

DRAINAGE INFORMATION

The project site is located at the northwest corner of the Cherry Hills Office Complex, 7007 Wyoming BLVD. NE, 87109. Flooding has occurred along the western perimeter of Building "E". Stormwater has accumulated at the parking lot curb and gutter and overtopped the adjacent sidewalk causing runoff to flow into the immediate vicinity of the office complex's western wall which is located below the back of sidewalk elevation. It is proposed that a retaining wall, rising 2' above the back of sidewalk be constructed at the back of the existing sidewalk. Further, re-grading of the area will direct runoff from the roof drains and adjacent areas south through the landscaped entrance to a new sidewalk culvert. Out fall from the new sidewalk culvert will sheet flow across the parking lot to the southeast corner of the property and discharge to the Pino Arroyo (the historic outfall for the project area).

The original design by Andrews, Asbury, & Roberts, Inc., dated January 1987, was used as a reference for the current design. Entitled, "Wyoming Office Park Phase II", the grading and drainage plan calculated the Q100 = 13.88 cfs. The flowrate is based on a drainage basin (3.46 ac) which is larger than the drainage basin delineated here (0.161 ac). Pro-rating the Q100 calculated in the original report results in a Q100 = 0.64 cfs. The calculation is shown below:

Pro-rated Q100 calculation: $0.161 \text{ ac} / 3.46 \text{ ac} = 0.0465$; $0.0465 \times 13.88 \text{ cfs} = 0.64 \text{ cfs}$.

Utilizing the DPM Section 22.2, Table A-9, the calculated Q100 = 0.64 cfs. The calculation is shown below:

Total Drainage Basin area = 0.161 ac
Precipitation Zone: 3
Land Treatment: D (0.092 ac), B (0.069 ac)
 $Q_{p100} = (0.092 \text{ ac})(5.02 \text{ cfs/ac}) + (0.069 \text{ ac})(2.60 \text{ cfs/ac}) = 0.64 \text{ cfs}$

Flow capacity of the proposed alley gutter was calculated using AutoCAD Civil 3D 2013 Hydratflow Express. Mannings coefficients: 0.012 concrete, 0.025 grass; slope = 0.5%. The result indicates sufficient capacity using an alley gutter as the primary conduit of runoff away from the building.

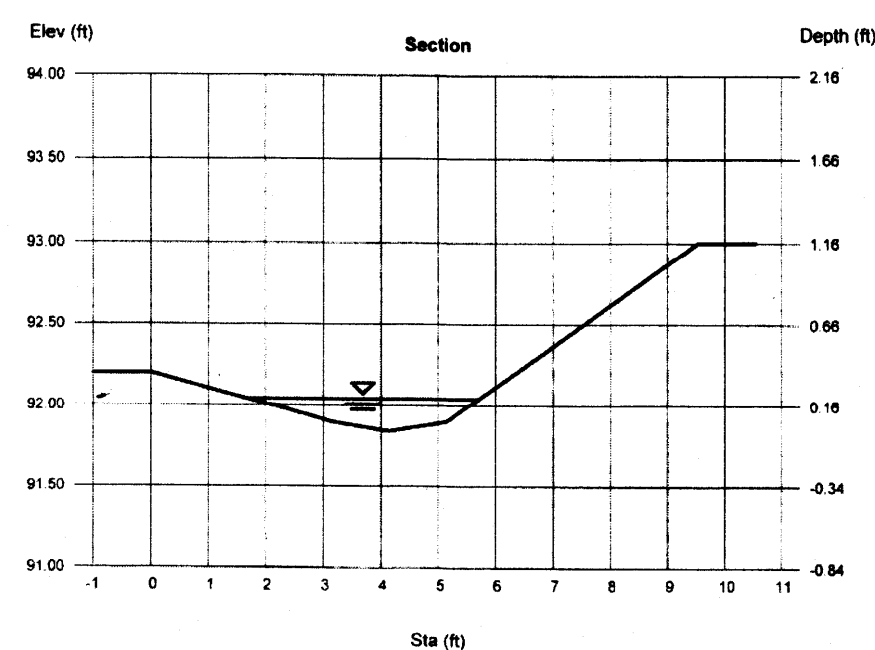
Channel Report

Hydratflow Express Calculation for AutoCAD Civil 3D 2013 by Autodesk, Inc.

Timestamp: Sep 10 2013

Cherry Hills Office Complex

User-defined	Invert Elev (ft)	= 91.84	Highlighted	Depth (ft)	= 0.20
	Slope (%)	= 0.50		Q (cfs)	= 0.640
	N-Value	= 0.019		Area (sqft)	= 0.48
				Velocity (ft/s)	= 1.33
Calculations	Known Q	= 0.64		Wetted Perim (ft)	= 4.05
Compute by:	Crit Depth, Yc (ft)	= 0.17		Top Width (ft)	= 0.17
	Top Width (ft)	= 4.02		EGL (ft)	= 0.23
	(Sta, EL, n) (Sta, EL, n)				
	(1.00, 92.25) (3.14, 91.80) (0.025) (4.14, 91.84) (0.012) (5.14, 91.80) (0.012) (6.14, 92.00) (0.025)				



LEGEND

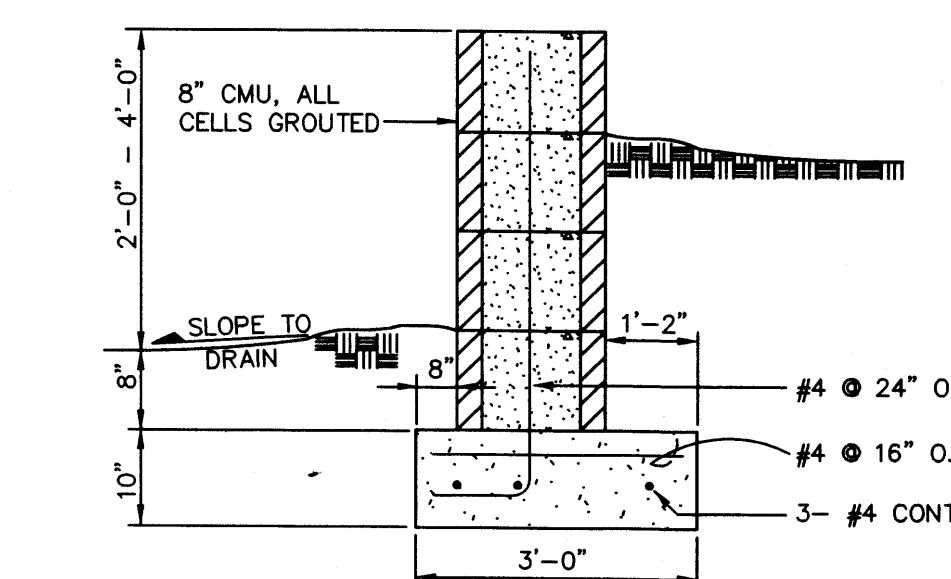
- DRAINAGE BASIN BOUNDARY
- FLOW DIRECTION
- 5.392 PROPOSED CONTOUR
- 5.392 EXISTING CONTOUR
- 91.66 EXISTING SPOT ELEVATION
- 91.66 PROPOSED SPOT ELEVATION

CONSTRUCTION NOTES

- Contractor must obtain a Topsoil Disturbance Permit from the Environmental Health Division prior to construction.
- The Contractor shall conform to all city, county, state and federal dust control measures and requirements and will be responsible for preparing and obtaining all necessary applications and approvals.
- The Contractor shall ensure that no soil erodes from the lots into public right-of-way. This can be achieved by constructing temporary barriers and wetting the soil to keep it from blowing.
- The earthwork Contractor shall stockpile enough material adjacent to Retaining wall locations to be utilized for wall backfill.
- New alley gutter to be constructed per C.O.A. Std. Dwg. 2415A.
- New 12" sidewalk culvert to be constructed per C.O.A. Std. Dwg. 2236
- Place joint filler per manufacturer's instructions over backer rod or joint tape.
- Contractor to grade site to provide positive drainage away from building.

KEYED NOTES ①

- Contractor to expose existing roof drain at flowline, remove connection to existing 4" pvc drain pipe, and install 90° bend to allow surface drain to new alley gutter.
- Contractor to remove and dispose of existing concrete pad and 4" pvc drain pipe and inlets.
- Contractor to preserve and protect existing trees in front courtyard. Areas disturbed by flood damage and new grading to be reseeded.

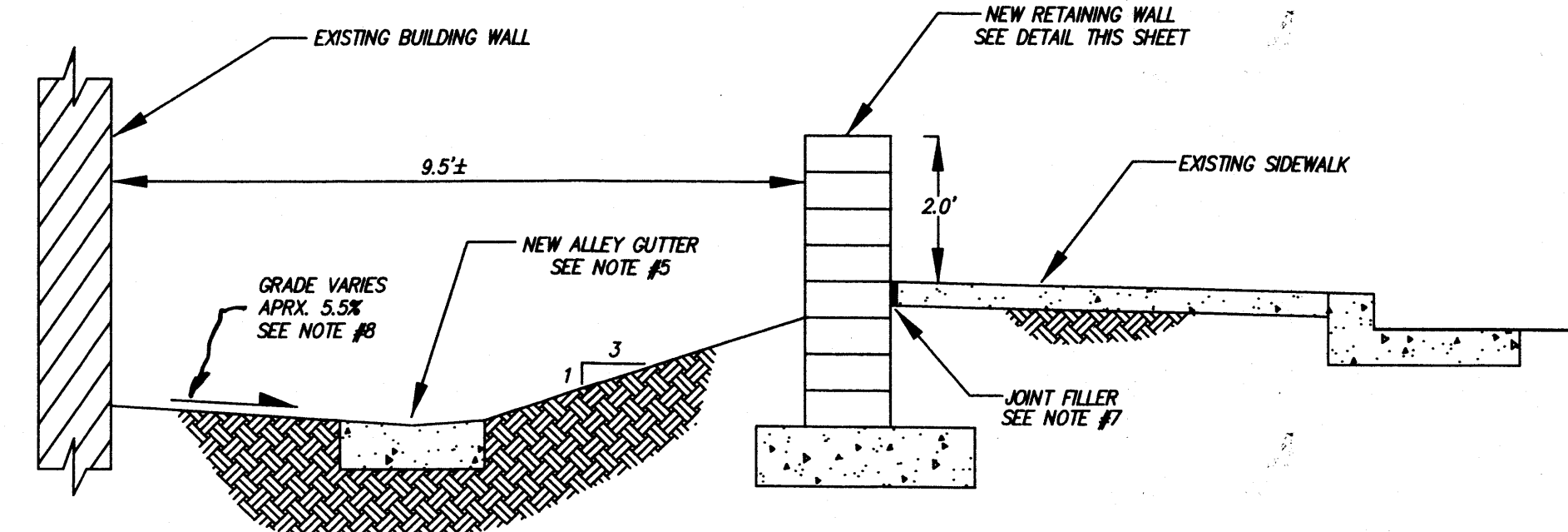


2'-0" TO 4'-0" RETAINING WALL DETAIL

SCALE: NONE

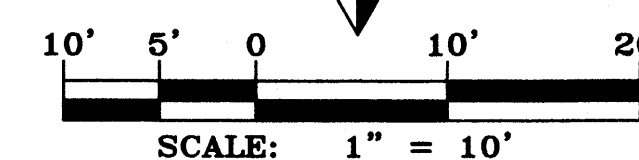
GENERAL NOTES:

- ALL WALLS ARE TO HAVE 12" CMU PILASTERS @ 12'-0" O.C. PLACE NO. 4'S IN EACH CELL. FILL ALL CELLS WITH CONCRETE.
- ALL CONCRETE IS TO BE 3000 PSI.
- MINIMUM COMPACTION UNDER FOOTINGS IS TO BE 95% PER ASTM D 1557 FOR A DEPTH OF 12". MOISTURE CONTENT IS TO BE $\pm 2.0\%$.
- BACK FILL AGAINST WALLS IS TO BE HAND-PLACED AND COMPACTED.
- ALL BARS ARE TO BE GRADE 40, ASTM 615.
- TRUSS TYPE DUR-O-WALL EVERY OTHER COURSE.
- BOND BEAM SHALL BE A #4 CONTINUOUS.



TYPICAL CROSS SECTION

SCALE: N.T.S.

CHERRY HILLS OFFICE COMPLEX
GRADING & DRAINAGE PLAN

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Designed: JG	Drawn: JG	Checked: DMG	Sheet 1 of 1
Scale: 1" = 10'	Date: 9/10/13	Job: A13048	