



SOUTHERN NEVADA BUILDING OFFICIALS (SNBO)

STRUCTURAL ANALYSIS AND CONSTRUCTION

OF ROCKERY WALLS STANDARD

Southern Nevada Building Officials

c/o City of North Las Vegas
2250 Las Vegas Blvd. North
North Las Vegas, NV 89030

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The following are the minimum requirements for the structural analysis and construction of rockery walls.

1. A dimensioned drawing that identifies the location of each rockery wall with respect to the property lines, easement, streets, and other rights-of-way. Existing construction, required setbacks as noted below, and drainage features shall clearly be identified on drawings.
2. Cross section of wall showing the approximate rock size for each lift, maximum height, backfill, drainage, slope of ground, embedment, cuts, and required face inclination.
3. Rockery wall height for the purpose of this standard shall be measured from the bottom of the base rock to top of wall.
4. The maximum exposed face of any single-story rockery wall shall not exceed sixteen feet (16 ft).
5. All rockery walls six feet (6 ft) high and greater shall require engineering analysis.
6. All rockery walls six feet (6 ft) high and greater shall require a geotechnical report.
7. The passive pressure resistance shall be neglected when computing the safety factor against sliding and overturning.
8. The base rock shall be embedded at least 12" into the soil. Placement of base rocks at grade followed by subsequent backfilling of the "toe area" shall not be permitted unless specific recommendations are provided by the Geotechnical and/or Structural Engineer(s). The base should be level and shall not have a slope greater than 1 unit vertical to 10 units horizontal (10-percent); otherwise, a stepped base shall be required.
9. The wall shall have a face inclination ratio of at least 1 unit horizontal to 6 units vertical (1:6) measured at the exposed face of wall. The ratio may be greater than 1:6.
10. The surrounding site shall be graded such that water cannot flow over the top of the wall.
11. Landscape materials, if used, shall not have detrimental effect on the wall. The use of landscape materials in close proximity to rockery walls shall be specifically addressed in the structural analysis.
12. Rockery walls greater than ten feet (10 ft) high shall have a slope stability analysis performed by the Geotechnical Engineer. Total height shall be measured from the bottom of the base rock at the lowest wall (or bottom of the lowest wall as shown in Detail 18) to the top of the highest wall or total slope height.

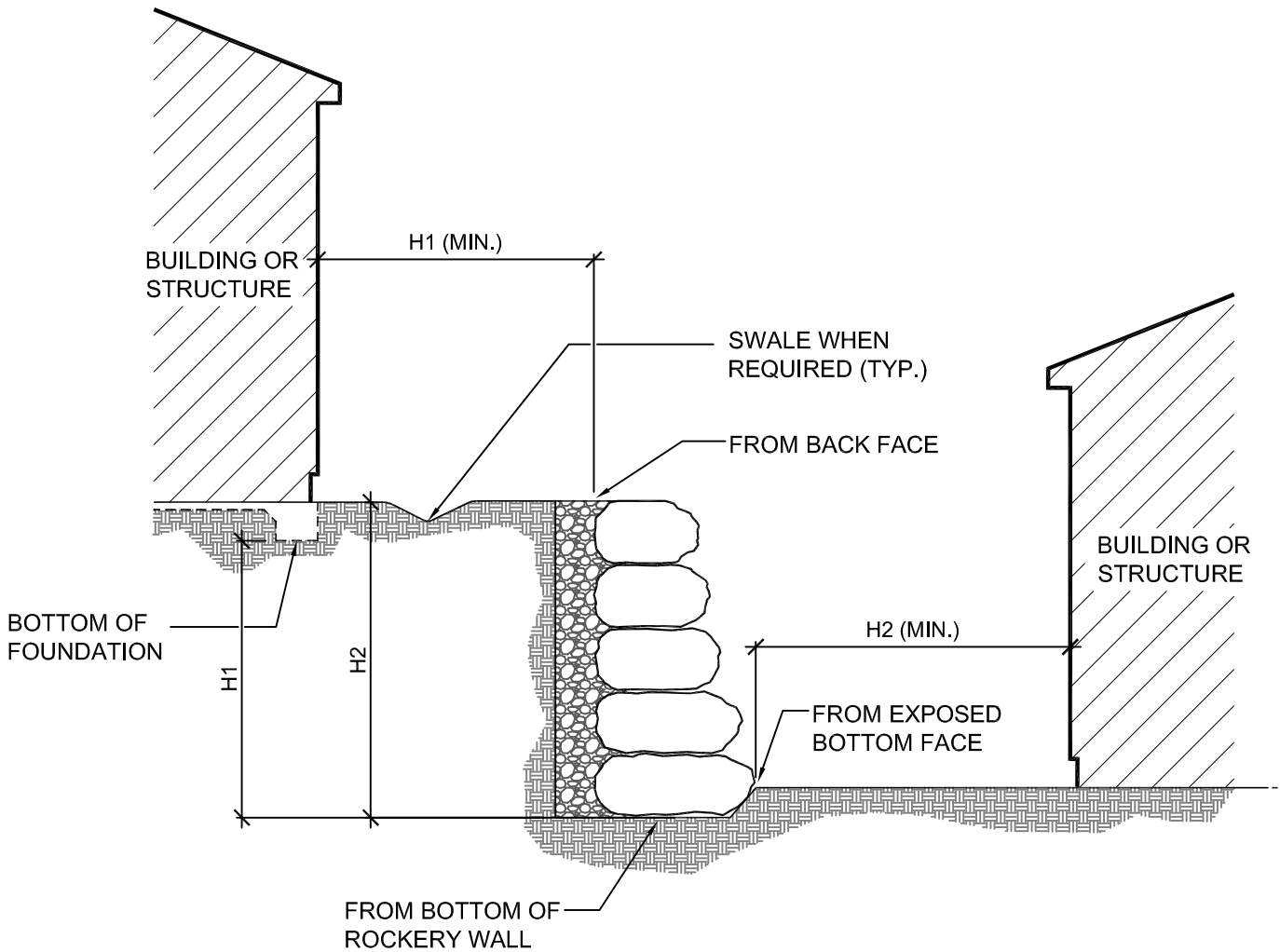
13. No rockery wall shall be constructed as the sole means of repair to provide stability to any unstable slope. In this case a rockery wall may only be used after the slope is first stabilized by MSE, soil nailing or some other approved engineered repair.
14. Caliche and other "cemented soils" formed by precipitation shall not be used in rockery wall construction unless special design considerations are provided to address their suitability for use.
15. Rockery walls six feet (6 ft) high and greater: Rocks sized as "two man" (approximately 200-700 pounds and 18-28 inch nominal diameter) or greater shall be tightly fitted and interlock with neighboring rocks. Smaller rocks may be intermittently used for "structural chinking" which allows large rocks to rest in a stable movement free position. Void spaces between larger rocks shall be tightly filled or "aesthetically chinked" such that large gaps between rocks in the exposed face are reasonably well filled. There shall be no loose rocks or scree present at any point in the exposed face or top of a rockery wall.
16. Rockery walls six feet (6 ft) high and greater: No rocks smaller than the nominal "two man" size (approximately 200-700 pounds and 18-28 inch nominal diameter) shall be permitted to be exposed in the front face or top rock layer. Tightly fitted smaller rocks used for the purpose of filling voids or "chinking" shall not be subject to this limitation.
17. The setback from the top back face of the rockery wall to a building or structure on the high side shall be not less than the height of the rockery wall minus the embedment depth of the building or structure foundation. The setback from the base of a rockery wall to a building or structure on the low side shall be not less than the height of the rockery wall. *Exception: Where the building or structure foundation has been designed so as to not impose a surcharge on the rockery wall, this requirement may be waived at the option of the authority having jurisdiction.* (See Detail 17).
18. When a masonry or concrete (or other non-rockery material) retaining wall surcharges a rockery wall below it, the non-rockery wall shall be set back not less than the height of the lower wall minus the embedment depth of the upper wall footing; this distance shall be measured from the top back face of the rockery wall to the toe of the non-rockery wall footing. When a rockery wall surcharges another rockery wall below it, the upper rockery wall shall be set back not less than the height of the lower wall minus the embedment depth of the upper wall; this distance shall be measured from the top back face of the lower wall to the exposed bottom face of the upper wall. When a rockery wall surcharges a masonry or concrete (or other non-rockery material) retaining wall below it, the rockery wall shall be set back not less than $\frac{1}{2}$ the height of the lower wall minus the embedment depth of the upper wall; this distance shall be measured from the back face of the non-rockery wall to the exposed bottom face of the rockery wall. Surcharge loading from one wall to another shall be considered in the design. (See Detail 18).
19. The setback from a rockery wall to the foundation of ornamental fences, guards or screen walls shall be not less than two feet (2 ft) measured from the top back face of the rockery wall to the foundation edge nearest the high side of the rockery wall. Ornamental fences, guards, or screen walls shall have their own foundations and not rely on the rockery wall for structural support. Rockery walls shall not be disturbed by the ornamental fences, guards, or screen wall foundations. Any surcharge loading from ornamental fences, guards or screen walls shall be considered in the design. (See Detail 19).

20. Rockery walls shall be set back the required distances from fire hydrants, light poles, gas meters, water meters, electrical transformers, utility boxes or similar features. These distances shall be established and enforced by the authority having jurisdiction. Where permitted, rockery walls located within a utility or other easement shall be in accordance with the published standards of the department or agency having authority of the easements.
21. All structural analysis shall be in accordance with adopted building code of the jurisdiction having authority, the local amendment adopted by the authority having jurisdiction, and this document.
22. The minimum factor of safety for sliding and overturning in a rockery wall shall be in accordance with the adopted codes and regulations of the authority having jurisdiction.
23. The following analysis provisions shall apply:
 - a. The maximum unit weight of the rocks used in the design of a rockery wall shall be 155 pcf unless field verified by special inspection or preconstruction lab analysis of samples from the source rock materials.
 - b. The maximum coefficient of friction between rocks in a rockery wall shall be 0.5.
 - c. Applied loads from adjacent foundations, surcharge materials, or dynamic/transient loads shall be taken into consideration in the analysis.
 - d. Specifications shall be provided to clearly define acceptance criteria for rock materials.
 - e. Design documents shall clearly address the need (or lack thereof) for drainage provisions behind the wall. Items to be addressed are a gravel/cobble drainage blanket, filter fabric and drainage pipes. Specific requirements may be implemented by the authority having jurisdiction based upon prevailing geologic and climate conditions.
 - f. The Structural and/or Geotechnical Engineer(s) of record shall provide specific acceptance criteria to address special inspection details. Specific information shall be provided regarding how the special inspector should determine compliance with embedment requirements outlined in Item 8.
24. Inspections shall be performed as required by the authority having jurisdiction.
25. Special inspection of rockery wall construction shall be required for all walls six feet (6 ft) tall and greater (See item 3 for wall height definition).
26. A final report shall be submitted by the special inspector to the authority having jurisdiction.

Reference: Federal Highway Administration, Rockery Design and Construction Guidelines (publication No. FHWA-CFL/TD-06-006)

ROCKERY WALL MINIMUM SETBACKS

<p>Clark County Building Department 4701 W Russell Rd Las Vegas, NV 89118 (702) 455-3000</p>	<p>Boulder City Building Department 401 California Avenue Boulder City, NV 89005 (702) 293-9282</p>	<p>Henderson Building & Fire Safety Dept. 240 Water Street Henderson, NV 89015 (702) 267-3650</p>	<p>Las Vegas Building & Safety Dept. 495 S. Main Street Las Vegas, NV 89101 (702) 229-6251</p>
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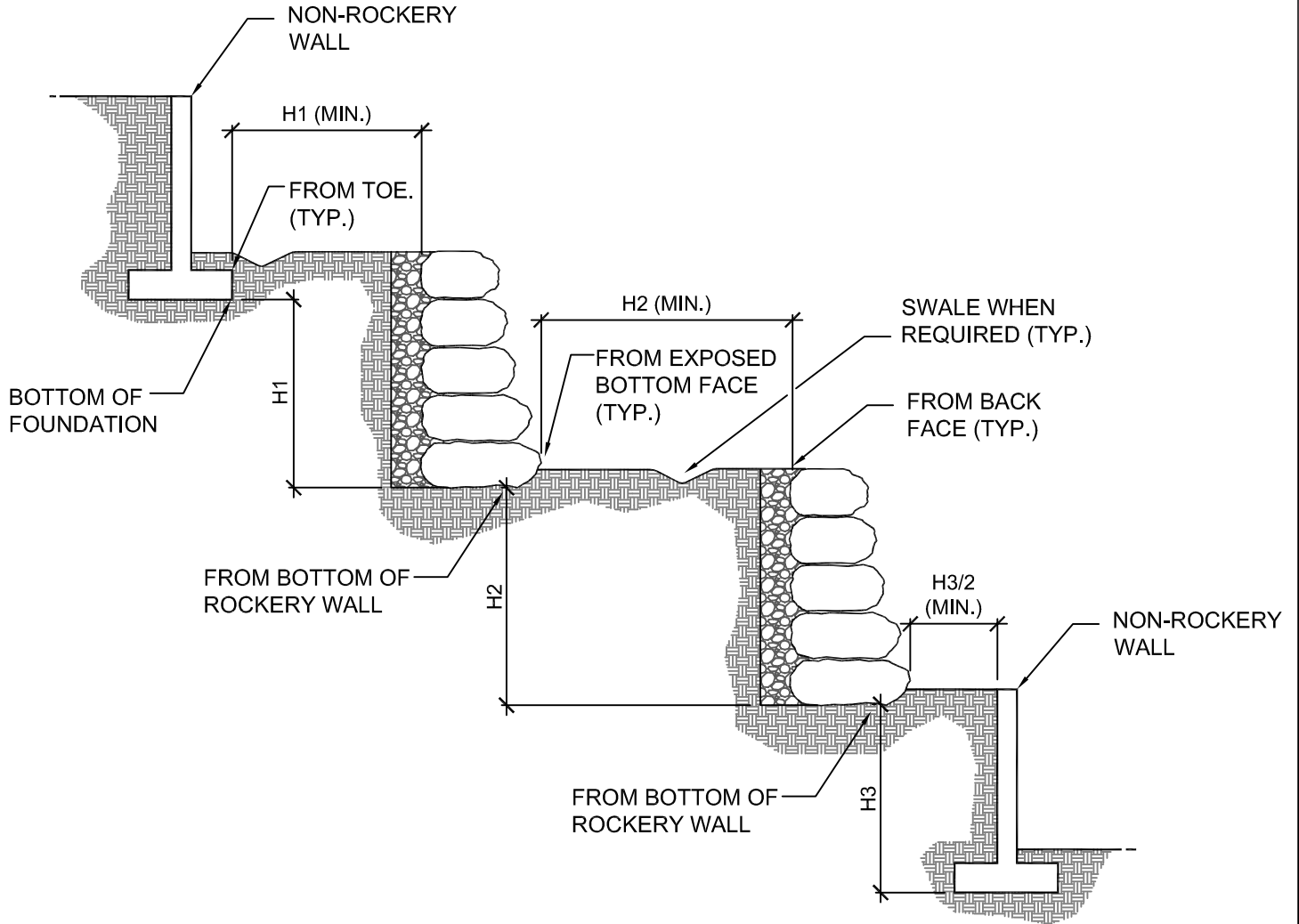
DETAIL NOT TO SCALE

DETAIL 17

<p>Mesquite Building Department 10 East Mesquite Blvd. Mesquite, NV 89027 (702) 346-2835</p>	<p>North Las Vegas Building Safety 2250 Las Vegas Blvd. N N. Las Vegas, NV 89030 (702) 633-1577</p>	<p>Pahrump Nye County Building Department 2041 E. Calvada North Pahrump, NV 89048 (775) 751-3373</p>	<p>Clark County School District Building Department 1180 Military Tribute Place Henderson, NV 89074 (702) 799-7605</p>
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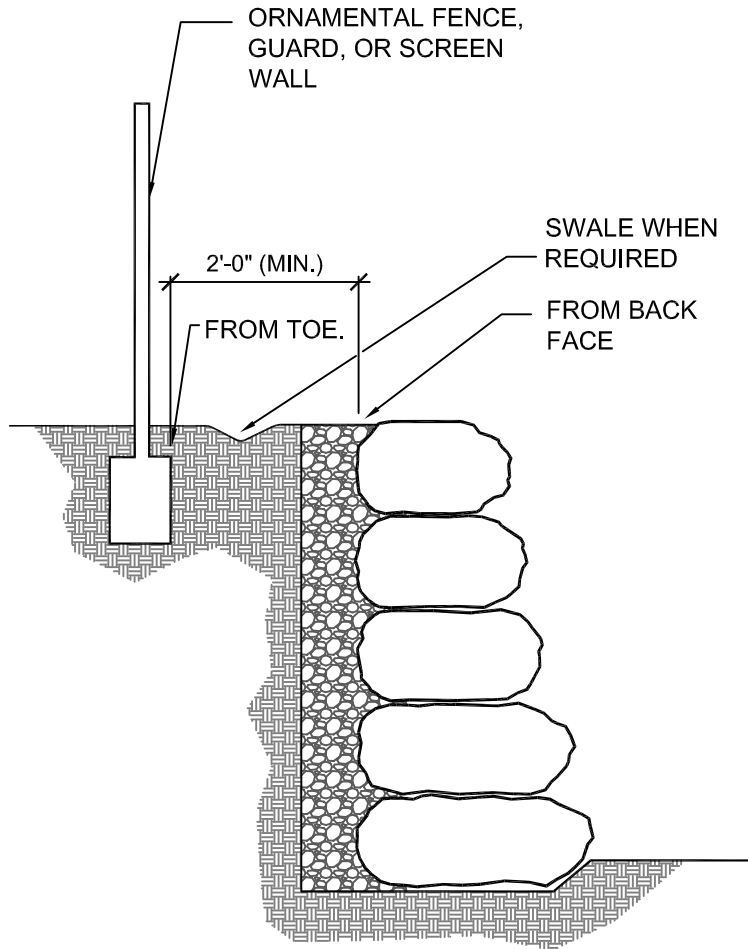
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DETAIL 18

<p>Mesquite Building Department 10 East Mesquite Blvd. Mesquite, NV 89027 (702) 346-2835</p>	<p>North Las Vegas Building Safety 2250 Las Vegas Blvd. N N. Las Vegas, NV 89030 (702) 633-1577</p>	<p>Pahrump Nye County Building Department 2041 E. Calvada North Pahrump, NV 89048 (775) 751-3373</p>	<p>Clark County School District Building Department 1180 Military Tribute Place Henderson, NV 89074 (702) 799-7605</p>
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DETAIL NOT TO SCALE

DETAIL 19

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