid as to form a close joint with the next adjoining pipe and to bring the inverts continuously to the required grade.

C. Unless otherwise permitted by the Engineer, the Contractor shall provide for the temporary diversion of water to permit the installation of the pipe in a reasonably dry trench.

D. Where the pipe is to be laid below the existing ground line, a trench shall be excavated to the required depth and to a width sufficient to allow for joining of the pipe and compaction of the bedding and backfill material under and around the pipe.

E. The completed trench bottom shall be firm for its full length and width.

F. If indicated on the plans or directed by the Engineer, unsuitable foundation material encountered below the normal grade of the pipe bed shall be removed and replaced with Granular Backfill, or other specified or approved material.

G. The Contractor shall take all necessary precautions to prevent floatation of the pipe in the trench.

H. When pipe laying is not in progress, the open ends of the pipe shall be closed with temporary watertight plugs. If water is in the trench when work is resumed, the plug shall not be removed until all danger of water entering the pipe is eliminated.

3.05 MANHOLES

A. Precast concrete structures:

1. Place precast concrete structures and covers as shown on the Drawings.
2. Where manholes occur in pavement, set tops of frames and covers flush with finish surface.
3. Provide rubber joint gasket complying with ASTM C443.

## SANITARY SEWER SERVICE

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:

1. Gravity Sewer Pipe

1.02 SUBMITTALS

A. Product Data: Submit published data from manufacturers of products and accessories specified, indicating compliance with requirements.

1.03 QUALITY ASSURANCE

A. All sanitary sewer materials and construction of same shall be as shown on the Contract Plans and shall meet the requirements of the State of Vermont Agency of Natural Resources (Department of Environmental Conservation) and the Public Works Standards and Specifications of the local municipality.

PART 2 – PRODUCTS

2.01 GENERAL

A. Furnish ells, tees, reducing tees, wyes, couplings, increasers, crosses, transitions and end caps of the same type and class of material as the conduit, or of material having equal or superior physical and chemical properties as acceptable to the Engineer to provide a complete and operable system.

2.02 PVC GRAVITY SANITARY SEWER PIPE

A. PVC sewer pipe shall conform in all respects to the latest revision of ASTM Specifications D–3034 or F679, Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings, SDR 35 pipe. All pipe and fittings shall be clearly marked as follows:

– Manufacturer's Name and Trademark

– Nominal Pipe Size (as shown on plans)

– Material Designation 12454–C PVC

– Legend "Type PSM SDR 35 PVC Sewer Pipe" or "PS 46 PVC Sewer Pipe"

– Designation ASTM D–3034 or F679

B. Joints shall be push–on type using elastomeric gaskets and shall conform to ASTM D–3212. The gaskets shall be factory installed. The pipe shall be furnished in nominal 13 foot lengths. Sufficient numbers of short lengths and full machine fittings shall be provided for use at manholes and connections. All connections will require the use of manufactured fittings. Field fabricated, saddle–type connections will not be considered acceptable.

C. Any pipe or fitting having a crack or other defect or which has received a severe blow shall be marked rejected and removed at once from the work site. All field cuts are to be made with saw and 90 degree miter box. Bevel the cut end to the same as the factory bevel and remove all interior burrs. Measure and place a homing mark on the pipe before assembling. The pipe installed under this specification shall be installed so that the initial deflection, measured as described below, shall be less than five percent (5%).

D. The Contractor will submit certification that the materials of construction have been sampled, tested, inspected, and meet all the requirements including wall thickness in accordance with ASTM D–3034 or ASTM F679 for all pipe and fittings to be included in project work. PVC pipe shall not be installed when the temperature drops below 32 degrees Fahrenheit or goes above 100 degrees Fahrenheit. During cold weather, the flexibility and impact resistance of PVC pipe is reduced. Extra care is required when handling PVC pipe during cold weather. PVC pipe shall not be stored outside and exposed to prolonged periods of sunlight, as pipe discoloration and reduction in pipe impact strength will occur. Canvas and other opaque material shall be used to cover PVC pipe when stored outside.

2.05 CLEANOUTS

A. Cleanouts for gravity sewers and force mains shall be provided at locations indicated on the plans or as directed by the Engineer. Cleanout frames and covers shall be of tough gray cast iron. Castings shall be true to pattern and free from flaws. The bearing surface of cleanout frames and covers against each other shall be machined to give continuous contact throughout their circumference.

2.06 PIPELINE INSULATION

A. Approved sewer lines with less than four feet (4'–0") of cover over the crown, five (5'–0") in plowed areas that cross a storm sewer, or where indicated on the plans, shall be protected against freezing by the installation of two inch (2") thick highest available density extruded polystyrene insulating sheets or equivalent. Sheets shall be the the lesser of 3' or 2 x diameter of the pipe. The sheets shall be placed six inches (6") above the crown after placement of four to six inches (4"–6") of clean medium or coarse sand below the pipe bottom and four to six inches (4"–6") above the crown. Joints shall be overlapped so there is no gap that will allow frost to penetrate. Care shall be exercised during backfill and compaction over the polystyrene sheets to prevent damage to the sheets. The polystyrene sheets shall meet the comprehensive strength requirements of ASTM D1621–73. In no cases shall the waterline have less than four feet (4') of cover over the top of the pipe. When sewer line passes within 5 feet of a catch basin install 2" min. rigid insulation, polystyrene sheets, between sewer line and cb.

PART 3 – EXECUTION

3.01 GENERAL

A. Care shall be exercised by the Contractor to avoid disrupting the operation of existing sanitary sewer facilities without prior written approval of the Engineer.

B. When existing underground utilities not scheduled for removal or abandonment are encountered in the excavation, they shall be adequately supported and protected from damage. Any damage to utilities shall be repaired promptly at no additional cost to the Owner.

C. Installation of pipe shall be in accordance with the Utility Trenching and Backfilling and as specified by this section.

3.02 BEDDING FOR PIPE

A. The bedding material shall be shaped to fit the pipe for a depth of not less than 10 percent of its total height and shall have recesses to receive the bell.

3.03 LAYING PIPE

A. In general, sewer pipe shall be installed in accordance with the latest detailed instructions of the manufacturer.

B. The laying shall begin at the outlet end and the lower segment of the pipe shall be in contact with the shaped bedding throughout its full length. Bell or grooved ends of rigid pipes and the circumferential laps of flexible pipe shall be placed facing upstream.

C. All pipe and fittings shall be carefully examined for defects and no pipe or fittings shall be laid which are known to be defective. If any defective piece is discovered after laying, it shall be removed and replaced at the Contractor's expense. All pipes and fittings shall be cleaned before they are laid and shall be kept clean until accepted in the completed work.

D. The pipe shall be laid to conform to the lines and grades indicated on the drawings or given by the Engineer. Each pipe shall be so laid as to form a close joint with the next adjoining pipe and to bring the inverts continuously to the required grade.

E. The Contractor shall take all necessary precautions to prevent flotation of the pipe in the trench.

F. When pipe laying is not in progress, the open ends of the pipe shall be closed with temporary watertight plugs. If water is in the trench when work is resumed, the plug shall not be removed until all danger of water entering the pipe is eliminated.

G. Any pipe that is not laid to grade and alignment shall be re–laid to the satisfaction of the Town Wastewater Department. The bedding material shall be placed and compacted on each side of the pipe to a height equal to one–half (1/2) the pipe diameter and for the full width of the excavated trench and as shown on the accepted plans. Bedding shall be #2 pea stone from Shelburne Limestone or an equivalent approved by the Town Wastewater Department and the Engineer.

H. All sewer pipes shall be marked with magnetic marking tape. The marking tape shall be installed one (1) foot directly over . Concrete thrust blocks "sewer "the pipe and shall be labeled or anchors shall be placed at bends, tees, fittings, and other locations on the force main as shown on the contract drawings or as directed by the Town Wastewater Department. Concrete for thrust blocks and anchors shall be Class B concrete. Steel rods and clamps as required shall be galvanized and rust proofed or painted.

3.04 GRAVITY SEWER PIPE TESTING

A. The Contractor shall provide all necessary equipment and instrumentation required for proper completion of the flushing and testing. Quality of water, test procedures, and method of disposal of water shall be approved by the Engineer. Prior to testing, flush with water to remove construction debris and pass through a full gauge squeegee.

B. All tests shall be made in the presence of the Engineer. Preliminary tests made by the Contractor without being observed by the Engineer will not be accepted. The Engineer will be notified at least eight hours before any work is to be inspected or tested. The Town shall be notified at least at least two (2) days before testing.

C. The maximum sewer length to be tested at one time shall be that length between any two manholes.

D. Air Testing: Low pressure air testing shall be conducted in accordance with the following procedures:

1. Each end of the test section and laterals shall be plugged, capped and braced. Necessary safety precautions shall be taken to prevent blowouts and possible injury.
2. An air hose shall be connected to a tapped plug used for an air inlet. The hose will be connected to the air control equipment, which shall include valves and pressure gauges. These shall allow air to enter the sewer test line, monitor air pressure in the sewer, shut off air, and provide pressure reduction and relief. The monitoring pressure gauge shall have a range of 0–10 psi with divisions of 0.10 psi and accuracy of 0.05 psi±.
3. The air compressor and air supply shall be connected to the test line and the test section filled slowly, until a constant pressure of 4.0 psig is maintained.
4. A pressure above 3.0 psig shall be maintained for at least five minutes to allow the temperature to stabilize. A check for leaks shall be made and if any are found, the pressure shall be released and the fitting replaced or repaired.
5. After the stabilization period, the pressure shall be adjusted to 3.5 psig and the air supply disconnected.
6. Measure and record the time interval for the test line pressure to drop from 3.5 psig to 2.5 psig.
7. If the groundwater table is above the pipe, increase above test pressures 0.5 psig for each foot the groundwater is above the invert of the pipe.
8. The requirements of this specification shall be considered satisfied if the time required in seconds for the pressure to decrease from 3.5 to 2.5 psi greater than the average back pressure of any groundwater that may submerge the pipe is not less than that computed according to the following table:

Minimum Test Time for Various Pipe Sizes

| Diameter (Inches) | Time (Sec./100 Ft.) |
|---|---|
| 4 | 18 |
| 6 | 45 |
| 8 | 75 |
| 10 | 90 |
| 12 | 110 |

3.05 SERVICE CONNECTION

No sanitary sewer shall be placed in service until such time as the Town has given final approval to the sewer installation, including satisfactory completion of all required tests. Service connections shall not be made until all receiving sewer mains have been completed and approved and as–builts received along with GPS coordinates and approved by the Town Wastewater Department.

A. Laterals

Where required on the plans, sewer service connections for one house shall be constructed of four inch (4") pipe, unless otherwise noted on the plans, of the type material specified under this section. The pipe shall be laid and its joints made as required for sewer construction in this specification. Open ends of pipes shall be properly sealed to prevent damage and intrusion of foreign matter where hookup to the building sewer is not coincident with sewer main construction. Additionally, the Contractor will provide a stable, temporary marker approved by the Town Wastewater Department from the sewer service invert up to six inches (6") above the finish grade and seated securely into the ground for ease in relocating the end of sewer service connection for hooking up the building sewer. Two (2) tie points to permanent objects shall be documented. The tie points shall be submitted to the homeowner and to the Wastewater Department.

In the case of reconnection of existing services, such reconnection will be made only after the new sewer main has been completed, tested, and accepted. The excavation, bedding material, installation, and backfill for service connections shall be the same as for sewer mains.

B. Cleanouts for Sewers

Cleanouts for gravity sewers and force mains shall be provided at locations indicated on the plans or as directed by the Town Wastewater Department. Cleanout frames and covers against each other shall be machined to give continuous contact throughout their circumference. All iron castings shall be thoroughly cleaned and then coated with hot coal tar before being delivered. Individual laterals shall have cleanouts every one hundred feet (100'). Cleanouts shall also be installed in laterals with changes of alignment of 45 degrees or greater.

## WATER SUPPLY SERVICE

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:

1. Pipe Materials
2. All other appurtenances necessary to complete the water main system as shown on the Contract Plans.

1.02 SUBMITTALS

A. Product Data: Submit published data from manufacturers of products and accessories specified, indicating compliance with requirements to the Engineer and local municipality.

1.03 QUALITY ASSURANCE

A. All materials and the installation procedure shall be in accordance with the Department of Environmental Conservation, Water Supply Division and the applicable construction ordinances of the local municipality.

PART 2 – PRODUCTS

2.01 GENERAL

A. Furnish ells, tees, reducing tees, wyes, couplings, increasers, crosses, transitions and end caps of the same type and class of material as the conduit, or of material having equal or superior physical and chemical properties as acceptable to the Engineer as necessary to complete the water system.

2.02 PIPE BEDDING

A. Water lines shall be laid and maintained on lines and grades established by the plans for the project. Pipeline trenches shall be excavated to the width and depths shown on the plan typicals. Pipeline trenches in which pipe is to be laid directly on the trench bottom shall not be excavated entirely by machinery, but shall be finally excavated by hand tools such that the trench shall have a bottom shaped to support the pipe throughout its entire length by firm and undisturbed material. Pipeline trenches, for which bedding is required, may be excavated to the required depths using machinery. No pipe shall be laid directly on ledge, hard shale or a very compact glacial till. When an unstable trench bottom is encountered and the Town Water Department determines that it cannot support the pipe adequately, an additional depth shall be excavated and refilled to the pipe invert with approved material at the contractor's expense. Pipeline trenches shall be dry during the laying of pipe. Wood supports under pipe shall be removed prior to backfilling. Pipeline installation procedures can be found in AWWA Standard C600.

B. Bedding material shall consist of crushed or natural stone conforming to ASTM D2321.

| Sieve | Percent Passing |
|---|---|
| 1" Screen | 100% |
| ¾" Screen | 100% |
| ½" Screen | 90 – 100% |
| ⅜" Screen | 40 – 70% |
| No. 4 Sieve | 0 – 15% |

C. Bedding and blanket material shall be Class II material (ASTM D2321) consisting of clean, granular material (sand), particle size limits described as follows:

| Sieve | Percent Passing |
|---|---|
| No. 4 | 100% |
| No. 100 | 30% |
| No. 200 | 12% |

2.03 PIPELINE INSULATION

A. Approved waterlines with less than six feet (6'–0") of cover over the crown, that cross a storm sewer, or where indicated on the plans, shall be protected against freezing by the installation of two inch (2") thick highest available density extruded polystyrene insulating sheets or equivalent. Sheets shall be the the lesser of 3' or 2 x diameter of the pipe. The sheets shall be placed six inches (6") above the crown after placement of four to six inches (4" – 6") of clean

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medium or coarse sand below the pipe bottom and four to six inches (4" – 6") above the crown. Joints shall be overlapped so there is no gap that will allow frost to penetrate. Care shall be exercised during backfill and compaction over the polystyrene sheets to prevent damage to the sheets. The polystyrene sheets shall meet the comprehensive strength requirements of ASTM D1621–73. In no cases shall the waterline have less than four feet (4') of cover over the top of the pipe.When water line passes within 5 feet of a catch basin install 2" min. rigid insulation, polystyrene sheets, between water line and cb.

2.04 SERVICE CONNECTIONS

A. Service lines shall be installed so as to run perpendicular, in a straight line from the water main to the curb stop.

B. Each service shall consist of a corporation, curb stop, copper tubing and a curb box with a cast iron or stainless steel service rod. Service lines from three–quarter to two inch (3/4" to 2") shall be copper tubing from the corporation stop to the curb stop. Copper tubing shall be type "K", soft temper, conforming to ASTM B88. The name or trademark of the manufacturer and type shall be stamped at regular intervals along the pipe. Copper service pipe shall be one piece from the corporation to the curb stop. The minimum service for a single–family residence shall be three–quarter inch (3/4"). The minimum service for a duplex shall be one inch (1").

C. Corporations shall be AY McDonald or Cambridge Brass Low–Lead and manufactured in accordance with AWWA C800. Corporations shall have threads per AWWA C800 Table 7 / Figure 2, at the inlet and a compression type fitting at the outlet. Both inlet and outlet shall be the same size. Three–quarter inch and one–inch corporations shall be directly tapped into ductile iron pipe six inches (6") and larger in diameter. Larger size corporations up to two inches (2") shall use a tapping saddle. Pipe less than six inches (6") shall require the use of a tapping saddle and corporation. Corporations shall be used for all taps up to two inches (2"). In no instance, except when a tapping sleeve and valve are used, shall a tap be made without a corporation. Corporations shall be Mueller 110 (3/4" – 1"), or Mueller H 15013 (1 1/2" – 2"). A connection made to a pipe that requires a tapping saddle or is not ductile iron will have a body with a suitable outlet, seal, and suitable means for attachment to the main. The body shall be made to conform to the outside configuration of the main. The service saddle shall be designed to provide a drip tight connection. The body shall be Teflon or Epoxy coated with stainless steel strap(s), bolts, nuts, and mechanism for attaching to the pipe barrel.

D. Curb stops shall be a ball valve type with a minimum allowable pressure rating of 300 psi and be manufactured in accordance with AWWA C800. The curb stop shall open left, have a positive stop, be full port, provide drip–tight shutoff in the closed position and be of the tee design or flat design. No curb stop shall have the ability to drain the service line. Both the inlet and outlet of the curb stop shall have compression type fittings. The tee head of the curb stop shall have the provision for the connection of a service rod. Curb stops shall be AY McDonald or Cambridge Brass Low–Lead, or approved equal. The curb stop shall rest on a four inch by eight inch by sixteen–inch (4" x 8" x 16") concrete block for support. Curb stops shall be installed just inside the municipality R.O.W.

E. Curb boxes shall be of sliding adjustable type capable of adjusting from five feet to six feet (5' – 6') (Erie Style). The base of the box shall be arch type so as to prevent the box from resting on the curb stop. The adjustable upper section shall be one inch (1") diameter for use with 3/4" and 1" curb stops. For larger curb stops, the upper section shall be 1 1/4" in diameter. Stationary rods affixed to the key of the curb stop with a brass pin shall be thirty inches (30") in length for 3/4" and 1" curb stops and twenty–four inches (24") for large curb stops. Curb box rods may be cast iron or stainless steel, as determined by the Town Water Department. The word "WATER" shall be inscribed on the cover of the box.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Contractors shall notify the Town Water Department and Dig Safe at least seven days prior to any work on the water system.

B. Skilled workers experienced in such work shall install all items. Tools shall be adequate for the work and in good condition so as to produce good, clean cut threads of the correct size, pitch, and taper.

C. Installation of all water lines shall be in accordance with the latest version of AWWA C600 or AWWA C605 , as applicable, current edition.

D. Connection to an existing water main shall be done under the supervision of and with the approval of the Town Water Department. It is the applicant's, developer's, or owner of record's responsibility to secure ALL necessary connection permits and pay ALL applicable fees to make the connection, and to coordinate all parties involved in the process. The engineer and the Town Water Department shall be notified at least two working days in advance of the intended connection time. No existing valves, hydrants, curb stops, etc. shall be operated without prior approval of the Town Water Department. The Town Water Department shall operate all valves initially to ensure the integrity of the valve. The Town Water Department may then allow the contractor to operate those valves. Any damage occurring after the use of any valve operated by the contractor shall be the contractor's responsibility.

E. Care shall be taken to prevent damage to valves and other appurtenances during handling and installation. All materials shall be carefully inspected for defects in workmanship and materials; all debris and foreign matter cleaned out of valve openings, etc.; all operating mechanisms operated to check their proper functioning, and all other nuts and bolts checked for tightness. Valves and other equipment, which do not operate easily, or are otherwise defective, shall be replaced. All valves shall be carefully incorporated into the water main and supported in their respective positions free from all distortion and strain. Valves and valve boxes shall be set plumb. Valve boxes, besides being plumb, shall be centered directly over the valves.

F. All pipes showing cracks shall be rejected. If cracks occur in the pipe, the contractor may, at his own expense and after approval of the Town Water Department, cut off cracked portions at a point at least twice the pipe diameter from the visible limits of the crack and use the sound portion of the pipe.

G. All water mains shall have no less than six feet (6') of cover unless waived by the Town Water Department. The pipe shall be laid to conform to the lines and grades indicated on the Department. The Town Water Department may restrict work before November 15 and after April 1 during adverse weather conditions. The Town Water Department may not allow excavating for water mains during the winter months except by special permission for emergencies. Each pipe shall be laid so as to form a close joint with the next adjoining pipe and to bring the inverts continuously to the required grade. In no cases shall the waterline have less than four feet (4') of cover over the top of the pipe.

H. Temporary support, adequate protection, and maintenance of all underground structures, drains, sewers and other obstructions encountered in the progress of the work shall be provided at all times. If utility service is interrupted as a result of work for the project, the contractor shall immediately restore service by repairing the damaged utility at the contractor's expense.

I. At all times, when pipe laying is not actually in progress, the open ends of the pipe shall be closed by temporary watertight plugs or by other approved means. If water is in the trench when work is resumed, the plug shall not be removed until all danger of water entering the pipe has passed. During construction, the contractor shall conduct operations so as to prevent the accumulation of water, ice, and snow in the vicinity of excavations or in the vicinity of excavated areas, and to prevent water from interfering with the progress and quality of the work.

J. Under no conditions shall water be allowed to rise in open trenches after pipe has been laid.

K. Accumulated water, ice, and snow shall be promptly removed and disposed of by pumping or other approved means. Disposal shall be carried out in a manner that will not create a hazard to public health, nor cause injury to public or private property, work completed or in progress, or public streets. Disposal shall not cause any interference in the use of streets and roads by the public. Pipes under construction shall not be used for drainage of excavations.

L. Any deflection of joints in pipe up to twelve–inch (12") diameter shall be within the limits specified by the manufacturer, but not to exceed five degrees or nineteen inches (19") per eighteen feet (18') of pipe length.

M. Concrete thrust blocks shall be installed on all hydrants, plugs, tees, and bends deflecting 11 1/4 degrees or more. Concrete thrust blocks shall be used in conjunction with "Mega–Lug" restraining glands or equivalent. Care shall be taken to ensure that concrete will not come into contact with flanges, joints, or bolts. The required area of thrust blocks shall be indicated on plan typicals and approved by the Town Water Department. Concrete shall be placed against undisturbed soil. Wooden side forms or equal shall be provided for thrust blocks. No backfilling shall be allowed until concrete masonry has set sufficiently. Where directed by the Town Water Department or engineer, concrete encasement of the waterline may be made for stream crossings and similar purposes. Where required on the plans or as directed by the Town Water Department or engineer, a concrete cradle shall be used to bolster and strengthen the pipe. The Town Water Department or his designee shall inspect all thrust blocks prior to backfilling.

N. All trenching safety standards shall be in conformance with all applicable State and Federal guidelines. The contractor shall be solely responsible for any safety citations by State or Federal inspectors.

O. There shall be no physical connection between the distribution system and any pipes, pumps, hydrants, or tanks that are supplied with water that is, or may be, contaminated.

P. As necessary, temporary PVC markers shall be supplied at all gate valves, curb boxes, and at the end of water lines to a minimum of twelve inches (12") above finish grade until accepted by the Town Water Department.

Q. All surplus material and debris shall be removed as the project progresses, leaving all areas clean and presentable.

R. Unless otherwise required, all paving and sidewalks that may be damaged during construction shall be replaced with the same kind of material that previously existed.

S. The contractor shall be responsible for proper protection of persons and property on the project. The contractor shall barricade open holes and depressions occurring as part of the work, and post warning lights on adjacent property to or with public access.

T. Warning lights shall be operated during hours from dusk to dawn and as otherwise requested.

U. The contractor shall protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by construction operations.

V. No water lines shall be installed after November 15 or before April 1 without prior approval of the Town Water Department.

3.02 BACKFILLING

A. Trenches shall be backfilled to subgrade with, wherever possible, material excavated from the trench, and shall be done only after the approval of the Town Water Department. Material for backfilling shall be free of roots, stumps, and frost. Backfill shall not be placed on frozen material. Materials used for backfilling trenches shall be free of stones measuring more than twenty four (24) pounds. No stones measuring over three inches (3") in the longest dimension shall be placed within one foot (1') of the pipeline being backfilled. Stones found in the trench shall be removed for a depth of at least six inches (6") below the bottom of the pipe. In general, use of blasted rock as trench backfill will not be permitted.

B. Backfill material shall be tamped in layers around the pipe to a sufficient height above the pipe to adequately support and protect the pipe. Backfill for pipelines shall be placed in six inch (6") lifts, each lift being compacted to not less than 95% of maximum dry density as determined by the AASHTO–T–99 Standard Proctor. If conditions warrant, the backfilling of trenches may be done with mechanical equipment. Particular precautions shall be taken in the placement and compaction of the backfill material in order not to damage the pipe, pipe coating or structure. The backfill shall be brought up evenly. Around valve boxes, the backfill shall be tamped to a distance of four feet (4') on all sides of the box, or to the undisturbed trench face, if less than four feet (4'). Backfilling in all public roadways shall be so compacted as to leave no depression in the road. Additional backfill requirements may apply within State or local Highway Right–of–Ways. All public road surfaces shall be restored to a condition at least equal to that which existed prior to the start of construction. Precautions shall be taken against undue damage to existing surface materials.

C. No compacting shall be done when the material is too wet to be compacted properly. At such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compaction, or such other precautions are taken as may be necessary to obtain proper compaction.

D. Surplus excavated materials shall be disposed of in a satisfactory manner. Surplus material or spoil shall be removed promptly and disposed of so as not to be objectionable to abutters or the general public.

E. Trenches that have been improperly backfilled, enclosed or covered before inspection of fittings and joints shall be reopened and re–backfilled at the contractor's expense.

3.03 WATER/SEWER SEPARATION

A. Water mains crossing sewers shall be laid to provide minimum vertical distance of eighteen inches (18") between the outside of the water main and the outside of the sewer line. This shall be the case where the water main is either above or below the sewer. At crossings, one full length of pipe shall be located so both joints will be as far from the sewer as possible. This vertical separation shall be maintained for that portion of the water main located within ten feet (10') horizontally of any sewer it crosses. Water mains must be laid at least five feet (5') horizontally from any existing or proposed storm sewer and ten feet (10') from any existing or proposed sanitary sewer.

B. When it is impossible to obtain horizontal and vertical separation on new installations, both the water main and sewer main shall be constructed of waterworks material with watertight joints and shall be pressure tested before backfilling. A PVC sleeve may be required for one or both mains in addition to the waterworks material. Lines may also be encased in concrete as required by the Retail Department. No water main shall pass through or come in contact with any part of a sewer manhole.

C. Distribution lines shall not be placed closer than fifty feet (50') horizontal distance from any septic tank or leach field unless approved by the VT Water Supply Rule Provisions under Chapter 21.8.6.4 or the Town Water Department.

D. Force main crossing shall be arranged so that at least one full length of sewer pipe is centered above or below the water line, with the sewer joints as far as possible from the water joints. The new force main line shall be constructed to water main standards for a minimum of twenty feet (20') on either side of the crossing. The section constructed to water main standards shall be pressure tested to maintain 50 psi for fifteen (15) minutes without leakage prior to backfilling. In those areas that proper cover cannot be provided, proper insulation shall be installed.

E. Sewer and waterline separation shall conform to all VT Water Supply Rule requirements, and installed in accordance with the latest edition of the "Ten States Standards – Recommended Standards for Water."

3.04 TESTING AND DISINFECTION

A. All water mains shall be constructed, tested and disinfected in accordance with AWWA Standards C–600, C–605, C651 and The Vermont Water Supply Rule. All tests shall be conducted by and at the expense of the Contractor.

1. The Contractor shall furnish all gauges, testing plugs, caps and all other necessary equipment and labor to perform leakage and pressure tests in sections of an approved length. Each valved section, including hydrant laterals, or a maximum length of 1,000 feet of pipe shall be tested. The Contractor shall provide at his own expense any additional taps to the water line necessary to perform the pressure and leakage test between valves. All didinfection/testing shall be completed by an independent third party unless otherwise approved by the Engineer or local municipality.

2. All water required for testing shall be potable. All testing shall be conducted in the presence of the Engineer.

3. The Contractor shall make the necessary provisions to tap the pipe at the high point to release all air and shall plug same after completing the test. Hydrants or blowoffs located at high points may be used for air release in lieu of taps if approved by the Engineer.

4. For the pressure test, the Contractor shall develop and maintain for two hours, 150% of the working pressure, or 200 psi, whichever is greater. Failure to hold within 5 psi of the designated pressure for the two hour period constitutes a failure of the section tested.

5. No pipe installation shall be accepted if the leakage is greater than that determined by the following. Maximum allowable leakage will be:

$$L = \frac{SD\sqrt{P}}{148{,}000} \quad \text{or} \quad L = \frac{ND\sqrt{P}}{7{,}400}$$

whichever is less

Where:

L = allowable leakage, in gallons per hour
S = length of pipe tested, in feet
D = nominal diameter of the pipe, in inches
P = average test pressure during the leakage test, in pounds per square inch (gauge).
N = Number of joints in the pipeline tested

All testing shall be conducted in accordance with AWWA C600 (latest edition)

6. Should any section of pipe fail either the pressure or leakage test, the Contractor shall do everything necessary to locate and repair or replace the defective pipe, fittings, or joints at no cost to the Owner.

7. Disinfection: Disinfection of the pipeline shall be directed by the Engineer and at the Contractor's expense. AWWA Standard C–651 shall be used as a basis for the disinfection process.

B. The Engineer or Town Water Department will require as minimum:

1. Complete flushing of the pipeline to wash out all dirt, debris, etc. which may have accumulated in the pipeline during construction. A reducing agent shall be used at the point of flushing to eliminate the free chlorine residual per the direction of the Town Water Department.

2. Following flushing to clean clear water, the Contractor will add chlorine through continuous feed to the entire pipeline volume of water such that the water will have not less than 25 mg/L free chlorine, and let the mixture set for at least 24 hours.

3. After the 24–hour duration, the water in the pipeline shall be tested for residual free chlorine and must contain a minimum of 10 mg/L chlorine. If less than 10 mg/L are found, then the disinfection procedure shall be repeated until at least 10 mg/L chlorine residual is indicated by test.

4. Upon successful completion of step 3 above, the pipeline shall be flushed again until the chlorine concentration in the pipeline is no higher than that prevailing in the supply system. A reducing agent shall be used to eliminate the free chlorine residual in the flushing process per the direction of the Town Water Department.

C. After final flushing and before the new water main is connected to the distribution system, two consecutive sets of acceptable samples, taken at least 24 hours apart, shall be collected from the new main, and submitted to the Vermont Health Department for analysis. At least one set of samples shall be collected from every 1,000 feet of the new water main, plus one set from the end of the line and at least one set from each branch. All samples shall show the absence of coliform organisms and, if required, the presence of a chlorine residual (AWWA C651–99). If the initial disinfection fails to produce samples which pass the V.S.H.D. requirements for potable drinking water, then the new main shall be reflushed and shall be resampled until satisfactory test results are obtained.

D. Upon satisfactory results by the Vermont State Health Department, the pipeline may be placed in service. All costs for water, materials, equipment and labor to perform the required testing disinfection, and flushing of the pipeline shall be paid by the Contractor.

3.05 SUBMITTAL OF TEST RESULTS

A. A. The Applicant or Project Engineer shall be responsible for submittal of test results to the Town Water Department. The Applicant or Project Engineer shall also provide a letter to the Town Water Department certifying that the water system has passed all tests, is constructed in accordance with the approved plans, except as may have been modified by approved Change Order, and is in condition to be placed in service. Submittal of all test results shall be required prior to the water main being placed into service.

3.06 FINAL INSPECTION

A. For one year from the date the new system is placed into service, the applicant's developer/contractor will be responsible for any necessary repairs or corrections as part of the project warranty. At the end of a one–year period, an inspection will be performed by the Town Water Department prior to the system owner assuming ownership of any of the lines and appurtenances. The contractor shall correct any punch list items accumulated during the inspection after receipt of this list. Incomplete work on the system shall not be included in the initial inspection, but shall be inspected as the project continues. The contractor shall repair, replace, or retest promptly as directed by the Town Water Department and without further charges, all work equipment, materials or parts, which may fail during the one year warranty period.

B. A final walk–through inspection shall be conducted by the Town Water Department prior to the water system being accepted for ownership by the system owner. This inspection shall include but not be limited to:

1. Curb stops operating properly.

2. Covers set plumb and at proper elevations.

3. Curb boxes inside ROW, set to grade, containing operating rod, and plumb.

4. Tie information and record drawings complete and submitted.

5. Material testing results, lab reports, manufacturers' certificates, and leakage test results complete and on file.

6. General appearance and restoration.

7. Submittal of As–Builts in hard copy format and Auto–CAD.DWG Version 2000 format or newer within 14 days of completion.

3.07 GENERAL INFORMATION

A. All persons taking water must keep the fixtures and service pipe within their own premises in good repair and fully protected from frost, and must prevent unnecessary leakage of water. The Town Water Department shall not be liable for leakage of hydrants, pipes or fixtures upon the premises of any consumer, nor for obstructions therein by freezing or otherwise, nor for damages resulting from any of the forgoing causes. All leaks that are on the building side of the curb stop will be the owner's responsibility and repaired at the owner's expense.

B. Water rates shall be collected for all water used until the water is shut off at the curb stop by the Town Water Department. No abatement of water rates will be allowed by reason of disuse, diminished use, or vacancy of premises without proper notice to the Town Water Department.

C. The Town Water Department or system owner shall not be liable for any injury, loss or damage of whatever nature occasioned by the failure to maintain a constant or uniform pressure in the water mains, or for damages occasioned by or growing out of a stoppage of said water by frost or other cause, or for damage occasioned by or growing out of an insufficient supply of the same, or for accident or damage of any kind caused by or growing out of the use or failure of said water.

D. No person shall open any hydrant or draw water there from except the Town Water Department personnel or persons under their direction, or the officers or designees of the municipal fire department and members of the fire companies under their direction for fire purposes, or those individuals who have been granted approval on a hydrant use application by the Town Water Department, in which case, all such usage shall be metered. Fines for unauthorized use of any hydrant or connection may be incurred, according to the Rules and Regulations of the Town Water Department.

E. One curb stop and one water meter shall be installed for each individual dwelling unit, condominium unit, apartment unit, commercial or office occupancy. Exceptions may be permitted in cases where a condominium association signs a binding agreement to be responsible for all collection of water bills. In cases where condominiums are converted into separate apartments, separate curb stops and water meters shall be installed for each unit. Town Water Department employees shall install all water meters. Under no circumstances are plumbers or persons other than those authorized by the Town Water Department permitted to turn water on or off at the curb stop. The water will not in any instance be turned on to any premise for use until the Town Water Department has suitably attached a meter.

F. The owner of the premises shall be responsible for all water payments. A change of tenants or premises will not relieve the owners from payment of a back bill.

SITE ENGINEER:
CIVIL ENGINEERING ASSOCIATES, INC.
10 MANSFIELD VIEW LANE, SOUTH BURLINGTON, VT 05403
802-864-2323 FAX: 802-864-2271 web: www.cea-vt.com

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OWNER:

VERMONT NATIONAL GUARD

VERMONT ARMY NATIONAL GUARD

CAMP JOHNSON
COLCHESTER, VERMONT

PROJECT:

CAMP ETHAN ALLEN TRAINING SITE

ENTRY IMPROVEMENTS

CAMP ETHAN ALLEN
TRAINING SITE
UNDERHILL, VT

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/30/2017 | BCE | BID DOCUMENTS |

SITE SPECIFICATIONS

DATE 8/30/2017
SCALE AS SHOWN
PROJ. NO. 17100.05

DRAWING NUMBER C4.2

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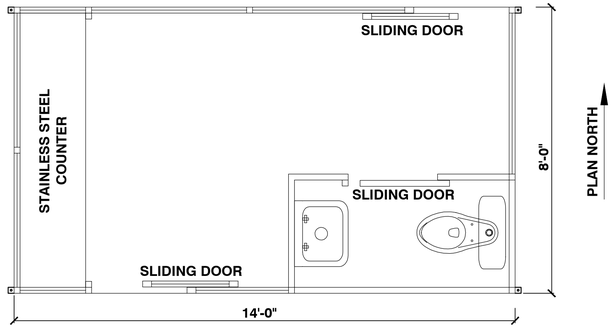


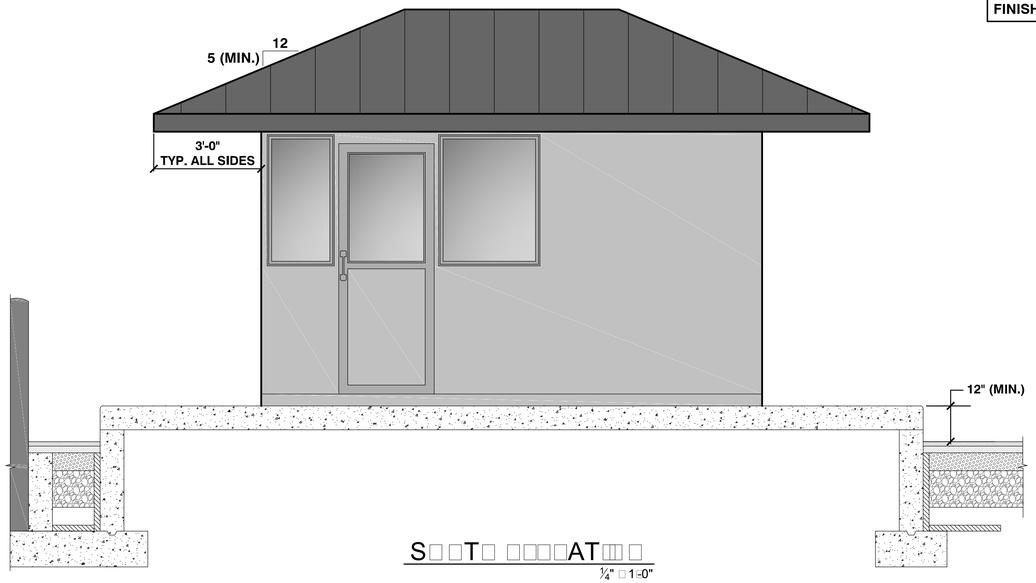

## FLOOR PLAN

SCALE: ½" = 1'-0"

**PRE-FABRICATED GUARD HOUSE**
**SIZE: 8'x14'**
**WALLS: U.L. LEVEL 5 BULLET RESISTANT EXTERIOR WALLS, 16 ga. (MIN.) INTERIOR.**
**HIP ROOF: STANDING SEAM HIP STYLE ROOF WITH 8" FASCIA (or AS REQUIRED FOR HVAC SYSTEMS), AND 36" (MIN.) OVERHANG ON ALL SIDES.**
**FLOOR: 2" STAINLESS STEEL FRAME, 12 ga. STAINLESS STEEL TOP PLATE w/BLACK POLYVINYL COMMERCIAL BLACK RESILIENT TEXTURED, 20" x 20" INTERLOCKING TILES.**
**DOORS: (2) SLIDING, U.L. LEVEL 5 BULLET RESISTANT**
**GLASS: U.L. LEVEL 5 TINTED LAMINATED GLASS CLAD POLYCARBONATE.**
**LIGHTS: INTERIOR LED LIGHTING w/DIMMER SWITCH**
**LOAD CENTER: 14 POLE, 3 WIRE, SINGLE PHASE, 120/240v**
**OUTLETS: 4 DUPLEX OUTLETS**
**JUNCTION BOXES: 2 DATA/COMM BOX UNDER SHELF**
**SHELF: 24" DEEP STAINLESS STEEL**
**FINISH: 1 COLOR PAINTED**

**RESTROOM:**
**RESTROOM AREA WITH STEEL PARTITION WALLS, SLIDE DOOR WITH HARDWARE, PLUMBING WALL WITH INTERIOR REMOVABLE STEEL PANELS FOR ACCESS, HARD POINTS AND CUT-OUTS FOR PLUMBING LINES AND FIXTURES, 3" ROOF JACK FOR VENT TUBE, EXHAUST FAN, LIGHT, WATER HEATER, GRAB BARS, T.P. ROLL HOLDER, PAPER TOWELS AND SOAP DISPENSER. PROVIDE ALL FIXTURES INCLUDING STANDARD WATER CLOSET AND LAVATORY. THE PLUMBING FIXTURES AND ACCESSORIES WILL NEED TO BE INSTALLED BY THE CONTRACTOR.**

**HEATING/COOLING:**
**INSULATION (MIN.)**
**- WALLS, R-21**
**- ROOF, R-28**
**- FLOOR, R-10**
**SPLIT SYSTEM HVAC WITH 22,000 BTU COOLING AND HEAT PUMP HEATING. THE BOOTH WILL HAVE THE INTERIOR AIR UNIT FULLY INSTALLED AND RECESSED IN THE ACOUSTIC TILE CEILING, ALL WIRING TO THE BREAKER PANEL AND TO THE THERMOSTAT LOCATION. THE REFRIGERANT LINE, CONDENSATE LINE, AND POWER LINE WILL BE ROUTED IN THE ATTIC AND OUT THE BACK OF THE BOOTH IN A 16 ga. GALVANIZED STEEL CHASE (OR MANUFACTURERS STANDARD EQUIVALENT APPROACH). THE EXTERIOR HVAC CONDENSER UNIT WILL SHIP LOOSE AND THE POWER AND REFRIGERANT LINES WILL NEED TO BE CONNECTED TO THE CONDENSER BY A LICENSED MECHANICAL CONTRACTOR. THE CONTRACTOR WILL ALSO HAVE TO CHARGE THE CONDENSER WITH R-410A, INSTALL & PROGRAM THE THERMOSTAT AND RUN START-UP.**

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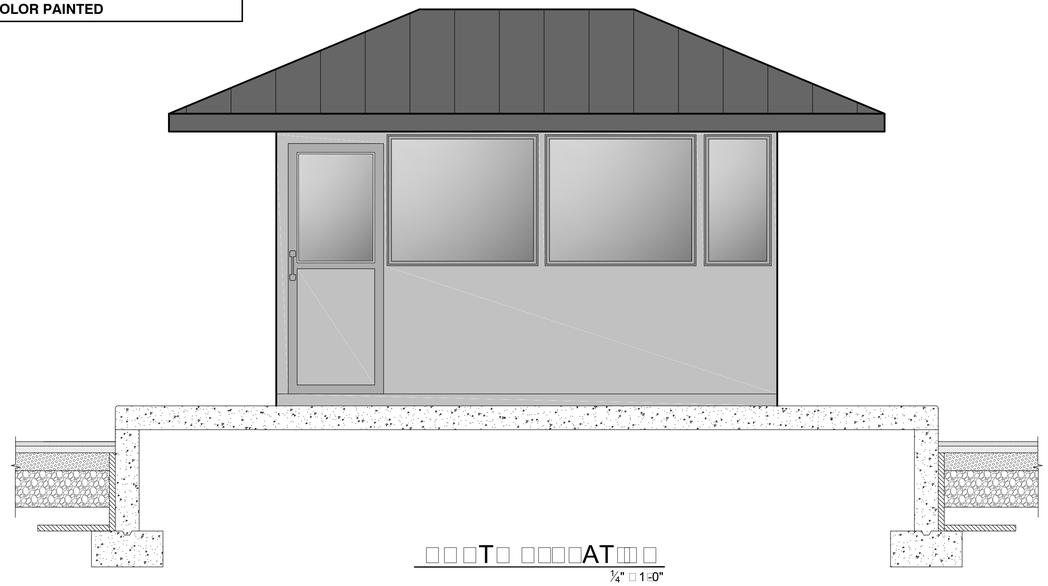

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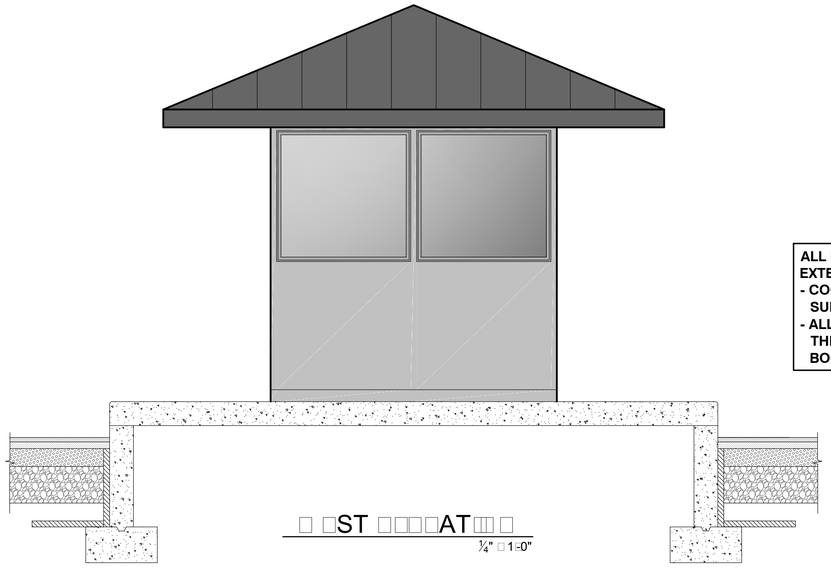

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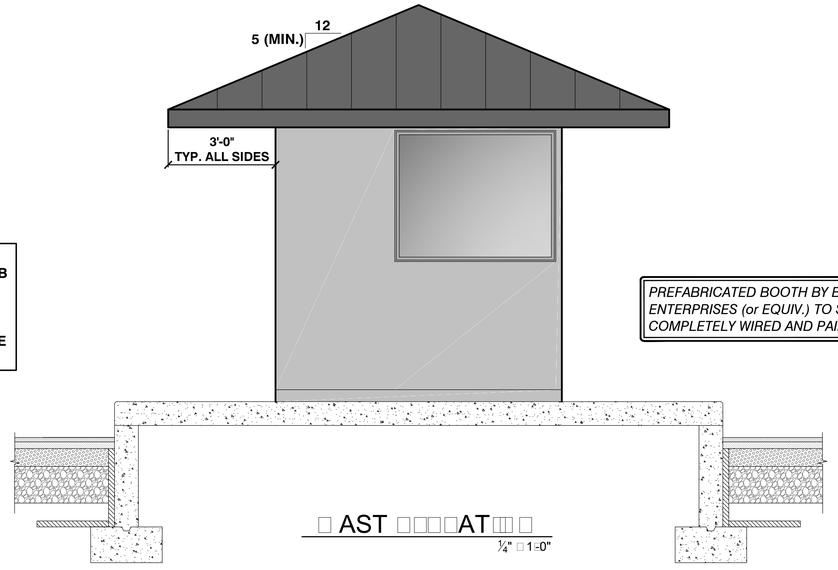
**ALL UTILITY SERVICES TO BE EXTENDED/STUBBED UP THROUGH THE SLAB**
**- COORDINATE LOCATIONS w/THE BOOTH SUPPLIER**
**- ALL CONNECTIONS TO BE COMPLETED BY THE CONTRACTOR IN CONJUNCTION w/THE BOOTH SHOPS**

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¼" □ 1□0"

*PREFABRICATED BOOTH BY B.I.G. ENTERPRISES (or EQUIV.) TO SHIP COMPLETELY WIRED AND PAINTED*


SITE ENGINEER:

CIVIL ENGINEERING ASSOCIATES, INC.
10 MANSFIELD AVENUE, SOUTH BURLINGTON, VT 05403-6405
802-864-2323 FAX: 802-864-2271 web: www.cea-vt.com



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APPROVED □C□

OWNER:

VERMONT NATIONAL GUARD

*VERMONT ARMY NATIONAL GUARD*

*CAMP JOHNSON*
*COLCHESTER, VERMONT*

PROJECT:

# *CAMP ETHAN ALLEN TRAINING SITE*

## *ENTRY IMPROVEMENTS*

*CAMP ETHAN ALLEN TRAINING SITE*
*UNDERHILL, VT*

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/30/2017 | BCE | BID DOCUMENTS |

## *GUARD HOUSE FLOOR PLAN and ELEVATIONS*

DATE 8/30/2017

SCALE AS SHOWN

PROJ. NO. 17100.05

DRAWING NUMBER **A1.0**


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## GENERAL NOTES

1. The structural drawings must be used in conjunction with the drawings and specifications from other disciplines.
2. All work shall be in accordance with the (IBC) International Building Code, 2015 edition, and the requirements of all local building codes.
3. The Contractor shall field verify all critical dimensions before fabrication of any materials.
4. All expansion bolts shall be as manufactured by Hilti, or approved equal. (See drawings for size and type.) Install in accordance with manufacturer's recommendations.
5. The structural drawings herein represent the finished structure. The Contractor shall provide all temporary guying and bracing required to erect and hold the structure in proper alignment until all structural work and connections have been completed. The investigation, design, safety, adequacy and inspection of erection bracing, shoring, temporary supports, etc. is the sole responsibility of the Contractor.
6. The Engineer shall not be responsible for the methods, techniques and sequences of the procedures to perform the work. The supervision of the work is the sole responsibility of the Contractor.
7. Contractors shall visit the site prior to bid to ascertain conditions which may adversely affect the work or cost thereof.
8. Shop drawings and other items shall be submitted to the Engineer for review prior to fabrication. All shop drawings shall be reviewed by the General Contractor before submittal. The Engineer's review is to be for conformance with the design concept and general compliance with the relevant Contract Documents. The Engineer's review does not relieve the Contractor of the sole responsibility to review, check and coordinate the shop drawings prior to submission. The Contractor remains solely responsible for errors and omissions associated with the preparation of shop drawings as they pertain to member sizes, details, dimensions, etc.

## CAST-IN-PLACE CONCRETE

1. Concrete shall be composed of Type I Portland Cement conforming to ASTM C150, fine and coarse aggregates conforming to ASTM C33, and mixing water free of oil, acid, or injurious amounts of alkalis and other salts. Air entraining admixtures shall conform to ASTM C260.

2. Concrete shall conform to the following compressive strength and slump requirements:

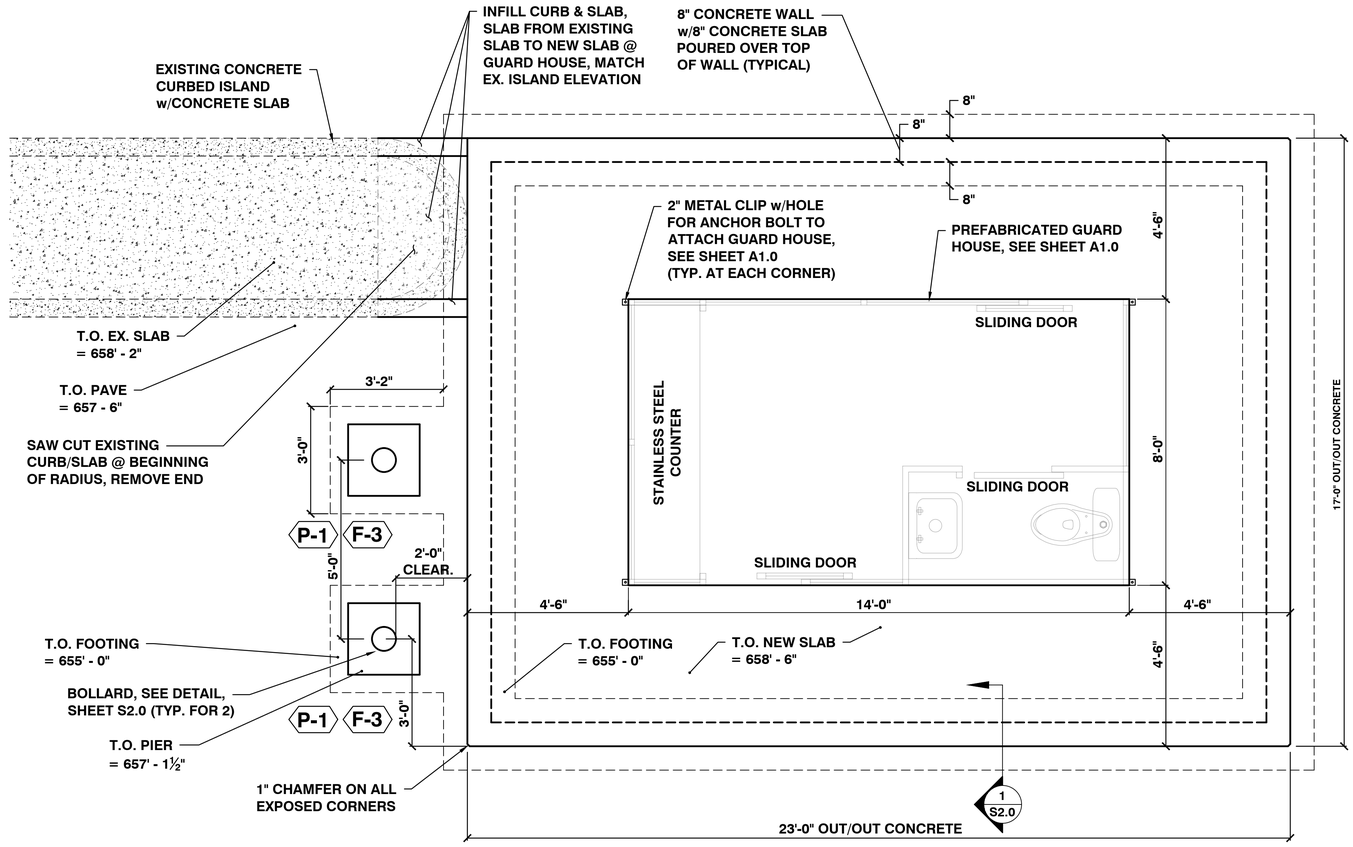
| Concrete Location | Min. f'c (28 days) | Slump* | Air Entrainment | max w/c |
|---|---|---|---|---|
| Footings | 3,000 psi | 4" max. | Not Required | 0.58 |
| Foundation walls/Columns/Piers | 3,000 psi | 4" max. | Required (5% ±1) | 0.58 |
| Interior Floor Slabs | 4,000 psi | 4" max. | Not Required | 0.50 |
| Exterior Conc. Slab | 4,000 psi | 4" max. | Required (6% ±1) | 0.45 |

* At Contractor's option, an approved admixture may be used to produce flowable concrete. Maximum slump shall not exceed 7 inches. If water reducing admixture is required for slabs, mid range admixture is recommended.

3. Chemical Admixtures: If used, provide admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water–soluble chloride ions by mass of cementitious material.
   A. Water–Reducing Admixture: ASTM C494, Type A.
   B. Retarding Admixture: ASTM C494, Type B.
   C. Water–Reducing and Retarding Admixture: ASTM C494, Type D.
   D. High–Range, Water–Reducing Admixture: ASTM C494, Type F.
   E. High–Range, Water–Reducing and Retarding Admixture: ASTM C494, Type G.
   F. Plasticizing and Retarding Admixture: ASTM C1017, Type II.
   G. Corrosion–Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C494/C494M, type C.
4. All concrete work shall conform to the requirements of ACI 301, "Specifications for Structural Concrete Buildings". Hot weather concreting shall be in accordance with ACI 305. Cold weather concreting shall be in accordance with ACI 306.
5. All reinforcing steel shall be set and tied in place prior to pouring of concrete, except that vertical dowels for masonry wall reinforcing may be "floated" in place. Do not field bend bars partially embedded in hardened concrete unless specifically indicated or approved by the Engineer. Support for reinforcing shall be via protected metal spacers, chairs, bolsters, or ties.
6. All edges of permanently exposed concrete surfaces shall be chamfered 3/4" unless otherwise noted.
7. Slabs on Grade
   A. Support for reinforcing shall be via protected metal spacers, chairs, bolsters, or ties.
   B. Slabs to be permanently exposed to weather shall be air entrained to 6% (±1%) with an admixture that conforms to ASTM C–260.
   C. In order to avoid concrete shrinkage cracking, place concrete slabs in an alternating lane pattern. The maximum length of slab cast in any one continuous pour shall be less than 80 feet.
   D. The use of polypropylene fibers (in lieu of welded wire fabric) is acceptable as outlined in the slab details and as authorized by the Engineer.
   E. See the architectural drawings for exact locations of depressed slab areas and drains. Slope slab to drains where shown.
   F. Slab joints shall be filled with approved material. This should take place as late as possible, preferably 4 to 6 weeks after the slab has been cast. Prior to filling, remove all debris from the slab joints, then fill in accordance with the Manufacturer's recommendations.
   G. Walkways and other exterior slabs are not indicated on the structural drawings. See the site plan and architectural drawings for locations, dimensions, elevations, jointing details and finish details.
   H. Provide finish in accordance with Owner requirements. Ramps shall have a broom finish. All other floors shall have a steel trowel finish.
   I. All slabs shall be kept continuously moist for a minimum of seven (7) days with water in full compliance with ACI 308. Curing sheets shall be used and are to remain in place during this period.
8. Under–slab Vapor Retarders shall conform to ASTM E–1745 with the following requirements:

| Criteria | ASTM Test Method | Class A | Thickness |
|---|---|---|---|
| Water Vapor Permeance | E–96 | 0.01 perms | 15 mils. (min.) |
| Tensile Strength | D–882 | 30.0 lbf/in | |
| Puncture Resistance | D–1709 Method B | 1700 grams | |

9. Protect newly placed concrete against low and high temperature effects and against rapid loss of moisture. Cure all concrete for at least seven (7) days at a temperature of at least 50 degrees Fahrenheit by approved curing methods. Forms may be stripped when the concrete has attained sufficient strength to carry its own weight and any applied loads.
10. Use corrosion–inhibiting admixture in concrete admixtures, not required in footings.
11. All floor areas shall receive a clear, Membrane–Forming Curing & Sealing Compound: ASTM C1315, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor coverings.
    A. Dissipating or strippable resin–based materials can be used for slabs receiving applied finishes or subsequent liquid surface treatments.
    B. Use solvent based, silane penetrating water–repellent sealer for slabs subject to chloride intrusion.




# FOUNDATION PLAN

SCALE: ½" = 1'-0"

## FOUNDATION NOTES

1. All footings have been designed based upon a max. soil bearing pressure of 2,000 psf. All footings shall bear on undisturbed, firm natural soil or compacted fill.
2. No unbalanced backfilling shall be done against foundation walls unless walls are securely braced against overturning, either by temporary bracing or by permanent construction.

## REINFORCING STEEL

1. All reinforcing steel shall be ASTM A615–Grade 60 and shall be detailed, fabricated and installed in accordance with the latest A.C.I. specifications.
2. Welded wire mesh (W.W.M.) shall be ASTM A185. Lap all splices 12" minimum. Securely fasten W.W.M. in place to prevent movement during concrete placement.
3. All horizontal rods are continuous. Lap all splices 30 diameters unless otherwise noted. Provide corner bars and dowel into existing walls. 4. Provide a clear cover from reinforcing steel to adjacent concrete surfaces as follows:
   A. Concrete cast against earth: 3"
   B. Formed concrete exposed to earth or weather:
      #5 and smaller – 1 1/2"
      #6 and larger – 2"
   C. Formed concrete not exposed to earth or weather:
      Slabs, walls – 3/4"

## RIGID INSULATION

Extruded–polystyrene board insulation: ASTM C 578, of type and density indicated below, with maximum flame–spread and smoke–developed indexes of 75 and 450, respectively:

1. Available manufacturers:
   a. DiversiFoam Products.
   b. Dow Chemical Company
   c. Owens Corning
   d. Pactiv Building Products Division
2. Type IV, 1.60 lb/cu. ft. minimum density, 25.0 psi compressive strength
3. Type VI, 1.80 lb/cu. ft. minimum density, 40.0 psi compressive strength
4. Type VII, 2.20 lb/cu. ft. minimum density, 60.0 psi compressive strength
5. Type V, 3.00 lb/cu. ft. minimum density, 100.0 psi compressive strength

## CONCRETE FIELD QUALITY CONTROL

1. Testing Agency: Contractor shall obtain a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
2. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
   A. Testing Frequency: Obtain at least 1 composite sample for each 50 cu. yd. or fraction thereof of each concrete mix placed each day.
   B. Slump: ASTM C 143; one test at point of placement for each load, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
   C. Air Content: ASTM C 231, pressure method; one test for each load, but not less than one test for each day's pour of each concrete mix.
   D. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each load.
   E. Compression Test Specimens: ASTM C 31; cast and laboratory cure one set of four standard cylinder specimens for each composite sample.
   F. Compressive–Strength Tests: ASTM C 39; test 1 specimen at 7 days and 2 specimens at 28 days. Retain one specimen for a 56 day test in the event the 28 day tests do not meet the specifications.
      i. A compressive–strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at 28 days.
3. Strength of each concrete mix will be satisfactory if average of any 3 consecutive compressive–strength tests equals or exceeds specified compressive strength and no compressive–strength test value falls below specified compressive strength by more than 500 psi.
4. Test results shall be reported in writing to Architect/Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive–strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7– and 28–day tests.

**FOOTING SCHEDULE**

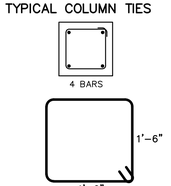
| FOOTINGS ⊗ | SIZE | REINFORCING |
|---|---|---|
| F–3 | 3'–0" x 3'–0" x 12" | 4 – #6's @ 10" O/C E/W |

ALL SPREAD FOOTINGS SHALL BE CENTERED IN BOTH DIRECTIONS UNDERNEATH THE PIERS UNLESS OTHERWISE SHOWN

**PIER SCHEDULE**

| PIER ⊗ | SIZE W x D | REINFORCING | TIES (TYP.)–(2) #4's @ TOP |
|---|---|---|---|
| P–1 | 24" x 24" | 4–#6 | #3 @ 12" O.C. |

TYPICAL COLUMN TIES




TYPE 'A' STIRRUP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802-864-2323 FAX: 802-864-2271 web: www.cea-vt.com



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VERMONT NATIONAL GUARD

*VERMONT ARMY NATIONAL GUARD*

*CAMP JOHNSON COLCHESTER, VERMONT*

PROJECT:

*CAMP ETHAN ALLEN TRAINING SITE*

*ENTRY IMPROVEMENTS*

*CAMP ETHAN ALLEN TRAINING SITE UNDERHILL, VT*

| DATE | CHECKED | REVISION |
|---|---|---|
| 8/30/2017 | BCE | BID DOCUMENTS |

*GUARD HOUSE FOUNDATION PLAN & DETAILS*

DATE 8/30/2017
SCALE AS SHOWN
PROJ. NO. 17100.05

DRAWING NUMBER S1.0

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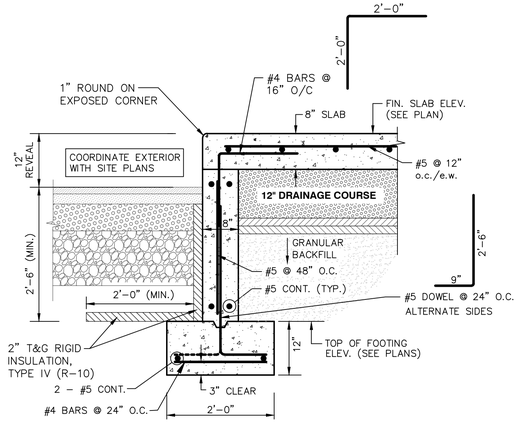
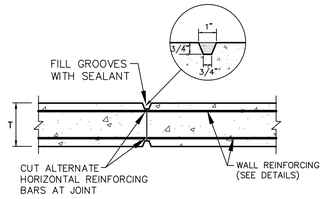
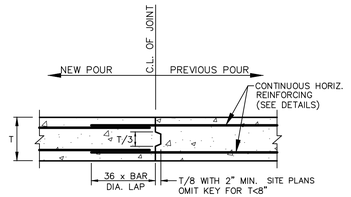



**1 S2.0 TYPICAL FOUNDATION WALL SECTION**
3/4" = 1'-0"



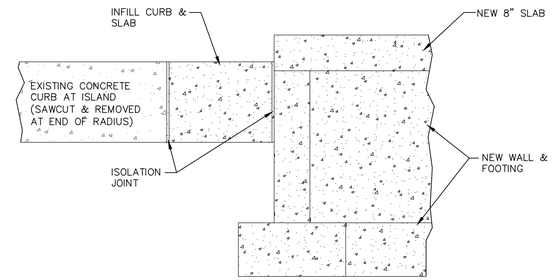

CONTROL JOINT



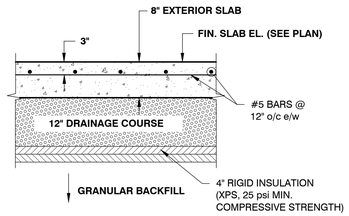

CONSTRUCTION JOINT

**4 S2.0 WALL CONSTRUCTION & JOINT DETAIL**
N.T.S.

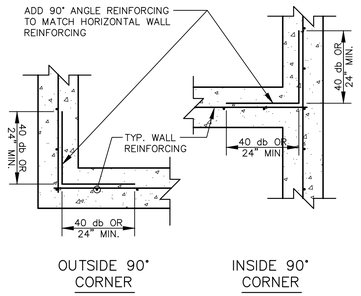
**NOTES:**
1. Construction or control joints shall be placed at points of minimum shear with a maximum distance between joints of 30' and maximum distance from corner of 15'.
2. No horizontal joints shall be permitted except as shown on the plans.
3. All foundation walls shall be adequately braced to withstand earth and construction load pressures.




**7 S2.0 CONNECTION @ EXISTING ISLAND**
N.T.S.



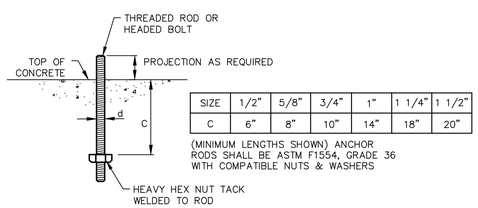

**2 S2.0 TYPICAL EXTERIOR SLAB SECTION**
3/4" = 1'-0"




**5 S2.0 CORNER REINFORCING DETAIL**
N.T.S.



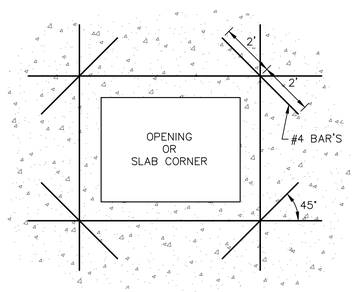

**8 S2.0 BOLLARD DETAIL**
N.T.S.




| SIZE | 1/2" | 5/8" | 3/4" | 1" | 1 1/4" | 1 1/2" |
|---|---|---|---|---|---|---|
| C | 6" | 8" | 10" | 14" | 18" | 20" |

(MINIMUM LENGTHS SHOWN) ANCHOR RODS SHALL BE ASTM F1554, GRADE 36 WITH COMPATIBLE NUTS & WASHERS

**3 S2.0 ANCHOR ROD SCHEDULE**
N.T.S.




**6 S2.0 ADDITIONAL REINFORCING AT OPENINGS IN CONCRETE SLABS OR WALLS**
N.T.S.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*COLCHESTER, VERMONT*

PROJECT:

*CAMP JOHNSON*

*BUILDING 5-10*

*CAMP JOHNSON*
*COLCHESTER, VT*

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| 8/30/2017 | BCE | BID DOCUMENTS |

*GUARD HOUSE FOUNDATION DETAILS*

DATE 8/30/2017
SCALE AS SHOWN
PROJ. NO. 17100.05

DRAWING NUMBER S2.0


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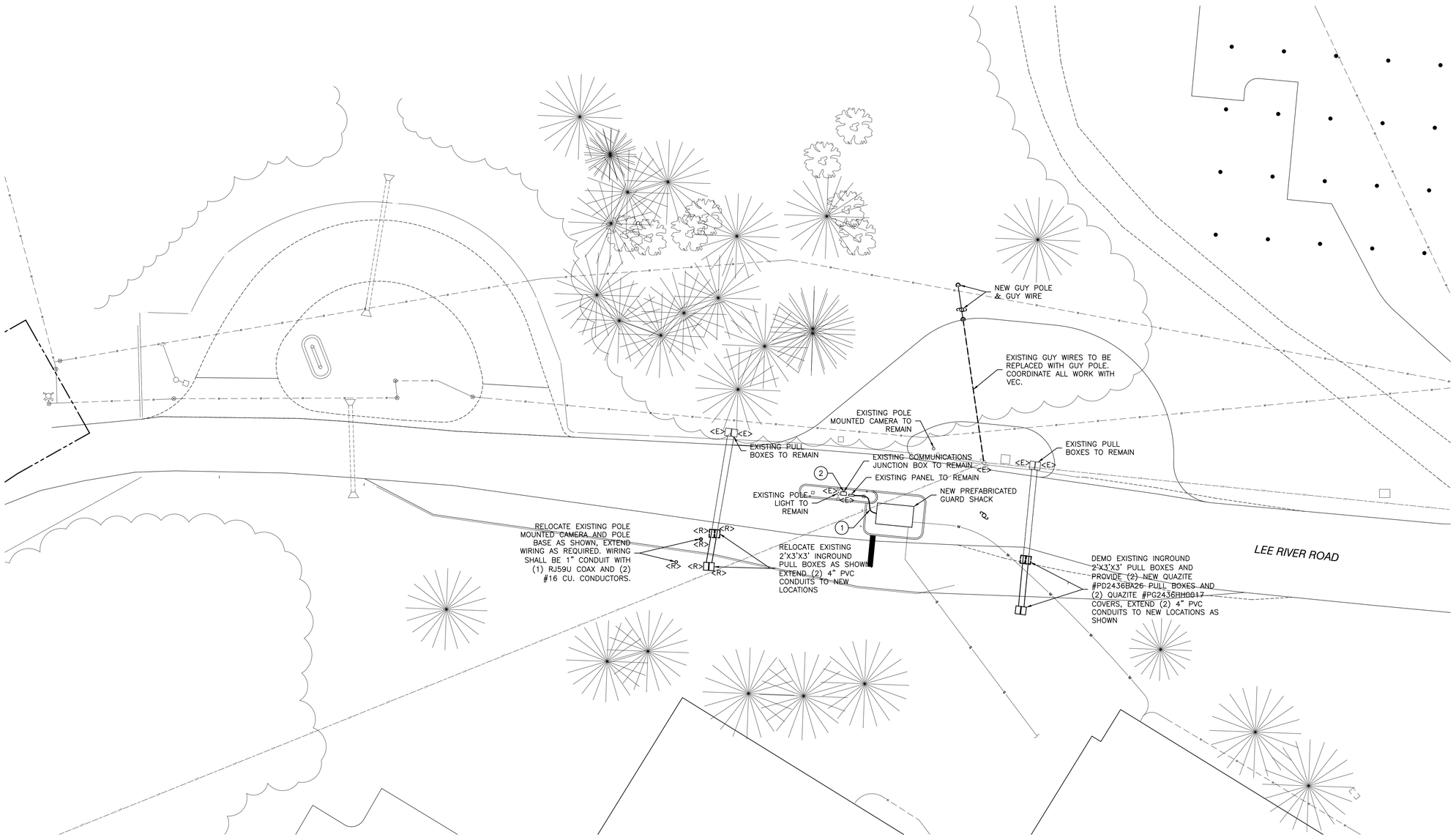


## ELECTRICAL SITE PLAN

SCALE: 1" = 20'

HORIZONTAL SCALE IN FEET

20 10 0 20 40 60 80

## KEYED NOTES:

1. PROVIDE A 240V, 60A FEED TO NEW GUARD SHACK FROM EXISTING ELECTRICAL PANEL. PROVIDE A 2P-60A BREAKER IN THE EXISTING PANEL. THE FEED SHALL BE RAN IN SURFACE MOUNTED 1" EMT CONDUIT SUPPORTED WITH UNISTRUT. THE FEEDER SHALL BE (3) #6 CU. CONDUCTORS PLUS (1) #8 CU. GROUND. THE FEED SHALL TERMINATE IN THE NEW GUARD SHACK PANEL, WHICH IS PROVIDED BY OTHERS. COORDINATE EXACT LOCATION OF PANEL IN GUARD SHACK.
2. PROVIDE (2) 1" SURFACE MOUNTED EMT CONDUITS SUPPORTED WITH UNISTRUT FROM EXISTING COMMUNICATION JUNCTION BOX TO NEW GUARD SHACK WITH (2) CAT. 5E CABLES, (1) CONDUIT SHALL BE A SPARE. EC SHALL TERMINATE CABLES IN GUARD SHACK, COORDINATE EXACT LOCATION IN GUARD SHACK.

## GENERAL DEMOLITION NOTES:

A. EQUIPMENT AND MATERIALS REMOVED OR DEMOLISHED AND NOT TO BE REINSTALLED BY THE EC SHALL BE CLASSIFIED BY THE OWNER AS SALVAGE OR SCRAP. THOSE CLAIMED BY THE OWNER SHALL BE DELIVERED TO THE OWNER BY THE EC WHERE DIRECTED AT THE SITE. THOSE NOT CLAIMED BY THE OWNER SHALL BECOME PROPERTY OF THE EC AND SHALL BE LEGALLY REMOVED FROM THE SITE AND PREMISES.

B. FIELD VERIFY ALL DIMENSIONS BEFORE COMMENCEMENT OF WORK. NOTIFY ENGINEER OF ANY ERRORS. CONTRACTORS SHALL FIELD INVESTIGATE ALL EXISTING CONDITIONS PRIOR TO THE BID DATE. NO EXTRA COMPENSATION SHALL BE GIVEN TO CONTRACTORS WHO FAIL TO VISIT THE SITE PRIOR TO THE BID DATE.

C. REFER TO THE ARCHITECTURAL PLANS FOR EXTENT OF DEMOLITION WORK TO BE PERFORMED BY THE GENERAL CONTRACTOR. ALL ITEMS THAT NEED TO BE REMOVED BY THE GC SHALL HAVE THE POWER DISCONNECTED BY THE EC.

## ELECTRICAL LEGEND

| | |
|---|---|
| <E> | EXISTING TO REMAIN |
| <R> | EXISTING TO BE REMOVED AND RELOCATED |
| - - - | ELECTRICAL DEVICES, WIRES, CONDUITS TO BE REMOVED |
| ——— | EXISTING ELECTRICAL DEVICES, WIRES, CONDUITS TO REMAIN |

ISSUED FOR CONSTRUCTION 8/30/17

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PLANS PREPARED BY:

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CHECKED: ASG
APPROVED: ASG

STATE OF VERMONT · ALAN S. GOULD · NO. 100299 · Electrical · PROFESSIONAL ENGINEER

OWNER:

VERMONT NATIONAL GUARD

*VERMONT ARMY NATIONAL GUARD*

*CAMP JOHNSON*
*COLCHESTER, VERMONT*

PROJECT:

*CAMP ETHAN ALLEN TRAINING SITE*

*ENTRY IMPROVEMENTS*

*CAMP ETHAN ALLEN TRAINING SITE*
*UNDERHILL, VT*

| DATE | CHECKED | REVISION |
|---|---|---|
| | | |

# ELECTRICAL SITE PLAN

DATE: 8/30/17
SCALE: AS SHOWN
PROJ. NO.: 17100.05

DRAWING NUMBER: SE1.1