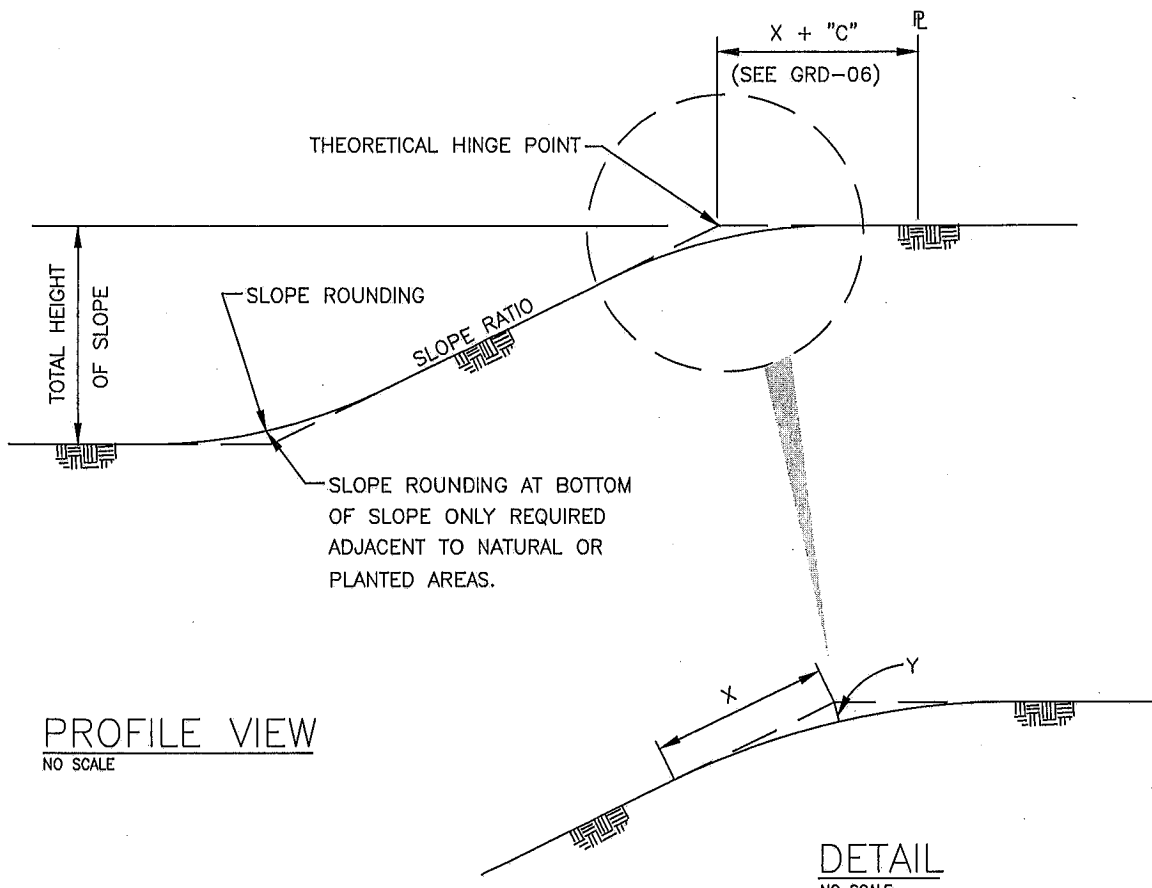


GRADING

(GRD)





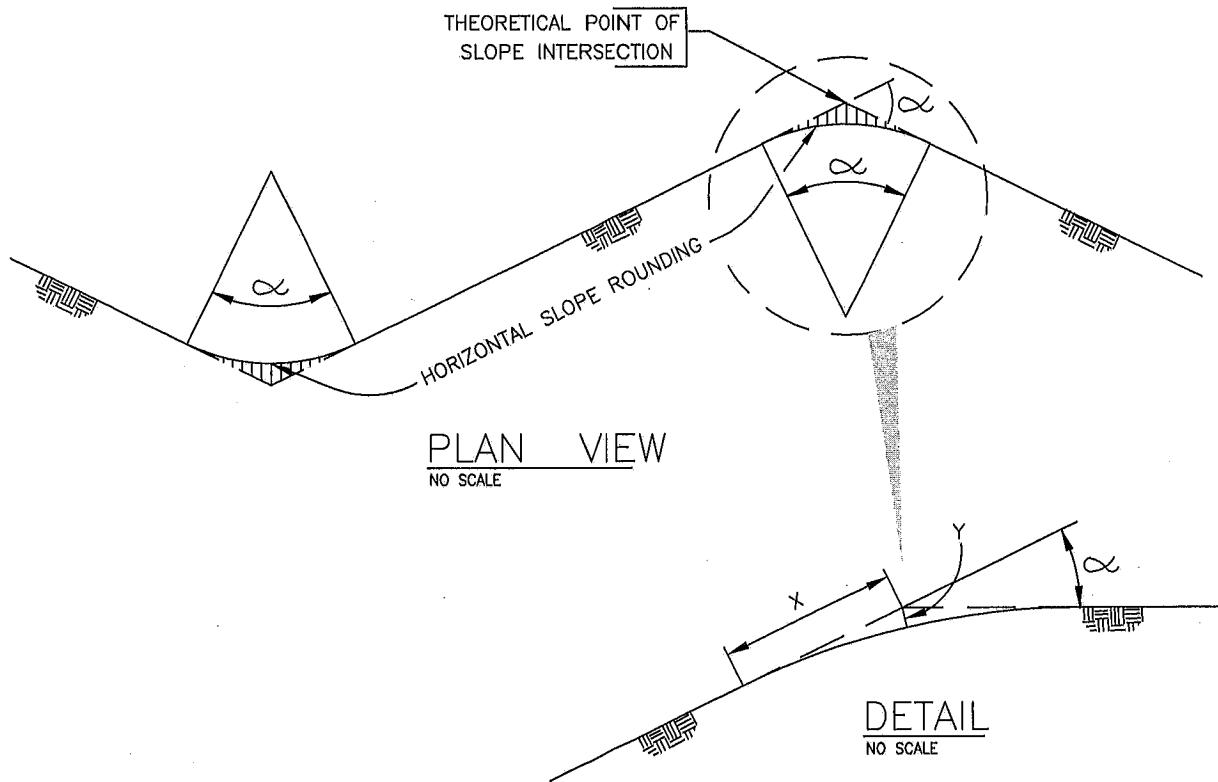
X = DISTANCE FROM THEORETICAL HINGE POINT TO POINT OF TANGENCY.
 Y = DEPTH OF CUT AT THEORETICAL HINGE POINT.

VERTICAL SLOPE ROUNING				
SLOPE RATIO	TOP OF SLOPE		BOTTOM OF SLOPE AND BENCHES	
	X	Y	X	Y
STEEPER THAN 2:1	16'	3'	8'	1.5'
2:1 TO 3:1	10'	2'	5'	1'
FLATTER THAN 3:1	6'	1'	3'	0.5'

NOTES:

1. SLOPE ROUNING IS REQUIRED FOR ALL SLOPES, EXCEPT WHERE WALLS ARE INSTALLED PER DEPARTMENT OF PLANNING AND BUILDING REQUIREMENTS.
2. FOR SLOPE GRADING AND SLOPE BENCHES, SEE GRD-06.
3. FOR BROW AND TERRACE DITCHES, SEE REG. STD. DWG. D-75.

REVISION	BY	APPROVED	DATE	CITY OF CHULA VISTA ENGINEERING & CAPITAL PROJECTS STANDARD DRAWING	<i>William S. Valle</i> WILLIAM S. VALLE 11/21/2017 CITY ENGINEER
ORIGINAL			07/75		
REVISION	CM	C. SWANSON	11/02		
REVISION	DPH	W. VALLE	11/17		
VERTICAL SLOPE ROUNING				GRD-01	



NOTES: SLOPE ROUNDING IS REQUIRED FOR ALL SLOPES.

X = DISTANCE FROM THEORETICAL POINT OF SLOPE INTERSECTION TO POINT OF TANGENCY.

Y = DEPTH OF CUT AT THEORETICAL POINT OF SLOPE INTERSECTION.

α = ANGLE OF SLOPE INTERSECTION.

HORIZONTAL SLOPE ROUNDING		
(α) ANGLE OF SLOPE INTERSECTION	X	Y
MORE THAN 60°	29'	8'
30° - 60°	21'	5'
LESS THAN 30°	14'	2'

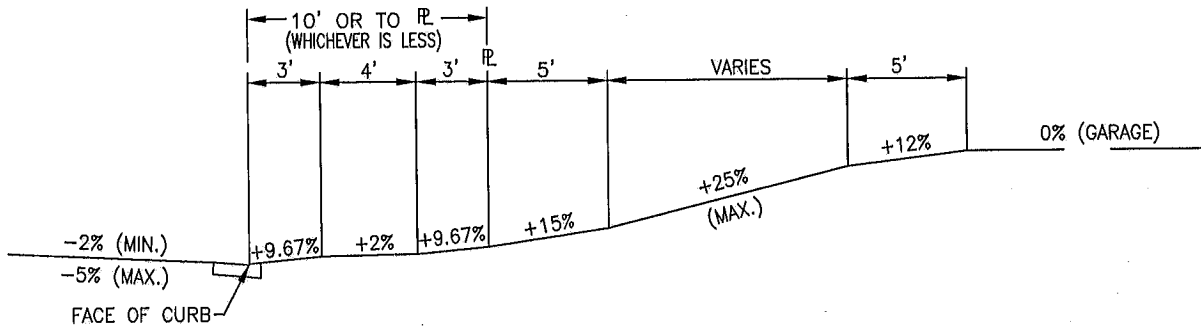
REVISION	BY	APPROVED	DATE
ORIGINAL			07/75
REVISION	CM	C. SWANSON	11/02
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CITY OF CHULA VISTA
ENGINEERING & CAPITAL PROJECTS
STANDARD DRAWING

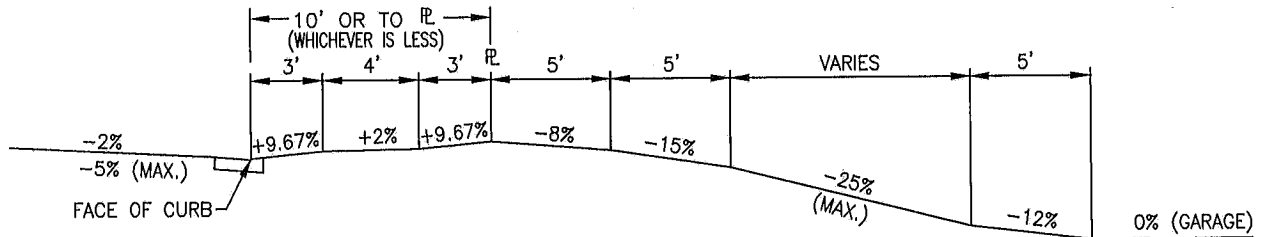
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CITY ENGINEER

HORIZONTAL SLOPE ROUNDING

GRD-02



UPHILL DRIVEWAY
NO SCALE



DOWNHILL DRIVEWAY
NO SCALE

NOTES:

1. PORTLAND CEMENT CONCRETE 564-C-3000 SHALL BE USED IF ANY PORTION OF DRIVEWAY GRADE EXCEEDS 12%.
2. VERTICAL CURVES (6' MIN. LENGTH) SHALL BE USED FOR CHANGE OF GRADE OF 6% OR GREATER.
3. SEE GSI-01 FOR CONSTRUCTION OF DRIVEWAY APPROACH.

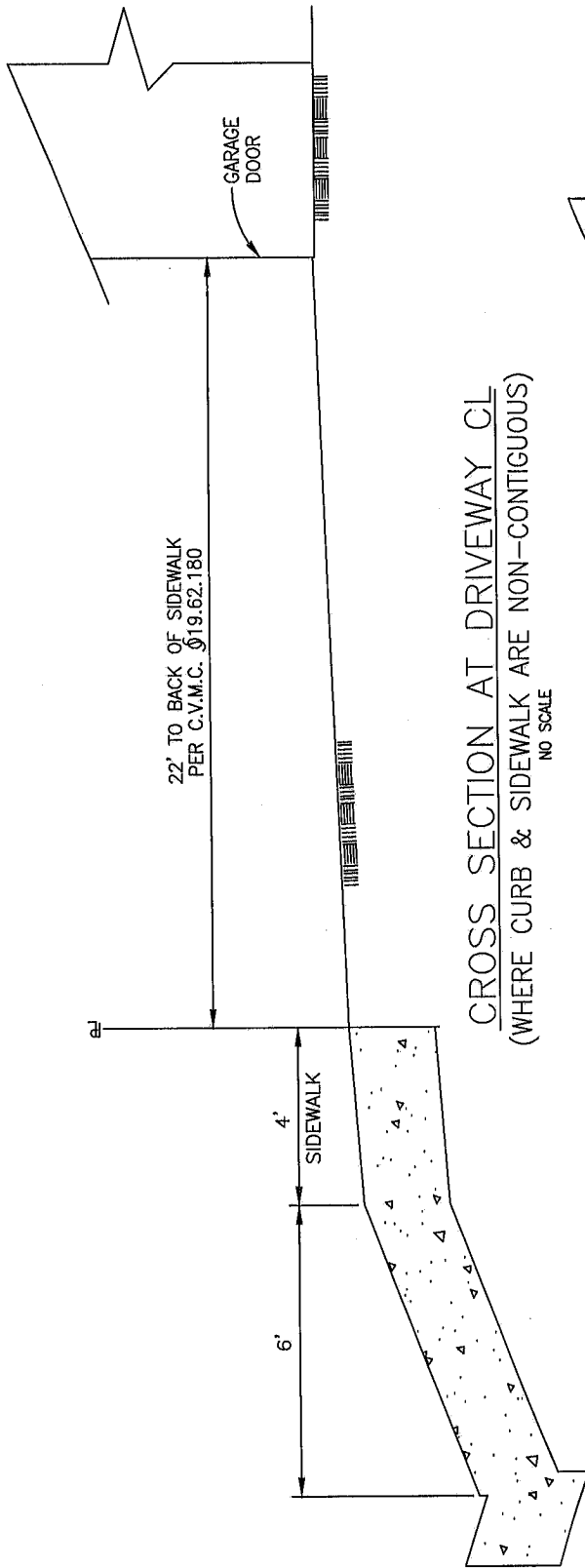
REVISION	BY	APPROVED	DATE
ORIGINAL			10/74
REVISION	CVM	C. SWANSON	11/02
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CITY OF CHULA VISTA
ENGINEERING & CAPITAL PROJECTS
STANDARD DRAWING

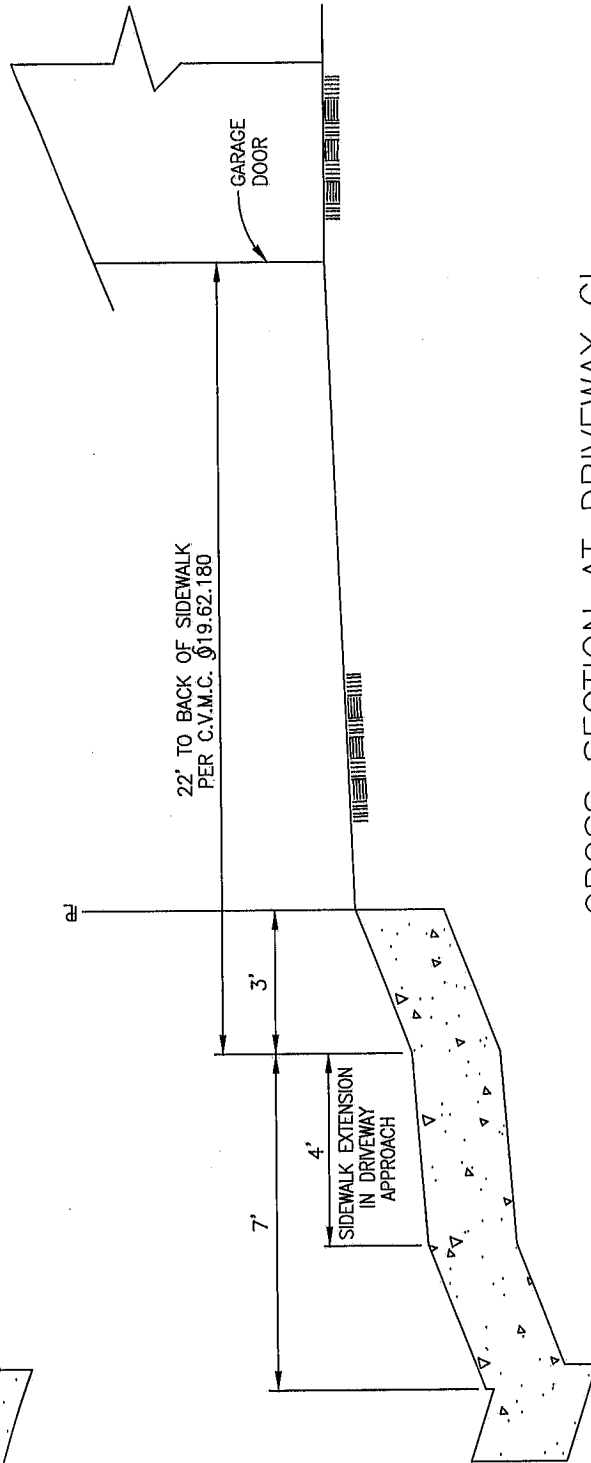
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DRIVEWAYS VERTICAL DESIGN

GRD-03



CROSS SECTION AT DRIVEWAY CL
(WHERE CURB & SIDEWALK ARE NON-CONTIGUOUS)
NO SCALE



CROSS SECTION AT DRIVEWAY CL
(WHERE CURB & SIDEWALK ARE CONTIGUOUS)
NO SCALE

NOTE
SEE GSI-01 FOR ADDITIONAL NOTES, DETAILS AND DIMENSIONS FOR DRIVEWAYS.

REVISION	BY	APPROVED	DATE
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REVISION	CVM	C. SWANSON	11/02
REVISION	DPH	W. VALLE	11/17

CITY OF CHULA VISTA
ENGINEERING & CAPITAL PROJECTS
STANDARD DRAWING
DRIVEWAYS MINIMUM GARAGE
SETBACK

William S. Valle
WILLIAM S. VALLE 11/21/2017
CITY ENGINEER
GRD-04

MASONRY RETAINING WALLS

The City of Chula Vista requires a permit for the construction of retaining walls, except those less than three feet in height and not supporting surcharge. This publication outlines the city's requirements for retaining walls with level backfill, with sloping backfill and with vehicular surcharge.

If construction does not involve grading, contact the Building Division of the Planning & Building Department for information on how to obtain a permit for a retaining wall (619-691-5272). If construction does involve grading, contact the Engineering Division of the Public Works Department (619-691-5024).

I. INSPECTIONS

You must call the City for inspections after several specific phases of construction. To schedule an inspection for a retaining wall permit having a permit number starting with a "B", call the Building Division at (619) 691-5009. For permit numbers starting with "PG", call the Engineering Division at (619) 585-5737. Please call for these inspections at the following times, and do not proceed to the next phase of construction until the City inspector has given you written approval to proceed:

A. Call for a footing inspection after you have made the excavation for the footing, tied the steel securely in its final position, and made the site ready for concrete placement. Do not place concrete until the City inspector has given you written approval to proceed.

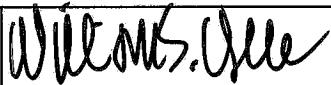
B. Call for a masonry pre-grout inspection after you have laid the block and have set the reinforcing steel in place, but before you place the grout. Do not lay blocks higher than 6 feet without a pre-grout inspection.

1. If cleanout holes are required, lay the block to the full height of the grout pour before you call for the pre-grout inspection. Place grout in a continuous pour in grout lifts not more than 4 feet in height.
2. If cleanout holes are not required, call for a masonry pre-grout inspection prior to each grout pour. Do not lay block higher than the grout pour. Note that cleanouts are required for all grout pours over 5 feet in height.

C. Call for a backfill/drainage inspection after grouting is completed and rock or rubble wall drains are in place, but before earth backfill is placed.

D. Call for a final inspection after you have completed the construction and, if the City has required one, after a licensed professional has prepared a compaction report. (See Section VII).

SHEET 1 OF 16

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REVISION	DPH	W. VALLE	11/17	RETAINING WALL REQUIREMENTS PUBLICATION OUTLINES	WILLIAM S. VALLE 11/21/2017 CITY ENGINEER
					GRD-05

II. DESIGN TABLES

The design tables, found towards the end of this publication, address a variety of different loading conditions and footing configurations. If you have a loading condition that is not shown in this publication, you must have a licensed professional engineer or architect design the wall specifically for conditions existing on the site. Examples of loading conditions not covered in this publication include walls supporting building foundations and walls subjected to truck traffic surcharge greater than 250 psf, unless those loads are applied away from the wall a distance at least equal to the height of the wall.

Retaining wall height is measured from the top of the footing to the top of the wall. You must not build higher than the design height of the wall.

III. BLOCK

All block must be Type "N", grouted solid. (Design $f'_m = 1,500$ psi)

IV. CONCRETE MIX REQUIREMENTS

Note: Use of plastic cement is not permitted in retaining walls located in this Seismic Zone.

A. The concrete mix footings must have a compressive strength of at least $f'_c = 2,500$ psi in 28 days. You may use a mix containing the following proportions by volume.

- 1 part Portland cement
- 2 1/2 parts sand
- 3 1/2 parts 3/4-inch maximum-size gravel
- 7 gallons of water maximum per sack of cement


Note: Hand mixed concrete and grout are not permitted on projects subject to the "Standard Specifications for Public Works Construction" ("Green Book".)

B. The mortar mix must have a compressive strength of at least 1,800 psi. You may use a mix containing the following proportions by volume:

- 1 part Portland cement
- 3 1/2 parts sand
- 1/4 part hydrated lime or lime putty

C. Grout must have a compressive strength of at least 2,000 psi in 28 days. You may use a mix containing the following proportions by volume:

- 1 part Portland cement
- 3 parts sand
- 2 parts pea gravel (3/8-inch aggregate)

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Note: Hand mixed concrete and grout are not permitted on projects subject to the "Standard Specifications for Public Works Construction" ("Green Book".)

Add water until you achieve pouring consistency without segregating the grout components. Rod or vibrate immediately. Re-rod or re-vibrate the grout about 10 minutes after pouring to ensure proper consolidation. When the grouting of a second lift is to be continued at later time, stop the grout placement 2 inches from the top of the masonry units.

Note: All cells must be filled solid with grout.

V. MORTAR KEY

To obtain proper bonding between the footing and the first course of block, form a mortar key by embedding a flat 2 x 4 flush with, and at the top of, the freshly placed footing concrete (See Drawing CVCS 33). Remove the 2 x 4 after the concrete has started to harden (about 1 hour). You may omit a mortar key if you set the first course of block into the freshly placed concrete footing.


VI. WALL DRAINS

Provide wall drains (4-inch-diameter) at 6-foot intervals along the length of the wall and located just above the level of the soil or paving on the front face of the wall (See Drawing CVCS 33). Alternatively, form the drains by placing a block on its side at 6-foot intervals, by leaving out the mortar in the vertical spaces between all the blocks in the first course above the soil, by paving (head joint) on the front face of the wall, or by some other equivalent method acceptable to the City. Backfill behind wall drains or open head joints must be 12 inches wide filled with gravel and must extend from the top of the footing to above the top of the drain or open joint.

VII. SOIL

Wall design, footing sizes and reinforcing steel are all based on an active earth pressure with an equivalent fluid pressure of 36 psf and a weight of 120 pounds per cubic foot (pcf). Extend all footings at least 12 inches into undisturbed natural soil or into fill that has been compacted to at least 90 percent density. Dampen soil prior to placing concrete in footings. Where the ground slopes away from the base of the wall, you must have a horizontal distance of at least 7 feet from the toe of the footing to "daylight" (See Drawing CVCS 33). The City may require a soils report, prepared by a licensed civil engineer specialized in soil mechanics or a licensed geotechnical engineer, depending on soil conditions at the site.

Footing sizes in the attached tables are based on a 1,000 psf maximum soil bearing value. If you wish to take advantage of a higher bearing value, you must have a licensed architect (a licensed architect may not design Public Works walls that are

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in the right-of-way) or civil/structural engineer design the wall(s) specifically for the existing site conditions. Again, the City may require a soils report, prepared by a licensed civil engineer specialized in soil mechanics or a licensed geotechnical engineer, depending on soil conditions at the site.

VIII. REINFORCING STEEL

Use reinforcing steel bars which conform to ASTM specification A615-85, Grade 40 or 60. When you can't use one continuous bar, you must lap or splice bars a distance of at least 40-bar diameters (i.e. 15" for #3 bars, 20" for #4 bars, 25" for #5 bars, 30" for #6 bars). The required minimum lap splice for bars of different size to be based on the diameter of the larger size bar. Bends in the reinforcing steel must conform to the Manual of Standard Practice, American Concrete Institute. Backing for hooks must be at least a distance equal to four bar diameters. All required bar embedment dimensions are clear distances to outside of bar. Spacing for parallel bars is center to center of bars.

Place two or more bars longitudinally in the footing (See Tables for number of bars needed). For 6-inch or 8-inch blocks, place one #3 bar longitudinally in the center of the wall in a bond beam block every 16 inches of wall height as the blocks are laid up. For 12-inch blocks, place one #4 bar longitudinally in the center of the wall in a bond beam block every 16 inches of wall height as the blocks are laid up.

IX. JOINTS


Vertical control joints are needed at intervals of not more than 32 feet. Joints must resist shear and other lateral forces and still permit longitudinal movement. Vertical expansion joints are needed at intervals of not more than 96 feet (See Drawing CVCS 34).

X. STEP FOOTINGS

Base the footing dimensions and the amount of reinforcing steel on the maximum height of the wall on either side of a step in the footing elevation. The construction of the step must follow the details on Drawing CVCS 34.

XI. BACKFILL

Do not place backfill material against a masonry retaining wall until the grout has either reached design strength or has cured for a minimum of 28 days. Compaction of backfill material by either jetting or ponding with water is not permitted. Each layer of backfill must be moistened and thoroughly tamped, rolled or otherwise compacted until the relative compaction is not less than 90%. If the wall is within the City right-of-way, subject to vehicular surcharge or

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subject to the "Standard Specifications for Public Works Construction" (Green Book"), the City will require a compaction test and certificate, from a soil engineer, showing that the entire fill has been compacted to at least 90%.

XII. FENCING

If a pedestrian walkway is adjacent to the top of a retaining wall that is more than 30-inches in height, you must install safety fencing at the top of the wall. If a wall is greater than 30-inches in height and is adjacent to a street, driveway or parking area, you must install a vehicular guardrail at the top of the wall.

XIII. USE OF TABLES

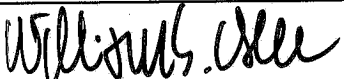
First, determine the height of wall you need to construct. Then determine the slope of retained earth or if the wall supports vehicular surcharge. Based on what distance you choose from the footing toe to the face of wall, use the table with the necessary wall height and slope of retained earth or surcharge. From the appropriate table, copy the wall design information, including block width, reinforcing steel size and spacing, and footing and key dimensions, on to a copy of the City's typical wall section form (Drawings CVCS 31 or CVCS 32). Use a separate form for each different design of wall. (One wall design may be used for all walls of a certain height and lower. However, there may be savings in material costs if a different, more economical, design is used for walls of lower height). Indicate on each form the locations on the property that the particular wall design will be used. See EXAMPLE at end of the attached forms.

XIV. PLAN SUBMITTAL

Prepare a land development plan (for Engineering Division permits) or plot plan (for Building Division permits) showing the location, type and height of each wall. Show all adjacent structures, driveways, parking areas and pedestrian walkways. Attach a completed form for each proposed wall design, as well as a copy of this procedure with the (following) disclaimer signed and dated.

XV. DISCLAIMER

These design standards indicate a minimum acceptable design for retaining walls meeting very specific field conditions and construction procedures. City approval of retaining walls and any related improvements shall not constitute a representation of the adequacy of the design or engineering of such retaining walls or improvements, nor shall it constitute an implied representation as to its suitability or fitness for any particular purpose. The City assumes no liability or any responsibility for damage or failure. The owner should consult with an appropriate Registered Civil Engineer or licensed architect.

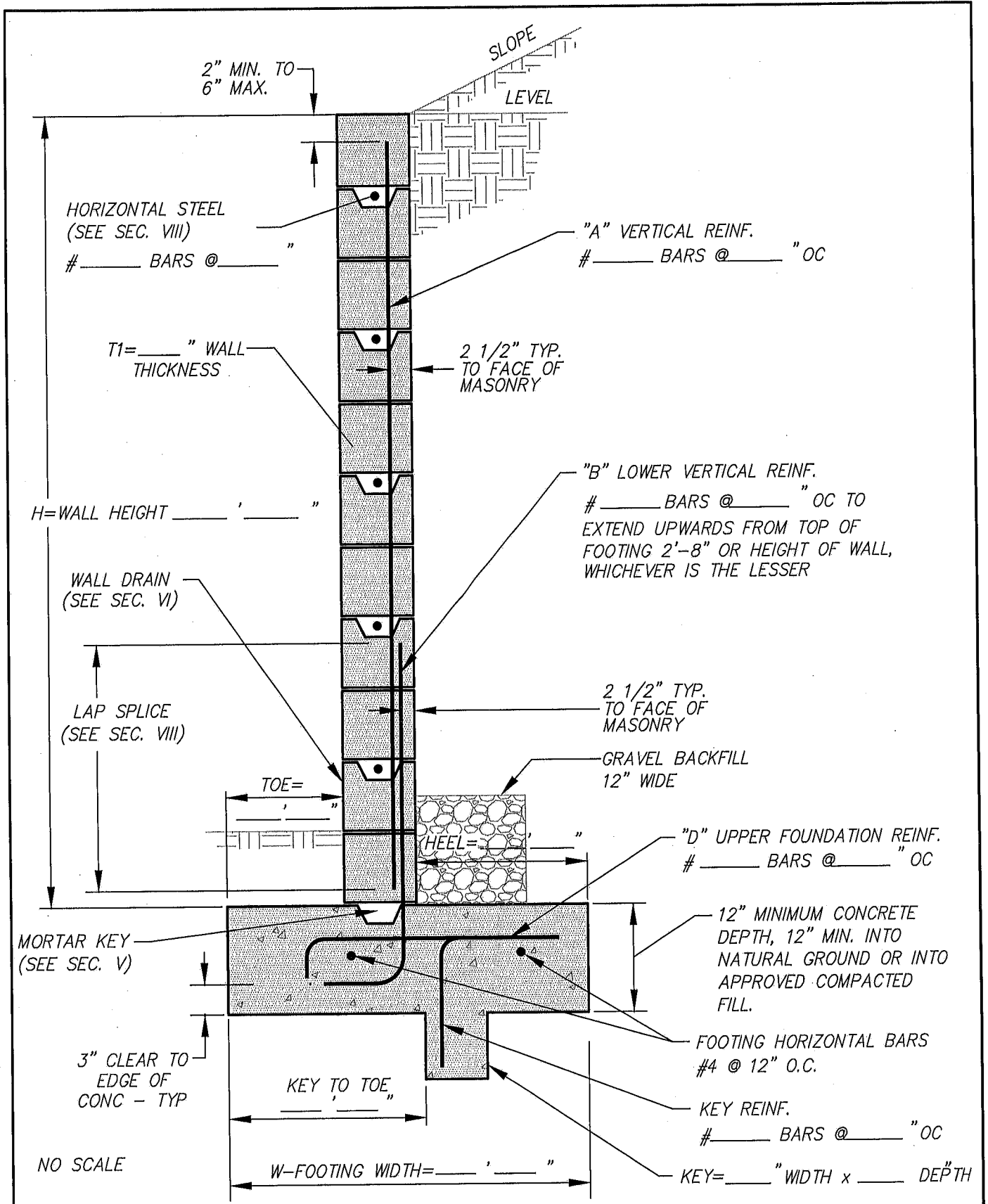
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HOW TO USE THE DESIGN TABLES

- Based on the site conditions and retaining wall location, determine if the wall will have a variable heel size (no limitation on the size of the heel), a 6-in or 2-in heel size, then
- Determine if the wall is retaining a level or sloping backfill, or level backfill with vehicular surcharge, then
- Based on the conditions noted above, select the appropriate design table (for ex. Variable heel (Minimum toe), 1.5 to 1 slope), then
- Move across the table and find the applicable retaining wall height (for ex. 6'-8"). Retaining wall height is measured from the top of the footing to to the top of the wall. The design data found under that column (for ex. column titled CVV15-68) is what applies to the wall. Then,
- From the design data under the applicable column, determine if the wall is TYPE I or II, in case of the example TYPE II, then
- Transfer the design data to the appropriate drawing, CVCS 31 for TYPE I wall and CVCS 32 for TYPE II wall, as shown on the attached example, then
- Indicate on the plot plan the location and extent of where each wall type (for ex. CVV15-68) is to be built.
- Repeat the above steps for each wall with different height and/or conditions (for ex. heel size, backfill slope or vehicular surcharge).

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SHEET 7 OF 16

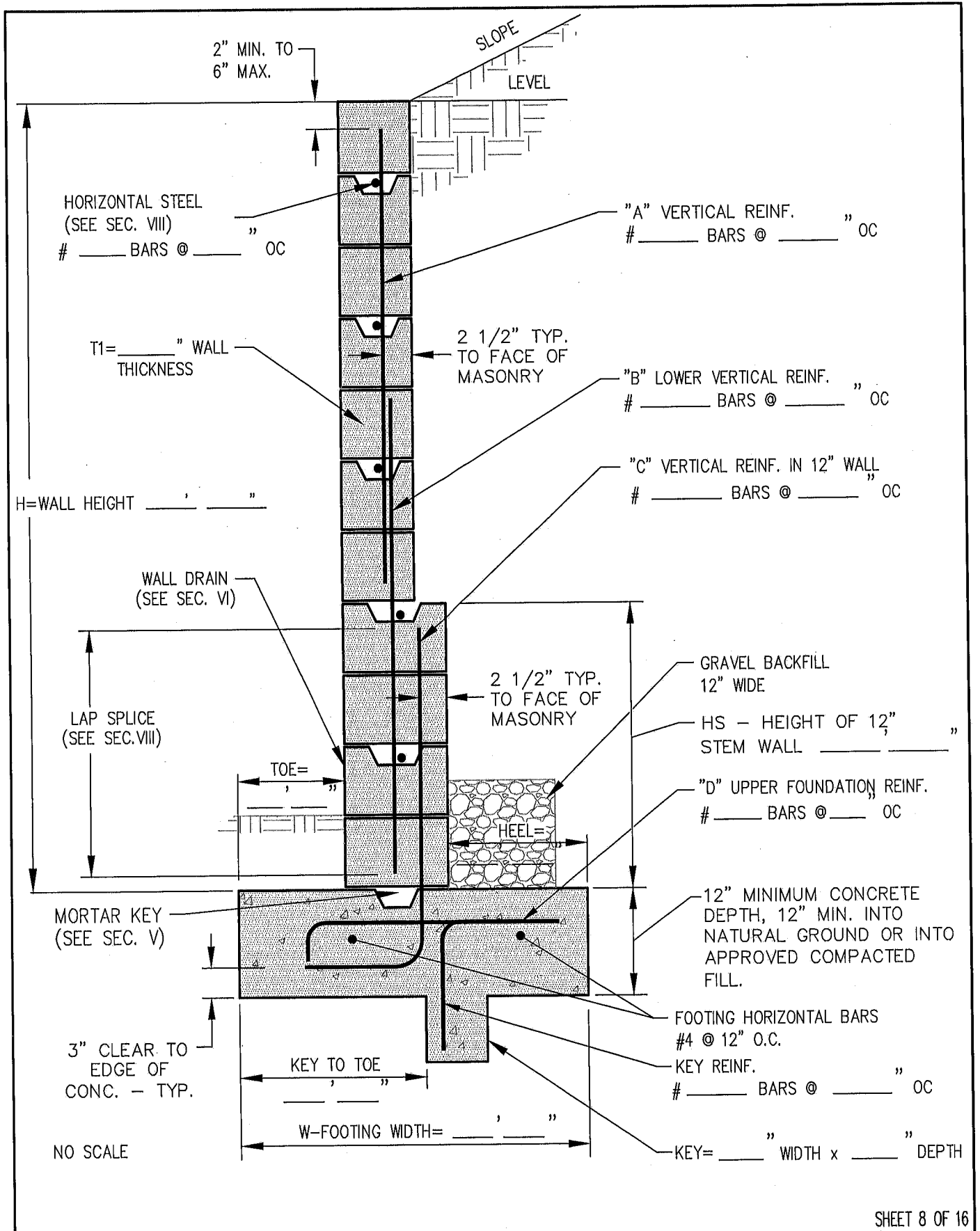
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CITY OF CHULA VISTA
ENGINEERING & CAPITAL PROJECTS
STANDARD DRAWING

RETAINING WALL TYPE I

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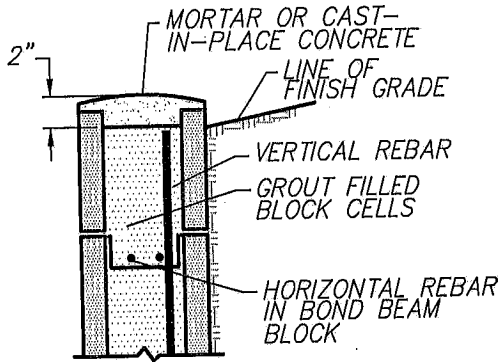


SHEET 8 OF 16

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REVISION	DPH	W. VALLE	11/17		
RETAINING WALL TYPE II				11/21/2017	GRD-05

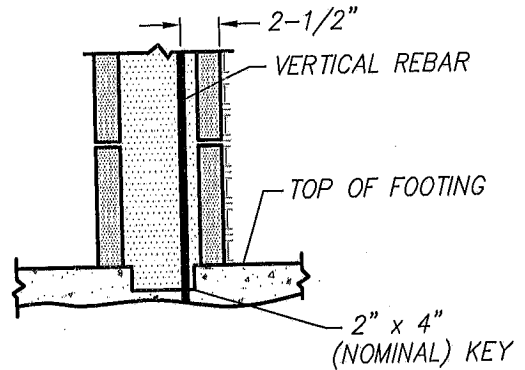
RETAINING WALL

CAP, KEY & DRAINAGE DETAILS



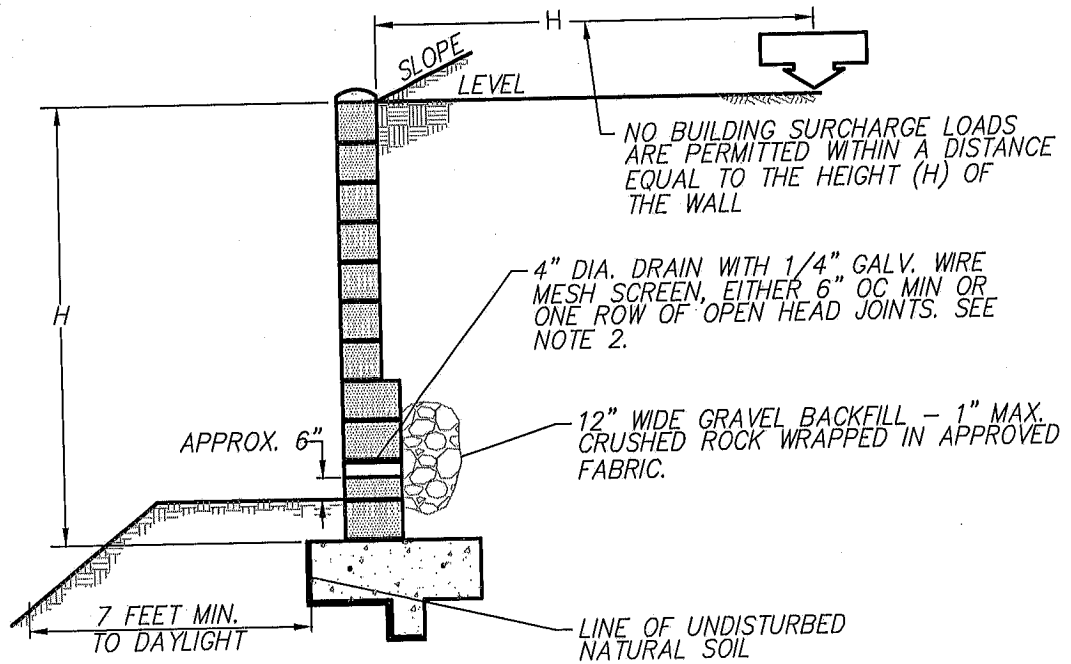
CAP DETAIL

SEE NOTE 1



KEY DETAIL

SEE NOTE 1



TYPICAL SECTION

NOTES:

1. ALL MASONRY WALLS MUST BE BUILT WITH CAP, KEY AND DRAINAGE DETAILS AS SHOWN ABOVE.
2. A 4-INCH DIAMETER DRAIN MAY BE FORMED BY PLACING A BLOCK ON ITS SIDE.

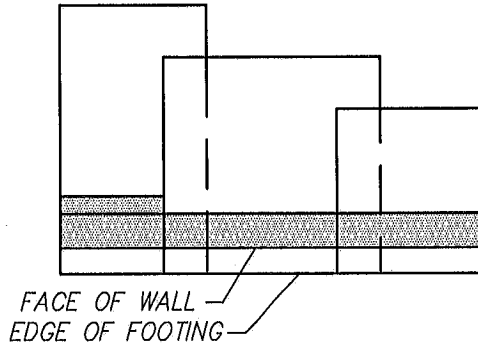
SHEET 9 OF 16

REVISION	BY	APPROVED	DATE	CITY OF CHULA VISTA ENGINEERING & CAPITAL PROJECTS STANDARD DRAWING	 WILLIAM S. VALLE CITY ENGINEER
ORIGINAL	CVM	C. SWANSON	12/01		
REVISION	DPH	W. VALLE	11/17	RETAINING WALL, CAP, KEY, & DRAINAGE DETAILS	11/21/2017
					GRD-05

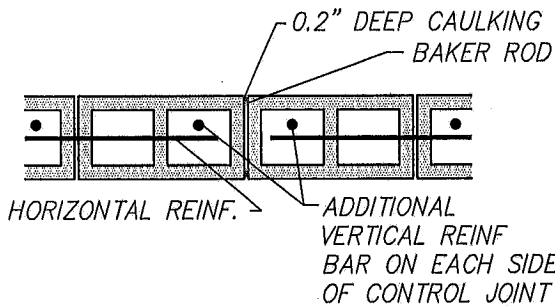
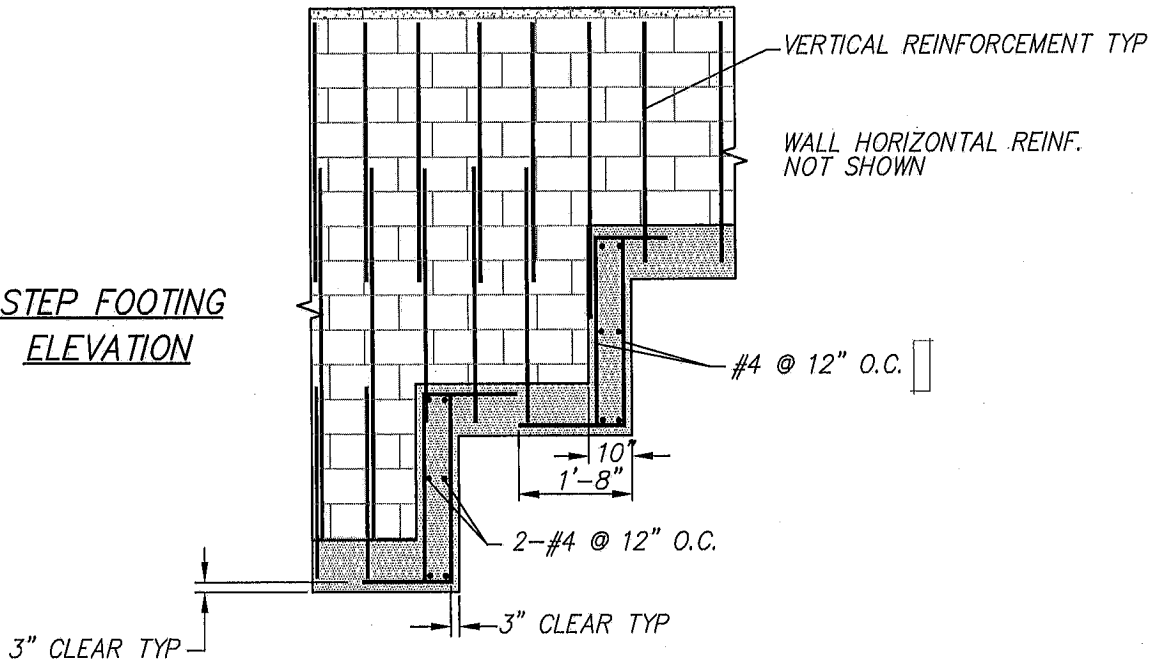
RETAINING WALL

STEP FOOTING & JOINT DETAILS

STEP FOOTING
PLAN VIEW



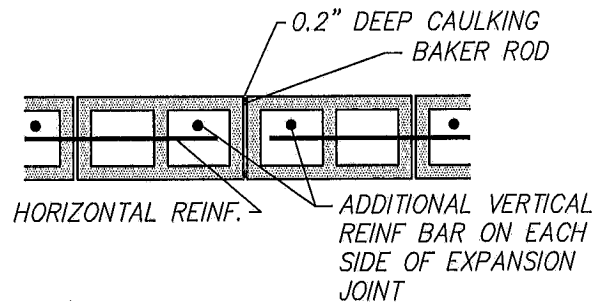
STEP FOOTING
ELEVATION



CONTROL JOINTS MUST EXTEND VERTICALLY EVERY 32 FT OC ALONG THE WALL. SOLID GROUT MAY CONTINUE THROUGH THE JOINT. RACK THE MORTAR BACK AT LEAST 1".

CONTROL JOINT

NO SCALE



EXPANSION JOINTS MUST EXTEND VERTICALLY EVERY 96 FT OC ALONG THE WALL. JOINT MUST NOT CONTAIN ANY INCOMPRESSIBLE MATERIAL (EX. GROUT OR MORTAR).

EXPANSION JOINT

NO SCALE

SHEET 10 OF 16

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CITY OF CHULA VISTA
ENGINEERING & CAPITAL PROJECTS
STANDARD DRAWING

RETAINING WALL STEP FOOTING &
JOINT DETAILS

William S. Valle
WILLIAM S. VALLE 11/21/2017
CITY ENGINEER

GRD-05

Variable heel (Minimum Toe), Level Backfill

CV Wall	CVVL-14	CVWL-20	CVVL-28	CVWL-34	CVVL-40	CVWL-48	CVWL-54	CVWL-60	CVWL-68	CVWL-74	CVWL-80
TYPE	I	I	I	I	I	I	I	I	I	I	I
Height-h	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-8"	5'-4"	6'-0"	6'-8"	7'-4"	8'-0"
Slope	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
Block-t1	6"	6"	6"	6"	8"	8"	8"	8"	8"	8"	8"
Stem Block											
Heel	0'-4"	0'-6"	0'-7"	0'-9"	0'-10"	1'-1"	1'-3"	1'-2"	1'-7"	1'-10"	2'-1"
Toe	0'-3"	0'-5"	0'-6"	0'-8"	0'-9"	1'-0"	1'-2"	1'-5"	1'-6"	1'-9"	2'-0"
Vert Bar-A				#3@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"
40 dia Lap				16"	20"	20"	20"	20"	20"	20"	20"
Horiz Bars	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#4@16"	#4@16"	#4@16"	#4@16"
Lower Bar-B	#3@24"	#3@24"	#3@24"	#3@24"	#4@24"	#4@24"	#4@24"	#5@8"	#4@24"	#4@24"	#4@16"
Min. Height of 12" Stem Wall											
Stem Bar-C									#5@24"	#5@16"	#5@8"
Stem Horiz Bars								#4@16"	#4@16"	#4@16"	#4@16"
Top Bar-D								#4@16"	#4@16"	#4@16"	#4@12"
Footing Width-W	1'-1"	1'-5"	1'-7"	1'-11"	2'-3"	2'-9"	3'-1"	3'-7"	4'-1"	4'-7"	5'-1"
Footing Horiz Bars	2#4	2#4	3#4	3#4	3#4	4#4	4#4	5#4	5#4	6#4	6#4
Key to Toe	None	None	None	6" by 4"	6" by 6"	8" by 8"	12" by 10"	12" by 12"	12" by 13"	12" by 15"	12" by 18"
Key (w by d)											
Key Reinf											#4@16"

Variable heel (Minimum Toe), 2 to 1 Slope

CV Wall	CVV20-14	CVV20-20	CVV20-28	CVV20-34	CVV20-40	CVV20-48	CVV20-54	CVV20-60	CVV20-68	CVV20-74	CVV20-80
TYPE	I	I	I	I	I	I	I	I	I	I	I
Height-h	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-8"	5'-4"	6'-0"	6'-8"	7'-4"	8'-0"
Slope	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1
Block-t1	6"	6"	6"	8"	8"	8"	8"	8"	8"	8"	8"
Stem Block											
Heel	0'-8"	0'-6"	0'-8"	1'-2"	1'-4"	1'-1"	1'-10"	2'-9"	2'-6"	2'-6"	2'-6"
Toe	0'-2"	0'-6"	0'-8"	0'-8"	1'-0"	1'-6"	1'-6"	1'-6"	2'-0"	2'-6"	3'-0"
Vert Bar-A				#4@24"	#4@24"	#4@24"	#5@16"	#4@24"	#4@24"	#4@24"	#4@24"
40 dia Lap				20"	20"	20"	25"	20"	20"	20"	20"
Horiz Bars	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"
Lower Bar-B	#3@24"	#3@24"	#3@24"	#4@24"	#4@24"	#4@16"	#5@8"	#4@24"	#4@24"	#4@24"	#4@16"
Min. Height of 12" Stem Wall											
Stem Bar-C									#6@16"	#6@8"	#8@8"
Stem Horiz Bars								#4@16"	#4@16"	#4@16"	#4@16"
Top Bar-D								#4@16"	#4@12"	#5@16"	#5@12"
Footing Width-W	1'-4"	1'-6"	1'-10"	2'-6"	3'-0"	3'-3"	4'-0"	5'-3"	5'-6"	6'-0"	6'-6"
Footing Horiz Bars	3#4	3#4	3#4	4#4	4#4	4#4	5#4	6#4	7#4	7#4	8#4
Key to Toe	0'-7"	0'-7"	1'-0"	1'-1"	1'-1"	1'-6"	2'-4"	3'-0"	2'-9"	2'-4"	2'-0"
Key (w by d)	6" by 4"	6" by 4"	8" by 8"	12" by 11"	12" by 14"	12" by 18"	12" by 22"	12" by 25"	12" by 29"	12" by 33"	12" by 37"
Key Reinf						#4@16"	#4@16"	#4@16"	#4@16"	#4@16"	#4@16"

REVISION	BY	APPROVED	DATE
ORIGINAL	CVM	C. SWANSON	12/01
REVISION	DPH	W. VALLE	11/17

CITY OF CHULA VISTA
ENGINEERING & CAPITAL PROJECTS
STANDARD DRAWING

TABLE FOR VARIABLE HEEL, LEVEL
BACKFILL, & 2 TO 1 SLOPE

William S. Valle
WILLIAM S. VALLE 11/21/2017
CITY ENGINEER

GRD-05

Variable heel (Minimum Toe), 1.5 TO 1 Slope

CV Wall	CWV15-14	CWV15-20	CWV15-28	CWV15-34	CWV15-40	CWV15-48	CWV15-54	CWV15-60	CWV15-68	CWV15-74
TYPE	I	I	I	I	I	I	I	I	I	I
Height -h	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-8"	5'-4"	6'-0"	6'-8"	7'-4"
Slope	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1
Block-t1	6"	6"	6"	8"	8"	8"	8"	8"	8"	8"
Stem Block										
Heel	0'-8"	0'-9"	0'-11"	1'-0"	1'-3"	2'-1"	1'-9"	2'-0"	2'-4"	1'-7"
Toe	0'-4"	0'-8"	0'-10"	0'-11"	1'-2"	1'-2"	1'-8"	1'-11"	2'-3"	2'-7"
Vert Bar-A				#4@24"	#4@24"	#4@16"	#4@24"	#4@24"	#4@16"	#4@24"
40 dia Lap				20"	20"	20"	20"	20"	20"	20"
Horiz Bars	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"
Lower Bar-B	#3@24"	#3@24"	#3@24"	#4@24"	#4@24"	#5@16"	#4@24"	#4@24"	#4@16"	#4@24"
Min. Height of 12" Stem Wall							2'-0"	2'-8"	2'-8"	4'-0"
Stem Bar-C							#4@16"	#5@16"	#5@8"	#8@8"
Stem Horiz Bars							#4@16"	#4@16"	#4@16"	#4@16"
Top Bar-D							#4@16"	#5@16"	#5@16"	#5@16"
Footing Width-W	1'-6"	1'-11"	2'-3"	2'-7"	3'-1"	3'-11"	4'-5"	4'-11"	5'-7"	6'-3"
Footing Horiz Bars	3-#4	3-#4	3-#4	4-#4	4-#4	5-#4	5-#4	6-#4	7-#4	7-#4
Key to Toe				0'-11"	1'-2"	1'-2"	1'-8"	1'-11"	2'-3"	2'-7"
Key (w by d)	None	6" by 6"	12" by 8"	12" by 11"	12" by 15"	12" by 17"	12" by 21"	12" by 25"	12" by 29"	12" by 32"
Key Reinf							#4@16"	#4@16"	#4@16"	#4@16"

Variable heel (Minimum Toe), Level, 250 PSF Vehicular Surcharge

CV Wall	CWV250-14	CWV250-20	CWV250-28	CWV250-34	CWV250-40	CWV250-48	CWV250-54	CWV250-60	CWV250-68	CWV250-74
TYPE	I	I	I	I	I	I	I	I	I	I
Height -h	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-8"	5'-4"	6'-0"	6'-8"	7'-4"
Slope/Surcharge	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250
Block-t1	6"	6"	6"	8"	8"	8"	8"	8"	8"	8"
Stem Block										
Heel	0'-9"	1'-0"	1'-0"	1'-0"	1'-9"	1'-6"	1'-9"	1'-6"	2'-3"	2'-0"
Toe	0'-3"	0'-6"	0'-9"	1'-0"	1'-0"	1'-6"	1'-6"	2'-0"	2'-0"	2'-6"
Vert Bar-A				#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"
40 dia Lap				20"	20"	20"	20"	20"	20"	25"
Horiz Bars	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"
Lower Bar-B	#3@24"	#3@24"	#4@16"	#4@24"	#5@16"	#5@8"	#4@24"	#4@16"	#4@24"	#5@16"
Min. Height of 12" Stem Wall							2'-0"	2'-8"	3'-4"	4'-0"
Stem Bar-C							#4@16"	#5@16"	#6@8"	#8@8"
Stem Horiz Bars							#4@16"	#4@16"	#4@16"	#4@16"
Top Bar-D							#4@16"	#4@12"	#4@12"	#4@12"
Footing Width-W	1'-6"	2'-0"	2'-3"	2'-8"	3'-5"	3'-8"	4'-3"	4'-6"	5'-3"	5'-6"
Footing Horiz Bars	3-#4	3-#4	3-#4	4-#4	4-#4	5-#4	5-#4	6-#4	7-#4	7-#4
Key to Toe	0'-6"	0'-10"	1'-0"	1'-3"	1'-2"	1'-6"	1'-11"	2'-3"	2'-3"	2'-9"
Key (w by d)	6" by 3"	8" by 5"	8" by 8"	12" by 11"	12" by 11"	12" by 15"	12" by 17"	12" by 21"	12" by 21"	12" by 25"
Key Reinf							#4@16"	#4@16"	#4@16"	#4@16"

REVISION	BY	APPROVED	DATE
ORIGINAL	CVM	C. SWANSON	12/01
REVISION	DPH	W. VALLE	11/17

CITY OF CHULA VISTA
 ENGINEERING & CAPITAL PROJECTS
 STANDARD DRAWING

TABLE FOR VAR. HEEL, 1.5-1
 SLOPE, 250 PSF, & SURCHARGE

William S. Valle
 WILLIAM S. VALLE 11/21/2017
 CITY ENGINEER

GRD-05

6-Inch heel, Level Backfill

CV Wall	CV6L-14	CV6L-20	CV6L-28	CV6L-34	CV6L-40	CV6L-48	CV6L-54	CV6L-60	CV6L-68	CV6L-74	CV6L-80
TYPE	I	I	I	I	I	I	I	I	I	I	I
Height -h	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-8"	5'-4"	6'-0"	6'-8"	7'-4"	8'-0"
Slope	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
Block-t1	6"	6"	6"	6"	8"	8"	8"	8"	8"	8"	8"
Stem Block											
Heel	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"
Toe	0'-3"	0'-5"	0'-7"	1'-0"	0'-11"	1'-5"	1'-8"	2'-1"	2'-1"	2'-6"	2'-11"
Vert Bar-A				#3@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"
40 dia Lap				15"	20"	20"	20"	20"	20"	20"	20"
Horiz Bars	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"
Lower Bar-B	#3@24"	#3@24"	#3@24"	#3@24"	#4@24"	#4@24"	#4@16"	#5@8"	#4@24"	#4@24"	#4@16"
Min. Height of 12" Stem Wall											
Stem Bar-C											
Stem Horiz Bars											
Top Bar-D											
Footing Width-W	1'-3"	1'-5"	1'-7"	2'-0"	2'-1"	2'-7"	2'-10"	3'-3"	3'-7"	4'-0"	4'-5"
Footing Horiz Bars	2-#4	2-#4	3-#4	3-#4	3-#4	4-#4	4-#4	4-#4	5-#4	5-#4	5-#4
Key to Toe			0'-9"	1'-0"	1'-2"	1'-3"	1'-6"	1'-9"	2'-1"	2'-6"	2'-9"
Key (w by d)	None	None	6" by 1"	6" by 4"	8" by 7"	12" by 12"	12" by 13"	12" by 16"	12" by 18"	12" by 21"	12" by 24"
Key Reinf								#4@16"	#4@16"	#4@16"	#4@16"

6-Inch heel, 2 to 1 Slope

CV Wall	CV620-14	CV620-20	CV620-28	CV620-34	CV620-40	CV620-48	CV620-54	CV620-60	CV620-68	CV620-74
TYPE	I	I	I	I	I	I	I	I	I	I
Height -h	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-8"	5'-4"	6'-0"	6'-8"	7'-4"
Slope	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1
Block-t1	6"	6"	6"	6"	8"	8"	8"	8"	8"	8"
Stem Block										
Heel	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"
Toe	0'-4"	0'-6"	0'-9"	1'-2"	1'-4"	1'-10"	2'-2"	2'-3"	2'-10"	3'-3"
Vert Bar-A				#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"
40 dia Lap				20"	20"	20"	20"	20"	20"	20"
Horiz Bars	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"
Lower Bar-B	#3@24"	#3@24"	#3@24"	#4@24"	#4@24"	#4@16"	#5@8"	#4@24"	#4@24"	#4@24"
Min. Height of 12" Stem Wall										
Stem Bar-C										
Stem Horiz Bars										
Top Bar-D										
Footing Width-W	1'-4"	1'-6"	1'-9"	2'-2"	2'-6"	3'-0"	3'-4"	3'-9"	4'-4"	4'-9"
Footing Horiz Bars	2-#4	3-#4	3-#4	3-#4	4-#4	4-#4	4-#4	5-#4	5-#4	6-#4
Key to Toe	None	0'-6"	0'-9"	0'-11"	1'-3"	1'-7"	2'-0"	2'-3"	2'-8"	3'-4"
Key (w by d)	None	6" by 4"	8" by 8"	12" by 11"	12" by 14"	12" by 18"	12" by 22"	12" by 25"	12" by 28"	12" by 32"
Key Reinf							#4@16"	#4@16"	#4@16"	#4@16"

REVISION	BY	APPROVED	DATE
ORIGINAL	CVM	C. SWANSON	12/01
REVISION	DPH	W. VALLE	11/17

CITY OF CHULA VISTA
 ENGINEERING & CAPITAL PROJECTS
 STANDARD DRAWING

TABLE FOR 6-IN HEEL, LEVEL
 BACKFILL, & 2 TO 1 SLOPE

Williams, Valle
 WILLIAM S. VALLE 11/21/2017
 CITY ENGINEER

GRD-05

6-inch heel, 1.5 to 1 Slope

CV Wall	CV615-14	CV615-20	CV615-28	CV615-34	CV615-40	CV615-48	CV615-54	CV615-60	CV615-68	CV615-74
TYPE	I	I	I	I	I	I	II	II	II	II
Height -h	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-8"	5'-4"	6'-0"	6'-8"	7'-4"
Slope	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	8"	8"	8"	8"
Block-t1	6"	6"	6"	8"	8"	8"	12"	12"	12"	12"
Stem Block										
Heel	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"
Toe	0'-6"	1'-0"	1'-8"	1'-4"	1'-8"	2'-1"	2'-4"	2'-9"	3'-3"	3'-9"
Vert. Bar-A				#4@24"	#4@24"	#4@16"	#4@24"	#4@24"	#4@24"	#4@24"
40 dia Lap				20"	20"	20"	20"	20"	20"	20"
Horiz Bars	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"
Lower Bar-B	#3@24"	#3@24"	#3@24"	#4@24"	#4@24"	#5@16"	#4@24"	#4@24"	#4@24"	#4@24"
Min. Height of 12" Stem Wall							2'-0"	2'-5"	2'-8"	4'-0"
Stem Bar-C							#4@16"	#5@16"	#5@8"	#8@8"
Stem Horiz Bars							#4@16"	#4@16"	#4@16"	#4@16"
Top Bar-D										
Footing Width-W	1'-6"	2'-0"	2'-8"	2'-6"	2'-10"	3'-3"	3'-10"	4'-3"	4'-9"	5'-3"
Footing Horiz Bars	3-#4	3-#4	4-#4	4-#4	4-#4	4-#4	5-#4	5-#4	6-#4	6-#4
Key to Toe		0'-6"	1'-0"	1'-0"	1'-6"	1'-11"	2'-4"	2'-9"	3'-3"	3'-9"
Key (w by d)	None	6" by 4"	8" by 10"	12" by 12"	12" by 17"	12" by 21"	12" by 25"	12" by 30"	12" by 34"	12" by 38"
Key Reinf						#4@16"	#4@16"	#4@16"	#4@16"	#4@16"

6-inch heel, Level Backfill, 250 PSF Vehicular Surcharge

CV Wall	CV6S-14	CV6S-20	CV6S-28	CV6S-34	CV6S-40	CV6S-48	CV6S-54	CV6S-60	CV6S-68	CV6S-74
TYPE	I	I	I	I	I	I	II	II	II	II
Height -h	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-8"	5'-4"	6'-0"	6'-8"	7'-4"
Slope/Surcharge	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250
Block-t1	6"	6"	6"	8"	8"	8"	8"	8"	8"	8"
Stem Block										
Heel	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"
Toe	0'-8"	1'-0"	1'-5"	1'-5"	1'-10"	2'-4"	2'-3"	2'-9"	3'-2"	3'-9"
Vert. Bar-A				#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"
40 dia Lap				20"	20"	20"	20"	25"	20"	25"
Horiz Bars	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"
Lower Bar-B	#3@24"	#3@24"	#4@16"	#4@24"	#5@16"	#5@8"	#4@24"	#5@24"	#4@24"	#5@16"
Min. Height of 12" Stem Wall							2'-0"	2'-8"	3'-4"	4'-0"
Stem Bar-C							#4@16"	#5@16"	#6@8"	#8@8"
Stem Horiz Bars							#4@16"	#4@16"	#4@16"	#4@16"
Top Bar-D										
Footing Width-W	1'-8"	2'-0"	2'-5"	2'-8"	3'-0"	3'-6"	3'-9"	4'-3"	4'-8"	5'-3"
Footing Horiz Bars	2-#4	3-#4	3-#4	3-#4	4-#4	4-#4	4-#4	5-#4	5-#4	6-#4
Key to Toe	0'-9"	2'-0"	2'-5"	2'-8"	3'-0"	3'-6"	3'-9"	4'-3"	4'-8"	5'-3"
Key (w by d)	6" by 4"	8" by 7"	8" by 10"	12" by 13"	12" by 16"	12" by 19"	12" by 22"	12" by 25"	12" by 28"	12" by 31"
Key Reinf						#4@16"	#4@16"	#4@16"	#4@16"	#4@16"

REVISION	BY	APPROVED	DATE
ORIGINAL	CVM	C. SWANSON	12/01
REVISION	DPH	W. VALLE	11/17

CITY OF CHULA VISTA
 ENGINEERING & CAPITAL PROJECTS
 STANDARD DRAWING

TABLE FOR 6-IN HEEL, 1.5 TO 1
 SLOPE, 250 PSF, & SURCHARGE

William S. Valle
 WILLIAM S. VALLE 11/21/2017
 CITY ENGINEER

GRD-05

2-inch heel, Level Backfill

CV Wall	CV2L-14	CV2L-20	CV2L-28	CV2L-34	CV2L-40	CV2L-48	CV2L-54	CV2L-60	CV2L-68	CV2L-74	CV2L-80
TYPE	I	I	I	I	I	I	I	I	I	I	I
Height -h	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-8"	5'-4"	6'-0"	6'-8"	7'-4"	8'-0"
Slope	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
Block-t1	6"	6"	6"	6"	8"	8"	8"	8"	8"	8"	8"
Stem Block											
Heel	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"
Toe	0'-4"	0'-8"	1'-1"	1'-3"	1'-5"	1'-8"	2'-2"	2'-4"	2'-4"	2'-8"	3'-4"
Vert Bar-A				#3@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"
40 dia Lap				15"	20"	20"	20"	20"	20"	20"	20"
Horiz Bars	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"
Lower Bar-B	#3@24"	#3@24"	#3@24"	#3@16"	#4@24"	#4@24"	#4@16"	#5@8"	#4@24"	#4@24"	#4@16"
Min. Height of 12" Stem Wall											
Stem Bar-C									#5@24"	#5@16"	#5@8"
Stem Horiz Bars									#4@16"	#4@16"	#4@16"
Top Bar-D											
Footing Width-W	1'-0"	1'-4"	1'-9"	2'-0"	2'-3"	2'-6"	3'-0"	3'-4"	3'-6"	3'-11"	4'-6"
Footing Horiz Bars	2 #4	2 #4	3 #4	3 #4	4 #4	4 #4	4 #4	4 #4	5 #4	5 #4	6 #4
Key to Toe			1'-0"	1'-1"	1'-2"	1'-0"	1'-5"	1'-9"	2'-2"	2'-6"	2'-6"
Key (w by d)	None	None	6" by 2"	6" by 6"	8" by 8"	12" by 11"	12" by 14"	12" by 17"	12" by 19"	12" by 22"	12" by 26"
Key Reinf									#4@16"	#4@16"	#4@16"

2-inch heel, 2 to 1 Slope

CV Wall	CV220-14	CV220-20	CV220-28	CV220-34	CV220-40	CV220-48	CV220-54	CV220-60	CV220-68	CV220-74
TYPE	I	I	I	I	I	I	I	I	I	I
Height -h	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-8"	5'-4"	6'-0"	6'-8"	7'-4"
Slope	2:0:1	2:0:1	2:0:1	2:0:1	2:0:1	2:0:1	2:0:1	2:0:1	2:0:1	2:0:1
Block-t1	6"	6"	6"	8"	8"	8"	8"	8"	8"	8"
Stem Block										
Heel	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"
Toe	0'-7"	0'-8"	1'-1"	1'-4"	1'-8"	2'-0"	2'-5"	2'-5"	2'-11"	3'-4"
Vert Bar-A				#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"
40 dia Lap				20"	20"	20"	20"	20"	20"	20"
Horiz Bars	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"
Lower Bar-B	#3@24"	#3@24"	#3@24"	#4@24"	#4@24"	#4@16"	#5@8"	#4@24"	#4@24"	#4@24"
Min. Height of 12" Stem Wall										
Stem Bar-C									#6@16"	#6@8"
Stem Horiz Bars									#4@16"	#4@16"
Top Bar-D										
Footing Width-W	1'-3"	1'-4"	1'-9"	2'-0"	2'-6"	2'-10"	3'-3"	3'-7"	4'-1"	4'-6"
Footing Horiz Bars	2 #4	2 #4	3 #4	3 #4	3 #4	4 #4	4 #4	5 #4	5 #4	6 #4
Key to Toe		0'-7"	1'-0"	0'-11"	1'-3"	1'-7"	2'-0"	2'-5"	2'-11"	3'-4"
Key (w by d)	None	6" by 6"	8" by 8"	12" by 12"	12" by 14"	12" by 18"	12" by 22"	12" by 25"	12" by 28"	12" by 32"
Key Reinf							#4@16"	#4@16"	#4@16"	#4@16"

REVISION	BY	APPROVED	DATE
ORIGINAL	CVM	C. SWANSON	12/01
REVISION	DPH	W. VALLE	11/17

CITY OF CHULA VISTA
 ENGINEERING & CAPITAL PROJECTS
 STANDARD DRAWING

TABLE FOR 2-IN HEEL, LEVEL
 BACKFILL, & 2 TO 1 SLOPE

W. Valle
 WILLIAM S. VALLE
 CITY ENGINEER

11/21/2017

GRD-05

2-inch heel, 1.5 to 1 Slope

CV Wall	CV215-14	CV215-20	CV215-28	CV215-34	CV215-40	CV215-48	CV215-54	CV215-60	CV215-68	CV215-74
TYPE	I	I	I	I	I	I	II	II	II	II
Height -h	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-8"	5'-4"	6'-0"	6'-8"	7'-4"
Slope	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1
Block-t1	6"	6"	6"	8"	8"	8"	8"	8"	8"	8"
Stem Block										
Heel	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"
Toe	1'-2"	1'-4"	1'-6"	1'-9"	2'-4"	2'-9"	3'-0"	3'-3"	3'-10"	5'-0"
Vert Bar-A				#4@24"	#4@24"	#4@16"	#4@24"	#4@16"	#4@16"	#4@16"
40 dia Lap				20"	20"	20"	20"	20"	20"	20"
Horiz Bars	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"
Lower Bar-B	#3@24"	#3@24"	#3@24"	#4@24"	#4@24"	#5@8"	#4@24"	#4@16"	#4@16"	#4@16"
Min. Height of 12" Stem Wall										
Stem Bar-C										
Stem Horiz Bars										
Top Bar-D										
Footing Width-W	1'-10"	2'-0"	2'-2"	2'-7"	3'-2"	3'-7"	4'-0"	4'-5"	5'-0"	6'-2"
Footing Horiz Bars	3-#4	3-#4	3-#4	4-#4	4-#4	4-#4	5-#4	5-#4	6-#4	7-#4
Key to Toe		1'-4"	1'-2"	1'-7"	2'-2"	2'-7"	3'-2"	3'-5"	3'-10"	5'-0"
Key (w by d)	None	4" by 6"	12" by 9"	12" by 13"	12" by 17"	12" by 22"	12" by 26"	12" by 30"	12" by 34"	12" by 38"
Key Reinf						#4@16"	#4@16"	#4@16"	#4@16"	#4@16"

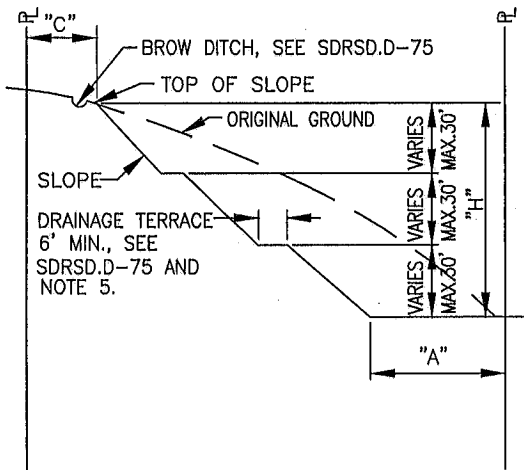
2-inch heel, Level Backfill, 250 PSF Vehicular Surcharge

CV Wall	CV2S-14	CV2S-20	CV2S-28	CV2S-34	CV2S-40	CV2S-48	CV2S-54	CV2S-60	CV2S-68	CV2S-74
TYPE	I	I	I	I	I	I	II	II	II	II
Height -h	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-8"	5'-4"	6'-0"	6'-8"	7'-4"
Slope/Surcharge	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250	Level / 250
Block-t1	6"	6"	8"	8"	8"	8"	8"	8"	8"	8"
Stem Block										
Heel	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"
Toe	1'-4"	1'-9"	2'-2"	2'-3"	2'-10"	3'-2"	2'-8"	3'-1"	3'-8"	4'-0"
Vert Bar-A				#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"	#4@24"
40 dia Lap				20"	20"	20"	20"	25"	20"	25"
Horiz Bars	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"	#3@16"
Lower Bar-B	#3@24"	#3@24"	#4@24"	#4@24"	#5@16"	#6@8"	#4@24"	#5@16"	#4@24"	#5@16"
Min. Height of 12" Stem Wall										
Stem Bar-C										
Stem Horiz Bars										
Top Bar-D										
Footing Width-W	2'-0"	2'-5"	2'-10"	3'-1"	3'-8"	4'-0"	3'-10"	4'-4"	4'-10"	5'-2"
Footing Horiz Bars	3-#4	3-#4	4-#4	4-#4	4-#4	5-#4	5-#4	5-#4	6-#4	6-#4
Key to Toe	1'-0"	1'-4"	1'-3"	1'-6"	1'-11"	2'-3"	2'-8"	3'-0"	3'-8"	4'-0"
Key (w by d)	6" by 4"	8" by 8"	12" by 11"	12" by 14"	12" by 17"	12" by 20"	12" by 23"	12" by 26"	12" by 30"	12" by 34"
Key Reinf						#4@16"	#4@16"	#4@16"	#4@16"	#4@16"

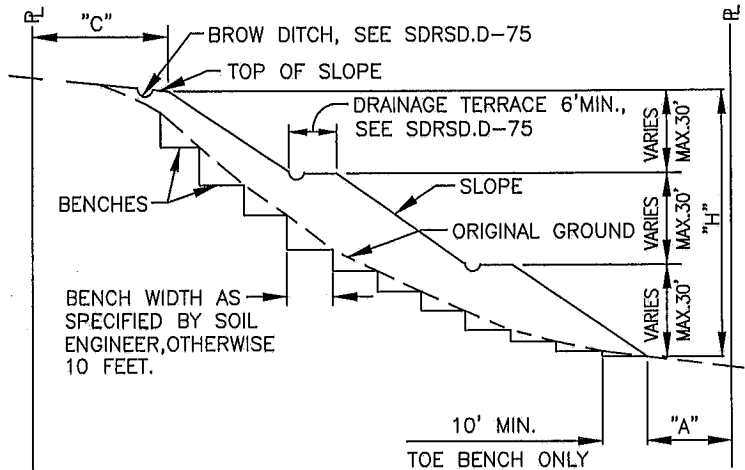
REVISION	BY	APPROVED	DATE
ORIGINAL	CVM	C. SWANSON	12/01
REVISION	DPH	W. VALLE	11/17

CITY OF CHULA VISTA
 ENGINEERING & CAPITAL PROJECTS
 STANDARD DRAWING
 TABLE FOR 2-IN HEEL, 1.5 TO 1
 SLOPE, 250 PSF & SURCHARGE

William S. Valle
 WILLIAM S. VALLE 11/21/2017
 CITY ENGINEER
 GRD-05



PROFILE-TYPICAL CUT SLOPE

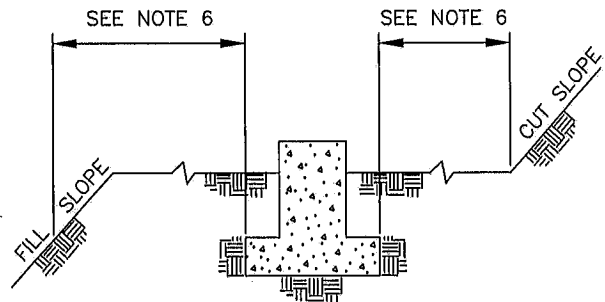


PROFILE-TYPICAL FILL SLOPE

H = VERTICAL HEIGHT OF SLOPE.

A = DISTANCE TOE OF SLOPE TO OUTER BOUNDARIES OF THE PERMIT AREA, INCLUDING SLOPE RIGHT AREAS AND EASEMENTS.

C = DISTANCE TOP OF SLOPE TO OUTER BOUNDARIES OF THE PERMIT AREA, INCLUDING SLOPE RIGHT AREAS AND EASEMENTS. WHERE BROW DITCH IS TO BE CONSTRUCTED "C" DISTANCE MUST BE A MINIMUM OF 3 FEET.



BUILDING FOUNDATION
CLEARANCE
CUT/FILL SLOPE

HEIGHT OF CUT/FILL	REQUIRED SETBACKS FROM CUT/FILL SLOPES	
H	A	C
0 - 5'	1 - 6'	1'
5' - 30'	H/2	H/5
OVER 30'	15'	6'

NOTES:

1. GRADING SHALL BE DONE IN ACCORDANCE WITH THE PROVISIONS OF THE GRADING ORDINANCE AND GRADING PERMIT.
2. SLOPE RATIOS SHALL NOT BE STEEPER THAN 2:1 CUTS AND FILLS.
3. LANDSCAPING AND IRRIGATION SHALL BE DONE IN ACCORDANCE WITH CITY LANDSCAPE MANUAL.
4. FENCING SHALL BE INSTALLED AS DIRECTED BY CITY ENGINEER.
5. SLOPE TERRACES ARE OPTIONAL UNLESS DIRECTED BY SOILS ENGINEER.
6. SEE SOILS REPORT, ZONING & BUILDING CODE REQUIREMENTS FOR LOCATION OF FOOTINGS.

REVISION	BY	APPROVED	DATE
ORIGINAL			1/95
REVISION	CVM	C. SWANSON	4/02
REVISION	DPH	W. VALLE	11/17

CITY OF CHULA VISTA
ENGINEERING & CAPITAL PROJECTS
STANDARD DRAWING

GRADED SLOPES

William S. Valle
WILLIAM S. VALLE 11/21/2017
CITY ENGINEER

GRD-06