

NOTES:

- Rockery construction shall be performed in accordance with the Associated Rockery Contractor Guidelines.
- Rockery construction is a craft. The skill and experience of the builder will largely dictate the success of the construction.
- A rockery is a protective system with respect to the weathering and erosion process on an exposed soil face.
- Maximum inclination of the slopes above and in front of rockeries should be 2 : 1 (horizontal : vertical).
- Minimum thickness of rock filter layer = 18 inches.
- Rockeries greater than 6 feet in height should be installed under the observation of the Geotechnical Engineer.
- The long dimension of the rocks should extend back towards the cut or fill face to provide maximum stability.
- Rocks should be placed to avoid continuous joint planes in vertical or lateral directions. Each rock should bear on two or more rocks below it, with good flat-to-flat contact.
- Rock designations and approximate weights are provided below.
- For Fill Rockeries, it is imperative that Structural Fill compaction extend all the way to the back of the Rockery and Filter Drain Rock Zone. Reduced lift thickness and light compaction equipment may be required to fully achieve the required compaction.

Size	Approximate Weight - lbs.	Approximate Diameter
1 Man	50 - 200	12" - 18"
2 Man	200 - 700	18" - 28"
3 Man	700 - 2000	28" - 36"
4 Man	2000 - 4000	36" - 48"
5 Man	4000 - 6000	48" - 54"
6 Man	6000 - 8000	54" - 60"

GEOGRID SOIL REINFORCEMENT

- A. Geosynthetic reinforcement shall consist of geogrids manufactured specifically for soil reinforcement applications and shall be manufactured from high tenacity polyester yarn or high density polyethylene. Polyester geogrid shall be knitted from high tenacity polyester filament yarn with a molecular weight exceeding 25,000 Meg/m and a carboxy end group values less than 300. Polyester geogrid shall be coated with an impregnated PVC coating that resists peeling, cracking and stripping.
- B. Long term design strength of geogrid shall be at least 2,361 lbs/ft for rockeries 8' or less.
- C. Manufacturing Quality Control: The geogrid manufacturer shall have a manufacturing quality control program that includes QC testing by an independent laboratory. The QC testing shall include:
 - ...Tensile Strength Testing
 - ...Melt Flow Index (HDPE)
 - ...Molecular Weight (Polyester)

STRUCTURAL FILL

- A. Structural Fill shall consist of granular well graded material with a fines content of less than 25 percent (percent passing the #200 sieve based on the minus three-quarters inch fraction). Some rockery applications may require the use of "select" free draining Structural Fill Material. Structural Fill Material shall be approved and tested by the Geotechnical Engineer.

STRUCTURAL GEOGRID INSTALLATION

- A. Geogrid shall be oriented with the highest strength axis perpendicular to the rockery alignment.
- B. Geogrid Reinforcement shall be placed at the strengths, lengths and elevations shown on the construction design drawings or as directed by the Engineer.
- C. The geogrid shall be laid horizontally on compacted backfill and extend to the back of the rockery. The geogrid shall be pulled taut, and anchored prior to backfill placement on the geogrid.
- D. Geogrid Reinforcements shall be continuous throughout their embedment lengths and placed side-by-side to provide 100% coverage at each level. Spliced connections between shorter pieces of geogrid or gaps between adjacent pieces of geogrids are not permitted.

REINFORCED BACKFILL PLACEMENT

- A. Reinforced Backfill shall be placed, spread and compacted in such a manner that minimizes the development of slack in the geogrid and installation damage.
- B. Reinforced Backfill shall be placed and compacted in lifts not to exceed 6 inches where hand compaction is used, or 8 - 10 inches where heavy compaction equipment is used. Lift thickness shall be decreased to achieve the required density as required.
- C. Reinforced Backfill shall be compacted to 95% of the maximum density as determined by ASTM D-1557-91. The moisture content of the backfill material prior to and during compaction shall be at or near the optimum moisture content.
- D. The required compaction shall extend all the way to the back of the Rockery and Filter Drain Rock Zone.

- E. Only lightweight hand-operated equipment shall be allowed within 3 feet of the back of the rockery.
- F. Tracked construction equipment shall not be operated directly upon the geogrid reinforcement. A minimum fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.
- G. Rubber tired equipment may pass over geogrid reinforcement at slow speed, less than 10 MPH. Sudden braking and sharp turning shall be avoided.
- H. At the end of each day's operation, the Contractor shall slope the last lift of reinforced backfill away from the rockery to direct runoff away from wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

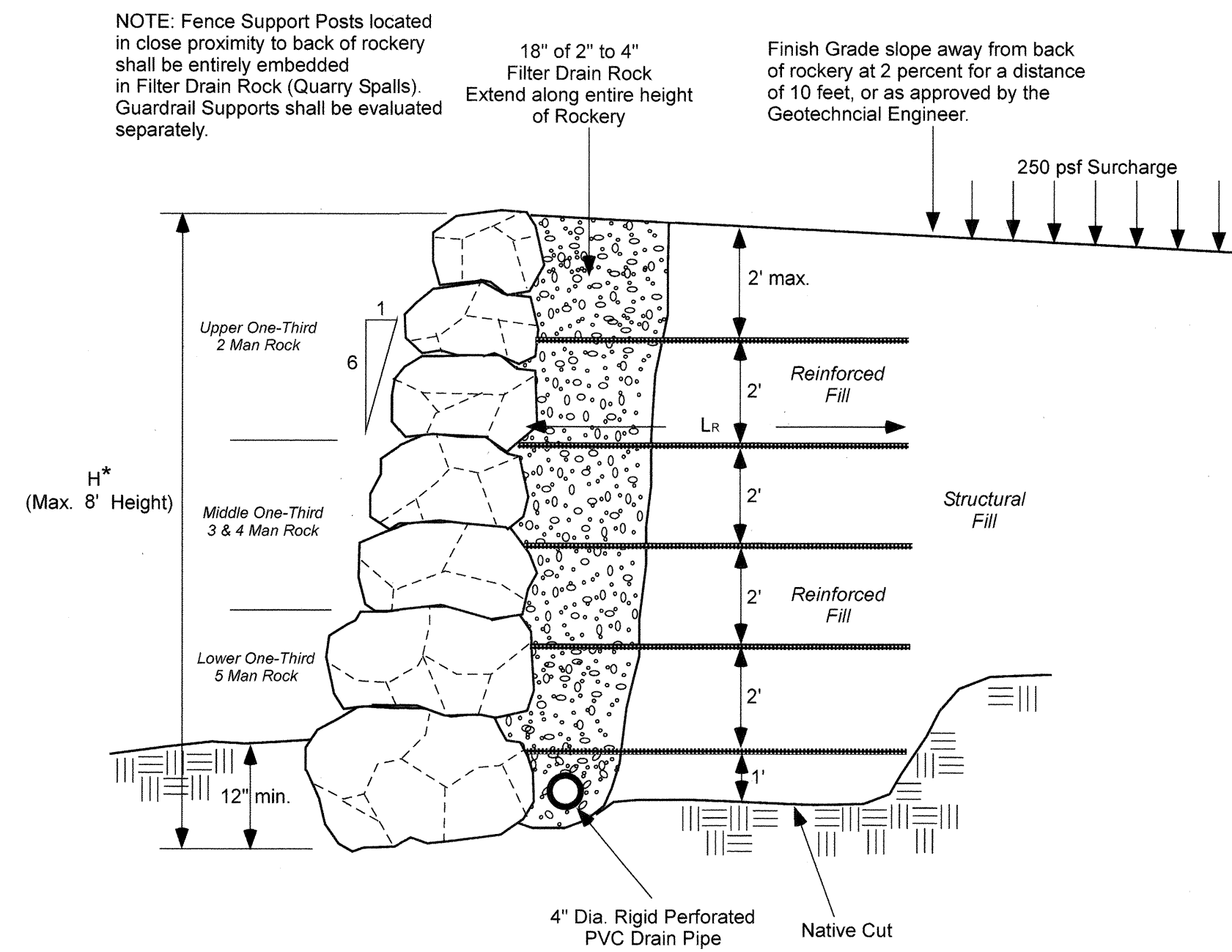
NATIVE CUT ROCKERY

- A. The Geotechnical Engineer shall observe cuts for the rockery. Additional flattening of cuts may be recommended by the Geotechnical Engineer depending on the soil and groundwater conditions observed. Where Native Cuts do not expose competent Native Soils, additional excavation and the addition of reinforcement and Compacted Structural Fill may be necessary.

FIELD QUALITY CONTROL

- A. The rockery construction shall be observed by the Geotechnical Engineer on a periodic or full-time basis as appropriate. Testing of the compacted backfill shall be performed by the Geotechnical Engineer.
- B. Quality assurance shall include foundation soil inspection, soil and backfill testing, verification of design parameters and observation of construction for general compliance with design drawings and specifications.

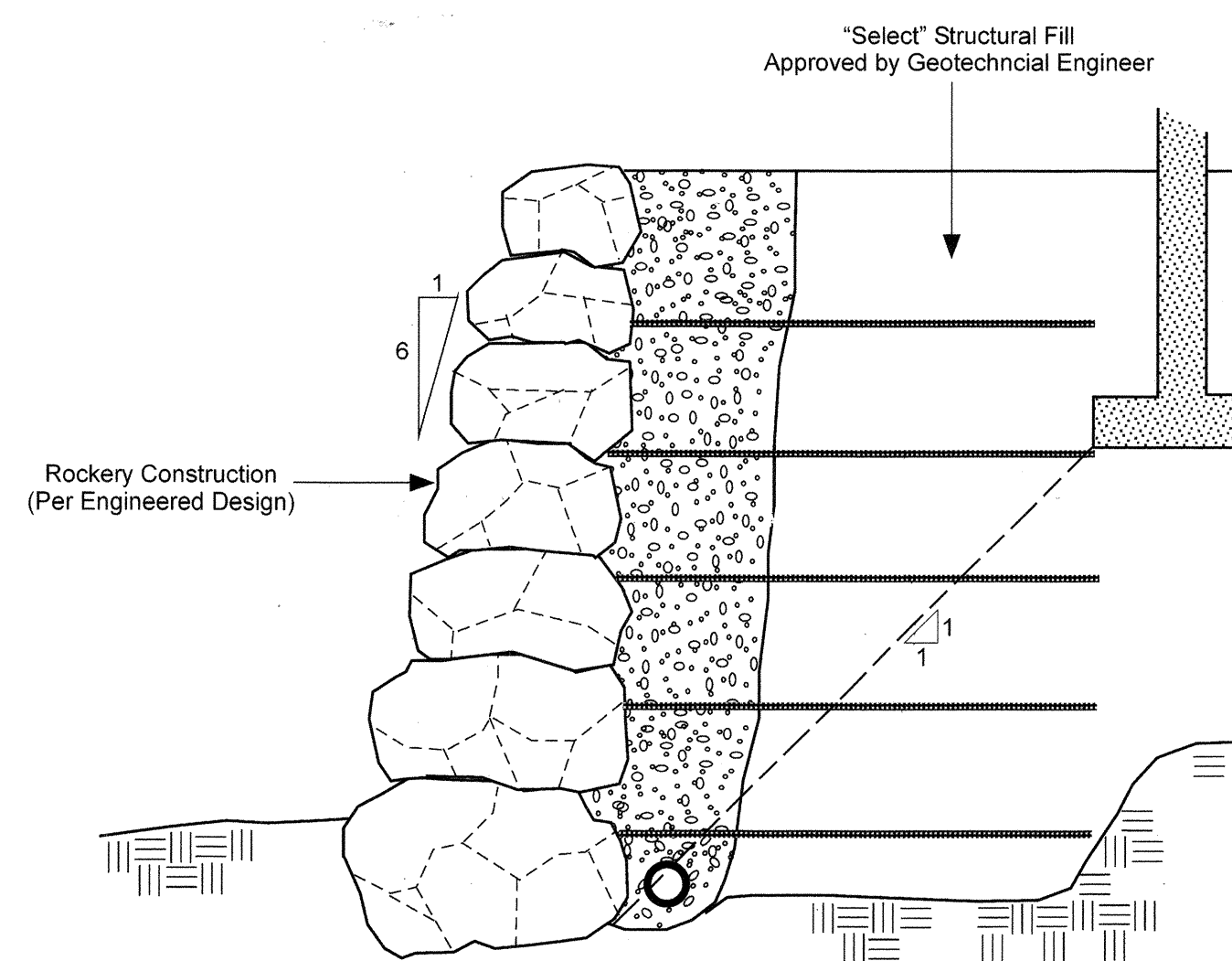
REINFORCEMENT SCHEDULE	
Wall Height (feet) H	Length of Reinforcing (feet) L _R
4.0	4.0
6.0	6.0
8.0	7.0



ENGINEERED FILL ROCKERY DETAIL

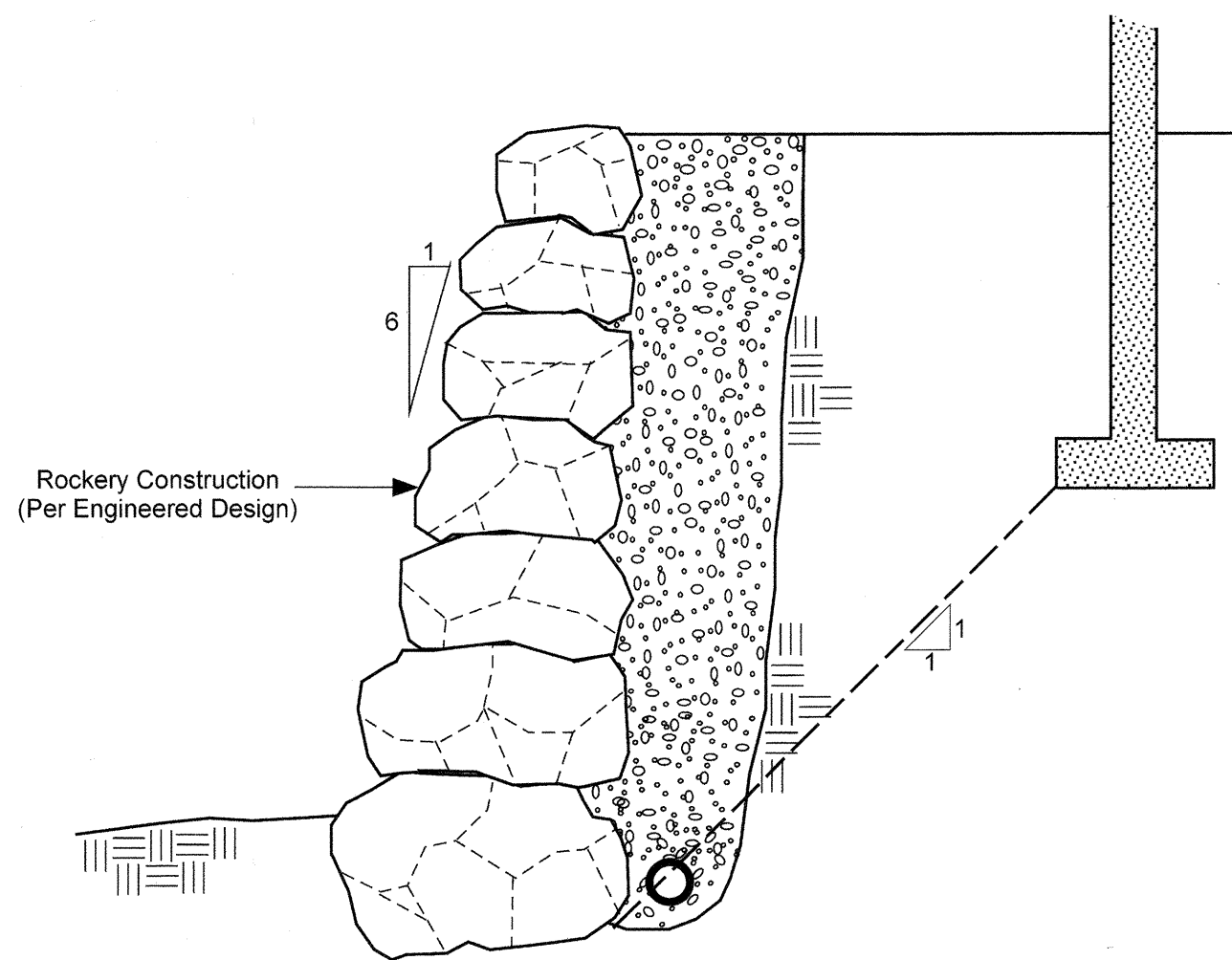
NOT - TO - SCALE

* Rockeries greater than 8 feet require additional consideration with respect to location, proximity to structures, adjacent properties and right - of - ways. Tiered configurations may be recommended. Supplement recommendations shall be provided by the Geotechnical Engineer, as appropriate.



**ENGINEERED FILL ROCKERY DETAIL
TYPICAL SIDE YARD CONDITIONS**

NOT - TO - SCALE

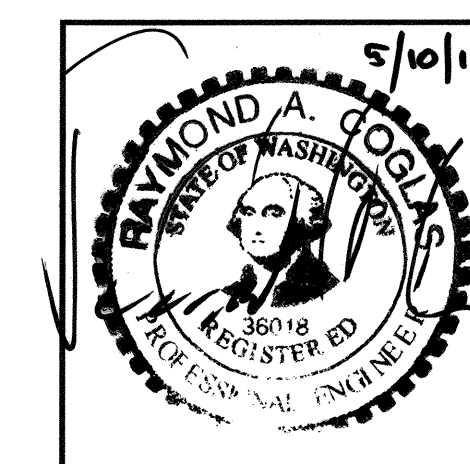


NATIVE CUT ROCKERY DETAIL

NOT - TO - SCALE

PROJECT REF: FAC07-0016
 45 May 16, 2013
 THESE PLANS ARE APPROVED FOR CONFORMANCE WITH THE CITY OF AUBURN'S ENGINEERING REQUIREMENTS.
 APPROVED BY: Dennis Sull
 DATE APPROVED: 5/16/13

RECORD DRAWING CERTIFICATION
 THESE DRAWINGS CONFORM TO THE CONTRACTOR'S CONSTRUCTION RECORDS.
 BY _____ DATE _____
 TITLE POSITION _____
 CONFIRMED BY CITY _____ DATE _____



Rockery Design
LAKELAND HILLS
 Auburn, Washington

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 Geotechnical Engineering, Construction Management
 and Environmental Sciences

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Revisions
 Date
 0040.12
 11/15/2012
 Date
 5/10/13
 Drawn By
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W2