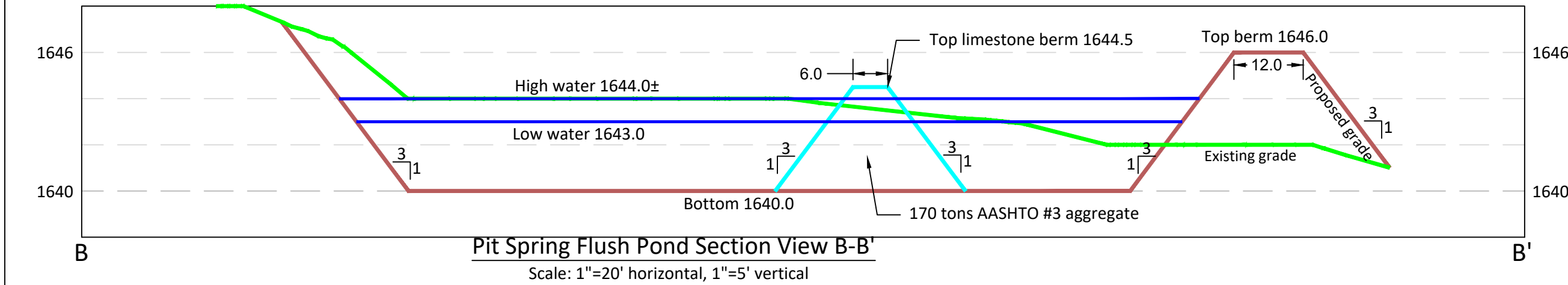
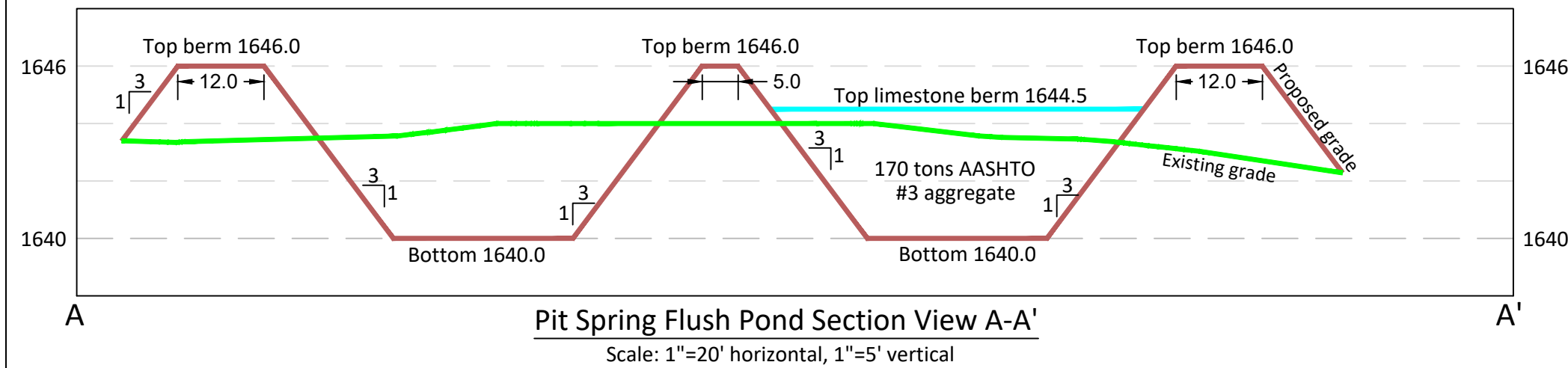
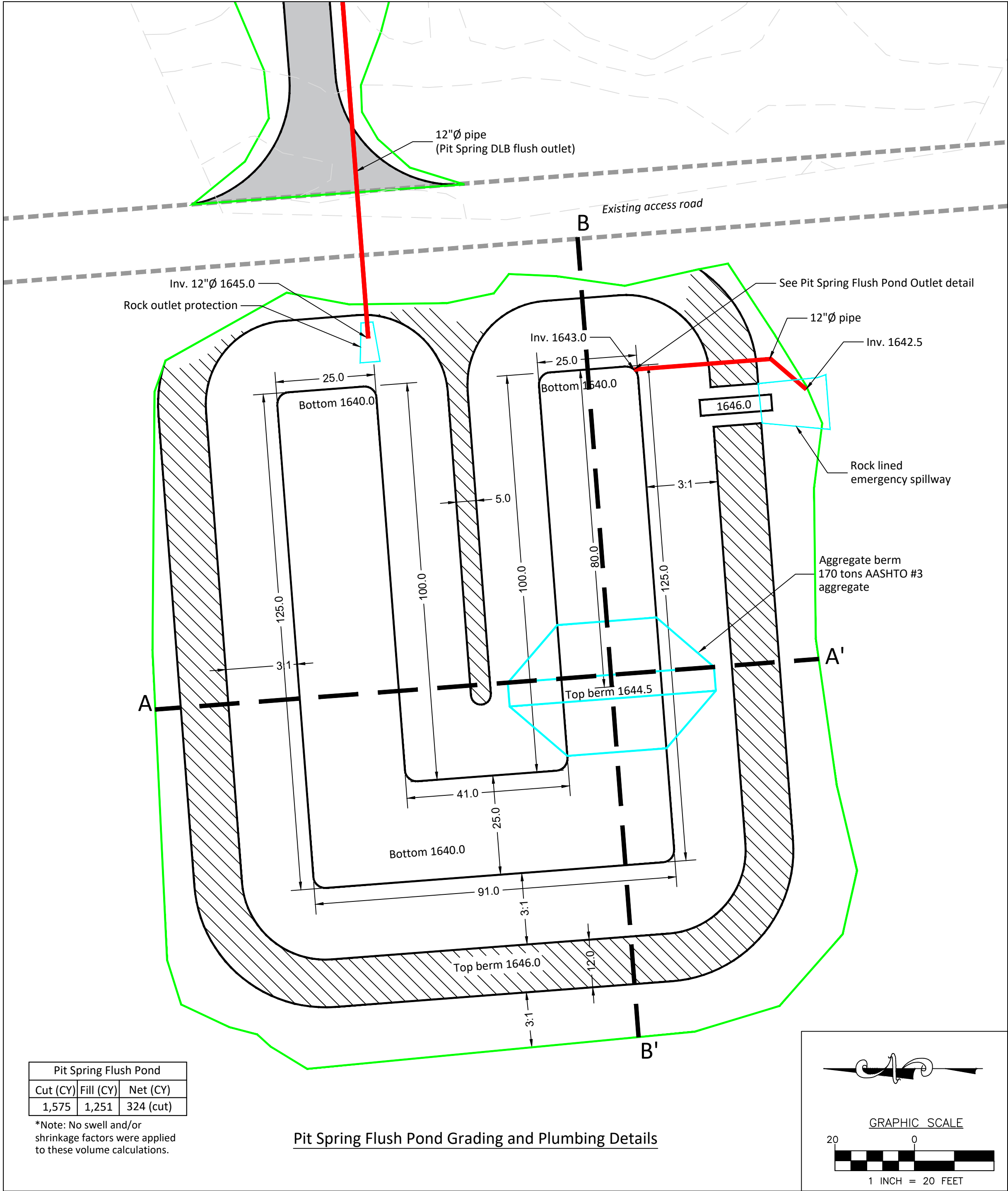


8						 Hedin Environmental 195 Castle Shannon Blvd. Pittsburgh, PA 15228 www.hedinenv.com	As-Built Plan North Culvert & Pit Spring Collection Details Morgan Run MR-7 Passive Mine Water Treatment Project	Sheet 3 of 6 As-Built
7								
6								
5								
4								
3	10/31/23	As-built		NAW				
2	3/23/22	NC intake overflow added		NAW				
1	3/14/22	File created		NAW				
No.	Date	Description		By				



Notes
Pit Spring Flush Pond
A pond shall be constructed to receive water from the Pit Spring DLB during flushing events. The pond is U-shaped to promote longer residence time. An aggregate berm shall be constructed as shown to disrupt the rapid flow of water during flushing events.

Effluent from the pond will be through a 12" pipe fitted with a tee whose run is oriented vertically. The bottom of the run is fitted with a cap with a hole that restricts the flow through the pipe and allows the water level in the pond to rise and fall with flush events so that the retention of solids is maximized. The top of the tee is fitted with a bar guard (as produced by AgriDrain or similar). The tee prevents clogging by floating debris. Consult General Construction Specifications for pipeline installation procedure on Sheet 13.

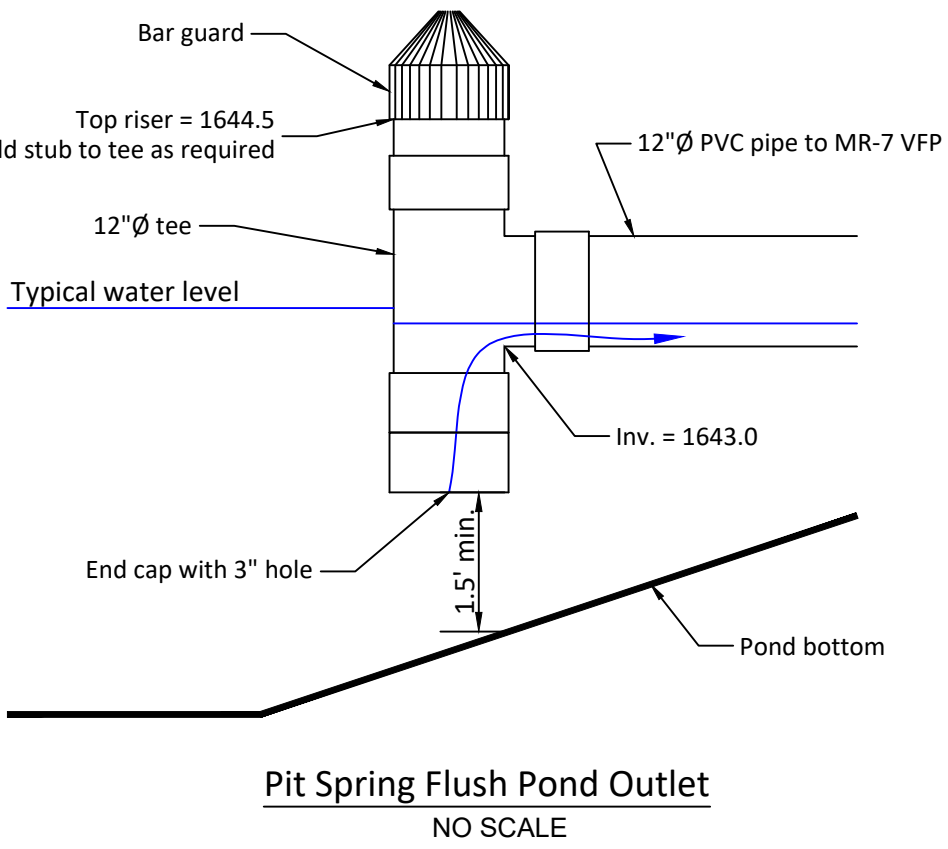
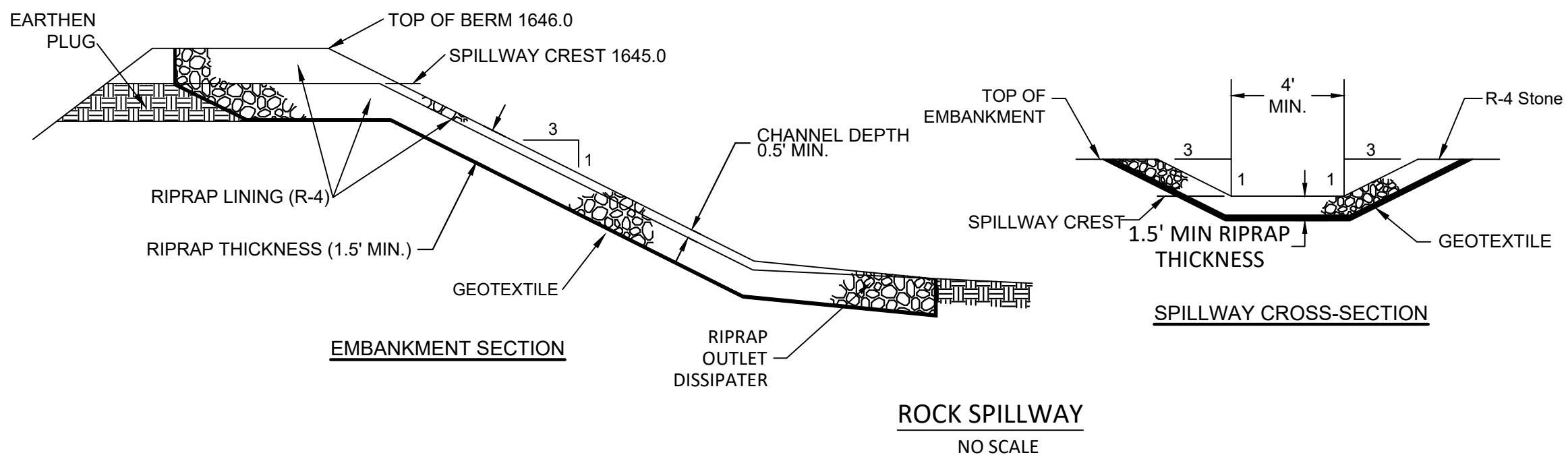
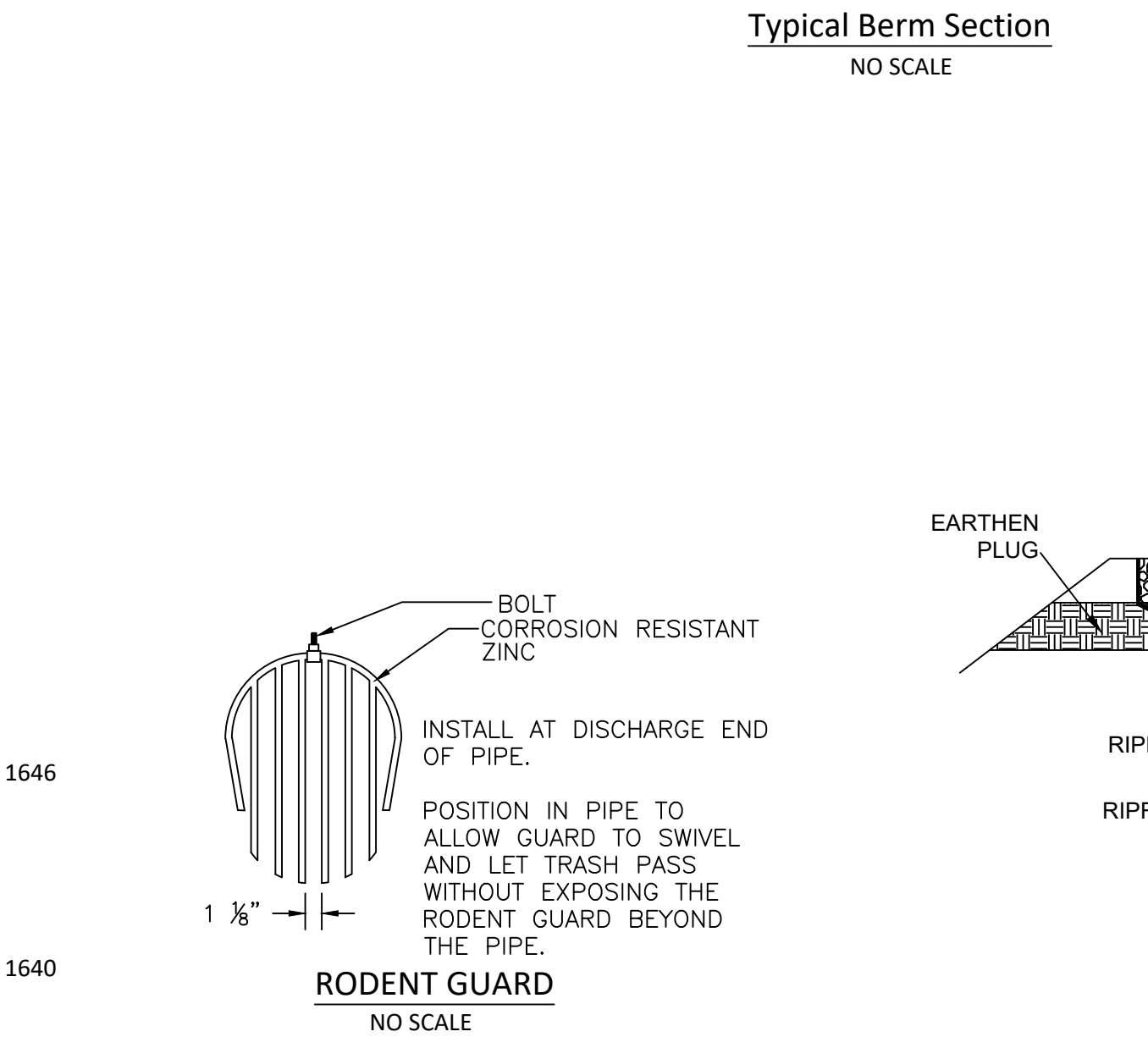
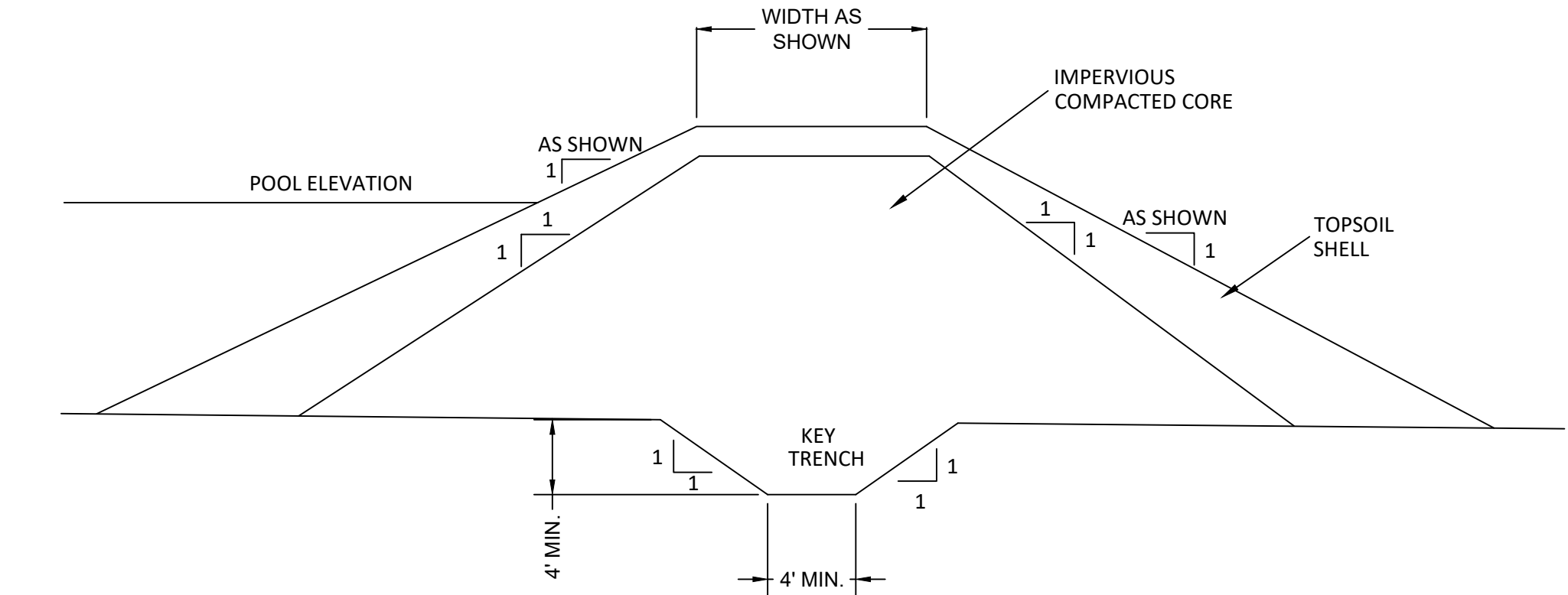
- General Construction Specifications**
Pipe
All pipe (except culverts) must meet at least one of the following specifications:
- Schedule 40 PVC
 - SDR 35 PVC
 - HDPE DR-26, DR-21, DR-19, or DR-17

Clearing and Grubbing
All trees, snags, logs, brush, stumps, shrubs, rubbish, and similar materials shall be cleared from within the limits of the pond and wetland construction areas. Unless otherwise specified, all stumps, roots, and root clusters that have a diameter of 1 inch or larger shall be grubbed out to a depth of at least 1 foot below the ground surface under footprint of all pond and wetland basins. Stumps, logs, and large tops are to be hauled to disposal Area 1. Small brush may be distributed along edges of work area.

Earthwork
All topsoil is to be removed prior to berm construction and stored within the project boundary for future use. All earthwork that involves construction of berms and placing of soils meant to hold water shall be placed in 6-inch compacted lifts free of stones greater than 5 inches. All earthen berms shall be keyed into inside bottom and each inside slope by excavating trench 4 ft deep below existing grade to a width determined by site conditions and compacted with a drum roller. This key shall have clay soil compacted in 6 inch compacted lifts back up to existing grade. The earthen berm can then be constructed as shown on plans with appropriate compaction methods employed. When pond basin is complete the basin shall be rolled with a smooth drum roller to help seal the clay soil.

Pipe Penetrations
All pipe penetrations through pond berms shall be backfilled with clay material by hand up to the haunches of the pipe and compacted by vibratory foot tamper. Backfilling of trench shall proceed until layer of clay soil covers pipe with 6 inches of clay using vibratory compaction methods. Complete backfilling of trench with clay soil in 6 inch compacted lifts free of stones greater than 5 inches compacting by either compaction equipment at end of arm of excavator, vibratory foot stomper or small vibratory roller. At the engineer's discretion, the influent end of pipes penetrating berms shall have 300 pounds of bentonite clay chips incorporated below and around the sides of the pipe to provide waterproof seal.

Inline Water Level Control Structure Installations.
All inline water level control structures shall be installed with protection from uneven soil compaction that could contort the structures preventing proper use of boards used to control water level. This protection shall consist of HDPE corrugated pipe with smooth inner bore large enough to completely surround the flow structure. The pipe shall be placed on top of a compacted aggregate pad level with top of effluent pipe and within one foot of top of box. The annulus between shall be filled with AASHTO #57 limestone aggregate to top. When completed the box lids shall be easily open and closed with no obstructions from the HDPE pipe.



Pipeline Installations
Pipe shall be buried in a ditch that is variable in depth but at least 2 feet deep and 2 feet wide. Contractor must follow all applicable safety guidelines when working in and around open trenches. The pipeline may be either be Schedule 40 PVC Pipe with solvent weld bell and sockets or DR21 HDPE pipe that is to be fused on location. Pipe bedding shall be used in areas where the soil contains excessive stones preventing safe backfilling of pipe. When bedding is used (fine grained aggregate) it shall be placed 4 inches on bottom and sides and 6 inches top of pipe. All pipe and fittings must be assembled and installed according to pipe manufacturer specifications. Pipe that is broken or damaged during installation must be replaced at Contractor's expense.

General Site Work
A smooth drum roller and pad foot roller shall be on site for all earth work. Once the site has been cleared at end of each day's work all disturbed areas shall be rolled with smooth drum roller to help seal the soil from moisture. Prior to adding soil to any smooth drum rolled surface the top 6 inches of soil shall be scarified before next lift of soil is added.

Limestone
All limestone must have a minimum of 90% CaCO3 content. High calcite limestone aggregate from Glenn O Hawbaker's Pleasant Gap quarry and from Con-Stone's Aaronsburg quarry are approved. Other sources of limestone aggregate must be shown to meet the CaCO3 with certified laboratory analyses. The contractor shall provide weigh slips showing delivery of the limestone.

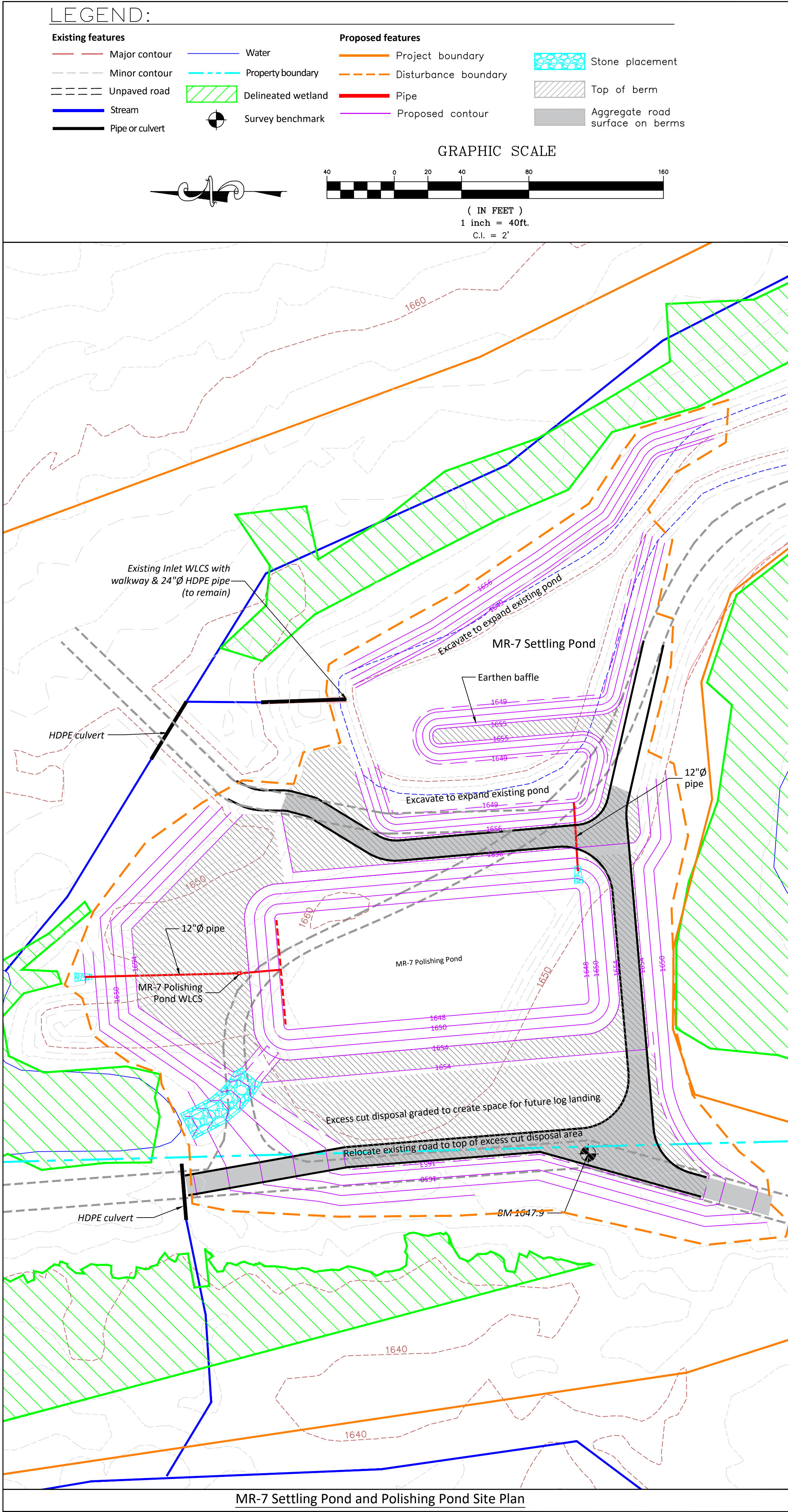
Limestone gradation shall be as specified in the construction plans. Deliveries of out-spec limestone, particularly the presence of excessive fines will be rejected. Removal and replacement of out of spec limestone that has already been placed is the responsibility of the Contractor.

Limestone Placement
The limestone aggregate will be installed in a uniform, level layer. Adequate cover must be maintained over any plumbing to prevent damage by equipment. All limestone is to be delivered and placed directly into the treatment cell. No stockpiling or double handling of limestone will be allowed without pre-approval. Any aggregate that contains excessive mud or fines (such as where truck traffic has crushed or fouled the aggregate) must be removed and replaced with clean aggregate at the expense of the contractor.

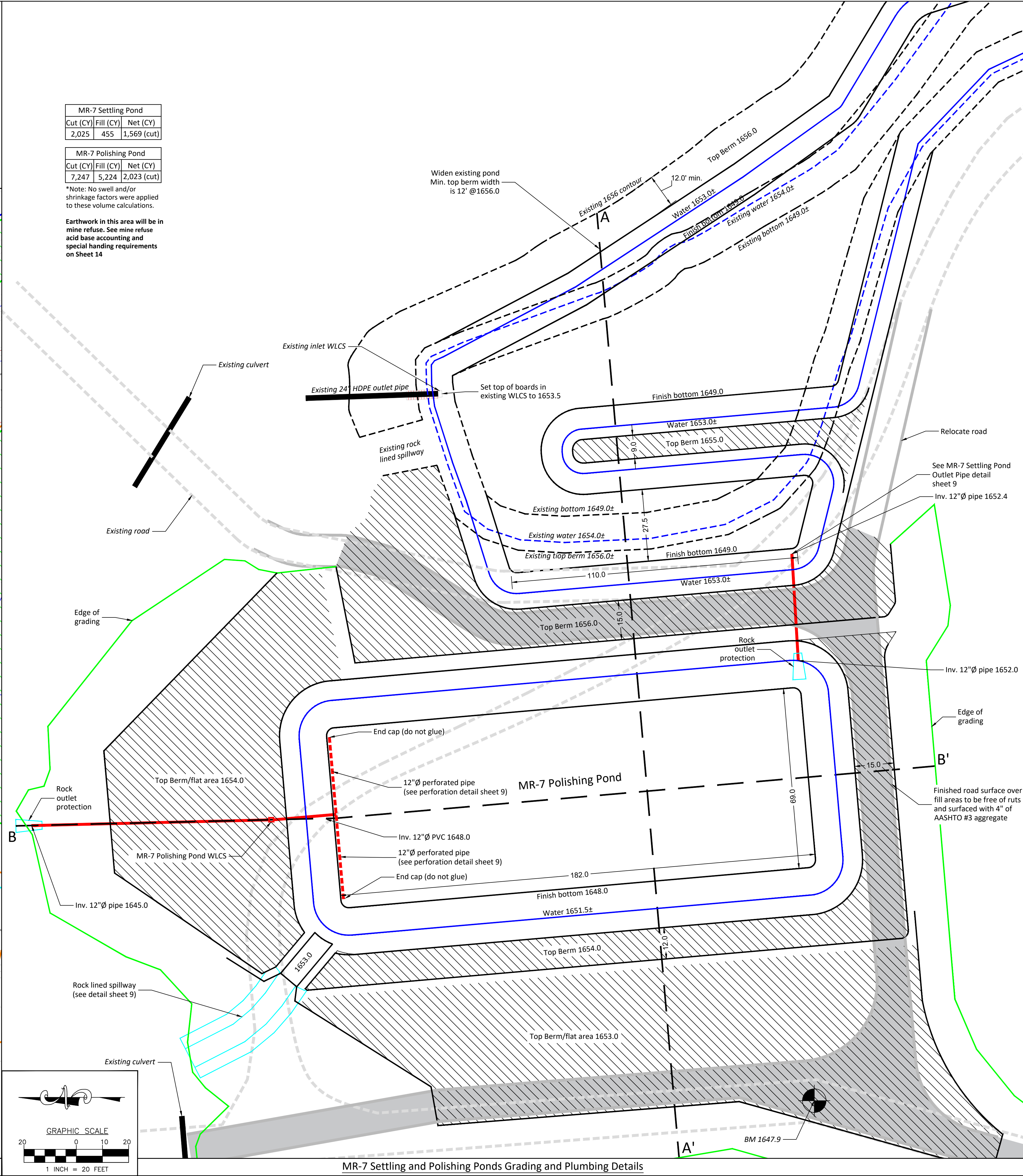
Alkaline Organic Substrate
Alkaline organic substrate will be prepared by mixing 1 part AASHTO #10 limestone (or similar) with 3 parts Phase IV fresh spent mushroom compost by volume. The limestone shall have a minimum calcium carbonate content of 90%. The organic substrate shall be protected from compaction and at no time shall equipment be allowed to operate on the organic substrate.

The Contractor is responsible for installing the specified depth of substrate in each VFP. Because the volume of compost stored outdoors for extended periods of time tends to decrease, storage of compost for more than a week is not recommended. When the Contractor is finished with organic substrate placement its depth will be measured by Hedin Environmental and the Contractor will be required to make up any deficiencies at their expense.

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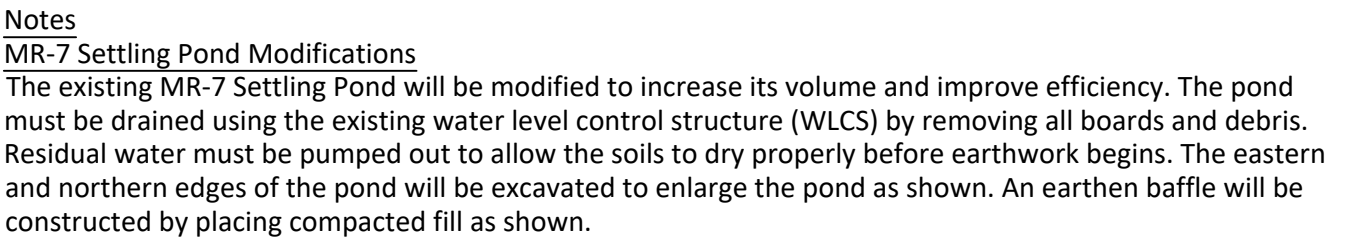


MR-7 Settling Pond and Polishing Pond Site Plan



MR-7 Settling and Polishing Ponds Grading and Plumbing Details

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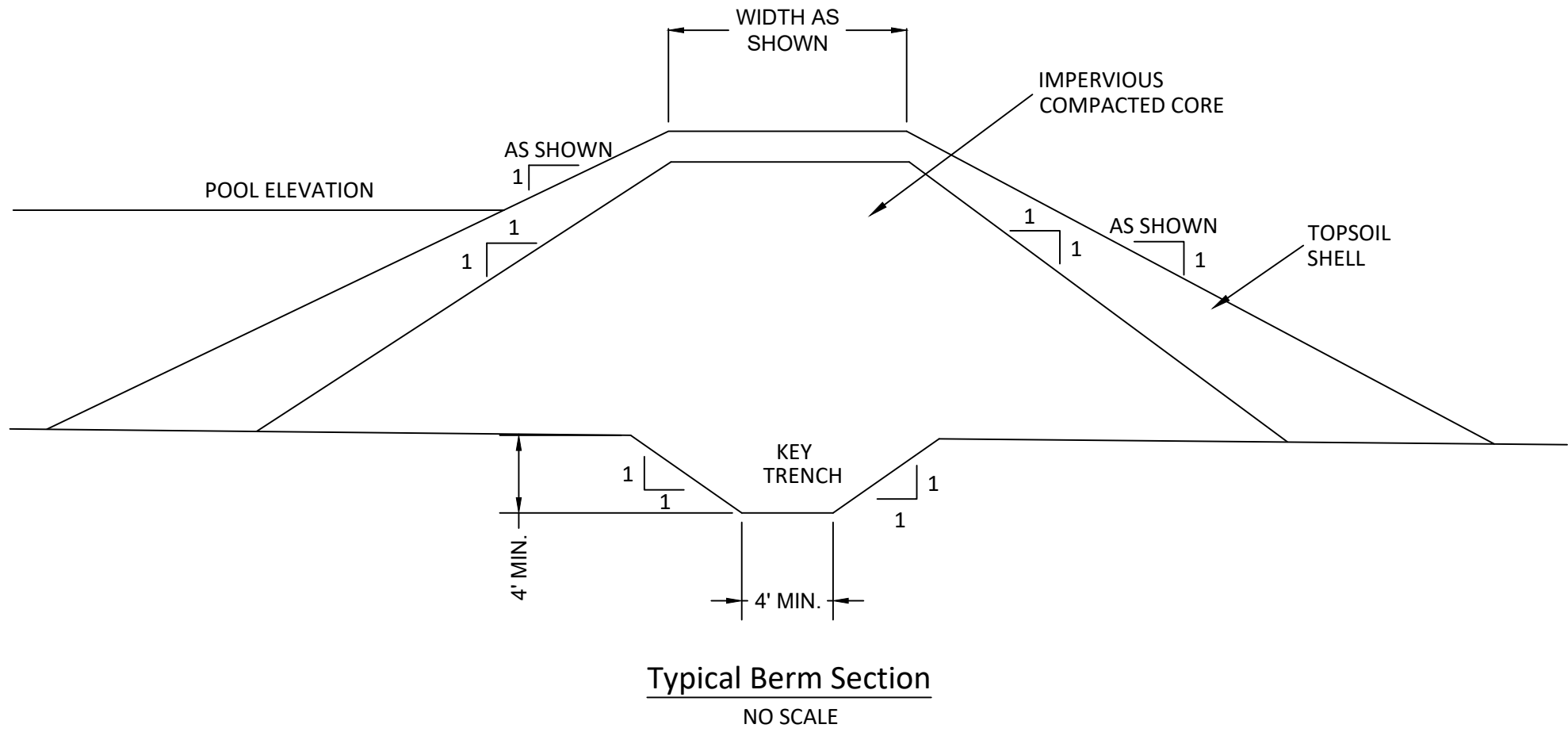
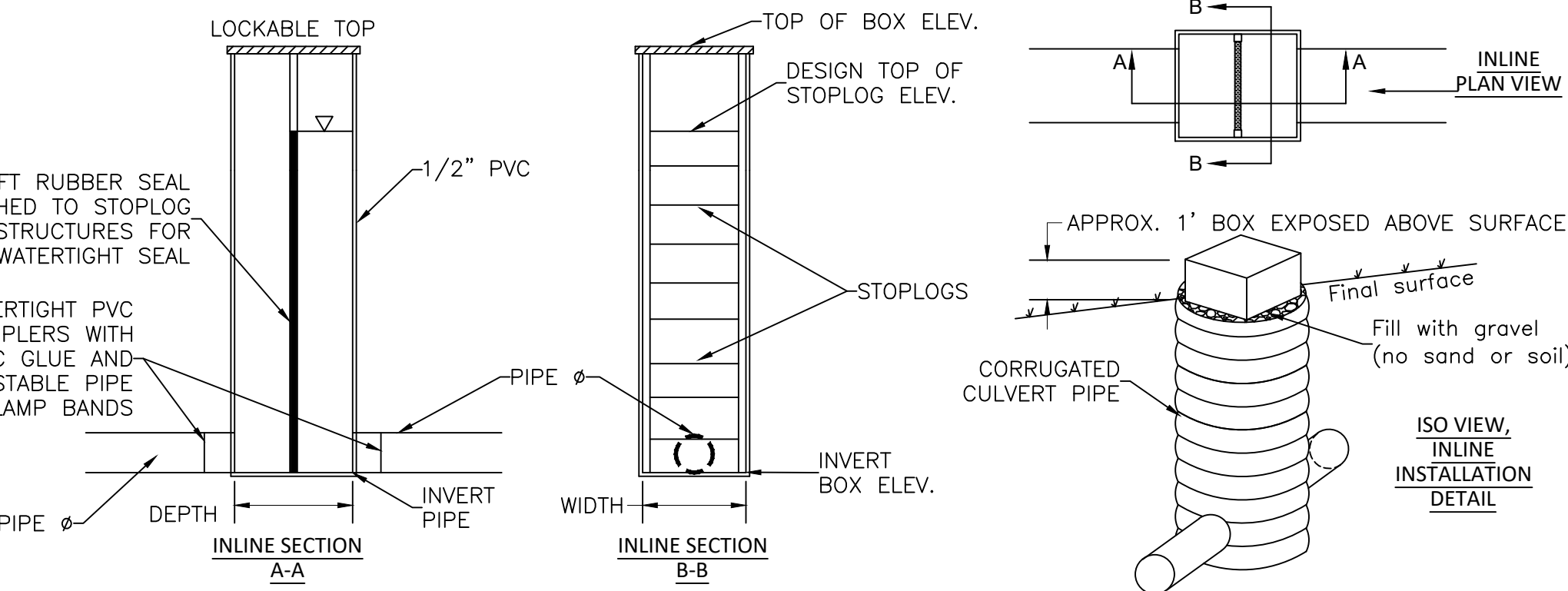
The MR-7 Settling Pond outlet is a 12" pipe fitted with a tee whose run is oriented vertically. The bottom of the run is open and the top is fitted with a bar guard (as produced by AgriDrain or similar). The tee prevents clogging by floating debris. The existing WLCS provides an outlet for unusually large flows to prevent damage to the MR-7 Polishing Pond. Consult General Construction Specifications for pipeline installation procedure on Sheet 13.

MR-7 Polishing Pond
An existing refuse pile will be regraded to create a polishing pond. The proposed grading plan is intended to minimize the amount of excess cut while also producing a finished grade that is largely flat with no slopes steeper than 3:1. To minimize cut disposal, the existing road will be built up and incorporated into a broad flat area that the landowner intends to use as a log landing in the future.

Water enters the MR-7 Polishing Pond from the MR-7 Settling Pond and flows horizontally through the limestone to a perforated pipe on the bottom of the pond at the opposite end. A WLCS sets the water level in the pond and the effluent is piped to an existing mine pit pond before flowing to Morgan Run.

See General Construction Specifications on Sheet 13 regarding WLCS installation, underdrain plumbing, earthwork, pipeline installation and limestone.

Access road on berms
Access roads on newly constructed berms must have a 3" subbase of AASHTO #3 Type A aggregate that will serve as the running surface during materials hauling. A finish surface of AASHTO #57 will then be placed after hauling is completed.



WLCS Location	Type of Structure	TOP OF BOX ELEV.	INVERT PIPE ELEV.	STRUCTURE HEIGHT (FT)	INSIDE DIMENSION WIDTH	INSIDE DIMENSION DEPTH	PIPE Ø	TOP STOPLOG ELEV.
MR-7 Polishing Pond	Inline	1655.5	1647.5	8	16"	20"	12"	1651.5

Water Level Control Structure (WLCS)

