

GEOLOGY

Chapter Nine

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Introduction:

In response to comments raised during the review of the DEIS, additional details regarding the proposed fill slopes and global stability have been provided in this chapter. In addition, these comments related to the relationship between the proposed infiltrator system and fill slope below them which is addressed in Chapter 13. As required by all site plan projects when the project continues with site plan review, additional soil testing and site specific details will be required to ensure that all slopes can be stabilized as shown on the site plans, that the proposed infiltration system will not affect the stability of the slopes uphill or downhill of their location, and that the soils have the capacity to infiltrate the volume of water proposed by the infiltration system.

Comment Geo-1

GEOLOGY

- 1. As previously noted, geotechnical details of design for retaining walls and manufactured 2:1 (two horizontal to one vertical) slopes should be provided. (NLJA (11/12/2013))*

Response:

The full construction details of the site retaining walls have not been finalized at this early stage of the project, but the sketch included at the end of this chapter depicts the typical geometry and construction of the proposed fill sloped embankment and boulder walls. As seen on the sketch the fill slope will be constructed at 2H:1V (horizontal to vertical), above three 10-foot high tiered boulder walls. Each boulder wall will be separated from the adjacent wall by a ten-foot distance. The bench between each wall will be planted with a dense ground cover, noninvasive vine, shrub, or ornamental trees and be sloped so as to shed water. The batter of the boulder walls (based on the sketch provided at the end of this chapter) will be approximately 1H:4V, and the slope of the berms will be about 5H:1V. Preliminary analyses were performed to determine that the proposed slope and boulder walls will be stable (at the proposed locations and proposed slope/wall heights and geometries).

Regarding the 2H:1V slopes, their design is typical and will require use of non-organic granular materials placed in lifts and compacted to a minimum of 92% of Dry Density, or if rock fill is used, the project's specifications will specify detailed means and methods to place the rock-fill materials in maximum lift thicknesses that match the compaction equipment sizes/weights and a minimum number of passes (four in each direction) to achieve the required strength and stability. Gradation requirements will also be provided for the choker layer material at the top of rock fill materials and below the building pad

and parking area base materials, as well as at the slope face if a vegetated cover is selected as the final slope facing.

Final design of manufactured slopes and retaining walls will be provided by the project Geotechnical Engineer and reviewed during the application for site plan approval.

Comment Geo-2

2. *As previously noted, this Chapter generally discusses the land surface changes resulting from the proposed development and notes that increased impervious areas will tend to reduce water infiltration (as flows are diverted into the stormwater system) while exposing bedrock and constructing rock fill on rock revetted slopes will tend to increase infiltration. In this regard, quantitative analysis is required to support the design of infiltration measures incorporated into the project development plans. (NLJA (11/12/2013))*

Response:

Quantitative analysis of the infiltration is included in the Stormwater Chapter (Chapter Thirteen) of this FEIS. As noted above, additional testing will be required to confirm the capacity of the soils to handle the proposed infiltration system. This testing will be required to meet the requirements of the NYCDEP, NYSDEC and Town of Southeast. Testing and full construction details will be prepared as part of the site plan review which follows the SEQRA process. A typical section of the infiltration system and the anticipated slope protections are provided in Chapter 13.

Comment Geo-3

3. *There are inconsistencies between current site plans, Chapter 8 of the DEIS, and Appendix M (Geotechnical Report). While the submitted site plans and Chapter 8 seem to be consistent, Appendix M makes reference to cut slopes, rock faces and fill slopes that appear to reference prior site designs. These discrepancies should be resolved. (NLJA (11/12/2013))*

Response:

Due to changes in the site plans as part of the SEQRA process, the geotechnical reports and data included in Appendix M were indeed prepared, in part, based on prior site designs. However, the data included in these reports is still valid. Some of the cut slopes and rock faces have been modified and/or eliminated since these reports were prepared and the FEIS Site Plans continue to address these issues. Moreover, since currently proposed cuts and fills are less steep and/or lower than in prior designs, the conclusions

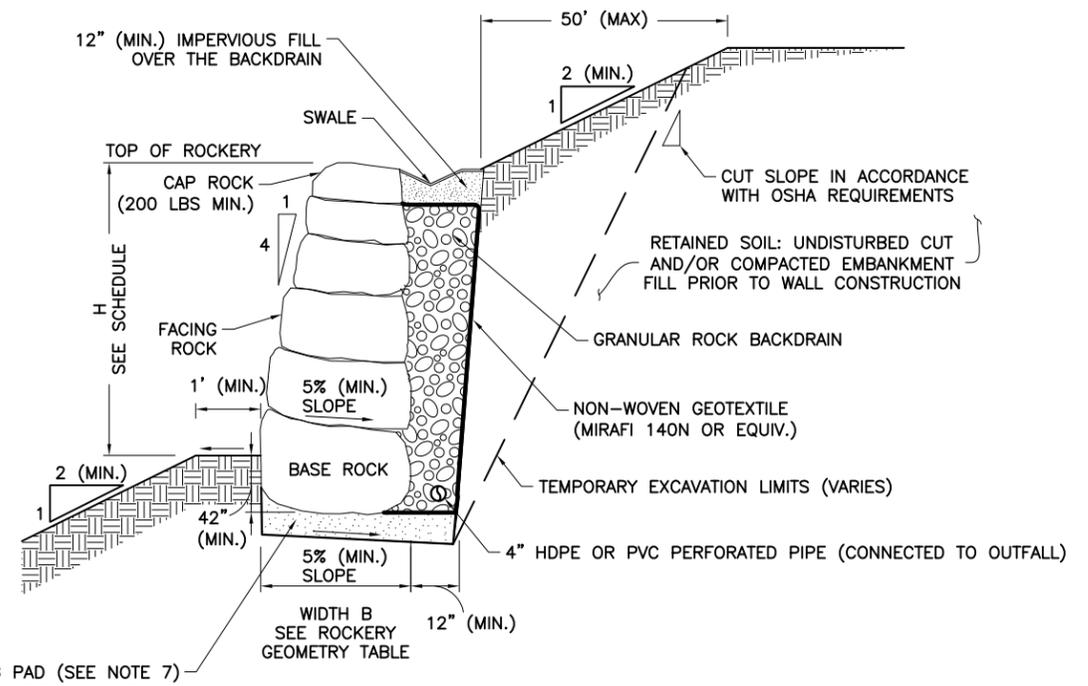
included in the geotechnical reports are still valid (because the present design places less geotechnical demands on the project and any related mitigation measures).

Comment Geo-4

Also, I have an additional point. We do not have a blasting code in the Town of Southeast, and from the description there is going to be considerable blasting. I would like to know the plan for the blasting of that particular parcel. (Public Hearing (11/07/2013))

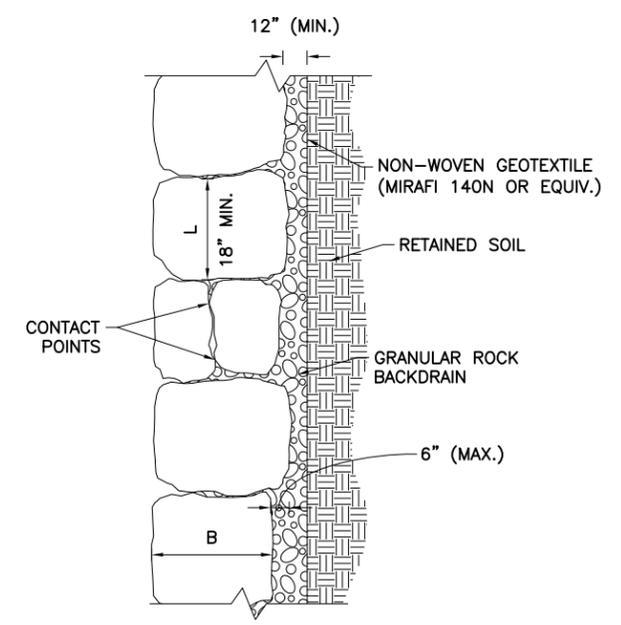
Response:

Blasting requirements are provided in Chapter 71 of the Town of Southeast Code Explosives and Blasting, This Chapter is known as the "Explosives and Blasting Law of the Town of Southeast New York".



6" (MIN.) BEARING PAD (SEE NOTE 7) OVER PROOF-ROLLED (MULTIPLE PASSES OF VIBRATORY ROLLER) NATURAL, GRANULAR SOIL. SUBGRADE TO BE INCLINED INBOARD 5% (MIN.)

ROCKERY WALL
TYPICAL SECTION
N.T.S.



BASE ROCK
PLAN VIEW
N.T.S.

ROCKERY GEOMETRY TABLE	
MAX WALL HEIGHT - H (FT)	MIN. BASE ROCK WIDTH - B (FT)
5	3
6	4
7	4.5
8	5
9	6
10	6.5

NOTES:

- CONSTRUCT ROCKERY WALL IN ACCORDANCE WITH GEODESIGN, INC.'S XXX, REPORT AND THESE DRAWINGS. PLACE EACH ROCK INDIVIDUALLY BY EQUIPMENT SUITABLE FOR LIFTING, MANIPULATING, AND PLACING ROCKS OF THE SIZE AND SHAPE SPECIFIED. ENSURE THAT EACH ROCK IS FREE OF SOIL ON SURFACE. EACH ROCK MUST BE FIRMLY SET AND SUPPORTED BY UNDERLYING MATERIALS AND ADJACENT ROCKS FOR FIRM BEARING. REPOSITION OR REPLACE LOOSE AND/OR ROCKING BOULDERS. OVERLAPPING IS REQUIRED IN ALL DIRECTIONS. (NO CONTINUOUS JOINTS ARE PERMITTED)
- A MAXIMUM TOLERANCE OF 6 INCHES MAY BE APPLIED TOWARD THE TOTAL BASE ROCK WIDTH (B). USE ROCKS WITH MINIMUM LENGTH (L) OF 18 INCHES. TWO APPROXIMATELY EQUAL SIZE BASE ROCKS MAY BE USED, PROVIDED ROCKS ARE IN CONTACT AT TWO POINTS OR MORE. DO NOT CONSECUTIVELY PLACE BASE ROCKS WITH LENGTHS LESS THAN B.
- PLACE BASE, FACING, AND CAP ROCKS SO THAT THEIR HEIGHT DIMENSION IS NOT GREATER THAN THEIR WIDTH. THE LONGEST DIMENSION OF THE BASE, FACING, AND CAP ROCKS IS PERPENDICULAR TO FACE OF ROCKERY.

WHERE VOIDS WITH A MINIMUM DIMENSION OF 6 INCHES OR GREATER EXIST IN THE FACE OF THE ROCKERY, CHINK VOIDS WITH SMALLER ROCK. CHINKING ROCKS MUST NOT PROVIDE PRIMARY SUPPORT FOR OVERLYING ROCK. CONFIRM THAT CHINKING ROCKS CANNOT BE MOVED OR REMOVED BY HAND AFTER ROCKERY IS COMPLETE.
- WHERE LOOSE, SOFT, OR OTHERWISE UNSUITABLE FOUNDATION SOIL CONDITIONS ARE ENCOUNTERED, CONTACT GEODESIGN FOR SUPPLEMENTAL RECOMMENDATIONS PRIOR TO CONSTRUCTION.

LIMIT CUT SLOPES (EXTENT AND GEOMETRY) TO PROVIDE FOR GLOBAL AND LOCAL STABILITY.
- SURROUND THE PERFORATED PIPE ON ALL SIDES BY AT LEAST 4 INCHES OF WASHED, GRANULAR BACKDRAIN MATERIAL.

GRANULAR BACKDRAIN MATERIAL SHALL CONSIST OF CRUSHED GRAVEL TO BE BROUGHT UP WITH EACH COURSE OF BOULDERS AND THOROUGHLY COMPACTED.

DISCHARGE OUTLET DRAIN PIPES TO A PROTECTED OUTLET OR OTHER PERMANENT DRAINAGE STRUCTURE AT LOW POINTS IN THE ROCKERY AND AT 100 FEET (MAX.) SPACING. DRAIN OUTLETS SHOULD NOT EMPTY INTO STORM DRAINS THAT ARE DESIGNED TO BACK-UP DURING HEAVY FLOWS.

INSTALL RISER CLEANOUTS AT 100 FEET (MAX.) SPACING AND WITH POSITIVE DISCHARGE.
- DO NOT CONSTRUCT ROCKERIES OR SLOPES EXCEEDING THE HEIGHTS SHOWN ON THE ROCKERY GEOMETRY TABLE AND/OR DRAWINGS WITHOUT PRIOR WRITTEN APPROVAL BY GEODESIGN.
- BEARING PAD SHALL CONSIST OF FREE-DRAINING, GRANULAR PROCESS (AASHTO NO. 57 OR EQUIV.).

CONCEPT ONLY
NOT FOR
CONSTRUCTION

N:\CL\3022\04\4.2\FES November 2014\Boulder Walls Design\Rockery Drawing CFR (10-24-12)_SAMPLE.dwg Ulrich, La Fosse 11/3/2014 10:22 AM GEO Standard Pen Table.ctb

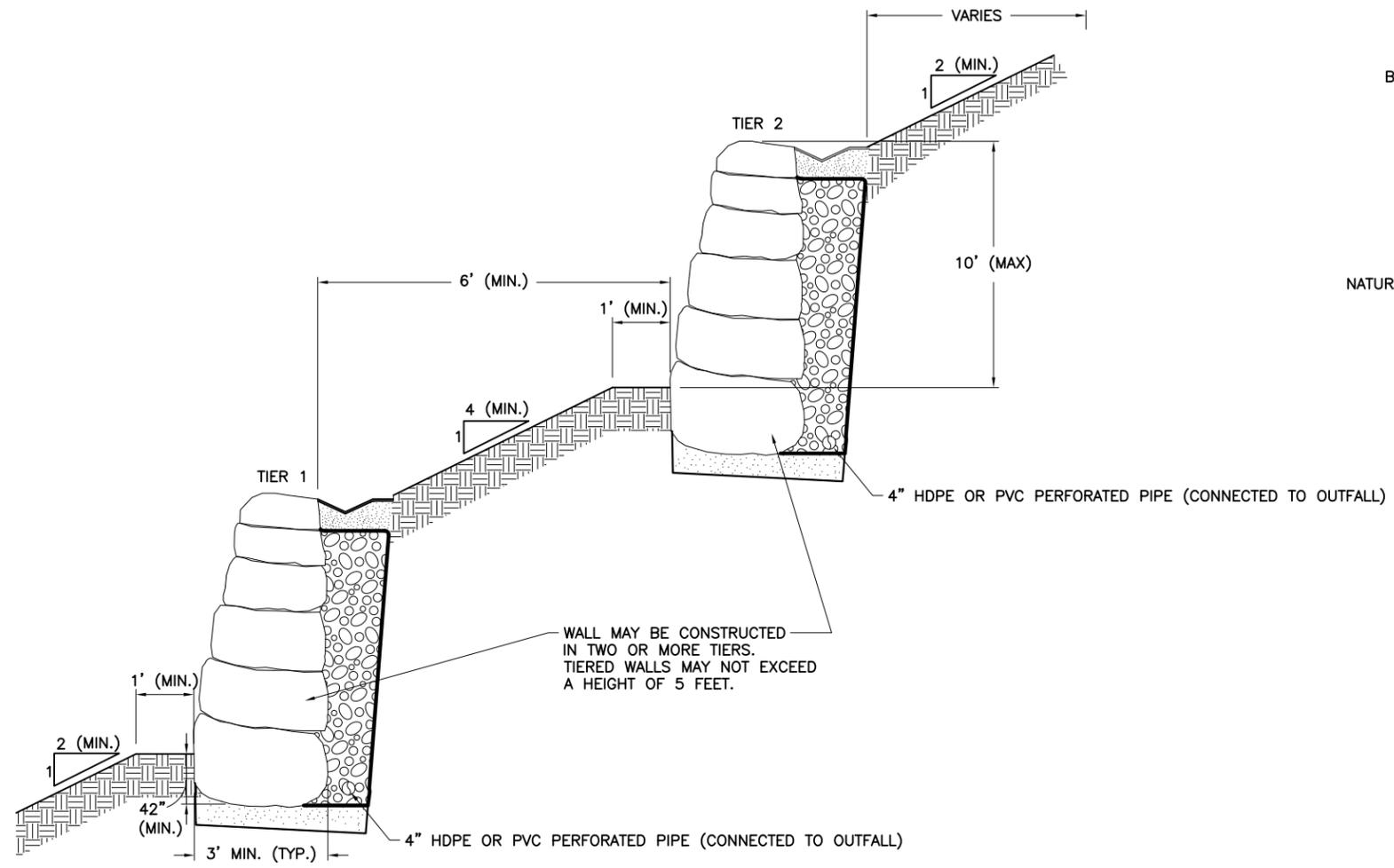
DESIGNED BY ULF					
DRAWN BY XXX					
CHECKED BY XXX					
APPROVED BY XXX	NO.	DATE	DRWN	CHKD	APPVD
REVISIONS					

Geotechnical | Construction | Environmental
Engineers and Scientists
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PROJECT ROCKERY (BOULDER) WALLS CONCEPT - CROSSROADS 312
DWG. TITLE TYPICAL SECTIONS & DETAILS

PROJECT NO. 3022-04.02
SCALE DATE N.T.S. 11/03/14
DRAWING NO. 1

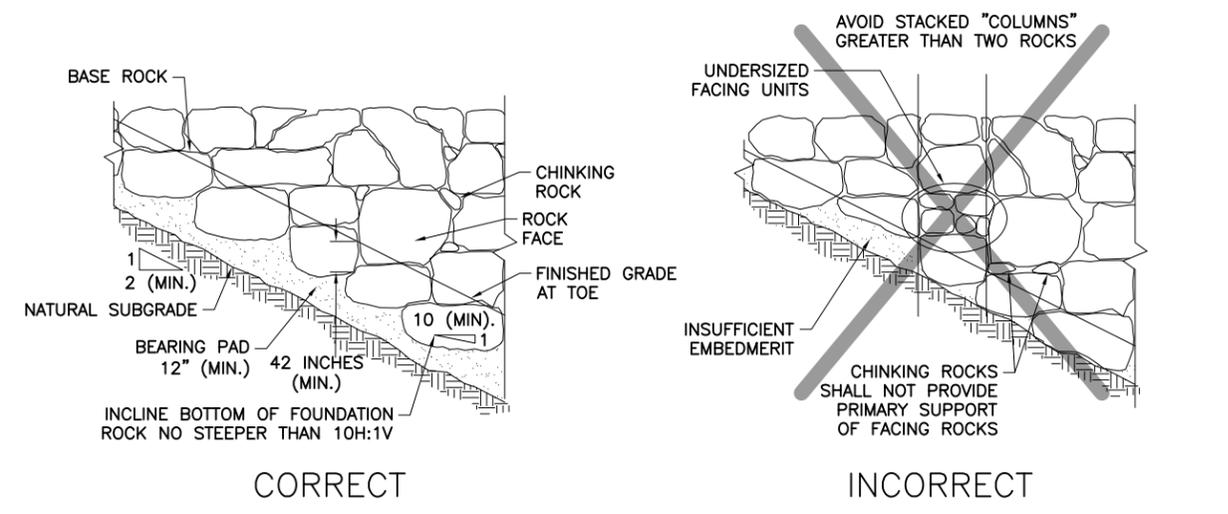
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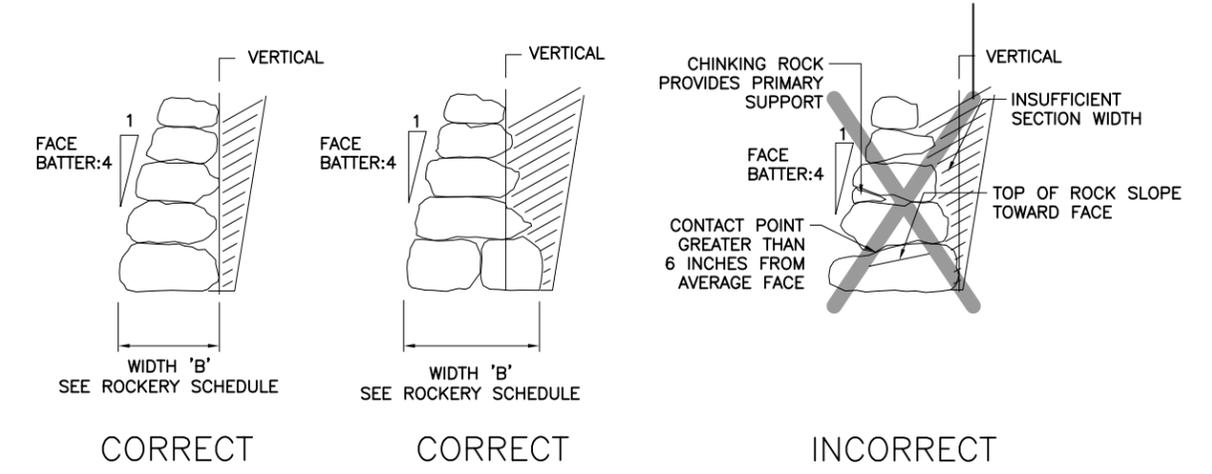
TIERED ROCKERY WALLS TYPICAL SECTION
(SEE SHEET 1 FOR ADDITIONAL REQUIREMENTS)
N.T.S.

NOTE: ROCK GEOMETRY TABLE ON DRAWING 1 DOES NOT APPLY TO TIERED WALLS

CONCEPT ONLY
NOT FOR
CONSTRUCTION



PARTIAL TYPICAL ELEVATION
AT SIDE SLOPES
N.T.S.



SECTION PROPERTIES

DESIGNED BY	ULF				
DRAWN BY	xxx				
CHECKED BY	xxx				
APPROVED BY	xxx				
	NO.	DATE	DRWN	CHKD	APPVD
	REVISIONS				

GEODESIGN
INCORPORATED

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PROJECT	ROCKERY (BOULDER) WALLS CONCEPT - CROSSROADS 312
DWG. TITLE	TYPICAL SECTIONS & DETAILS

PROJECT NO.	3022-04.02
SCALE	N.T.S.
DATE	11/05/14
DRAWING NO.	2