

FLH Standard Criteria Files

Section 11 –

Concrete Fill Wall Criteria Files

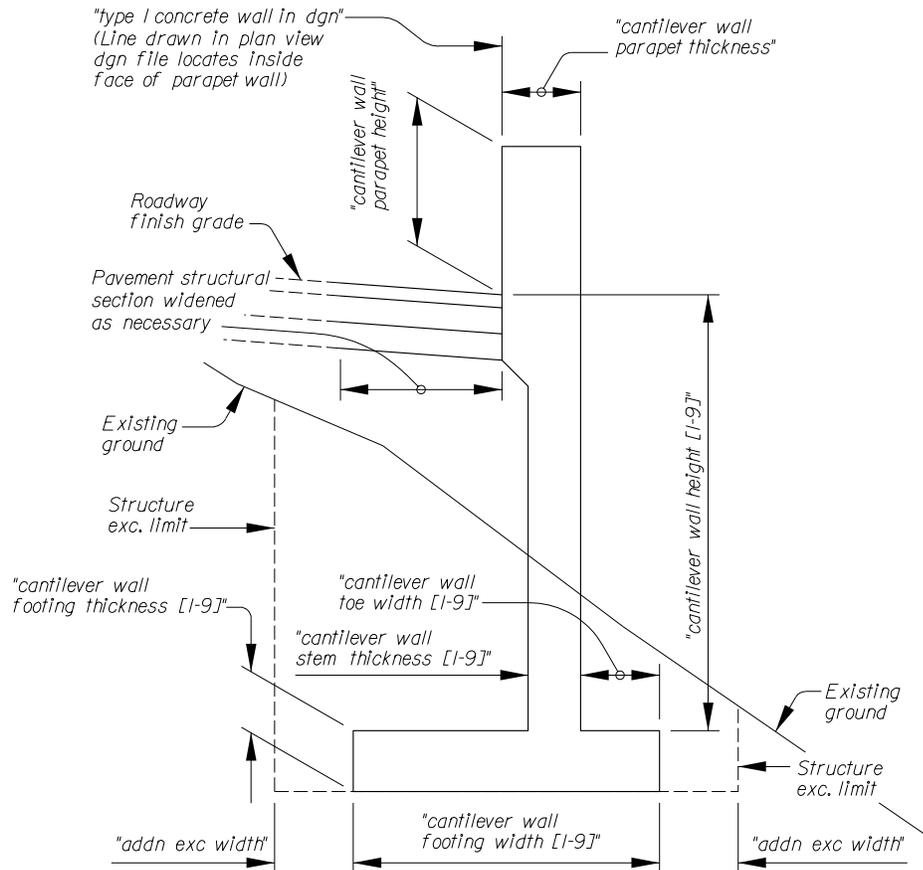
Concrete Fill Wall Criteria Files

These criteria files draw concrete fill walls including associated special excavation and backfill.

Criteria File	Elements Drawn by Criteria File
c_walld.x08	Cantilever concrete fill wall plus associated excavation and backfill. Uses lines in plan view dgn file to set station ranges and offset.
c_walls.x08	Cantilever concrete fill wall plus associated excavation and backfill. Uses exceptions data file to set station ranges and side of roadway.
c_zwalld.x08	Cantilever concrete "zee" wall plus associated excavation and backfill. Uses lines in plan view dgn file to set station ranges and offsets.

c_cwall1d.x08

Draws a cantilever concrete fill wall plus associated special excavation and backfill. Station ranges and offset from the roadway centerline are set using line(s) drawn in a plan view dgn file.
(Contrast this with *c_cwall1s.x08*, where the station ranges and side of the roadway for the cut wall are set in the exceptions data file.)



define variables that must be assigned values in the input data file:

- "addn exc width"
- "cantilever wall footing thickness [1-9]"
- "cantilever wall footing width [1-9]"
- "cantilever wall parapet height"
- "cantilever wall parapet thickness"
- "cantilever wall stem thickness [1-9]"
- "cantilever wall toe width [1-9]"
- "min footing depth" (see Footing Setback Details section below)
- "min footing setback" (see Footing Setback Details section below)

define_dgn variables that must be assigned values in the input data file:

- "type 1 concrete wall in dgn"

Variables that must be defined in exceptions data file:

c_cwall1d.x08

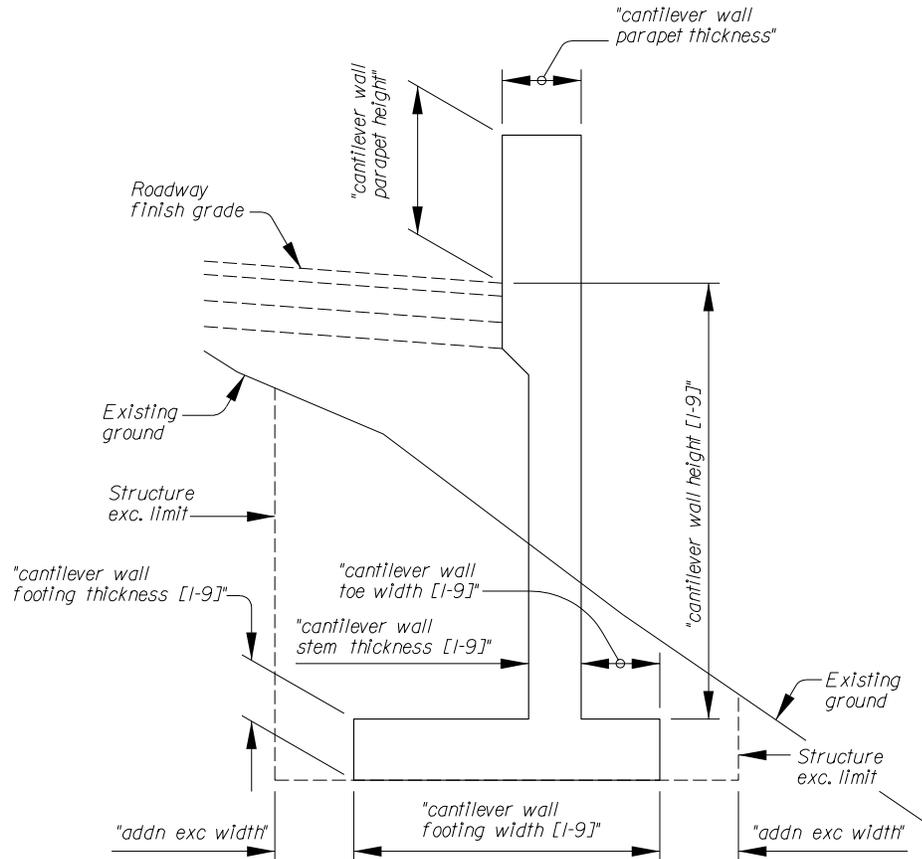
None

Notes for c_cwall1d.x08:

1. Both station ranges and offset from centerline for the wall are set using lines drawn in plan view dgn file (define_dgn variable "type 1 concrete wall in dgn").
2. "type 1 concrete wall in dgn" line defines the offset from roadway centerline to the inside face of the parapet wall. The pavement structural section is widened as necessary to position the wall to match the "in dgn" line.
3. This criteria file is a generalized rewrite of the wall criteria used for Generals Highway at Sequoia National Park.
4. User specifies all the dimensions for each of nine different wall sections ("cantilever wall ... [1-9]") in the input file, with "wall 1" being the shortest progressing to "wall 9", the tallest. By default dimensions for all the wall sections are set in the criteria file itself to the values used for Generals Highway, with the tallest wall ("cantilever wall height 9") being 5.50 meters.
5. Height of wall selected by this criteria is the shortest wall that satisfies both the "min footing depth" and the "min footing setback" requirements. (See Footing Setback Details section below for further explanation of these variables.)
6. Wall will always be drawn where called for, even if the entire wall is below existing ground -- in which case the shortest wall height ("cantilever wall height 1") is used.
7. If none of the specified walls satisfy the minimum footing depth/setback requirements, then a vertical line is drawn from top of pavement down to existing ground. This will allow earthwork and construction reports to be run on the cross-sections.
8. User must specify level/symbology very precisely for earthwork and the slope stake report.
Earthwork
 Finish grade: lv=2,8,10-12 co=0,10,11,16
 Existing suitable (structure exc): lv=46 co=46
 Proposed undercut (wall backfill): lv=47 co=47 soil type=same as proposed finish grade
Slope stake report
 Finish grade: lv=(bottom layer only),10,11 co=(bottom layer only),10,11,16

c_cwalls.x08

Draws a cantilever concrete fill wall plus associated special excavation and backfill. Station ranges and side of the roadway where the cut wall is drawn are set in the exceptions data file.
(Contrast this with *c_cwall1d.x08*, where the station ranges and offset from the roadway centerline for the wall are set using lines drawn in a plan view dgn file.)



define variables that must be assigned values in the input data file:

- "addn exc width"
- "cantilever wall footing thickness [1-9]"
- "cantilever wall footing width [1-9]"
- "cantilever wall parapet height"
- "cantilever wall parapet thickness"
- "cantilever wall stem thickness [1-9]"
- "cantilever wall toe width [1-9]"
- "min footing depth" (see Footing Setback. Details section below)
- "min footing setback" (see Footing Setback Details section below)

define_dgn variables that must be assigned values in the input data file:

None

c_cwalls.x08

Variables that must be defined in exceptions data file:

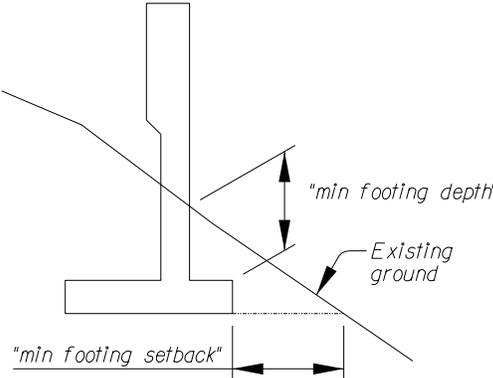
`_d_use_cantilever_wall1s_lt`
`_d_use_cantilever_wall1s_rt`

Notes for c_cwalls.x08:

1. Station ranges and side of road for the wall are set using the `_d_use_cantilever_wall1s_[lt,rt]` variables in the exceptions data file using the following syntax:

```
if sta >= 1+000 r 1 and sta <= 2+000 r 1 then
{
  _d_use_cantilever_wall1s_lt = 1
}
```
2. Wall is drawn at whatever point the preceding criteria file left off drawing; no pavement widening is done by this criteria.
3. This criteria file is a generalized rewrite of the wall criteria used for Generals Highway at Sequoia National Park.
4. User specifies all the dimensions for each of nine different wall sections ("cantilever wall ... [1-9]") in the input file, with "wall 1" being the shortest progressing to "wall 9", the tallest. By default dimensions for all the wall sections are set in the criteria file itself to the values used for Generals Highway, with the tallest wall ("cantilever wall height 9") being 5.50 meters.
5. Height of wall selected by this criteria is the shortest wall that satisfies both the "min footing depth" and the "min footing setback" requirements. (See Misc. Details section below for further explanation of these variables.)
6. Wall will always be drawn where called for, even if the entire wall is below existing ground -- in which case the shortest wall height ("cantilever wall height 1") is used.
7. If none of the specified walls satisfy the minimum footing depth/setback requirements, then a vertical line is drawn from top of pavement down to existing ground. This will allow earthwork and construction reports to be run on the cross-sections.
8. User must specify level/symbology very precisely for earthwork and the slope stake report.
Earthwork
Finish grade: lv=2,8,10-12 co=0,10,11,16
Existing suitable (structure exc): lv=46 co=46
Proposed undercut (wall backfill): lv=47 co=47 soil type=same as proposed finish grade
Slope stake report
Finish grade: lv=(bottom layer only),10,11 co=(bottom layer only),10,11,16

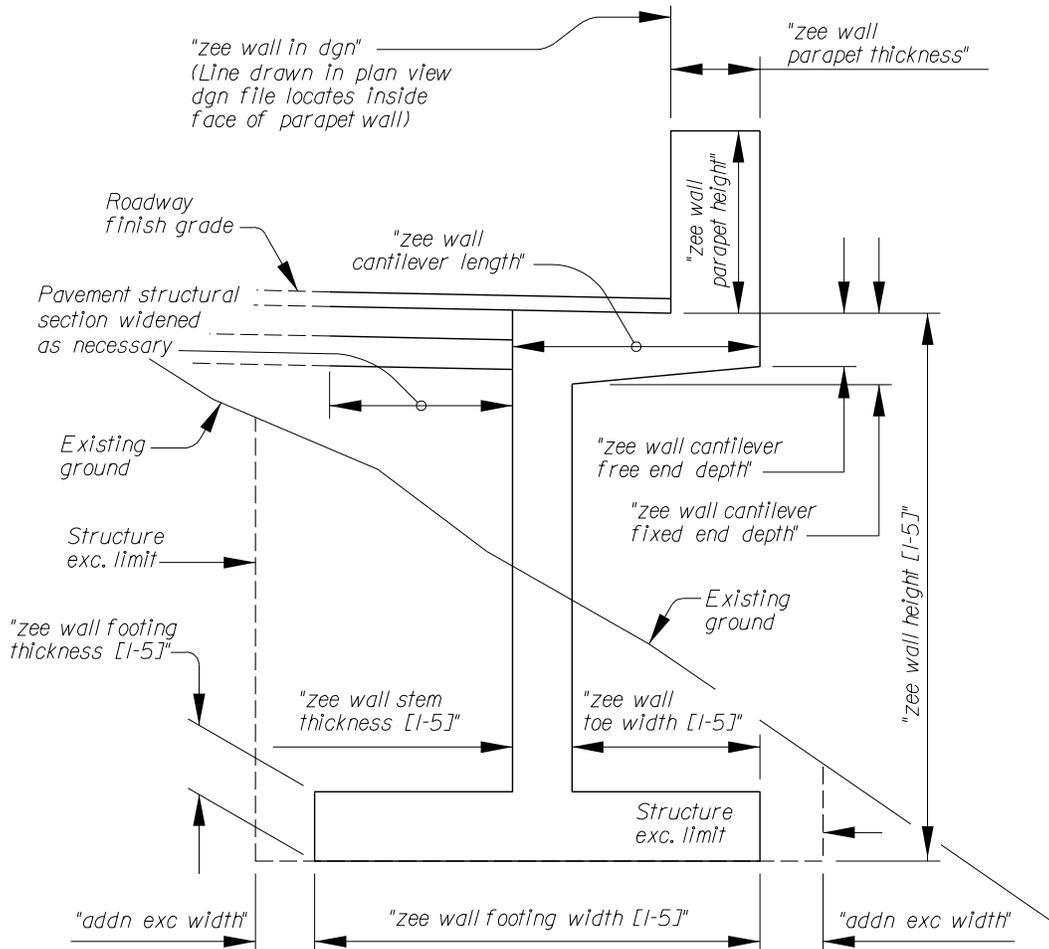
Footing Setback and Depth Details



MINIMUM REQUIREMENTS FOR FOOTING SETBACK AND DEPTH

c_zwalld.x08

Draws a cantilever concrete "zee" wall plus associated special excavation and backfill. Station ranges and offset from the roadway centerline are set using line(s) drawn in a plan view dgn file. User defines five wall heights and associated wall component dimensions.



define variables that must be assigned values in the input data file:

- "addn exc width"
- "min footing depth" (see Misc. Details section below)
- "min footing setback" (see Misc. Details section below)
- "zee wall parapet height"
- "zee wall parapet thickness"
- "zee wall cantilever length"
- "zee wall cantilever fixed end depth"
- "zee wall cantilever free end depth"
- "zee wall footing thickness [1-5]"
- "zee wall footing width [1-5]"
- "zee wall height [1-5]"
- "zee wall stem thickness [1-5]"
- "zee wall toe width [1-5]"

c_zwalld.x08

define_dgn variables that must be assigned values in the input data file:

"zee wall in dgn"

Variables that must be defined in exceptions data file:

None

Notes for c_zwalld.x08:

1. Both station ranges and offset from centerline for the wall are set using lines drawn in plan view dgn file (define_dgn variable "zee wall in dgn").
2. "zee wall in dgn" line defines the offset from roadway centerline to the inside face of the parapet wall. The pavement structural section is widened as necessary to position the wall to match the "in dgn" line. (The width of the concrete cantilever is fixed.)
3. This criteria file is a generalized rewrite of a wall criteria used for Generals Highway at Sequoia National Park 10(2).
4. The height of the wall drawn by this criteria is selected from among five user specified wall heights ("zee wall height [1-5]") in the input file. For each wall height the user also supplies dimensions for the other wall x-section elements. Wall heights should be in increasing order (i.e., "zee wall height 1" should be the shortest wall height and "zee wall height 5" should be the tallest).
5. Default (metric) dimensions for all the wall sections are set in the criteria file itself to match the values used for Generals Highway (see the table below). If the default dimensions are acceptable then the user does not have to define values for these variables in the cross-section input file.

Variable Name	n = 1	n = 2	n = 3	n = 4	n = 5
"zee wall height n"	1.85 m	2.45 m	3.05 m	3.65 m	4.25 m
"zee wall footing thickness n"	0.30 m	0.30 m	0.35 m	0.45 m	0.50 m
"zee wall footing width n"	2.15 m	2.15 m	2.45 m	2.75 m	2.75 m
"zee wall stem thickness n"	0.35 m				
"zee wall toe width n"	0.60 m				

6. Height of wall selected by this criteria will be the shortest of the user specified height that satisfies both the "min footing depth" and the "min footing setback" requirements. (See Misc.Details section below for further explanation of these variables.)
7. If none of the user specified wall heights ("zee wall height 1" thru "zee wall height 5") satisfy the minimum footing depth/setback requirements, then this criteria draws a "non-standard" wall height to fit the existing ground. The height of the wall for this case is determined by setting the toe of the wall footing "min footing depth" below existing ground. The other wall x-section dimensions for this case are the same as for wall height 5.
8. Wall will always be drawn where called for, even if the entire structure is below existing ground

c_zwalld.x08

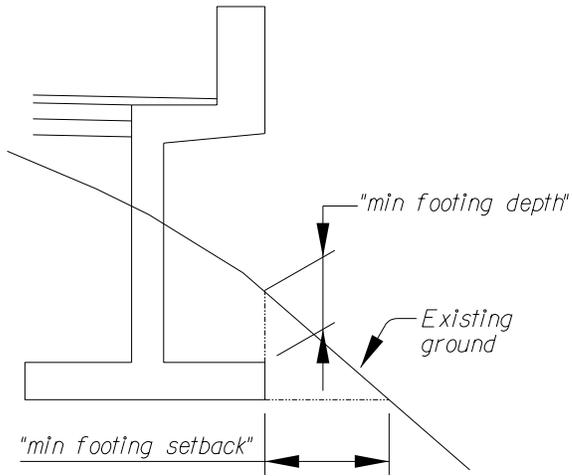
- in which case the shortest wall height ("zee wall height 1") is used.
- 9. The dimensions of the concrete wall cantilever section and the parapet wall are fixed. (i.e., they remain the same regardless of wall height)
- 10. Hidden define variables "~max wall search dist" (default = 20) and "~min pvmt widening" (default = 0.01) are available to fine tune the performance of this criteria.
- 11. User must specify level/symbology very carefully for the cross section reports to work correctly. (Notice that it was necessary to have the criteria draw an "extra" line with level/symbology lv=45 co=45 in order to get the reports to work.)

XS Report	Levels	Colors
Slope Stake Staking Detail	(bottom pavement layer level) + 8,10,45	(bottom pavement layer color) + 10,11,16,45
Red/Blue Top	(all pavement layer levels) + 8,10,45	(all pavement layer colors) + 10,11,16,45

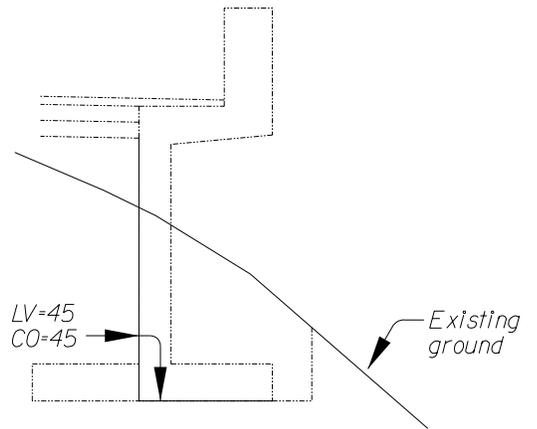
- 12. Level/symbology for earthwork is:

Classification	Levels	Colors
Proposed Finish Grade	2,8,10-12	0,10-12,16
Existing Ground	56	2
Existing Suitable (Structure Excavation)	46	46
Proposed Undercut (same soil type as Proposed Finish Grade)	47	46

Concrete Fill Wall Criteria Files
c_zwalld.x08 Misc. Details



*MINIMUM REQUIREMENTS FOR
FOOTING SETBACK AND DEPTH*



*SPECIAL PURPOSE LINES
FOR SLOPE STAKE AND
RED/BLUE TOP REPORTS*