ALLAN BLOCK
RETAINING WALL SYSTEMS

allanblock.com

STANDARDIZED MANUAL FOR PRE-ENGINEERED LANDSCAPE WALLS

The following information is provided for construction of landscape walls up to 6 feet in height. Varying soil strengths and loading conditions are addressed. The pre-engineered walls on the following pages are designed solely for the Allan Block Landscape Wall System, and are based on the Allan Block design methodology. The following Allan Block Landscape Wall blocks are included in this manual.

AB STONE 12º Setback

Unit Size: 11 7/ 8″d x 7 3/4″h x 17 5/8″w (approx.)
Weight: 75 lbs. (approx.)
Coverage: 0.95 sq. ft. per unit (approx.)

Notes:
Gravity Wall (no geogrid) maximum height is 5.5 ft. The following conditions must be true or geogrid reinforcement is required according to the pre-engineered tables for AB Stones.

1. Level slope and no surcharge above the wall
2. Sandy Soil – UBC soil type 3 or better. UBC soil type 4 and 5 requires geogrid reinforcement.

AB CLASSIC, AB ROCKS, OR DOVER 6º Setback

Unit Size: 11 7/ 8″d x 7 3/4″h x 17 5/8″w (approx.)
Weight: 75 lbs. (approx.)
Coverage: 0.95 sq. ft. per unit (approx.)

Notes:
Gravity Wall (no geogrid) maximum height is 4.0 ft. The following conditions must be true or geogrid reinforcement is required according to the pre-engineered tables for AB Classics, AB Rocks, or Dover.

1. Level slope and no surcharge above the wall
2. Sandy Soil – UBC soil type 3 or better. UBC soil type 4 and 5 requires geogrid reinforcement.

AB JUNIOR OR PALERMO 6º Setback

Unit Size: 9 1/2″d x 7 3/4″h x 8 1/2″w (approx.)
Weight: 35 lbs. (approx.)
Coverage: 0.46 sq. ft. per unit (approx.)

Notes:
Gravity Wall (no geogrid) maximum height is 4.0 ft. The following conditions must be true or geogrid reinforcement is required according to the pre-engineered tables for AB Juniors or Palermo.

1. Level slope and no surcharge above the wall
2. Sandy Soil – UBC soil type 3 or better. UBC soil type 4 and 5 requires geogrid reinforcement.

AB LITE STONES OR BARCELONA 6º Setback

Unit Size: 11 7/ 8″d x 3 7/8″h x 17 5/8″w (approx.)
Weight: 35 lbs. (approx.)
Coverage: 0.48 sq. ft. per unit (approx.)

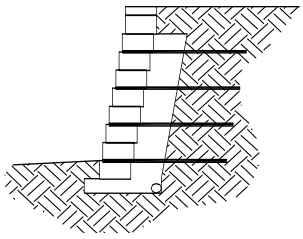
Notes:
Gravity Wall (no geogrid) maximum height is 4.0 ft. The following conditions must be true or geogrid reinforcement is required according to the pre-engineered tables for AB Lite Stones or Barcelona.

1. Level slope and no surcharge above the wall
2. Sandy Soil – UBC soil type 3 or better. UBC soil type 4 and 5 requires geogrid reinforcement.

STANDARDIZED MANUAL PROCEDURE

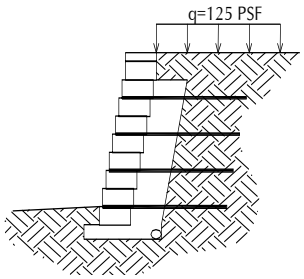
1. Determine the required wall height and geometry.
   - The wall height (H) represents the distance from the ground surface at the base of the wall to the top of the wall.
   - Identify what the condition above the wall is. The condition above the wall can be one of three things. Condition I is for a level slope above the wall with no surcharge. Condition II is for a level slope with a uniform live load surcharge of 125 PSF (generally a load associated with passenger vehicles). Condition III is for a sloped backfill with no surcharge.

Condition I:



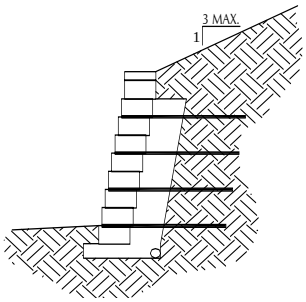
Level Slope
No Surcharge

Condition II:



Level Slope
125 PSF Surcharge

Condition III:



Slope Backfill
3:1 Maximum
No Surcharge

2. Determine the soil classification that is predominant at the site using the Uniform Building Code (UBC).

Sandy Soil – Soil Type 3

This soil type includes Sandy Gravel and/or Gravel (GW and GP)

Clay Soil – Soil Type 4/5

This soil type includes Clay, Sandy Clay, Silty Clay, and Clayey Silt (CL, ML, MH, and CH) And/or Sand, Silty Sand, Clayey Sand, Silty Gravel, and Clayey Gravel (SW, SP, SM, SC, GM, and GC)

Note:
When using this standardized manual to obtain building permits it may be necessary to document the UBC soil type. Assistance from a licensed engineer in the form of a letter identifying the specific soil may be helpful; however a complete soils report and investigation should not be necessary. In many residential developments a soils investigation is available from previous property development. The developer, building department or public works department may have these reports on file.

3. Determine the design based on the specific requirements for the wall (Wall Height, Condition, UBC Soil Type and Allan Block Retaining Wall block type) determine the design.
   - Geogrid: Determine if geogrid is needed. If the wall height is less than the maximum Gravity Wall heights and the additional conditions are met the retaining wall can be built without geogrid reinforcement. The specifications for each Allan Block product provide Gravity Wall heights.
   - Geogrid length, L: Geogrid length is measured from the front face of the Allan Block units to the back of the geogrid length.
   - Geogrid Layers: The total number of geogrid layers needed.
   - Geogrid Position: The location of each geogrid layer above the base.

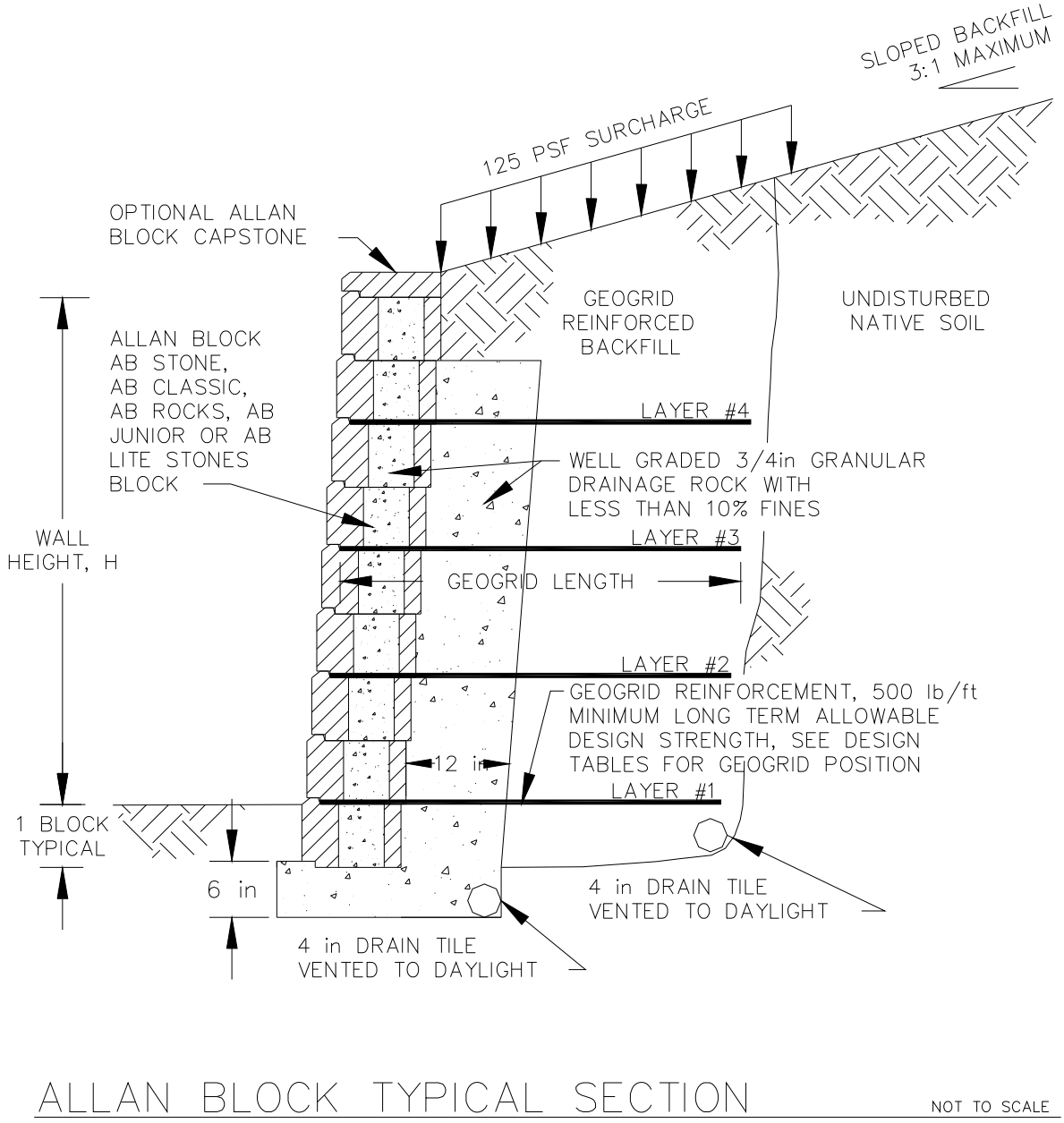
4. Submit the design to the Building Department if required.
   - Determine what the building department requirements are.
   - Identify if the wall falls within those requirements.
   - If a building permit is required submit the following:
     - The Standardized Manual with the specific design that applies to the wall identified.
     - The Allan Block Installation Guide for Allan Block Retaining Walls (when geogrid is needed) or the Allan Block Installation Guide for Allan Block Landscape Walls (when geogrid is not needed).
     - Any additional documents requested by the building department.

5. This manual does not consider the following special considerations. If any of them are present on the site this manual should not be used without consulting with a qualified engineer.
   - Noticeable water within the soil or large amounts of surface runoff directed at the retaining wall.
   - A slope descending from the front toe of the wall.
   - Walls built in a terraced application where their space apart is less than twice the lower walls individual wall height.
   - Any wall higher than 6 ft, supporting a slope steeper than specified or heavy truck and highway loading.
   - Requirements to include seismic loading in the calculations.
   - Requirements to analyze the site for global stability.

ALLAN BLOCK TYPICAL SECTION

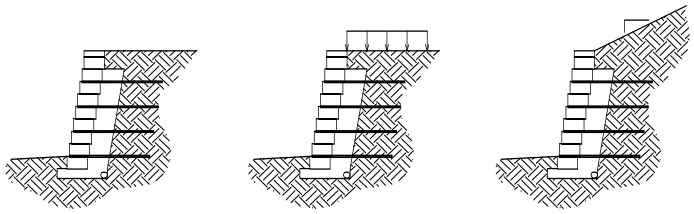
The section below is a typical section of an Allan Block Landscape Wall. Various conditions are noted relative to the above the wall condition. Additionally, dimensions pertinent to the wall design are defined within the drawing.

Figure 1: Allan Block Typical Section



ALLAN BLOCK TYPICAL SECTION NOT TO SCALE

AB STONES 12º Setback



Condition I: **Condition II:** **Condition III:**

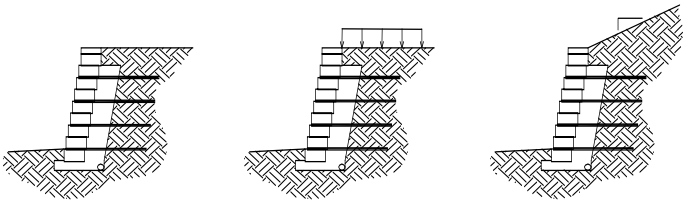
Table 1: SANDY SOIL – UBC Soil Type 3

Condition Above Wall	Wall Height, ft	Geogrid Length, ft	Geogrid Position (# courses above base)			
			Layer #1	Layer #2	Layer #3	Layer #4
I: No Slope or Surcharge	3	-	-	-	-	-
	4	-	-	-	-	-
	5	-	-	-	-	-
	6	4	1	3	5	7
II: 125 PSF Surcharge	3	-	-	-	-	-
	4	-	-	-	-	-
	5	3	1	3	5	-
	6	4	1	3	5	7
III: 3:1 Maximum Slope Above the Wall	3	-	-	-	-	-
	4	-	-	-	-	-
	5	-	-	-	-	-
	6	4	1	3	5	7

Table 2: CLAY SOIL – UBC Soil Type 4/5

Condition Above Wall	Wall Height, ft	Geogrid Length, ft	Geogrid Position (# courses above base)			
			Layer #1	Layer #2	Layer #3	Layer #4
I: No Slope or Surcharge	3	-	-	-	-	-
	4	3	1	3	-	-
	5	3	1	3	5	-
	6	4	1	3	5	7
II: 125 PSF Surcharge	3	3	1	3	-	-
	4	3	1	3	-	-
	5	3	1	3	5	-
	6	4	1	3	5	7
III: 3:1 Maximum Slope Above the Wall	3	3	1	3	-	-
	4	3	1	3	-	-
	5	4	1	3	5	-
	6	4	1	3	5	7

AB CLASSIC, AB ROCKS, and DOVER 6º Setback



Condition I: **Condition II:** **Condition III:**

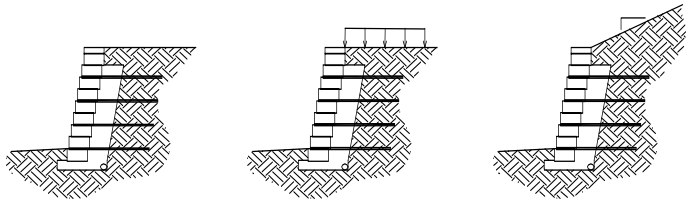
Table 3: SANDY SOIL – UBC Soil Type 3

Condition Above Wall	Wall Height, ft	Geogrid Length, ft	Geogrid Position (# courses above base)			
			Layer #1	Layer #2	Layer #3	Layer #4
I: No Slope or Surcharge	3	-	-	-	-	-
	4	-	-	-	-	-
	5	3	1	3	5	-
	6	4	1	3	5	7
II: 125 PSF Surcharge	3	-	-	-	-	-
	4	3	1	3	-	-
	5	3	1	3	5	-
	6	4	1	3	5	7
III: 3:1 Maximum Slope Above the Wall	3	-	-	-	-	-
	4	3	1	3	-	-
	5	3	1	3	5	-
	6	4	1	3	5	7

Table 4: CLAY SOIL – UBC Soil Type 4/5

Condition Above Wall	Wall Height, ft	Geogrid Length, ft	Geogrid Position (# courses above base)			
			Layer #1	Layer #2	Layer #3	Layer #4
I: No Slope or Surcharge	3	-	-	-	-	-
	4	3	1	3	-	-
	5	3	1	3	5	-
	6	4	1	3	5	7
II: 125 PSF Surcharge	3	3	1	3	-	-
	4	3	1	3	-	-
	5	3	1	3	5	-
	6	4	1	3	5	7
III: 3:1 Maximum Slope Above the Wall	3	3	1	3	-	-
	4	3	1	3	-	-
	5	4	1	3	5	-
	6	4	1	3	5	7

AB JUNIOR and PALERMO 6º Setback



Condition I: **Condition II:** **Condition III:**

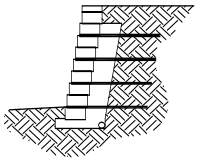
Table 5: SANDY SOIL – UBC Soil Type 3

Condition Above Wall	Wall Height, ft	Geogrid Length, ft	Geogrid Position (# courses above base)			
			Layer #1	Layer #2	Layer #3	Layer #4
I: No Slope or Surcharge	3	-	-	-	-	-
	4	-	-	-	-	-
	5	3	1	3	5	-
	6	4	1	3	5	7
II: 125 PSF Surcharge	3	-	-	-	-	-
	4	3	1	3	-	-
	5	3	1	3	5	-
	6	4	1	3	5	7
III: 3:1 Maximum Slope Above the Wall	3	-	-	-	-	-
	4	3	1	3	-	-
	5	3	1	3	5	-
	6	4	1	3	5	7

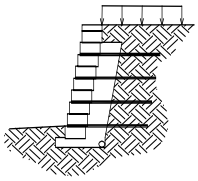
Table 6: CLAY SOIL – UBC Soil Type 4/5

Condition Above Wall	Wall Height, ft	Geogrid Length, ft	Geogrid Position (# courses above base)			
			Layer #1	Layer #2	Layer #3	Layer #4
I: No Slope or Surcharge	3	-	-	-	-	-
	4	3	1	3	-	-
	5	3	1	3	5	-
	6	4	1	3	5	7
II: 125 PSF Surcharge	3	3	1	3	-	-
	4	3	1	3	-	-
	5	3	1	3	5	-
	6	4	1	3	5	7
III: 3:1 Maximum Slope Above the Wall	3	3	1	3	-	-
	4	3	1	3	-	-
	5	4	1	3	5	-
	6	4	1	3	5	7

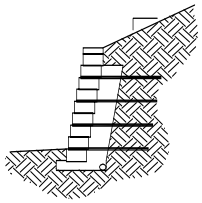
AB LITE STONES and BARCELONA 6º Setback



Condition I:



Condition II:



Condition III:

Table 7: SANDY SOIL – UBC Soil Type 3

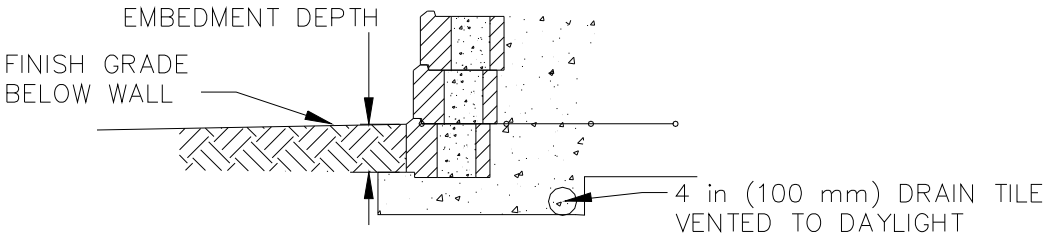
Condition Above Wall	Wall Height, ft	Geogrid Length, ft	Geogrid Position (# courses above base)			
			Layer #1	Layer #2	Layer #3	Layer #4
I: No Slope or Surcharge	3	-	-	-	-	-
	4	-	-	-	-	-
	5	3	2	6	10	-
	6	4	2	6	10	14
II: 125 PSF Surcharge	3	-	-	-	-	-
	4	3	2	6	-	-
	5	3	2	6	10	-
	6	4	2	6	10	14
III: 3:1 Maximum Slope Above the Wall	3	-	-	-	-	-
	4	3	2	6	-	-
	5	3	2	6	10	-
	6	4	2	6	10	14

Table 8: CLAY SOIL – UBC Soil Type 4/5

Condition Above Wall	Wall Height, ft	Geogrid Length, ft	Geogrid Position (# courses above base)			
			Layer #1	Layer #2	Layer #3	Layer #4
I: No Slope or Surcharge	3	-	-	-	-	-
	4	3	2	6	-	-
	5	3	2	6	10	-
	6	4	2	6	10	14
II: 125 PSF Surcharge	3	3	2	6	-	-
	4	3	2	6	-	-
	5	3	2	6	10	-
	6	4	2	6	10	14
III: 3:1 Maximum Slope Above the Wall	3	3	2	6	-	-
	4	3	2	6	-	-
	5	4	2	6	10	-
	6	4	2	6	10	14

GENERAL NOTES

1. All design tables in this manual have been constructed with the Allan Block design methodology, See Allan Block Engineering Manual, Doc ID #R0904.
2. Wall units and installation must conform to the Allan Block Modular Wall Systems Specification Guidelines and the Geogrid Reinforcement Systems Specification Guidelines as published in the Allan Block Design Manual, Doc #R0511 and the AB SPEC BOOK, Doc. #R0901-0705.
3. All installation procedures must be in accordance with the Allan Block installation guidelines, AB Doc. #R0511.
4. Base trench must be excavated to undisturbed soil. Remove any unsuitable or unstable soils and replace with compacted structural fill. Do not over excavate for the base trench unless it is necessary to remove unsuitable or unstable soils.
5. Minimum embedment depth of base course is 1 in. per ft. of wall height minimum for gravity walls (no geogrid). For all geogrid reinforced walls 1 block (8 in) should be buried. Geogrid Reinforcement must have a minimum Long Term Allowable Design Strength of 500 lb/ft.

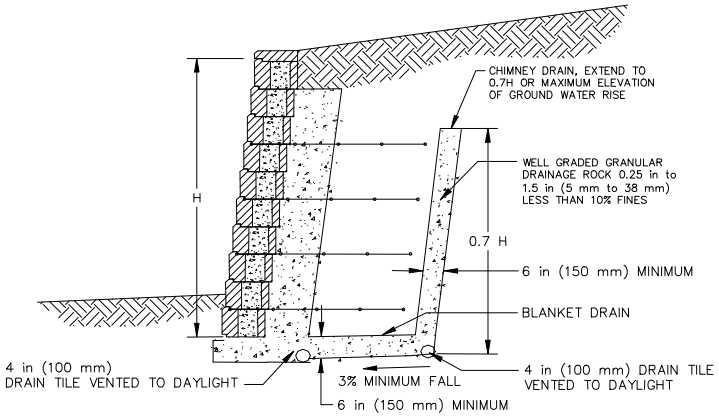


ALLAN BLOCK SECTION – EMBEDMENT DEPTH

6. Global stability and seismic loading are not considered in this design. It is the responsibility of the project owner to determine if local codes or conditions necessitate their inclusion in the wall structural analysis.
7. If the site conditions, soil conditions or water conditions vary from those listed in this manual a qualified engineer must be consulted to evaluate the conditions.
8. Reference documents are available at allanblock.com.

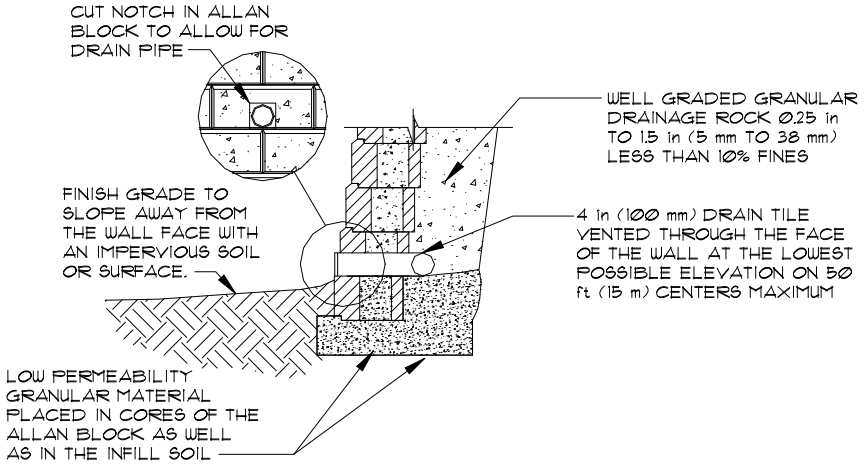
DRAINAGE NOTES

1. If water is encountered in the area of the wall during excavation or construction, a drainage system (chimney, composite or blanket) must be installed as directed by the geotechnical or site engineer.

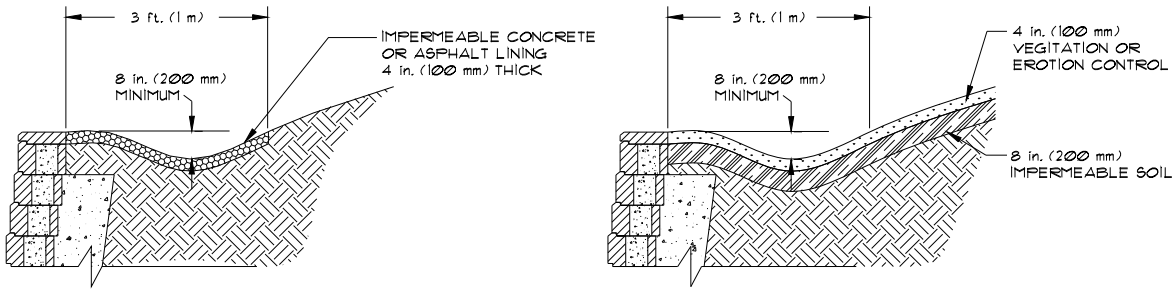


ALLAN BLOCK TYPICAL SECTION – CHIMNEY DRAIN

2. Drain tile must be vented to daylight at the ends of the wall. If this is not possible vent the drain tile to daylight through the wall face, above finish grade, at a minimum of 50 ft intervals.



3. Surface water must not be allowed to pond or be trapped in the area above or below the wall. Water must not be allowed to drain over the top of the wall. Establish final grade with a positive gradient away from the wall structure.
4. Concentrations of surface water runoff should be managed by providing necessary structures, such as paved ditches, drainage swales, catch basins, etc.



ALLAN BLOCK SECTION - SWALE DETAILS

5. All roof eaves near the wall must be guttered and discharged away from the wall. Gutters, downspouts and connections must have adequate capacity to carry storm water away from the wall.
6. Irrigation activities at the site should be done in a controlled and reasonable manner.