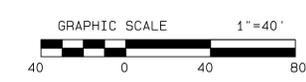
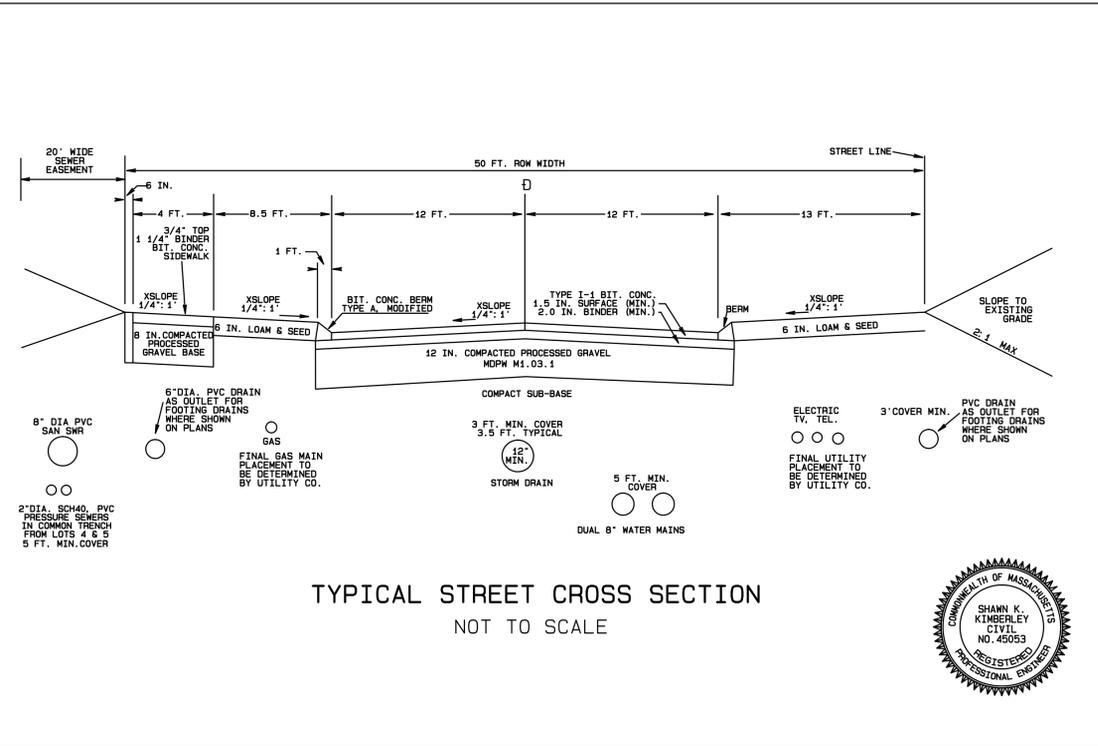
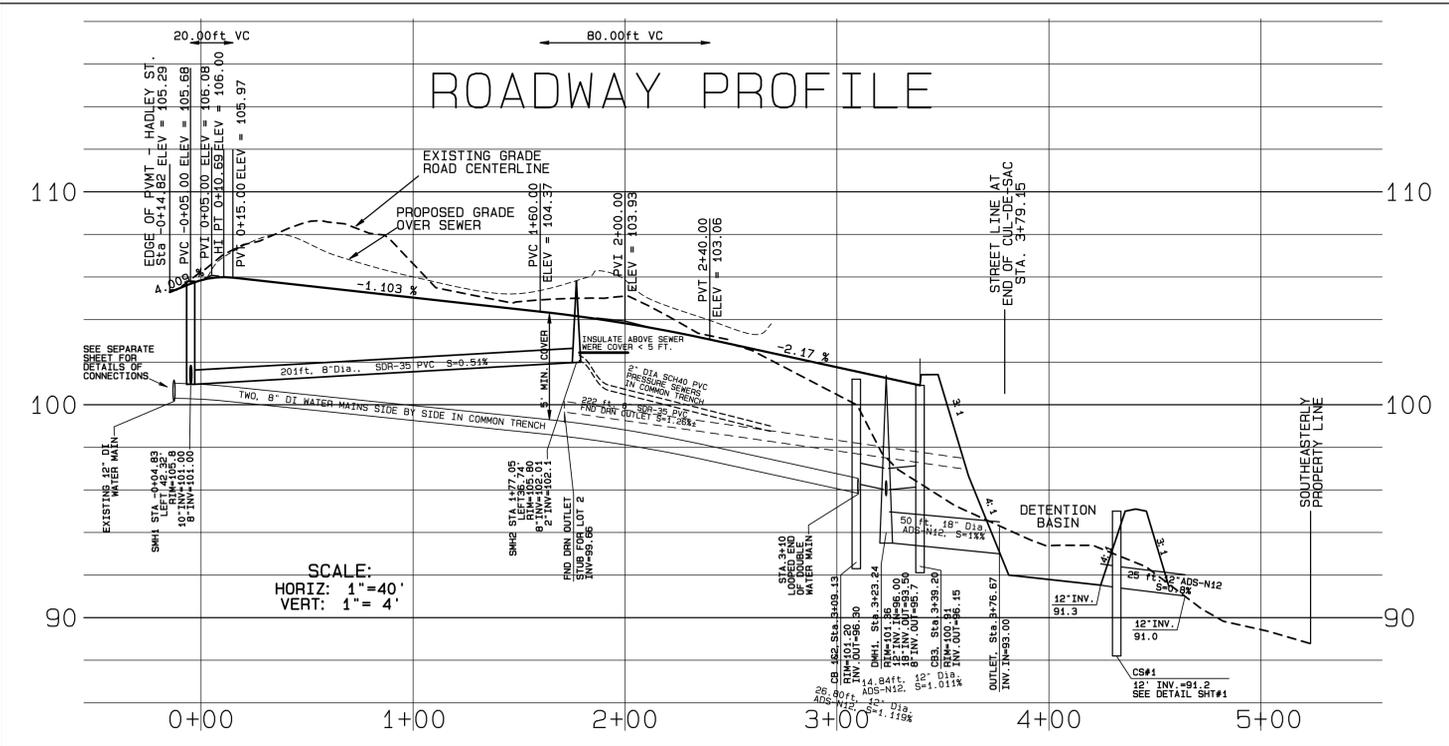


UTILITIES



GRADING AND DRAINAGE



**LEGEND**

- EXISTING CONTOURS
- PROPOSED CONTOURS
- METLAND EDGE
- 100 FT. BUFFER ZONE
- PROPERTY/LOT LINE
- SEDIMENT BARRIER/WORK LIMIT
- PROP. DRAIN LINE
- PROP. SEWER LINES
- PROP. WATER LINE
- ZONING SETBACK LINE

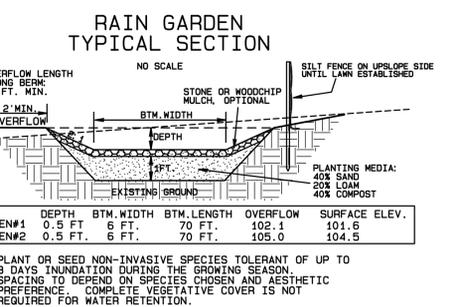
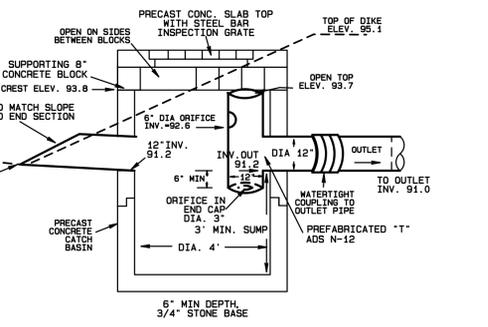
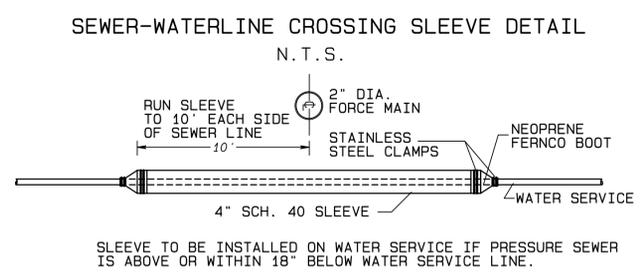
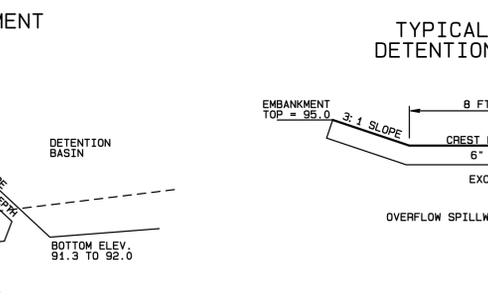
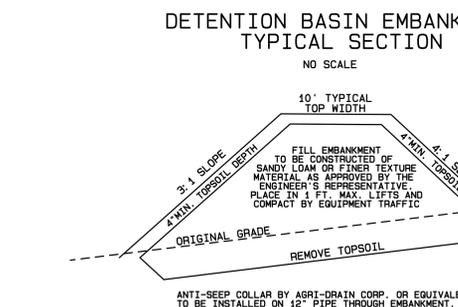
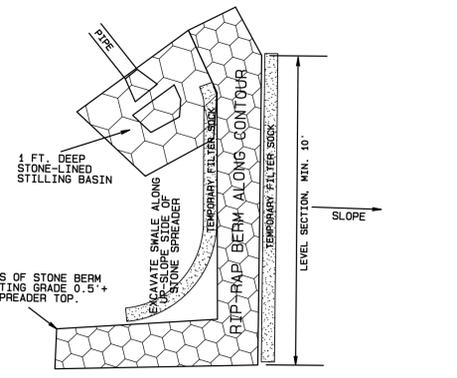
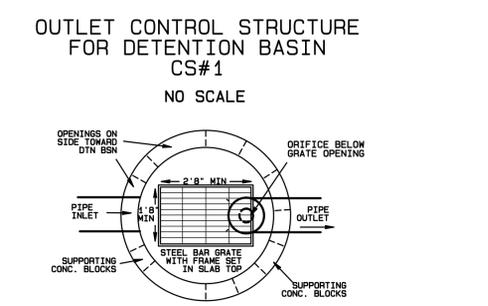
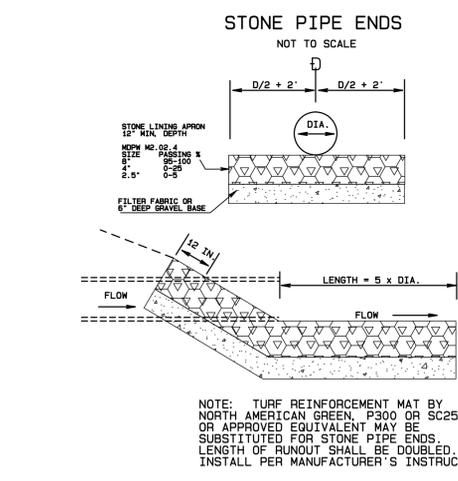
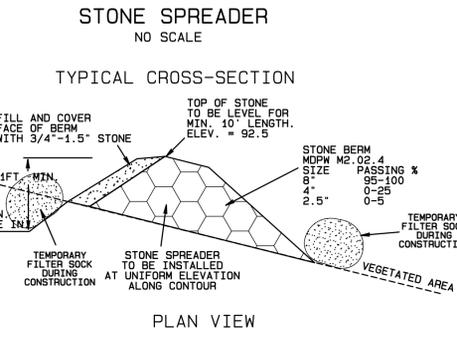
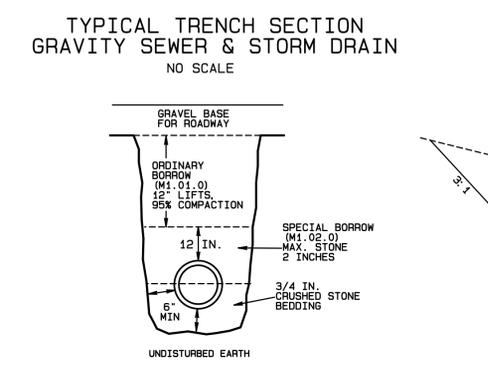
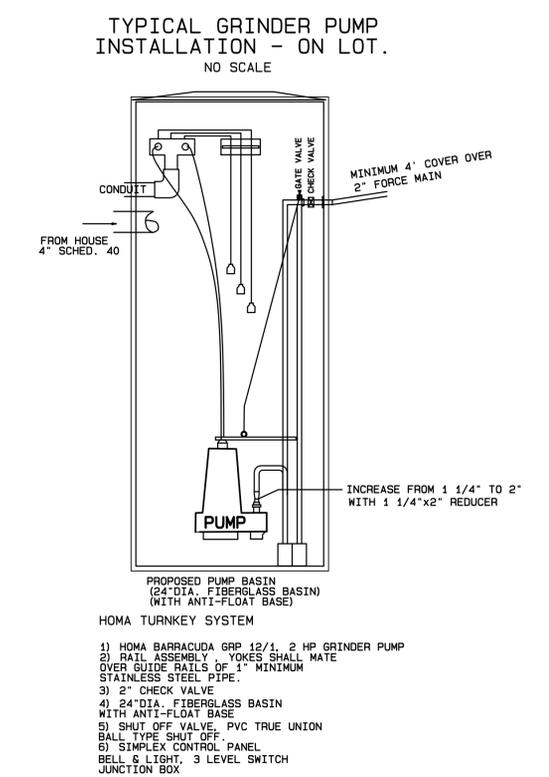
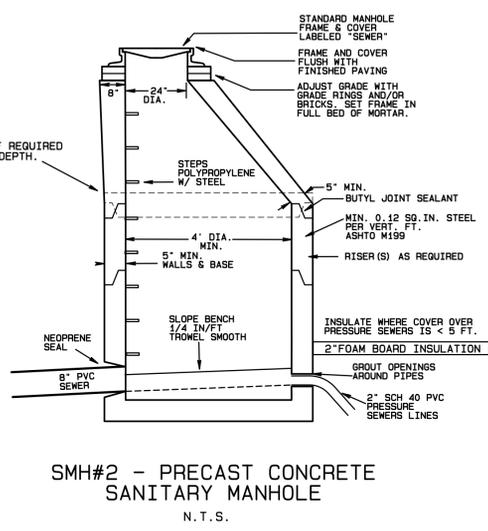
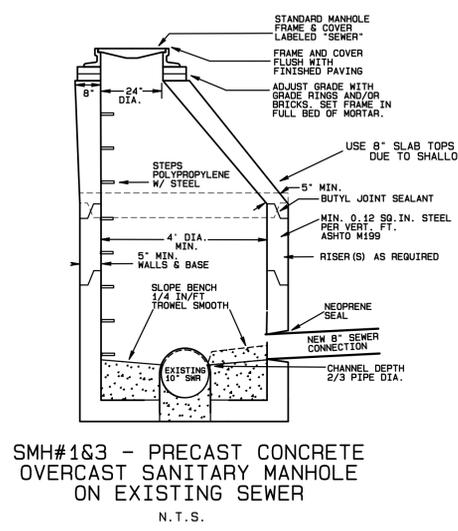
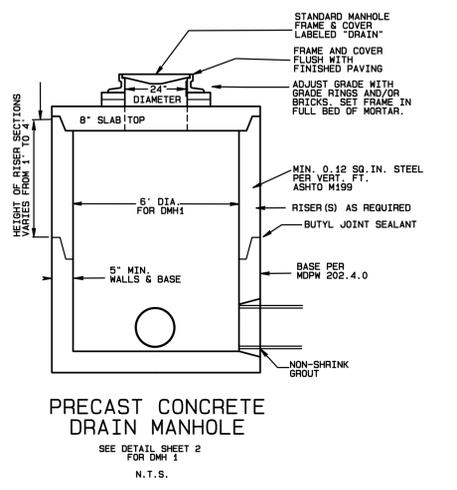
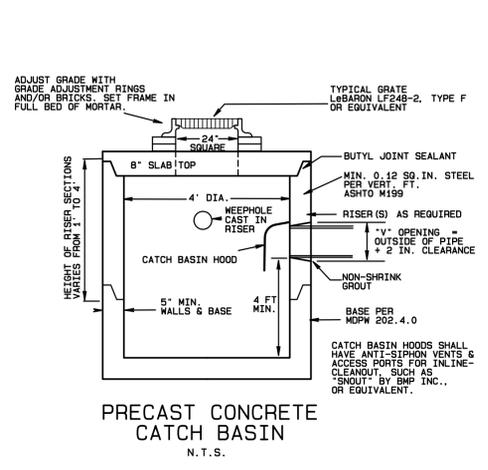
DATE: 12/24/13 SCALE: AS NOTED

| NO. | DATE    | REVISIONS   |
|-----|---------|---|
| 1   | 6/17/14 | REV. SAN SWS ALIGNMENT & TYPE, WATER MAIN ALIGNMENT FROM INFILTRATION DRAIN OUTLET MAIN, LOT 5&6 SWS ELEV'S |
| 2   | 8/11/14 | SEPARATE INFILTRATION & DETENTION, CHAMBER & STONE UNDER CUL-DE-SAC, SMALL REAR OF LOT 5, MOVE SWS          |
| 3   | 8/13/14 | ADD SEWER EASEMENTS, REV DMR#63, INFILTR BSN GRADINGS   |
| 4   | 8/25/14 | 08S WELL, AVE#66  |
| 5   | 9/28/14 | Y TURNAROUND, DELETE SC-740 CHAMBERS, EXPAND DTN BSN  |

**PLAN/PROFILE DEFINITIVE SUBDIVISION**  
**ETHAN CIRCLE**  
**SOUTH HADLEY, MA**  
 prepared for  
**ETHAN BAGG**

HAROLD L. EATON & ASSOC. INC.  
 REGISTERED PROFESSIONAL LAND SURVEYORS  
 235 RUSSELL STREET  
 HADLEY, MASSACHUSETTS  
 PHONE (413) 584-7599, FAX 585-5976  
 email: h1eaton@aol.com

SHEET: 3 OF 7



SEED MIXES FOR DETENTION AND INFILTRATION BASINS:

BASIN BOTTOM:  
TEMPORARY - WINTER WHEAT@ 100 LBS./AC.  
PERMANENT - NEW ENGLAND WETLAND PLANTS, EROSION CONTROL/RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES OR APPROVED EQUIVALENT.

EMBANKMENT AND SLOPES (PERMANENT):  
A COMMERCIAL "CONSERVATION MIX" INCLUDING BOTH GRASSES AND LEGUMES - TO BE APPROVED BY THE PROJECT WETLAND SPECIALIST.



**DATE: 12/24/13 SCALE: AS NOTED**

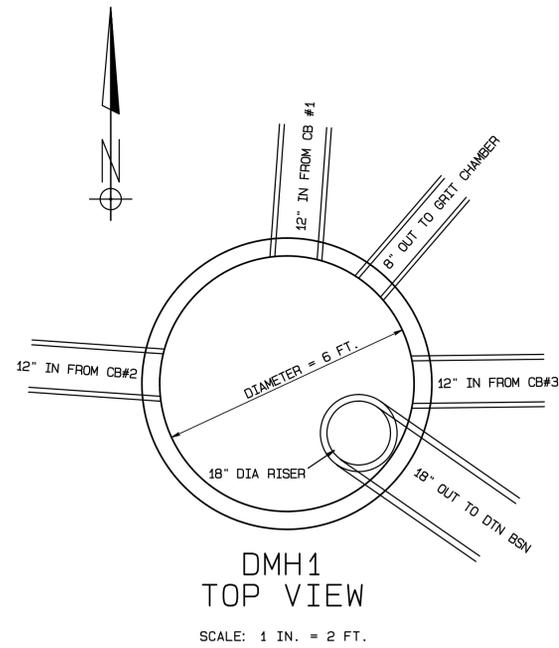
| NO. | DATE    | REVISIONS                          |
|-----|---------|------------------------------------|
| 1   | 6/17/14 | SMH2- REDUCED # OF INFLOWS         |
| 2   | 8/11/14 | CS#1, DI#1, PIPE OUTLET PROTECTION |
| 3   | 8/13/14 | REV. INFIL BSN GRADING             |
| 4   | 8/25/14 | DI#1 TO SHT6                       |
| 5   | 9/28/14 | REV. CB & MH TOP DETAILS           |

**CONSTRUCTION DETAILS DEFINITIVE SUBDIVISION ETHAN CIRCLE SOUTH HADLEY, MA**  
prepared for  
**ETHAN BAGG**

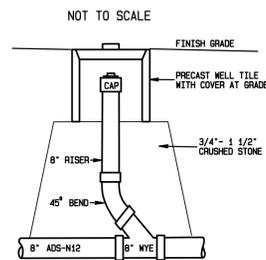
**HAROLD L. EATON & ASSOC. INC.**  
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PHONE (413) 584-7599, FAX 585-5976  
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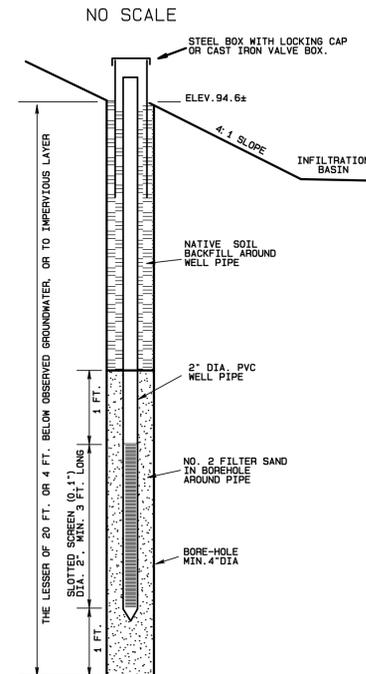
SHAWN K. KIMBERLEY CIVIL ENGINEER REGISTERED PROFESSIONAL ENGINEER



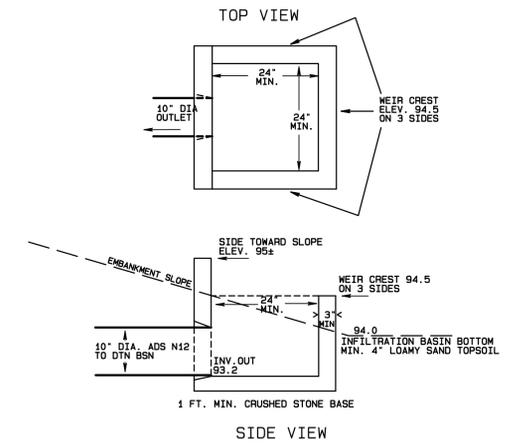
**CLEANOUT ON 8" LINE  
TO INFILTRATION BASIN**



**PROPOSED OBSERVATION WELL  
IN INFILTRATION BASIN**



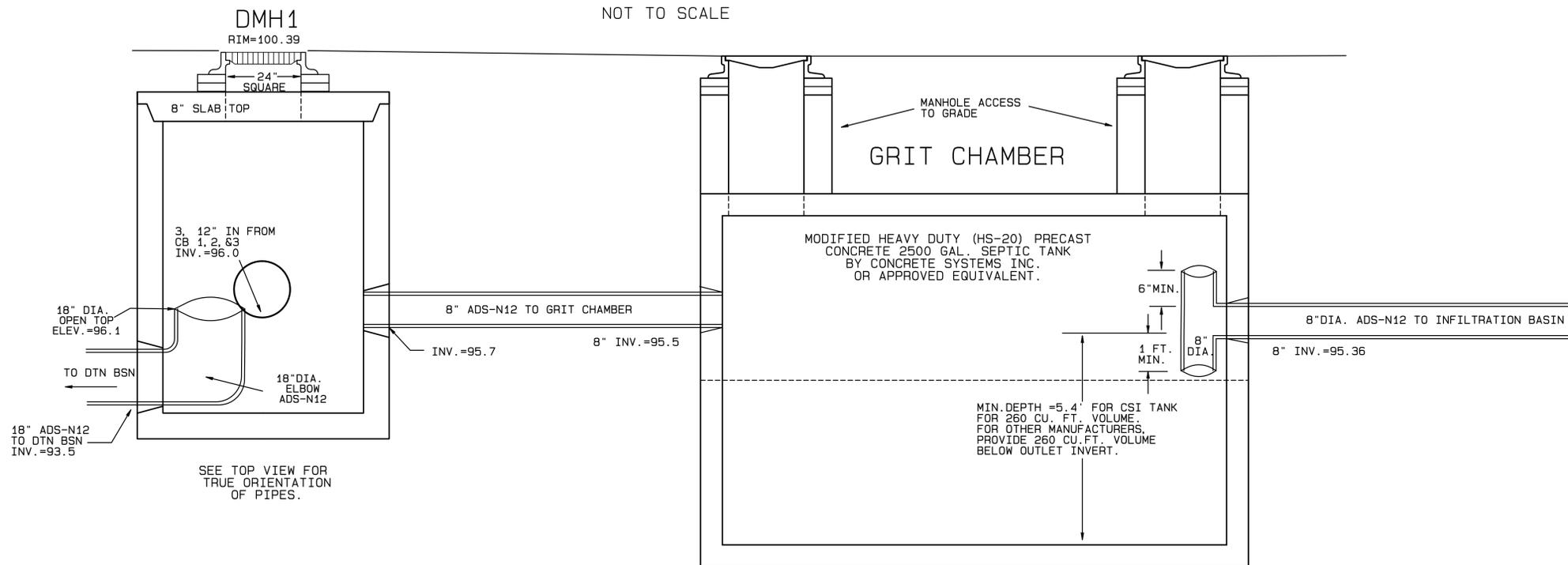
**DROP INLET #1  
OUTLET FROM INFILTRATION BASIN**



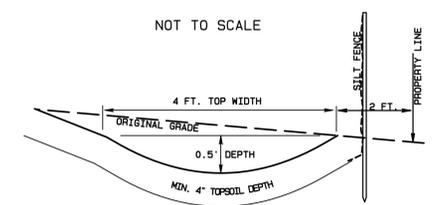
STRUCTURE MAY BE PRECAST, CAST IN PLACE, OR CONC. BLOCK.  
CONTRACTOR TO PROVIDE SHOP DRAWINGS TO ENGINEER FOR  
APPROVAL BEFORE ORDERING STRUCTURE.

NOTE:  
CONTRACTOR SHALL AVOID HEAVY EQUIPMENT TRAFFIC IN THE COMPLETED  
BOTTOM OF THE DETENTION BASIN. FINAL EXCAVATION AND SPREADING OF  
TOPSOIL SHOULD BE DONE BY EXCAVATOR WORKING FROM OUTSIDE THE BASIN  
OR BY LOW-GROUND-PRESSURE EQUIPMENT. GRADING OF THE BASIN BOTTOM  
SHALL NOT BE DONE DURING PERIODS WHEN THE SOIL IS WET. THE ENGINEER'S  
REPRESENTATIVE MAY REQUIRE ROTOTILLING OF THE BOTTOM PRIOR TO SEEDING.

**DIVERSION MANHOLE  
AND GRIT CHAMBER**  
NOT TO SCALE



**GRASS SWALE ALONG  
REAR OF LOTS 4 & 5  
TYPICAL SECTION**



SWALE TO BE CONSTRUCTED AND VEGETATED PRIOR TO CONSTRUCTION ON LOTS 4 & 5. SEED WITH GOOD QUALITY COMMERCIAL LAWN MIX FOR SHADY SITES.

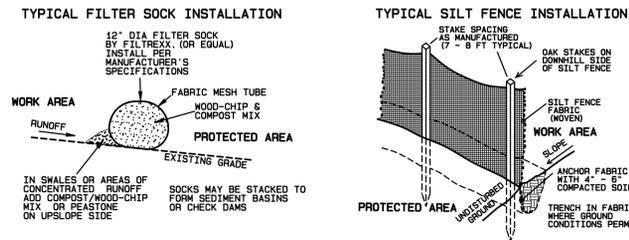
| NO. | DATE    | REVISIONS  |
|-----|---------|--|
| 1   | 8/25/14 | OBS. WELL, REV. OUTLET FROM DMH2, DI#1                     |
| 2   | 9/17/14 | CHAMBER X-SECTION NOTES AND LABELS                         |
| 3   | 9/28/14 | DELETE SC-740 DETAIL. REV. DMH & GRIT CHAMBER ADD CLEANOUT |

**CONSTRUCTION DETAILS #2  
DEFINITIVE SUBDIVISION  
ETHAN CIRCLE  
SOUTH HADLEY, MA**  
prepared for  
**ETHAN BAGG**

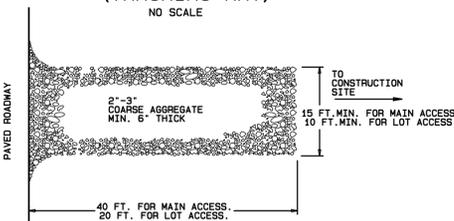


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**SEDIMENT BARRIER ALTERNATIVES  
CONTRACTOR'S OPTION**

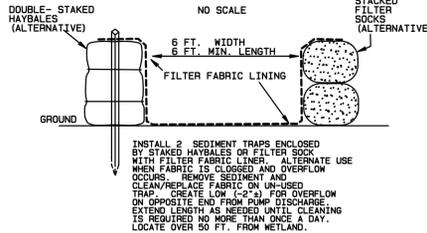


**STONE CONSTRUCTION ENTRANCE  
(TRACKING MAT)**

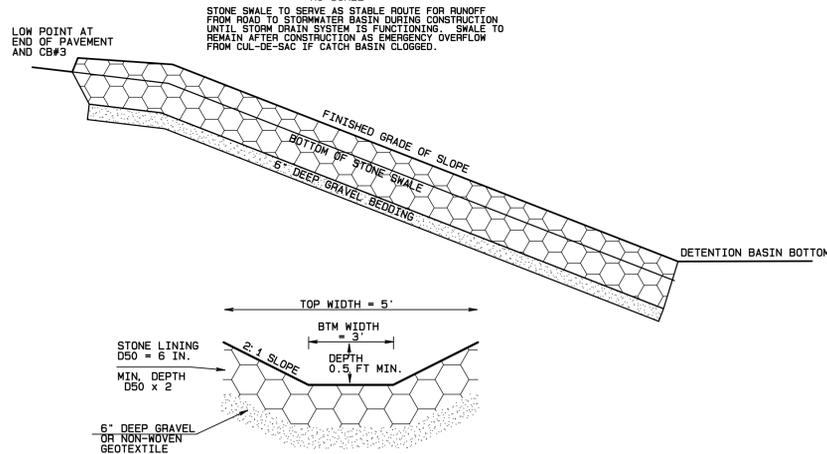


**NOTES:**  
THE ENTRANCE SHALL BE INSTALLED PRIOR TO OTHER GRADING AND EARTH MOVING ON THE SITE AND SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO A PAVED STREET. THIS MAY REQUIRE TOP DRESSING, REPLACEMENT OF STONE, OR WASHING OF STONE WITH DISCHARGE TO A SEDIMENT TRAP.  
STONE CONSTRUCTION ENTRANCE SHALL BE INSTALLED AS THE FIRST STEP IN GRUBBING AND GRADING OF THE SITE. ENTRANCE SHALL BE MAINTAINED UNTIL PREPARATION FOR PAVING.

**DEWATERING DISCHARGE  
SEDIMENT TRAP**



**STONE-LINED SWALE**



**EROSION AND SEDIMENT CONTROL MEASURES:**

Preconstruction notifications and meetings: No land disturbance associated with this project shall occur until 7 days after receipt of USEPA form 3510-9 "Notice of Intent" has been confirmed by the USEPA. No work shall be performed within 100 feet of any wetland area until any notification and pre-construction meeting requirements of the Order of Conditions under the Mass. Wetlands Protection Act have been completed.

Perimeter Sediment Barrier and Work Limit: Before installation of the sediment barriers, the location shall be staked in the field for review and approval by the engineer or their representative. To facilitate sediment barrier installation, woody vegetation may then be removed and any required trench may be cut by machine. No excavation, grading, filling, or removal of vegetative ground cover shall be performed within 100 feet of any wetland or stream until perimeter sediment barriers have been installed as shown on plans and have been inspected by the engineer or their representative.

Perimeter sediment barriers located adjacent to wetland areas shall serve as the limit of work for this project. No construction, equipment traffic, stockpiles, removal of vegetation, or other alteration shall be permitted on the wetland side of the sediment barrier/work limit without the approval of the engineer or their representative and the municipal Conservation Commission.

Silt fence: The bottom of the fence shall be trenched into the ground a minimum of 6" and back-filled with compacted soil. Where trenching is not feasible, silt fence skirt shall be covered with 6" of compacted soil. The top of the fabric shall be stretched as tightly as is practical, with intermediate stakes added to correct excessive sags. Stakes shall be driven at least 12" into the ground. Splices between sections shall be made by rolling end stakes together one complete turn and driving into the ground together.

Straw bales: Straw bales may be used as temporary and moveable control measures, temporary check dams, or as reinforcement for silt fence in areas of concentrated runoff or high fills. Bales shall be tightly butted and staked 12" into the ground. Where used without silt fence in front, the bales shall be trenched 4" into the ground, back-filled with compacted soil, and the spaces between bales shall be chinked with loose straw.

Filter Sock ("Filtrex" or equivalent): In areas of expected sheet flow, filter sock may be placed directly on the ground without trenching or stakes. In areas of expected concentrated flow, filter sock shall be staked as required to prevent movement or floatation, and mulch or washed stone shall be placed along the up-slope face to filter underflow.

Stone Construction Entrance: A "Stone construction entrance" or "tracking mat" shall be installed and maintained at any points where construction traffic from an unpaved construction road or site access enters onto the paved public way or a paved portion of the project roadway.

Stockpiles: There shall be a sediment barrier between any soil stockpile any wetland, waterway, swale, gutter, or drain inlet. The base of the stockpile shall be kept at least 10 feet from the barrier. Temporary piles of trench spoil may be closer to the sediment barrier but shall not rest against the barrier. Soil expected to remain stockpiled for over 30 days shall be shaped to stable slopes and seeded or mulched for temporary cover. No stockpile shall be placed within a swale, drainage-way, or other path of concentrated surface runoff.

Temporary runoff controls: As site grading progresses, temporary erosion control measures shall be installed, maintained, and removed as necessary to control erosive accumulations of runoff or sediment discharge until final grade and cover are established. Temporary control measures may include sediment barriers, check dams, diversions, sediment basins, open-top culverts, and stone-lined swales.

Stocking additional materials: A stock of additional erosion control materials shall be maintained available on the site for emergency repairs and temporary measures. Stock shall be replenished when decreased to 50% of the numbers below. Stock shall include:

- Straw-bales - 15 (Covered to be kept dry)
- Oak stakes - 30
- Silt fence - 100 linear feet.
- Washed stone - 2 cubic yards, 3/4" to 2" diameter
- Filter fabric - 25 linear feet of 12 ft. wide roll, or equivalent.

Trench protection: Open trenches shall be protected from accumulation of surface water or groundwater that could result in erosion of the trench and discharge of sediment. Where feasible, spoil shall be stockpiled on the up-slope side of the trench to prevent entrance of surface runoff. Backfill shall be crowned to allow for settlement and to avoid concentration of runoff on top of the trench.

Storm drain protection: The storm drain system shall be put into operation as soon as possible in order to control runoff within a non-erosible system. The storm drain system shall be protected against inflow of sediment. Open storm drain structures shall be protected by sediment barriers, filter socks, stone filter berms, or filter fabric inserts ("tea-bags", "silt-sacks" or equivalents). These measures shall be maintained until the tributary area is stabilized by pavement and vegetative cover.

Roadside slopes: Cut and fill slopes for roadway construction shall be finish graded, loamed, seeded, and mulched as soon as possible during road construction. This stabilization shall not await finish grading of lots.

Erosion control netting, mulch mats or Turf Reinforcement Mats shall be used on steep slopes or in swales where required to protect seeding until establishment. Materials shall be installed per manufacturers' recommendations and anchored by burial of edges, staples, or stakes, as applicable.

Site Stabilization - Temporary: Where a portion of the site will not be subject to construction activity for over 60 days, measures shall be taken to provide temporary stabilization of that inactive portion of the site, within 14 days of the cessation of construction activity. Stabilization measures may include seeding for temporary cover, mulching, or other measures to protect exposed soil from erosion and prevent sediment movement.

Site Stabilization - Permanent: Within 14 days of completion of loaming and finish grading on any portion of the site, that area shall be seeded or planted for permanent cover in accordance with USDA NRCS guidelines or equivalent, season permitting.

Roadway Sweeping: The entrance to the site and affected portions of the public roadway or paved project roadway shall be swept as needed to control sediment runoff into storm drains or waterways and to control blowing dust.

**GENERAL SEQUENCE OF WORK:**

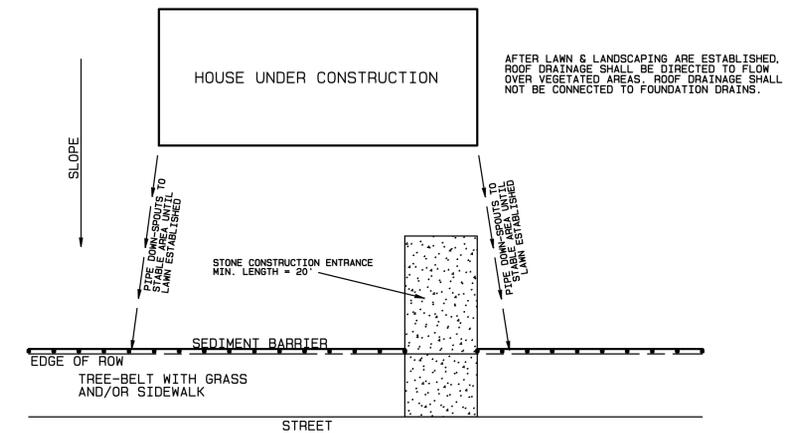
1. Stakeout and review of clearing limits and perimeter sediment barrier locations.
2. Clearing of work areas without stripping or grubbing.
3. Installation of perimeter sediment barriers along perimeter work limit.
4. Construction of detention basin, installation of outlet and stone spreader with temporary skimmer and filter sock at spreader, permanent seeding of cut slopes and embankment, and temporary seeding of basin bottom.
5. Grubbing and stripping of ROW and grubbing of lots as needed, including loaming and temporary seeding of disturbed areas on lots.
6. Rough grading of roadway, & grading/seeding of slope to Detention Basin, with stone swale.
7. Construction and seeding of infiltration basin and swale on lots 4 & 5 with min. 4" loamy-sand topsoil.
8. Construction of roadway, drainage, sewer, water, and utilities, with temporary erosion controls and maintenance of erosion control measures, as site conditions require.
9. Permanent seeding and stabilization of ROW. Outlet at DMH1 to Grit Chamber shall be blocked until ROW and adjacent slopes are stabilized.
10. Removal of accumulated sediment from detention basin and permanent seeding of basin bottom after initial temporary and permanent seedings on the site are sufficiently established to prevent erosion. Detention basin outlet skimmer shall remain in place until vegetation is established on detention basin bottom.
11. Site development of individual lots may begin during road construction, with erosion/sediment controls for each lot.

**WORK ON INDIVIDUAL LOTS:**

Site work on individual lots shall be controlled so as to prevent sediment discharge to the roadway, wetlands, or abutting lots. Typical measures may include:

- Sediment barrier along down-slope edge of graded areas.
- Stone construction entrance on driveway cut.
- Check dams across swales carrying concentrated runoff.
- Temporary diversions to carry runoff around open construction sites.
- Stone-lined swales to carry concentrated runoff.
- Immediate temporary re-vegetation of slopes, prior to finish grading of yard and lawn.
- Curtain drainage or stone blanket to control seepage from cut slopes.
- Temporary piping of down-slope discharges across graded areas until lawn establishment.
- Water-bars or open-topped culverts on unpaved driveways to divert runoff to vegetated areas.

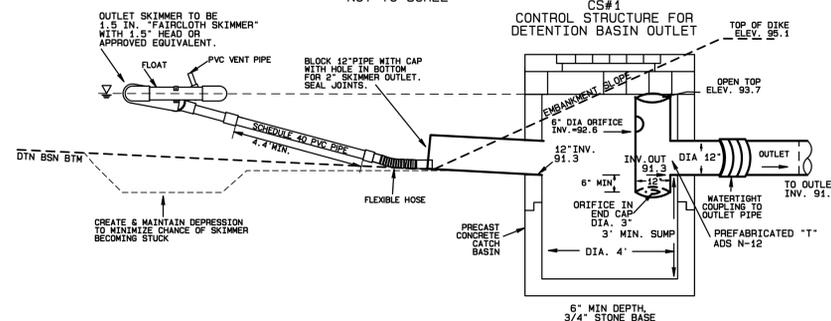
**TYPICAL ON-LOT EROSION CONTROL MEASURES**



**CONSTRUCTION PHASE HOUSE-KEEPING MEASURES:**

All vehicles on site will be monitored for leaks and receive regular preventive maintenance. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Asphalt substances will be applied according to manufacturer's recommendations. Sanitary waste will be collected from portable units a minimum of weekly to avoid overflowing. A covered dumpster or appropriate trash container will be used for all waste materials. Concrete trucks will not be allowed to wash out chutes within 100 feet of any waterway or wetland. Discharge of surplus concrete or drum wash is not permitted on site. Vehicle maintenance and fueling will not be allowed within 100 feet of any waterway or wetland. Fertilizer for lawn establishment and stabilization seeding will be applied in accordance with manufacturers instructions and will be incorporated into the soil or as part of a hydro seeding mulch or "Terraseeding" mix. Paints, Glues, cleaning solvents, and other construction related chemicals will be used in accordance with manufacturer's instructions. Residue and empty containers will be disposed of in closed containers for appropriate final off-site disposal.

**TEMPORARY "SKIMMER" ON  
DETENTION BASIN OUTLET**



DATE: 12/24/13 SCALE: AS NOTED

| NO. | DATE    | REVISIONS                       |
|-----|---------|---------------------------------|
| 1   | 8/11/14 | CS#1 AND SKIMMER, SEQUENCE NOTE |
| 2   | 9/25/14 | SEQUENCE NOTE                   |
| 3   | 9/17/14 | SEQUENCE NOTE                   |
| 4   | 9/28/14 | SEQUENCE NOTE                   |

**EROSION CONTROL DETAILS  
DEFINITIVE SUBDIVISION  
ETHAN CIRCLE  
SOUTH HADLEY, MA**  
prepared for  
**ETHAN BAGG**

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