

CITY OF ALBUQUERQUE

Planning Department
David Campbell, Director



Mayor Timothy M. Keller

March 22, 2019

Ronald Bohannon, P.E.
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM, 87109

**RE: Mister Car Wash - 98th St. & Volcano Rd.
Grading and Drainage Plan & Drainage Report
Engineer's Stamp Date: 03/14/19
Hydrology File: K08D004**

Dear Mr. Bohannon:

Based upon the information provided in your submittal received 03/14/2019, the Grading & Drainage Plan and Drainage Report **is not** approved for Building Permit, Grading Permit, Work Order, and for action by the DRB on Platting and Site Plan for Building Permit. The following comments need to be addressed for approval of the above referenced project:

1. Drainage Report. In the Introduction, please change "Hydrology Department" to "Hydrology Section".
2. Drainage Report. In the Drainage Basin Description, please replace "Rita Harmon" to "City of Albuquerque Hydrology Section".
3. Drainage Report. Please label "POSB-1" in the Proposed Basin Map Exhibit.
4. Drainage Report. Please remove the Worksheet for Capacity Check of Pipe Culvert P-2. This is a culvert and the calculation report for the culvert was done.
5. Drainage Report. Please revise the title of the above mention culvert calculation report from "P-3" to "P-2".
6. Drainage Report. Please plot the StormCAD profiles on individual sheets.
7. Sheet C2. Please either show a swale or revise grades to direct the flows from the off-site basin to Leonodas Lane.
8. Sheet C2. Please show the proposed 66 inch storm pipe along 98th St. and add a label stating. "To be constructed with work order."

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

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9. Sheet C2. Please add the flowline elevations along the prop curb on both 98th St. & Volcano Rd.
10. Sheet C2. Please enlarge the area of the stormwater quality pond and remove the proposed contours so that the proposed retaining wall will be shown.
11. Sheet C2. Please add the top of pond and bottom of pond for the City's detention pond.
12. Sheet C4. Please add a section showing the 48 inch culverts, temporary pond, Volcano Rd curb & sidewalk, the existing City Pond, and the existing 8" sanitary sewer. Also add the clearance for the sanitary sewer and the top of storm pipe.
13. Sheet C4 - Detail "A". Either change the pipe from HDPE to RCP or add a converter from HDPE to RCP at the R.O.W. and add the detail from ADS.
14. Please remove Sheets C3 and C5 from further submittals to Hydrology. These are not needed.
15. As a reminder, if the project total area of disturbance (including the staging area and any work within the adjacent Right-of-Way) is 1 acre or more, then an Erosion and Sediment Control (ESC) Plan and Owner's certified Notice of Intent (NOI) is required to be submitted to the Stormwater Quality Engineer (Curtis Cherne, PE, ccherne@cabq.gov, 924-3420) 14 days prior to any earth disturbance.
16. Also as a reminder, please provide Drainage Covenant for the temporary pond and the stormwater quality pond per Chapter 17 of the DPM prior to Permanent Release of Occupancy. Please submit this on the 4th floor of Plaza de Sol. A \$25 fee will be required.
17. Standard review fee of \$300 will be required at the time of resubmittal.

If you have any questions, please contact me at 924-3995 or rbrissette@cabq.gov.

Sincerely,

Renée C. Brissette, P.E. CFM
Senior Engineer, Hydrology
Planning Department



City of Albuquerque

Planning Department
Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 6/2018)

Project Title: Mister Car Wash **Building Permit #:** _____ **Hydrology File #:** _____

DRB#: PR-2019-001964 **EPC#:** _____ **Work Order#:** _____

Legal Description: South 233 Feet of Tracts 1 & 2, Unit "A", ROW 2, A West of Westland

City Address: _____

Applicant: Tierra West, LLC **Contact:** Joel Hernandez

Address: 5571 Midway Park Place NE Albuquerque NM 87109

Phone#: 505-858-3100 **Fax#:** 505-858-1118 **E-mail:** jdhernandez@tierrawestllc.com

Other Contact: _____ **Contact:** _____

Address: _____

Phone#: _____ **Fax#:** _____ **E-mail:** _____

TYPE OF DEVELOPMENT: _____ PLAT (# of lots) _____ RESIDENCE ☒ DRB SITE _____ ADMIN SITE

IS THIS A RESUBMITTAL? _____ Yes ☒ No

DEPARTMENT _____ TRANSPORTATION ☒ HYDROLOGY/DRAINAGE

Check all that Apply:

TYPE OF SUBMITTAL:

- ☐ ENGINEER/ARCHITECT CERTIFICATION
- ☐ PAD CERTIFICATION
- ☐ CONCEPTUAL G & D PLAN
- ☒ GRADING PLAN
- ☒ DRAINAGE REPORT
- ☐ DRAINAGE MASTER PLAN
- ☐ FLOODPLAIN DEVELOPMENT PERMIT APPLIC
- ☐ ELEVATION CERTIFICATE
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ TRAFFIC IMPACT STUDY (TIS)
- ☐ STREET LIGHT LAYOUT
- ☐ OTHER (SPECIFY) _____
- ☒ PRE-DESIGN MEETING? 11/16/18

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

- ☒ BUILDING PERMIT APPROVAL
- ☐ CERTIFICATE OF OCCUPANCY
- ☒ PRELIMINARY PLAT APPROVAL
- ☒ SITE PLAN FOR SUB'D APPROVAL
- ☒ SITE PLAN FOR BLDG. PERMIT APPROVAL
- ☒ FINAL PLAT APPROVAL
- ☐ SIA/ RELEASE OF FINANCIAL GUARANTEE
- ☐ FOUNDATION PERMIT APPROVAL
- ☐ GRADING PERMIT APPROVAL
- ☐ SO-19 APPROVAL
- ☐ PAVING PERMIT APPROVAL
- ☐ GRADING/ PAD CERTIFICATION
- ☐ WORK ORDER APPROVAL
- ☐ CLOMR/LOMR
- ☐ FLOODPLAIN DEVELOPMENT PERMIT
- ☐ OTHER (SPECIFY) _____

DATE SUBMITTED: 3/14/19 **By:** Joel Hernandez

COA STAFF:

ELECTRONIC SUBMITTAL RECEIVED: _____

FEE PAID: _____

**Mister Car Wash
98 St NW & Volcano Rd NW
Albuquerque, New Mexico**

March 14, 2019

**Prepared by:
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, New Mexico 87109**

I certify that this report was prepared under my supervision, and I am a registered Professional Engineer in the State of New Mexico in good standing.



Job No. 2018058

Table of Contents

Introduction.....	2
Drainage Basin Description	2
Hydrology	3
Hydraulics.....	4
Water Quality	5
Conclusions.....	5
Exhibit A-Vicinity Map.....	6
Appendix A.....	7

Introduction

Tierra West is seeking to develop a car wash on the vacant lot on the SE Corner of 98th St NW and Volcano Rd NW. The legal description of the property is South 233 Feet of Tracts 1 & 2, Unit "A", Row 2, West Of Westland in Town of Atrisco Grant containing 2.25 acres. The intent is to subdivide vacant land and develop a car wash facility on the eastern parcel to be platted as Tract 1. The westerly "Remainder Parcel" to be platted as Tract 2 is to be used for temporary drainage facilities until permanent facilities are constructed and the Tract can be developed. In the interim condition of the proposed drainage solution, Tract 2 will serve as a temporary pond to redirect offsite flows to the city ponds to the south of Volcano Road. This drainage report serves to demonstrate that public and private improvements involved within the site will comply with City of Albuquerque Development Process Manual requirements.

The existing drainage basins contributing to the site have been previously analyzed in the Amole-Hubbell Drainage Master Plan prepared by Wilson & Company in 1998 and then updated in 2013. They were updated again by THE Group for the Paradise RV Park Phase I Drainage Report and were then revised with minor revisions in the 98th St Inlet Study performed by Wooten Engineering in 2015 (WEIS). These reports in combination with site observations were used to determine the contributing flows to the site. Excerpts of the referenced reports can be found in Appendix B.

The proposed drainage solution on site involves discharging drainage from the developed site through a water quality pond which drains into the storm sewer system that runs parallel to the eastern property line and ultimately discharges into the City ponds to the south. A portion of this existing 36" storm drain that runs along the property frontage is undersized for the region's ultimate development and per discussions with the City of Albuquerque Hydrology Department, will need to be upsized. Offsite flows are to be redirected from the western remainder parcel to the City ponds to the south. This site is not located within a known floodplain mapped by FEMA as indicated by Map No. 35001C0328J.

Drainage Basin Description

This project is located in the 98th and Central Basin that was analyzed in the Amole-Hubbell Drainage Master Plan prepared by Wilson & Company in 1998 and then updated in 2013. According to the report update, the basin is approximately 0.81 sq. mi. and is generally bounded by 98th St to the east; I-40 to the north; by the powerline channel to the west; and Central Avenue to the south. The report also states that "A two cell pond made up of Pond NE2 and Pond NE3 receives the area's runoff." These ponds are the ultimate discharge point of the entire 98th and Central Basin. They are located just south of the proposed car wash site on the south side of Volcano Rd NW and can be found in both the Amole Hubbell Master Plan and the THE Group Paradise RV Park drainage reports. The latter was determined as the master plan for the 98th & Central Basin in correspondence with Rita Harmon in 2015. For this reason, the existing basin routing from this report was used as the basis to show which basins are contributing to the proposed car wash site.

Hydrology

Existing Conditions - Offsite

The hydrologic analysis of the existing contributing offsite flows to the proposed car wash site involved a review of the reports mentioned in the Existing Drainage Basin Description section of this report paired with site observations to confirm their findings. The Offsite Basin Map in Appendix A delineates the existing basin map in the Paradise RV Park Drainage Report to show the contributing offsite basins that Tierra West found to arrive at AP 2 - the analysis point at the SE corner of the proposed car wash site. Currently, the flows that make it to this location (AP 2) drain into a curb inlet on 98th Street NW and the 98th Street roadway as this single inlet is unlikely to have capacity. The delineation in this report's Offsite Basin Map conservatively assumes that Basins 102, 107, and one half of Basin 108 ultimately pass through the site from the west and will therefore need to be diverted to the City Ponds through the detention pond and pipe culvert on the remainder parcel of proposed car wash property. Basin 104, 70% of Basin 109, and the other 50% of Basin 108 are assumed to do the same and are to be diverted to the temporary pond on the remainder parcel from the north. These offsite basins are respectively designated as OS-1 and OS-2 on the Offsite Basin Map in Appendix A.

Existing Conditions – Onsite

It should be noted that the proposed car wash is encompassed within the portion of Basin 109 in the Offsite Basin Map that is assumed to drain to AP 2. Compared to the existing offsite flows that are assumed to arrive at the site, the onsite flows are negligible. Flows from the site are assumed to drain into the curb inlet in 98th St and into the roadway along with the rest of AP 2.

Proposed Conditions - Offsite

The intent of the proposed off-site drainage scheme is to intercept and reroute the majority of the flows that arrive at AP 2 to a temporary pond on the Remainder Parcel. This analysis is based on the flows calculated in the Offsite Existing Conditions analysis above. The intent is for the majority of offsite flows (225 cfs) to be passed into the North City Pond (Pond 2, NE2) through three 48" pipe culverts. The remaining flows (44 cfs) will bypass the culverts through a weir controlled outlet into Volcano Rd NW. No attenuation is being credited to this pond.

The proposed car wash property is protected by a berm on the east side of the Remainder Parcel. The temporary pond and pipe culverts on the Remainder Parcel are only intended to be in place until upstream infrastructure from the future Paradise RV Park development is in place – afterwards the pond on the Remainder Parcel may be filled, allowing for future development.

Proposed Conditions - Onsite

The onsite drainage schematic for the car wash site involves routing the proposed developed flows through overland swales and drop inlets to a water quality pond that will ultimately discharge into the 98th Street storm sewer. This will be done through a standpipe that has an orifice elevation that is higher than the elevation of the required water quality volume. The required water quality, or first flush volume was calculated as 0.34" over the entire pervious area of the proposed car wash property. The only offsite drainage that will be accepted will be flows from the berm that separates the property from the remainder parcel. Developed onsite flows were calculated using the Weighted E Method specified in the Albuquerque DPM. Onsite basin areas and flow calculations can be found in Appendix A.

Ultimate Conditions - Storm Drain Analysis

Neither of the aforementioned reports accounted for the drainage basins in 98th street that discharge into the same storm sewer as the areas mentioned in the analysis of the existing

basins. The Wooten Engineering Inlet Study, performed for the development just north of the proposed car wash property, analyzed the capacity of the inlets along 98th street and updated the analysis performed by THE Group to correct the total flow that makes it to AP 2 (Existing Conditions). This is a relevant analysis point for the proposed car wash site because it is at the corner of 98th St NW and Volcano Rd NW. The WEIS demonstrates that in existing conditions, there is an additional 32.3 cfs that comes to this analysis point that were not accounted for in the Paradise RV Park Drainage Report. It is unclear whether or not these additional flows were later accounted for in the developed conditions in the Paradise RV Park Drainage Report. For this reason, they were added in the hydraulic analysis of the storm sewer system in 98th Street between Volcano Rd NW and Avalon Rd NW. The system was conservatively analyzed for the 353 cfs shown at AP6 (same as AP2 but in proposed conditions) plus the additional flows cited in the WEIS. This is further discussed in the Hydraulics section of this report.

Hydraulics

All storm drainage facilities were sized and configured to accommodate the 100-year, 6-hour storm event. Hydraulic calculations were prepared using FlowMaster, CulvertMaster, StormCAD and spreadsheet calculations as necessary.

Existing Conditions - Offsite

Relevant offsite drainage facilities to the east include the existing storm drain system in 98th St that ultimately connects to the southern City Pond (Pond 3, NE 3). Because the existing 36" storm sewer is deficient to pass future developed flows, a portion along the property frontage will need to be upsized to 66" in the developed condition.

Ultimate Conditions - Offsite

As discussed in the hydrology section of this report, developed flows from the Paradise RV Park Drainage Report plus the flows shown entering the inlets on 98th St from the WEIS were used to conservatively analyze the necessary improvements to the existing system. The additional flows from each inlet were input into the StormCAD model at their approximate location by increasing the known flow at each manhole just upstream of each inlet. The storm drain schematic in Appendix A models how this flow will pass through the existing system with 1) no improvements; 2) by upsizing the 36" section to 66" all the way up to Avalon; and 3) by upsizing the 36" section to 66" solely along the frontage of the car wash property. The intent of this development is to only upsize the portion that is along the frontage of the property up to MH-12. The other cases demonstrate the entire system is undersized for the region's ultimate developed condition.

Proposed Conditions - Offsite

Proposed offsite facilities to the west include the temporary detention pond on the remainder parcel as well as the three 48" pipe culverts that reroute the majority of offsite flows (225 cfs) from the 98th and Central basin to the northern City Pond (Pond 2, NE 2). The remainder of these offsite flows (44 cfs) will be discharged from a weir controlled outlet into Volcano Rd. The velocity that this 44 cfs will be discharged at meets the City's criterion that requires the product of the velocity (ft/s) and flow depth (ft) to be less than 6.5. Calculations for the pipe culverts, the overflow weir, and the capacity of Volcano Rd can be found in Appendix A.

Proposed Conditions - Onsite

Onsite drainage facilities consist of a private storm drain system, landscaped swales, drop inlets, detention ponds, and a water quality/sediment basin. The onsite basin map in Appendix A shows the flows from the western part of the site being conveyed to a pond swale through overland sheet flow, curb cuts, and concrete flumes. This pond swale is connected to the water quality pond that is intended to connect to the existing public storm sewer system in 98th St NW. The eastern part of the site drains into two inlets that connect to a single pipe that discharges into the same water quality pond.

The proposed drainage facilities will continue to discharge into the two City Ponds to the south of the development. The basins that are to be routed through the temporary retention pond and pipe culverts to discharge into the Northern Pond (Pond 2, NE 2) are also shown to do so in the Paradise RV Park Drainage Report. This means that the temporary drainage solution is consistent with the intent of the current adopted master plan for the area.

Water Quality

As mentioned in the On-Site Conditions section of this report, water quality or first flush requirements are being met by detaining the required water quality volume of 0.34 inches over the entire impervious area of the site in a water quality pond. The required water quality volume was calculated to be 1383.7 cubic feet. This volume is contained within the bottom 1.2 feet of pond below a standpipe that functions as the outlet for the pond. Water quality calculations and the stage discharge curve for the pond can be found in Appendix A.

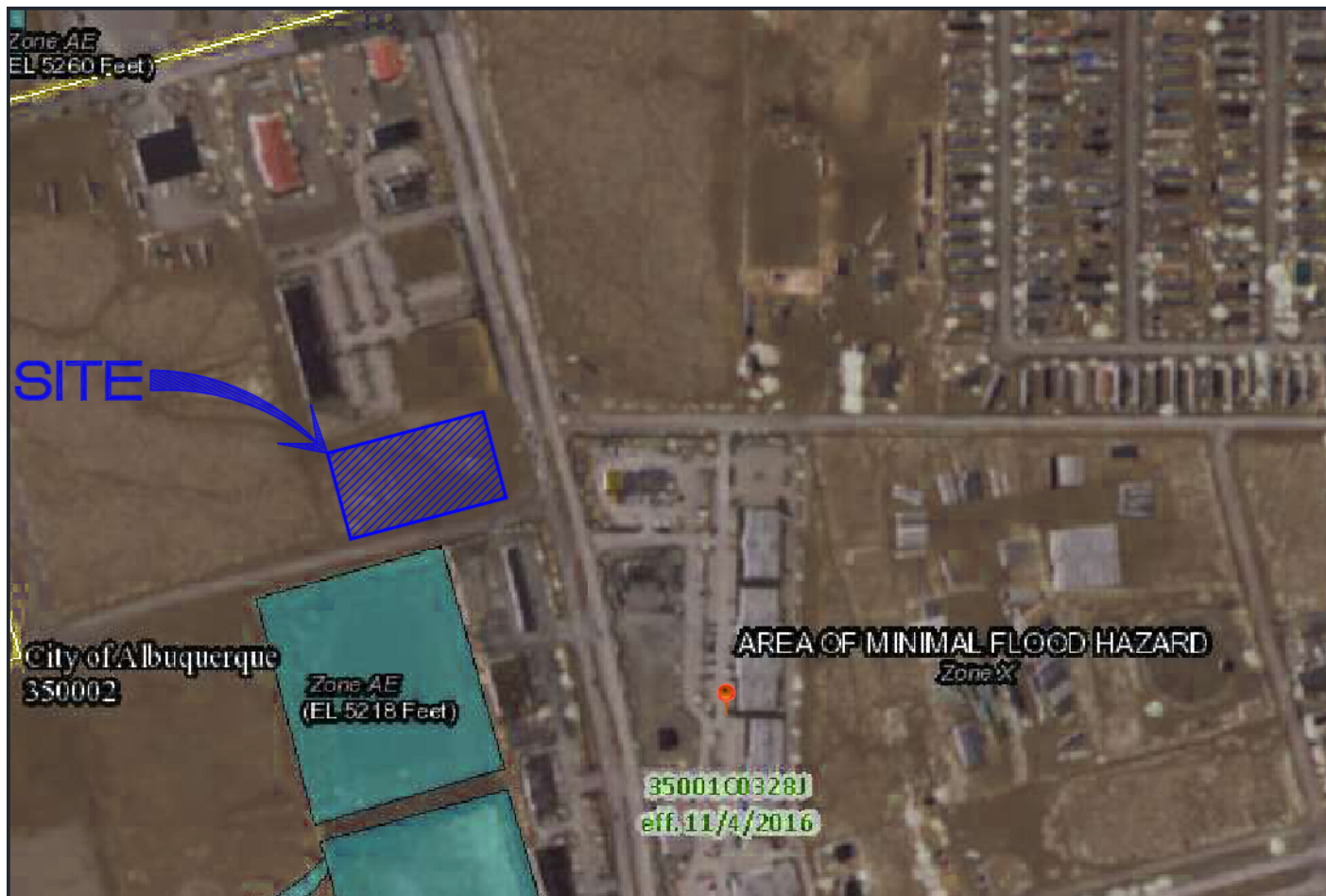
Conclusions

The methodology for design was prepared in accordance with the criteria set forth in the City of Albuquerque Development Process Manual. The proposed design demonstrates that the car wash site can be developed while accommodating existing and ultimate offsite flows from the 98th and Central Basin. The proposed drainage solution also complies with the existing master drainage plan for the area – the Paradise RV Park Drainage Report by THE Group. The site will freely discharge into the City Ponds to the south.

Exhibit A-Vicinity Map



Appendix A



FIRM MAP: 65001C9328J

DPM Weighted E Method

Precipitation Zone 1

Area Vicinity

Site Name and Address: Mister Car Wash 98th Street and Volcano Road

TWLLC

Date

2/13/2019

Existing Conditions

Basin Descriptions												100-Year, 6-Hr			10-Year, 6-Hr		
Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
				%	(acres)	%	(acres)	%	(acres)	%	(acres)						
PB-1	29,575.00	0.679	0.00106	0%	0.000	0%	0.000	10%	0.071	90%	0.608	1.868	0.106	2.86	1.157	0.065	1.86
PB-2	23,385.00	0.537	0.00084	0%	0.000	0%	0.000	25%	0.133	75%	0.404	1.727	0.077	2.15	1.042	0.047	1.37
PB-3	4,753.00	0.109	0.00017	0%	0.000	0%	0.000	0%	0.000	100%	0.109	1.970	0.018	0.48	1.240	0.011	0.32
PB-4	4,327.00	0.099	0.00016	0%	0.000	0%	0.000	100%	0.099	0%	0.000	0.990	0.008	0.29	0.440	0.004	0.15
PB-5	2307.00	0.053	0.00008	0%	0.000	0%	0.000	100%	0.053	0%	0.000	0.990	0.004	0.15	0.440	0.002	0.08
POSB-1	6538.00	0.150	0.00023	0%	0.000	0%	0.000	100%	0.150	0%	0.000	0.990	0.012	0.43	0.440	0.006	0.22
Total	70,885.00	1.477	0.00231		0.000		0.000		0.000		1.121		0.213	5.92		0.129	3.77

First Flush Volume= 0.0318 ac-ft
or 1383.7 cubic feet

Pond Capacity= 0.15 ac-ft
6539.5 cubic feet

Pond Capacity at Riser 0.032755 ac-ft
Elevation 15.2= 1426.8 cubic feet

PROPOSED BASIN MAP

FLows FROM OS-2 (SEE
OFFSITE BASIN EXHIBIT)

TRACT 1
98th STREET PLAZA
Filed 6-18-2015, Blk. 2015G, Pg. 97

TRACT 3
98th STREET PLAZA
Filed 6-18-2015, Blk. 2015G, Pg. 97

TRACT 3E WEST OF WESTLAND
ROW TWO (2), UNIT A
Filed 10-1-1998, Blk. 300C, Pg. 291

LEONODAS LANE

98TH STREET

STREET

FLows FROM OS-1 (SEE
OFFSITE BASIN EXHIBIT)

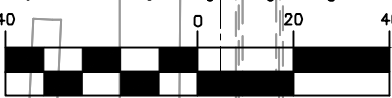
VOLCANO

ROAD

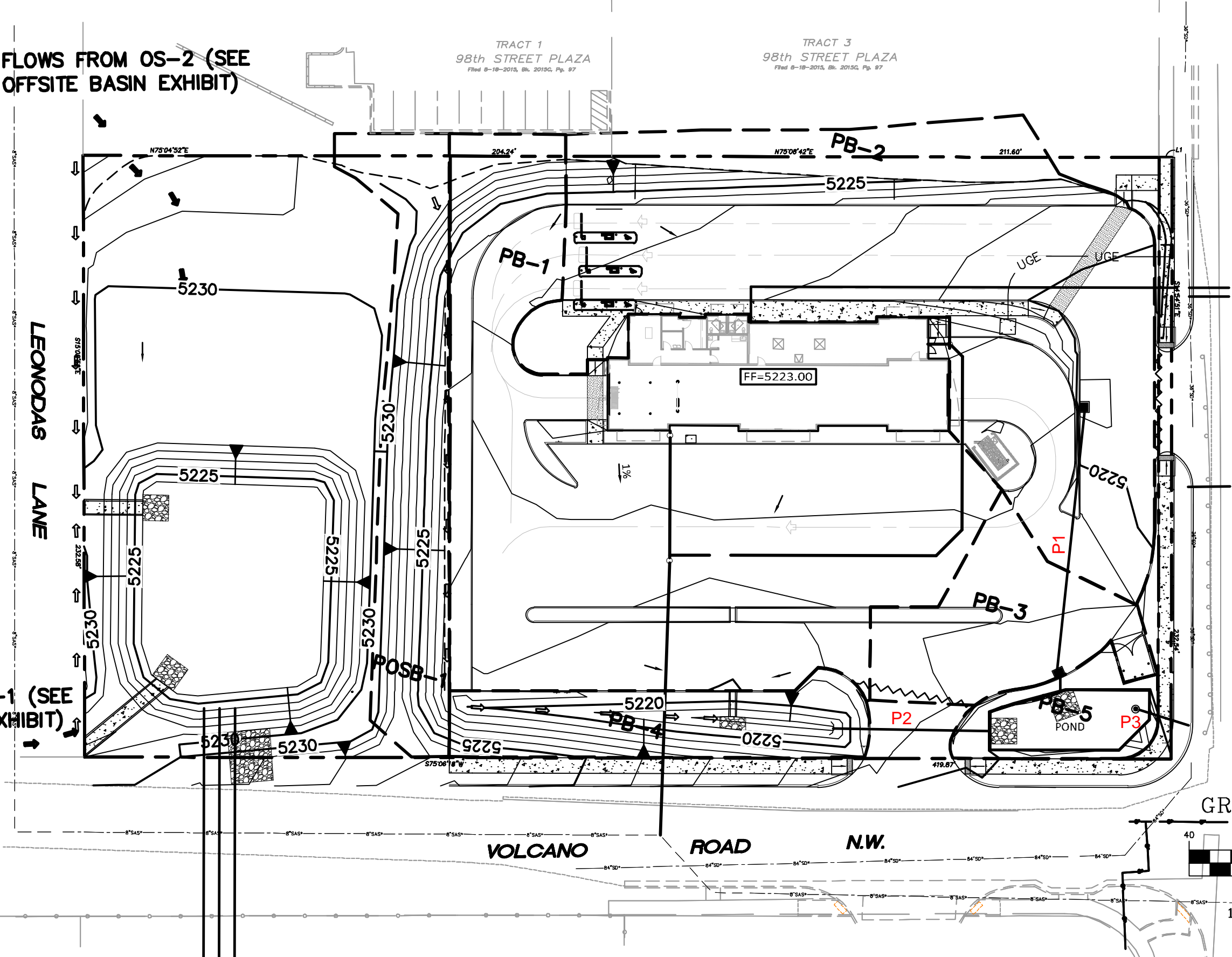
N.W.

N.W.

GRAPHIC SCALE



(IN FEET)
1 inch = 40 ft.



WQ Pond Discharge-Orifice Calculations

SURFACE POND VOLUME CALCULATIONS

ELEVATION (ft)	AREA (sf)	VOLUME (cf)	CUMULATIVE VOLUME (cf)
5114	0		
5115	1189	1189	1189
5115.2	1189	237.8	1427
5116	1189	951.2	2378
5117	1189	1189	3567
5118	1189	1189	4756
5119	1189	1189	5945
5119.5	1189	594.5	6540

Riser Orifice Elevation

Orifice Equation

$$Q = CA \sqrt{2gH}$$

$$C = 0.6$$

$$\text{Diameter (in)} = 12$$

$$\text{Area (ft}^2\text{)} = 0.785$$

$$g = 32.2$$

$$H \text{ (Ft)} = 4.3 \text{ head available above riser orifice}$$

$$Q \text{ (CFS)} = 7.84185 \text{ max flow rate out of pond} > 5.92 \text{ cfs}$$

Total unattenuated flow for the whole site is 5.92 cfs, therefore the flow can be passed into storm manhole on 98th Street safely.

Capacity of Onsite Curb Openings

Weir Equation:

$$Q = CLH^{3/2}$$

Q= Flow

C = 2.7 (Per 6-15(A) of proposed DPM)

L= Length of weir

H = Height of Weir

3.0' Curb Opening(s) to Drainage Swale

$$Q=2.7 * 3.0' * 0.5' ^{(3/2)}$$

Q = 2.86 cfs

2.86 cfs = 2.86 cfs (Basin PB1 discharge 100yr-6hr)

Opening has adequate capacity.

Emergency Overflow Weir at Water Quality Pond

$$Q=2.7 * 6.5' * 0.5' ^{(3/2)}$$

Q = 6.2 cfs

6.2 cfs > 5.92 cfs (Full unattenuated discharge of whole site)

Opening has adequate capacity.

Worksheet for Circular Pipe - 1 P-1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.01000	ft/ft
Diameter	1.50	ft
Discharge	2.15	ft ³ /s

Results

Normal Depth	0.46	ft
Flow Area	0.46	ft ²
Wetted Perimeter	1.76	ft
Hydraulic Radius	0.26	ft
Top Width	1.38	ft
Critical Depth	0.55	ft
Percent Full	30.7	%
Critical Slope	0.00496	ft/ft
Velocity	4.67	ft/s
Velocity Head	0.34	ft
Specific Energy	0.80	ft
Froude Number	1.43	
Maximum Discharge	11.30	ft ³ /s
Discharge Full	10.50	ft ³ /s
Slope Full	0.00042	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	30.69	%
Downstream Velocity	Infinity	ft/s

Worksheet for Circular Pipe - 1 P-1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.46	ft
Critical Depth	0.55	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.00496	ft/ft

Worksheet for Capacity Check of Pipe Culvert P-2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.010	
Channel Slope	0.01670	ft/ft
Diameter	1.00	ft
Discharge	3.58	ft ³ /s

Results

Normal Depth	0.56	ft
Flow Area	0.45	ft ²
Wetted Perimeter	1.69	ft
Hydraulic Radius	0.27	ft
Top Width	0.99	ft
Critical Depth	0.81	ft
Percent Full	55.7	%
Critical Slope	0.00614	ft/ft
Velocity	7.96	ft/s
Velocity Head	0.98	ft
Specific Energy	1.54	ft
Froude Number	2.09	
Maximum Discharge	6.44	ft ³ /s
Discharge Full	5.99	ft ³ /s
Slope Full	0.00598	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	55.72	%
Downstream Velocity	Infinity	ft/s

Worksheet for Capacity Check of Pipe Culvert P-2

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.56	ft
Critical Depth	0.81	ft
Channel Slope	0.01670	ft/ft
Critical Slope	0.00614	ft/ft

Worksheet for Pond Outlet Pipe P-3

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.05000	ft/ft
Diameter	1.00	ft
Discharge	5.92	ft ³ /s

Results

Normal Depth	0.64	ft
Flow Area	0.53	ft ²
Wetted Perimeter	1.86	ft
Hydraulic Radius	0.29	ft
Top Width	0.96	ft
Critical Depth	0.95	ft
Percent Full	64.2	%
Critical Slope	0.02395	ft/ft
Velocity	11.11	ft/s
Velocity Head	1.92	ft
Specific Energy	2.56	ft
Froude Number	2.63	
Maximum Discharge	8.57	ft ³ /s
Discharge Full	7.97	ft ³ /s
Slope Full	0.02761	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	64.22	%
Downstream Velocity	Infinity	ft/s

Worksheet for Pond Outlet Pipe P-3

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.64	ft
Critical Depth	0.95	ft
Channel Slope	0.05000	ft/ft
Critical Slope	0.02395	ft/ft

Culvert Calculator Report

On-Site Pipe Culvert P-3

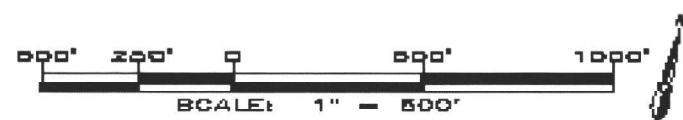
Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	20.50 ft	Headwater Depth/Height	4.90
Computed Headwater Elev.	20.40 ft	Discharge	3.58 cfs
Inlet Control HW Elev.	19.50 ft	Tailwater Elevation	19.50 ft
Outlet Control HW Elev.	20.40 ft	Control Type	Outlet Control
Grades			
Upstream Invert	15.50 ft	Downstream Invert	14.50 ft
Length	60.00 ft	Constructed Slope	0.016667 ft/ft
Hydraulic Profile			
Profile	Pressure Profile	Depth, Downstream	5.00 ft
Slope Type	N/A	Normal Depth	0.63 ft
Flow Regime	N/A	Critical Depth	0.81 ft
Velocity Downstream	4.56 ft/s	Critical Slope	0.008840 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.012
Section Material	HDPE (Smooth Interior)	Span	1.00 ft
Section Size	12 inch	Rise	1.00 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	20.40 ft	Upstream Velocity Head	0.32 ft
Ke	0.20	Entrance Loss	0.06 ft
Inlet Control Properties			
Inlet Control HW Elev.	19.50 ft	Flow Control	N/A
Inlet Type	Groove end w/headwall	Area Full	0.8 ft²
K	0.00180	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	2
C	0.02920	Equation Form	1
Y	0.74000		

Existing Basin Map

Map showing flow paths and infrastructure:

- Flow Paths:**
 - Flows that arrive to site from the north (indicated by a blue line).
 - Flows that arrive to site from roadway (indicated by a green line).
- Infrastructure:**
 - Avalon Road**
 - Volcano Road**
- Nodes and Ponds:**
 - AP 1:** Q = 105 CFS
 - AP 2:** Q = 173 CFS
 - AP 3:** Q = 122 CFS
 - AP 4:** Q = 218 CFS
 - POND 1:** Q IN = 86 CFS, Q OUT = 10 CFS, V = 1.9 AC-FT
 - POND 2:** Q IN = 231 CFS, Q OUT = 34 CFS, V = 5.7 AC-FT
 - POND 3:** Q IN = 444 CFS, Q OUT = 58 CFS, V = 18.9 AC-FT
- Other Labels:**
 - OS-1, OS-2
 - 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111
 - 122nd, 118th, 114th (handwritten labels)



EXISTING BASIN MAP

THE Group
300 Branding Iron Rd. SE
Rio Rancho, New Mexico 87124
Phone: (505) 251-1000

Culvert Calculator Report

Off-Site Pipe Culverts to Pond

Solve For: Discharge

Culvert Summary			
Allowable HW Elevation	30.00 ft	Headwater Depth/Height	1.00
Computed Headwater Elev.	30.00 ft	Discharge	225.15 cfs
Inlet Control HW Elev.	29.74 ft	Tailwater Elevation	28.70 ft
Outlet Control HW Elev.	30.00 ft	Control Type	Entrance Control

Grades			
Upstream Invert	26.00 ft	Downstream Invert	19.80 ft
Length	88.00 ft	Constructed Slope	0.070455 ft/ft

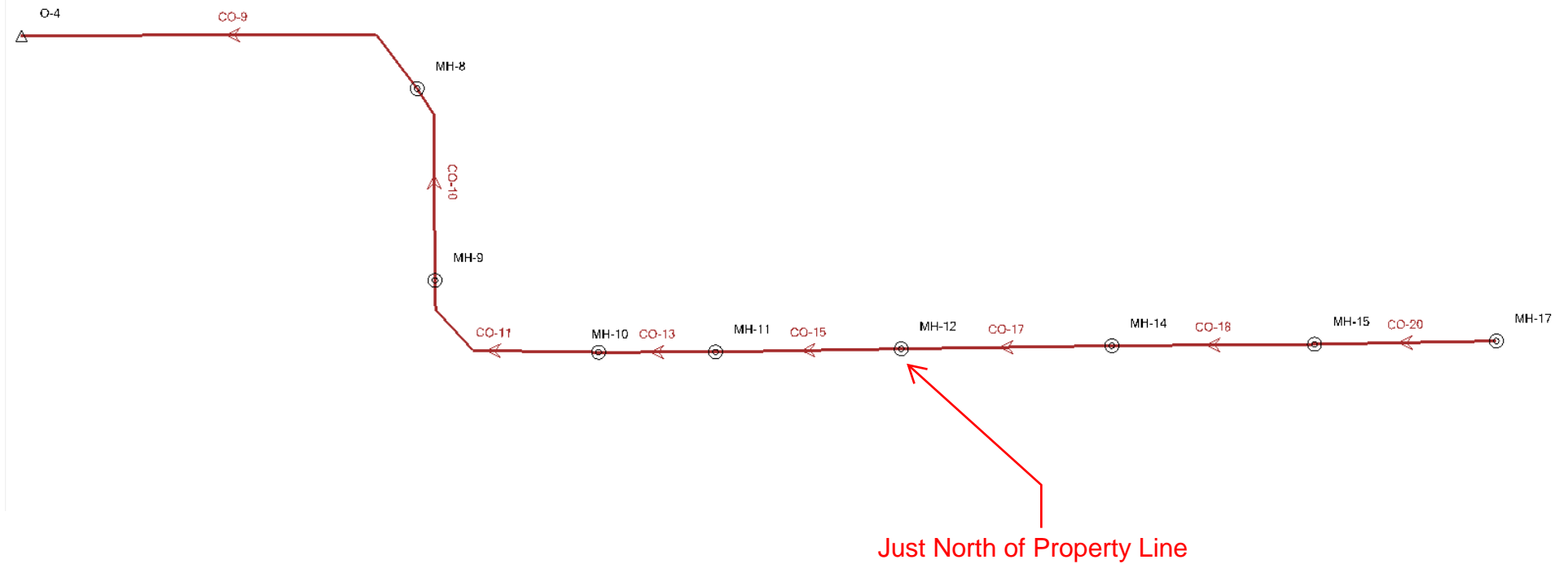
Hydraulic Profile			
Profile	CompositePressureProfileS1S2	Depth, Downstream	8.90 ft
Slope Type	N/A	Normal Depth	1.15 ft
Flow Regime	N/A	Critical Depth	2.62 ft
Velocity Downstream	5.97 ft/s	Critical Slope	0.003969 ft/ft

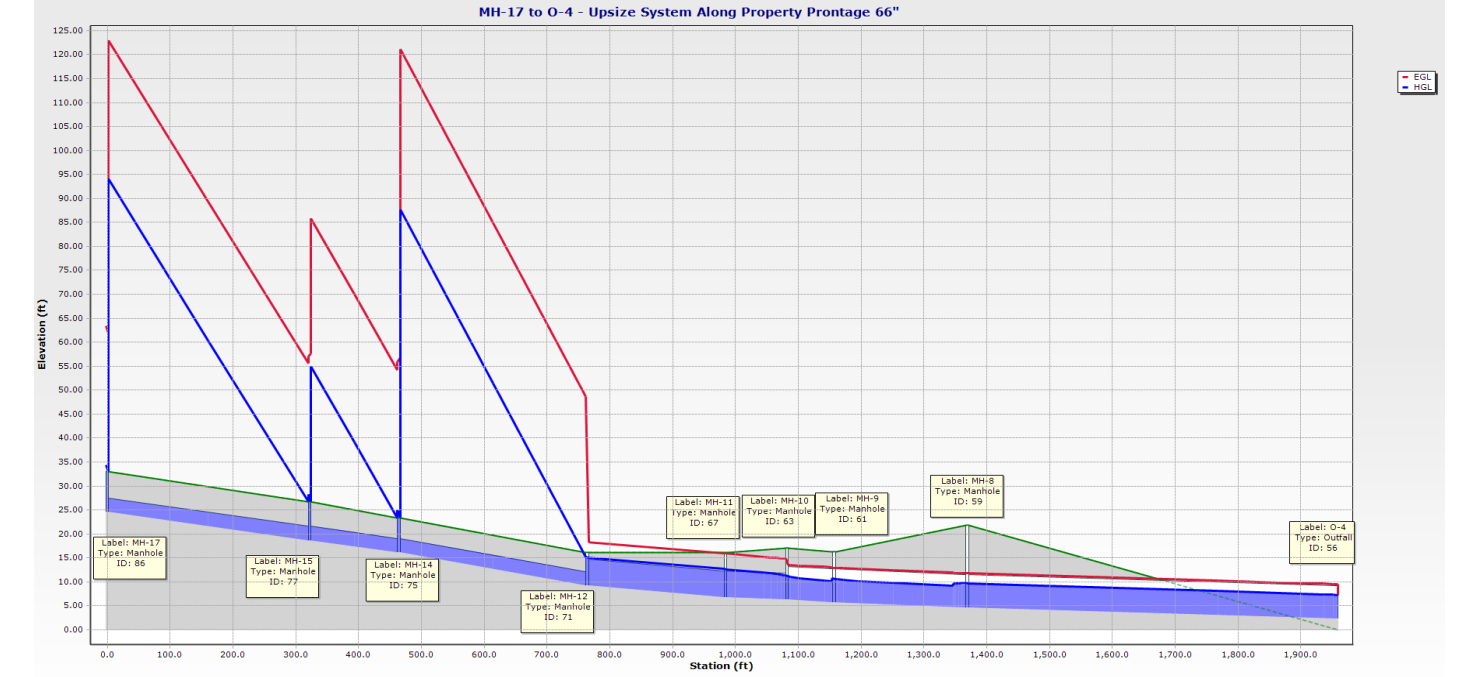
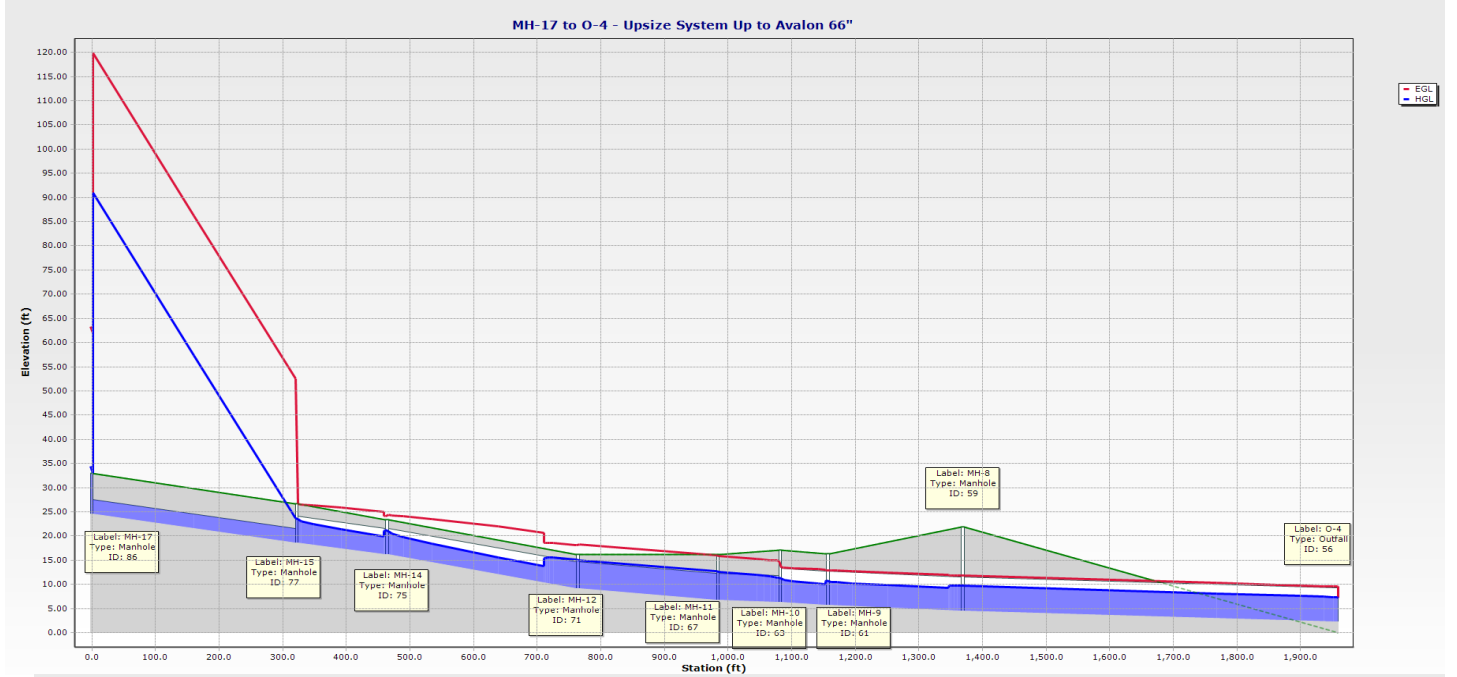
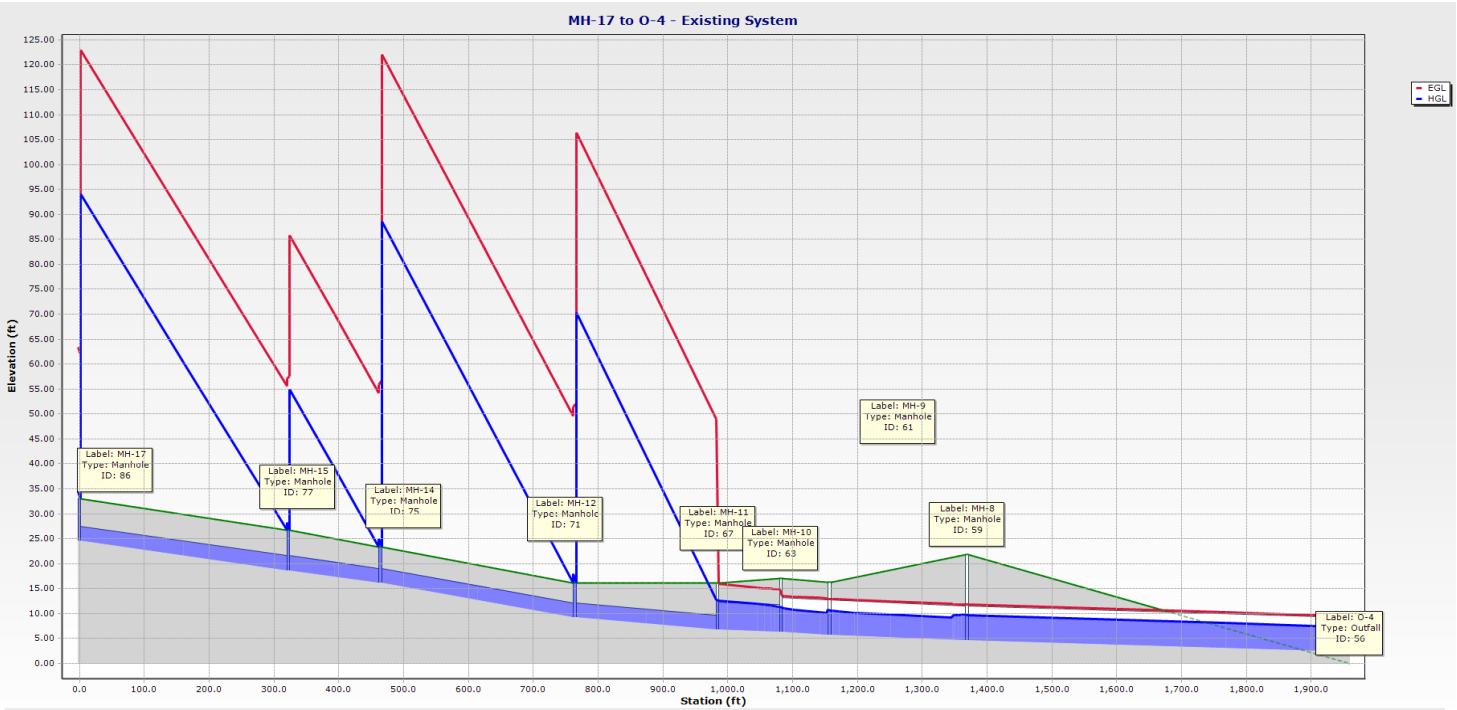
Section			
Section Shape	Circular	Mannings Coefficient	0.012
Section Material	HDPE (Smooth Interior)	Span	4.00 ft
Section Size	48 inch	Rise	4.00 ft
Number Sections	3		

Outlet Control Properties			
Outlet Control HW Elev.	30.00 ft	Upstream Velocity Head	1.15 ft
Ke	0.20	Entrance Loss	0.23 ft

Inlet Control Properties			
Inlet Control HW Elev.	29.74 ft	Flow Control	Unsubmerged
Inlet Type	Beveled ring, 33.7° bevels	Area Full	37.7 ft²
K	0.00180	HDS 5 Chart	3
M	2.50000	HDS 5 Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

STORMCAD - 98TH ST STORM SEWER SCHEMATIC





Offsite Pond Overflow Bypass Weir

Weir Equation:

$$Q = CLH^{3/2}$$

Q= 44 cfs

C = 2.7 (Per 6-15(A) of proposed DPM)

L= Length of weir

H = Height of Weir = 1'

Length of Weir Calculation

$$L = Q / (C * H^{1.5})$$

= 16.3' ~ Length of Curb Cut required

APPENDIX B

From: Harmon Rita T.
Sent: Friday, September 25, 2015 12:07 PM
To: Don R. Briggs; 'Bingham, Brad'
Cc: Robert Pierson; Daggett, Kevin; Eisenberg, Jame J.; ron@thegroup.cc; 'Catherine VerEecke'
Subject: 98th & Central Basin and Amole Del Norte Dam

Don,

A copy of the *Paradise RV Park Drainage Report, 2015 by Ron Hensley* is being provided to the County to serve as a Master Drainage Plan for the 98Th and Central Basin. Development within the County's jurisdiction will need to adhere to this report.

Discussions with the County Planner, Catherine VerEecke, indicated that while Zoned A-1 (1 dwelling unit per Acre) that it is anticipated this undeveloped property will be much denser. A new zoning plan is in the works. The City recommends using the *Paradise RV Park Drainage Report, 2015 by Ron Hensley* to establish appropriate use.

Attached is a summary of the analysis as well as the approved Drainage Report.

Brad,

The *Paradise RV Park Drainage Report, 2015 by Ron Hensley* establishes that the discharge out of the dam in the ultimate condition is 70 cfs. Therefore 48 cfs, rather than 75 cfs (per earlier emails) , will need to be absorbed by the new HEC-HMS study.

Sincerely,

Rita Harmon, P.E.

Senior Engineer

Planning Department

Development & Review Services Division

600 2nd St. NW, Suite 201

Albuquerque, NM 87102

t 505-924-3695

f 505-924-3864

Wooten Engineering

1005 21st Street SE, Suite B1
Rio Rancho, NM 87124
Ph: 505.980.3560



200' 100' 0 200'

SCALE: 1"=200'

Drainage Basin Map

THE Report = Paradise RV Park Report
by The Hensley Engineering
Group dated 9/8/2015

WEIS = Inlet Study for 98th St Plaza
by Wooten Engineering dated
2/13/2015.

DRAINS TO FLYING J SITE
& SWALE ALONG 98TH

$Q_{in}=2.90\text{cfs}$ per WEIS

FLYING J DRAINAGE
COLLECTED ON SITE

BASIN 106
 $Q_{100}=105\text{cfs}$
API (THE Report)

BASIN 105
EXISTING POND
 Q_{100} out = 10cfs
per THE Report

Ex 36" RCP (10cfs)

$Q_{100}=107.90\text{cfs}$

$Q_{in}=10.0\text{cfs}$ per WEIS

$Q_{100}=117.90\text{cfs}$

$Q_{in}=8.0\text{cfs}$ per WEIS

$Q_{100}=125.90\text{cfs}$

$Q_{in}=5.7\text{cfs}$ per WEIS

$Q_{100}=131.60\text{cfs}$

$Q_{in}=5.7\text{cfs}$ per WEIS

$Q_{100}=144.59\text{cfs}$

$Q_{100}=150.29\text{cfs}$

BASIN 107
 $Q_{in}=12.99\text{cfs}$
per WEIS

Ex 84" RCP

$Q_{100}=205.30\text{cfs}$
173cfs per THE Report
plus 32.3cfs (added 98th St Flows)



11/10/15

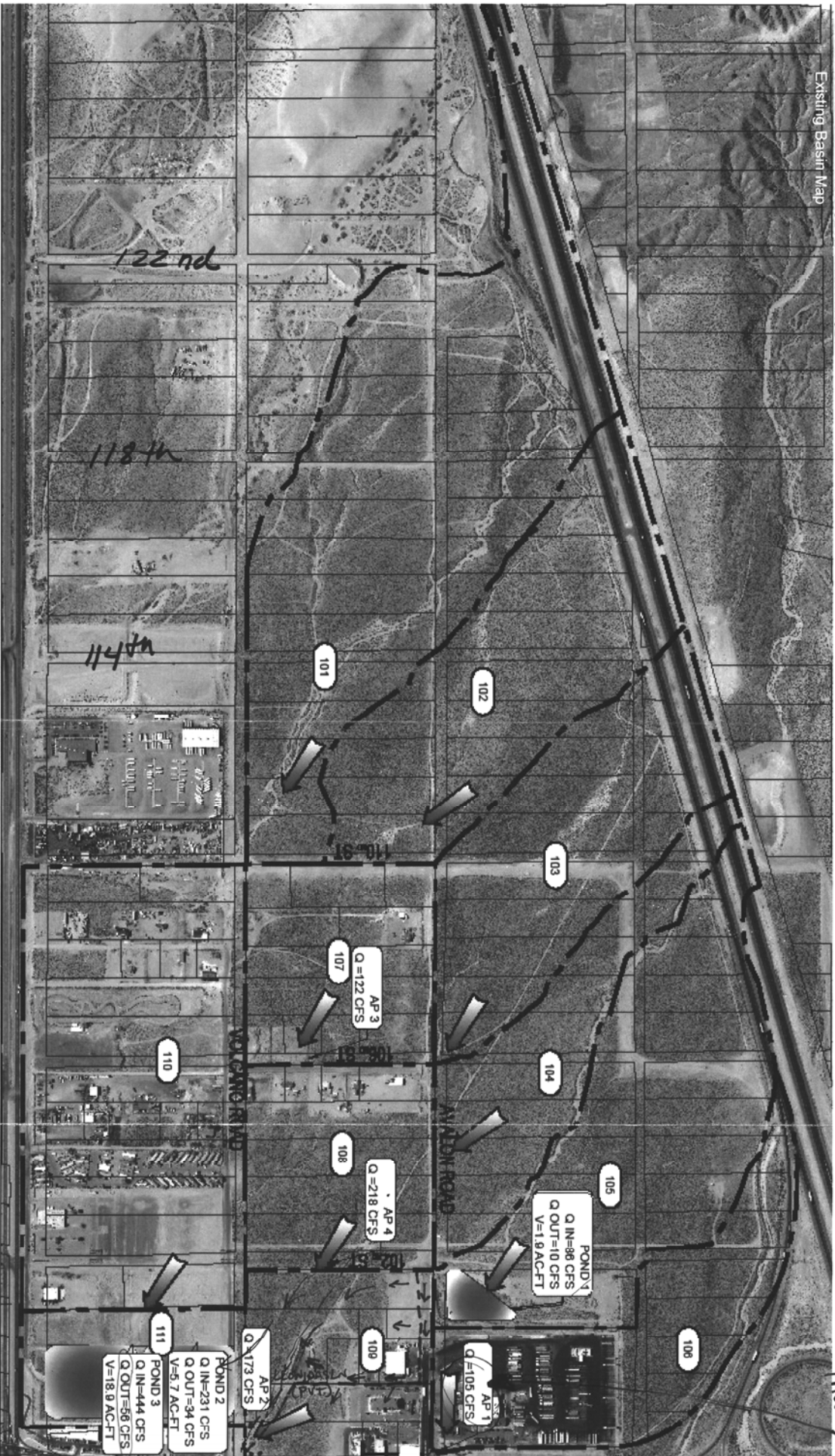
FUTURE SD TO POND

FUTURE SD TO POND

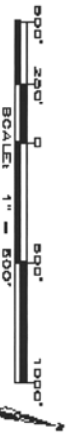
FUTURE SD TO POND

EX POND

Existing Basin Map



Does not include area st



EXISTING BASIN MAP

THE Group
300 Branding Iron Rd. SE
Rio Rancho, New Mexico 87104
Phone: (505) 241-1000

EXISTING CONDITIONS

Basin	Area (ac.)	Land Treatment				Yield (cfs/ac.)	Q ₁₀₀₋₂₄ (cfs)	V ₁₀₀₋₂₄ (cfs)
		A	B	C	D			
101	92.93	79	8	8	5	1.48	137.69	4.787
102	48.67	79	8	8	5	1.71	82.97	2.507
103	41.22	79	8	8	5	1.68	69.26	2.124
104	26.86	79	8	8	5	1.47	39.56	1.384
105	54.01	79	8	8	5	1.59	85.72	2.782
106	36.74	36	6	6	52	2.82	103.63	4.736
107	27.68	70	12	12	6	1.82	50.42	1.550
108	28.94	67	13	13	7	1.87	54.07	1.665
109	27.75	65	7	8	20	2.15	59.57	2.100
110	83.10	22	11	21	46	2.49	206.63	10.522
111	15.08	79	8	8	5	1.14	17.18	0.777

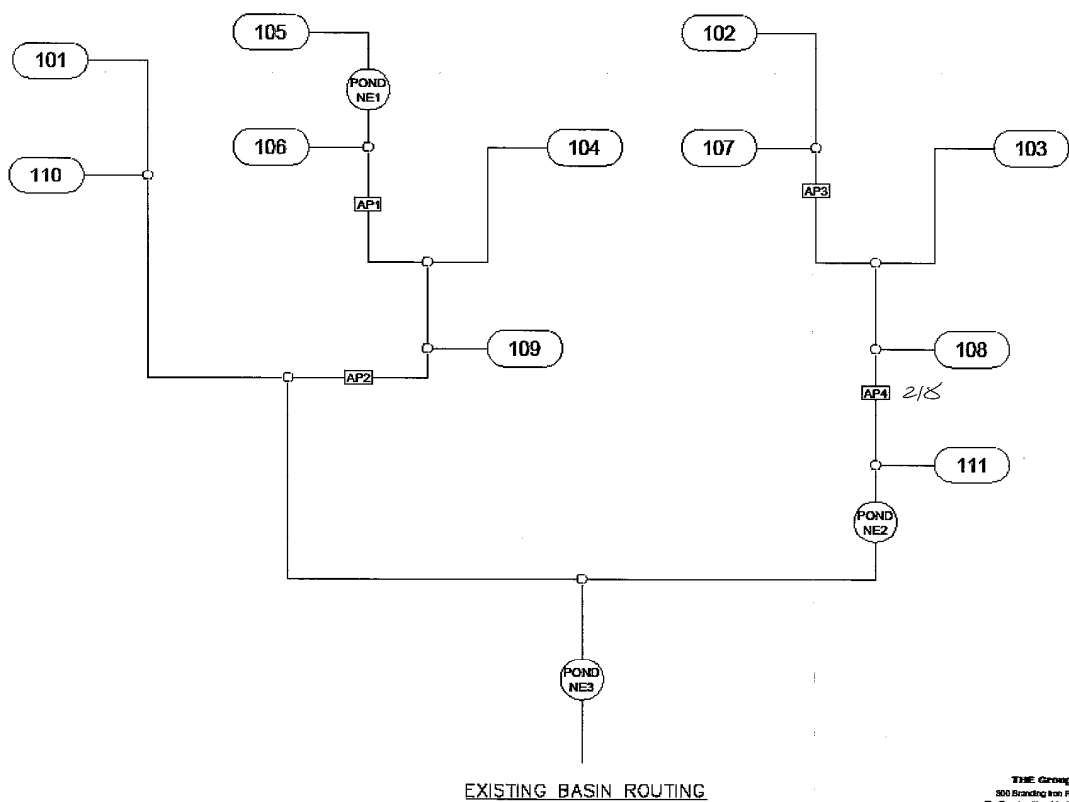
INCLUDES THIS SITE.

THIS IS SAME TREATMENTS
used in Amole Hubbard

2013

ATTN:MO for existing
conditionsBasins exactly match
that of 2013 Amole-Hubbard

DRAINAGE REPORT - PARADISE RV PARK PHASE I



THE Group
800 Branding Iron Rd. SE
Rio Rancho, New Mexico 87124
Phone: (505) 944-1111



FINAL BASIN MAP

THE GROUP
300 Branding Iron Rd. SE
Rio Rancho, New Mexico 87124
Phone: 505.833.2244



Proposed Conditions

The proposed condition provides analyses for the basin modifications due to the extension of storm drain into the basin. The interim conditions will be modified with the following:

- Modification of sub-basin boundaries and runoff due to future development.
- The runoff analysis includes storm drain extension.

*Generally used
land treatments
shown in Greiner
Report 1995*

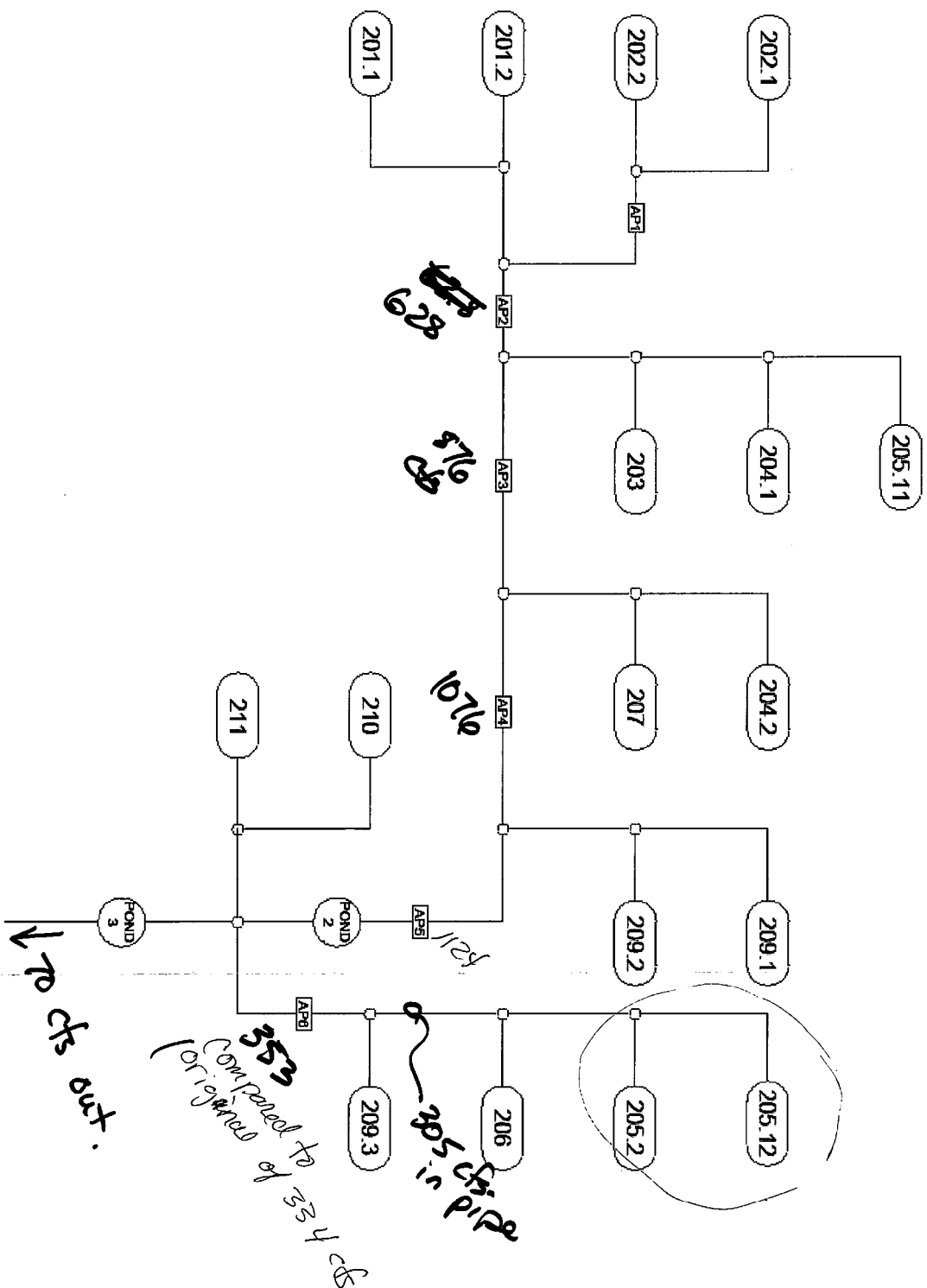
Hydrology

The analysis for the 100-yr 24-hr duration storm was done using AHYMO 97 software. The land treatments reflect existing and the proposed conditions of the basins and routing depicted on the following page. ~~Unless current development is of higher density, the land treatments for the undeveloped sub-basins have been modified to allow for a development density of 1 DU/AC as per current county zoning.~~ The land treatments in other sub-basins will remain equivalent to the interim condition. A summary of the result is listed below and the AHYMO files are detailed in the Appendix.

Basin	Area (ac.)	Land Treatment				Yield (cfs/ac.)	Q ₁₀₀ ⁽²⁴⁾ (cfs)	V ₁₀₀ ⁽²⁴⁾ (cfs)
		A	B	C	D			
201.1	54.16	0	18	19	63	3.88	209.91	8.520
201.2	27.83	0	18	19	63	3.88	107.94	4.378
202.1	54.01	0	18	19	63	3.88	209.31	8.496
202.2	39.58	0	18	19	63	3.88	153.51	6.227
203	32.93	0	18	19	63	3.88	127.70	5.180
204.1	27.72	0	18	19	63	3.88	107.52	4.361
204.2	29.22	0	18	19	63	3.88	113.33	4.597
205.11	16.82	0	41	22	37	3.26	54.79	2.008
205.12	30.95	0	41	22	37	3.26	100.80	3.696
205.2	38.64	0	41	42	17	2.94	113.62	3.688
206	28.15	0	15	16	69	4.00	112.51	4.653
207	32.89	0	18	19	63	3.88	127.55	5.174
209.1	5.80	0	0	20	80	4.32	25.06	1.064
209.2	10.00	0	0	20	80	4.32	43.14	1.832
209.3	11.95	0	0	15	85	4.40	52.51	2.261
210	83.10	0	20	21	59	2.93	243.06	12.612
211	15.08	16	5	21	58	2.76	41.54	2.201

205.2 smaller than 205.12 per map.

*These areas are based on basins
extending to I-40 - too large*



FINAL BASIN ROUTING

THE GROUP
900 Branding Inn Rd. SE
Rd. Rancho, New Mexico 87124
Phone: 505/441-0101



98TH STREET UTILITY PLAN (SECTION 2)

1" = 50'

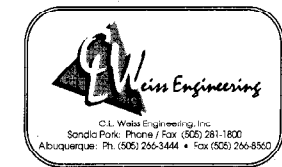
SEWER CENTERLINE DATA

SEWER CENTERLINE	BEARING	DISTANCE
MH 98-4 TO MH 98-5	N 13°02'14" W	270.19'
MH 98-5 TO MH 98-6	N 14°37'43" W	400.00'
MH 98-6 TO MH 98-7	N 14°37'43" W	390.00'
MH 98-7 TO MH 98-8	N 14°54'10" W	306.97'

FOR AVALON ROAD
SEWER PLAN/PROFILE

GENERAL NOTES

1. INSTALL TYPE 'E' MANHOLE. REMOVE AND REPLACE EXISTING ARTERIAL ASPHALT PAVING AS REQUIRED. SEE C.O.A. STD. DWGS. 202, 210 AND 2465.
2. EXISTING 24" CMP CULVERTS LOCATED AT APPROXIMATELY STA 12+58.
3. EXISTING UNDERGROUND 6" WATER LINE LOCATED AT APPROXIMATELY STA 12+58.
4. INSTALL TYPE 'E' MANHOLE. REMOVE AND REPLACE EXISTING ARTERIAL ASPHALT PAVING AS REQUIRED. SEE C.O.A. STD. DWGS. 202, 210 AND 2465.
5. INSTALL TYPE 'E' MANHOLE. REMOVE AND REPLACE EXISTING ARTERIAL ASPHALT PAVING AS REQUIRED. SEE C.O.A. STD. DWGS. 202, 210 AND 2465.
6. NEW 98TH STREET PAVING IMPROVEMENTS BEGIN AT STA 10+00. ALL NEW CONSTRUCTION IS TO BE COMPLETED PRIOR TO PAVING IMPROVEMENTS. SEE ALSO RELATED PROJECT DRAWINGS: 98TH STREET IMPROVEMENTS PLAN/PROFILE AND AVALON ROAD PLAN/PROFILE (BERNALILLO COUNTY PUBLIC WORKS DEPT.) FOR ADDITIONAL INFORMATION.
7. EXISTING UNDERGROUND 6" WATER LINE LOCATED AT APPROXIMATELY STA 20+47.
8. DRY-CONNECT NEW 12" WATER LINE TO EXISTING 12" LINE. NEW WATER LINES TO BE INSTALLED PRIOR TO NEW STREET CONSTRUCTION. SEE ALSO WATER SHUTOFF PLAN, THIS SHEET.
9. INSTALL TYPE 'E' MANHOLE. SEE C.O.A. STD. DWGS. 202, 210 AND 2465.
10. REFER TO PROJECT STORM SEWER PLANS FOR INFORMATION ON SYSTEM.

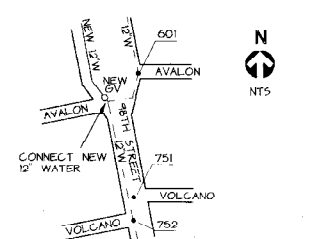


TRAFFIC HANDLING NOTES

1. CONTRACTOR MUST SUBMIT A CONSTRUCTION SIGNING AND BARRICADING PLAN TO BERNALILLO COUNTY TRAFFIC CONTROL ENGINEER AND RECEIVE A BARRICADING PERMIT PRIOR TO CONSTRUCTION.
2. ALL CONSTRUCTION SIGNING AND BARRICADING SHALL COMPLY WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, 10th EDITION, REVISION 3, SEPTEMBER 1993.
3. CONTRACTOR'S OPERATION, BARRICADING AND SIGNING SHALL NOT AFFECT THROUGH LANES BETWEEN 7 AM AND 7 PM, OR 4 PM AND 6 PM ON 98TH STREET OR CENTRAL AVENUE NW.
4. SEE ALSO RELATED PROJECT DRAWINGS: 98TH STREET IMPROVEMENTS PLAN/PROFILE, AVALON ROAD NW STREET + STORM DRAIN PLAN/PROFILE (BERNALILLO COUNTY PUBLIC WORKS DEPT.) AND 98TH STREET IMPROVEMENTS TRAFFIC CONTROL PLAN (10/19/93).

WATER VALVE SHUT-OFF PLAN

WATER DISTRIBUTION MAP K-8



1. CONTRACTOR IS RESPONSIBLE FOR COORDINATING SHUT-OFF PLAN WITH C.O.A. WATER SYSTEMS DIVISION (657-5200) AT LEAST 3 WORKING DAYS PRIOR TO ANY WORK DONE ON PUBLIC WATER LINES. ONLY WATER SYSTEMS DIVISION WILL PERFORM THE SHUT-OFF PLAN.
2. SHUT OFF VALVES 601, 751 AND 752 PRIOR TO MAKING NEW 12" NON-PRESSURIZED CONNECTION.

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE: 98TH STREET NW
WATER & SEWER PLAN / PROFILE (SECTION 2)

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRG CHAIRMAN	Sp. Sandoz	3-30-95	WATER	R.W. Kane	11-23-94
TRANSPORTATION	M.A. RWO	11-29-94	WASTE WATER	R.W. Kane	11-23-94
HYDROLOGY	N/A SMC	3-16-95			

PROJECT NO.	4506.90	MAP NO.	K 8	SHEET	2 OF 4
-------------	---------	---------	-----	-------	--------

98TH STREET UTILITY PROFILE (SECTION 2)

SCALES:
HORIZONTAL 1" = 50'
VERTICAL 1" = 5'

SCANNED BY
RY LASON

MH-17

MH-14

MH-15

MH-12

MH-11

DATUM ELEV
5200.00

VOLCANO EXTENSION
PROFILE

0+00 1+00

5218.0 5216.0

5215.0 5213.0

5212.0 5210.0

5208.0 5206.0

5204.0 5202.0

5200.0 5198.0

5194.0 5192.0

5188.0 5186.0

5184.0 5182.0

5178.0 5176.0

5174.0 5172.0

5168.0 5166.0

5164.0 5162.0

5158.0 5156.0

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5134.0 5132.0

5128.0 5126.0

5124.0 5122.0

5118.0 5116.0

5114.0 5112.0

5108.0 5106.0

5104.0 5102.0

5098.0 5096.0

5094.0 5092.0

5088.0 5086.0

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5074.0 5072.0

5068.0 5066.0

5064.0 5062.0

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5054.0 5052.0

5048.0 5046.0

5044.0 5042.0

5038.0 5036.0

5034.0 5032.0

5028.0 5026.0

5024.0 5022.0

5018.0 5016.0

5014.0 5012.0

5008.0 5006.0

5004.0 5002.0

4998.0 4996.0

4994.0 4992.0

4988.0 4986.0

4984.0 4982.0

4978.0 4976.0

4974.0 4972.0

4968.0 4966.0

4964.0 4962.0

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4954.0 4952.0

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4904.0 4902.0

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4754.0 4752.0

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4574.0 4572.0

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4558.0 4556.0

4554.0 4552.0

4548.0 4546.0

4544.0 4542.0

4538.0 4536.0

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4524.0 4522.0

4518.0 4516.0

4514.0 4512.0

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4504.0 4502.0

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4474.0 4472.0

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4464.0 4462.0

4458.0 4456.0

4454.0 4452.0

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4444.0 4442.0

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4434.0 4432.0

4428.0 4426.0

4424.0 4422.0

4418.0 4416.0

4414.0 4412.0

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4344.0 4342.0

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4334.0 4332.0

4328.0 4326.0

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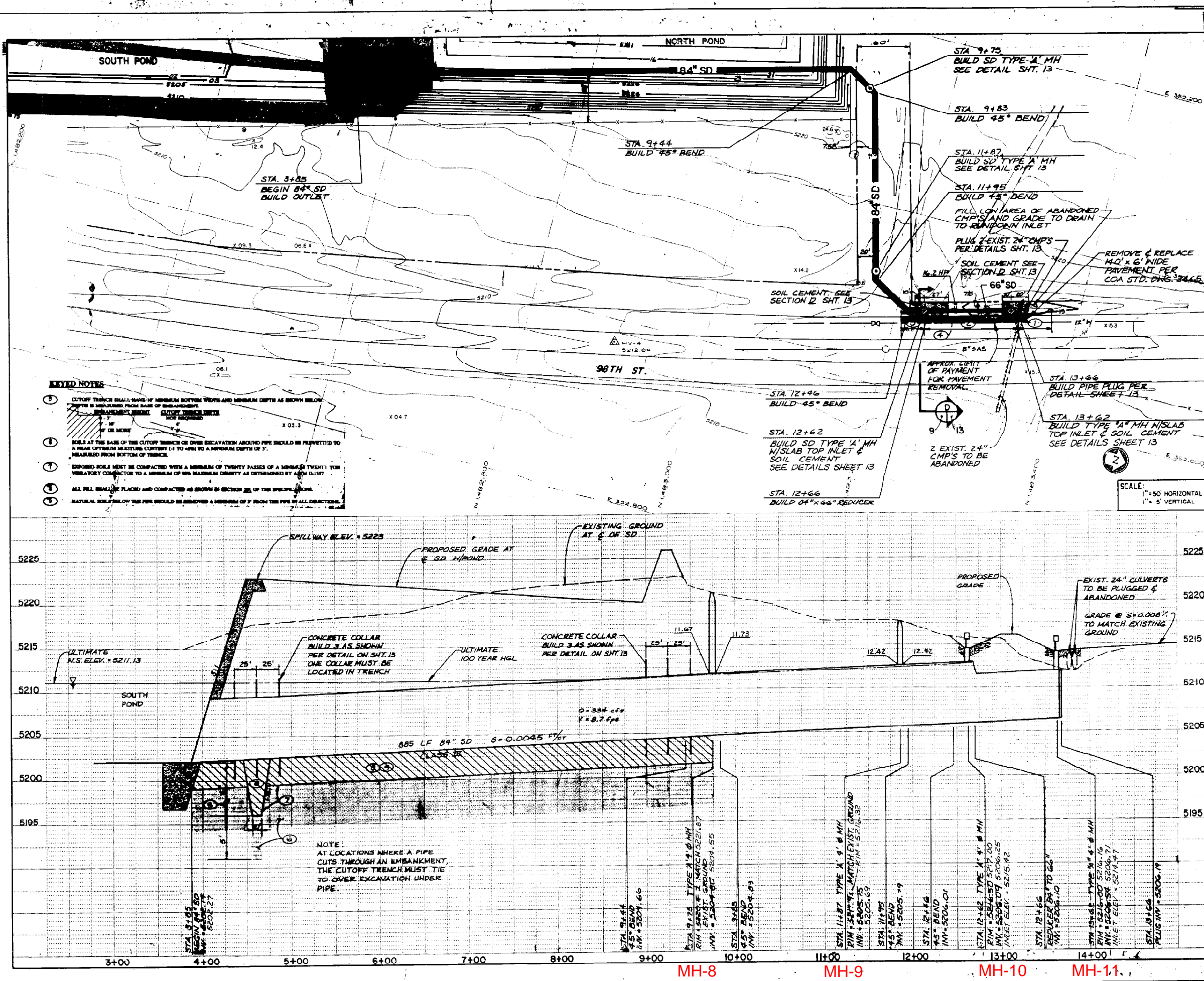
4224.0 4222.0

4218.0 4216.0

4214.0 4212.0

APPROVED FOR CONSTRUCTION
RECEIVED

OFFICE OF PUBLIC UTILITIES
SHEET 9 OF 15



KEYED NOTES

- STA 13+82 TO STA 14+00: 1.5' TYPE 'C' END ANCHORAGE PER COA STD. DWG. 2615
- STA 12+42 TO STA 13+82: 1.5' TYPE 'C' END ANCHORAGE PER COA STD. DWG. 2615
- STA 12+37 TO STA 12+42: 1.5' TYPE 'C' END ANCHORAGE PER COA STD. DWG. 2615
- SEE GUARDRAIL/INLET PLACEMENT DETAIL ON SHEET 13.

AS BUILT INFORMATION

CONTRACTOR: CHAVA TRUCKING

DATE: 12/15/92

BY: [Signature]

ENGINEER'S SEAL

MARK E. HOLSTED
No. 7288
4.25-95

RECORD DRAWINGS

THESE DRAWINGS HAVE BEEN REVISED TO REFLECT AS-CONSTRUCTED CONDITIONS FOR STORM DIVERSION FACILITIES IN ACCORDANCE WITH INFORMATION FURNISHED BY THE CONTRACTOR (CHAVA TRUCKING) AND THE CITY OF ALBUQUERQUE WHICH PERFORMED ON-SITE INSPECTION AND SURVEY DURING CONSTRUCTION.

DATE 12-15-92

Greiner Engineering

**CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP**

TITLE: AMOLE DEL NORTE STORM DIVERSION FACILITIES - PHASE II
TERRA BATTA DRAINAGE FACILITIES
98TH ST. STA. 3+85 TO STA. 13+66
STORM DRAIN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN	RO. [Signature]	5-12-95	WATER	[Signature]	5-12-95
TRANSPORTATION	[Signature]	4-16-95	WASTEWATER		
HYDROLOGY	S. [Signature]	4-24-95			

DRAWING NO. 4076.92 **MAP NO.** K-9 **SHEET** 9 **OF** 15

EROSION CONTROL NOTES:

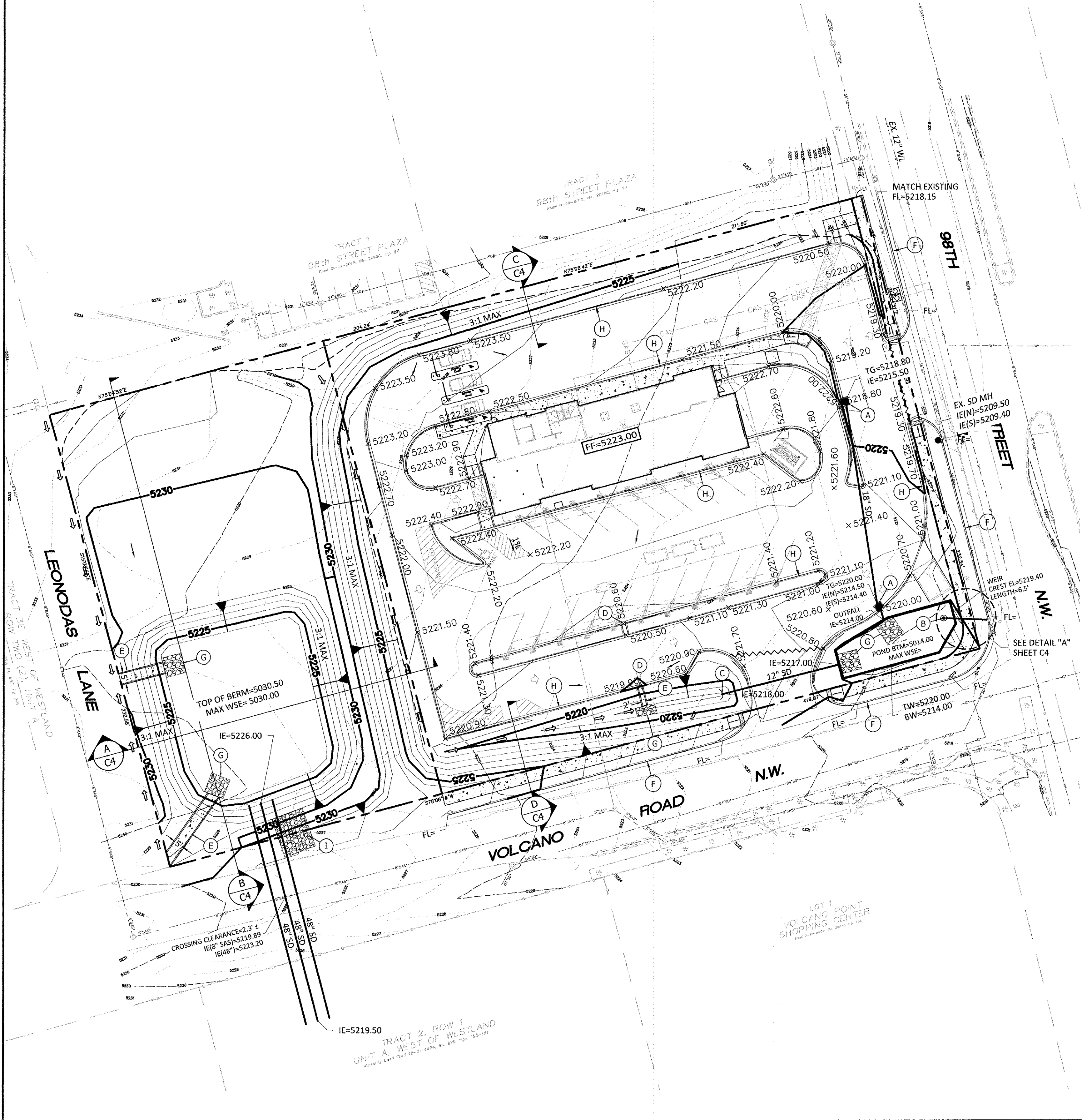
1. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.
2. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.
3. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
4. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL (CITY) ACCEPTANCE OF ANY PROJECT.

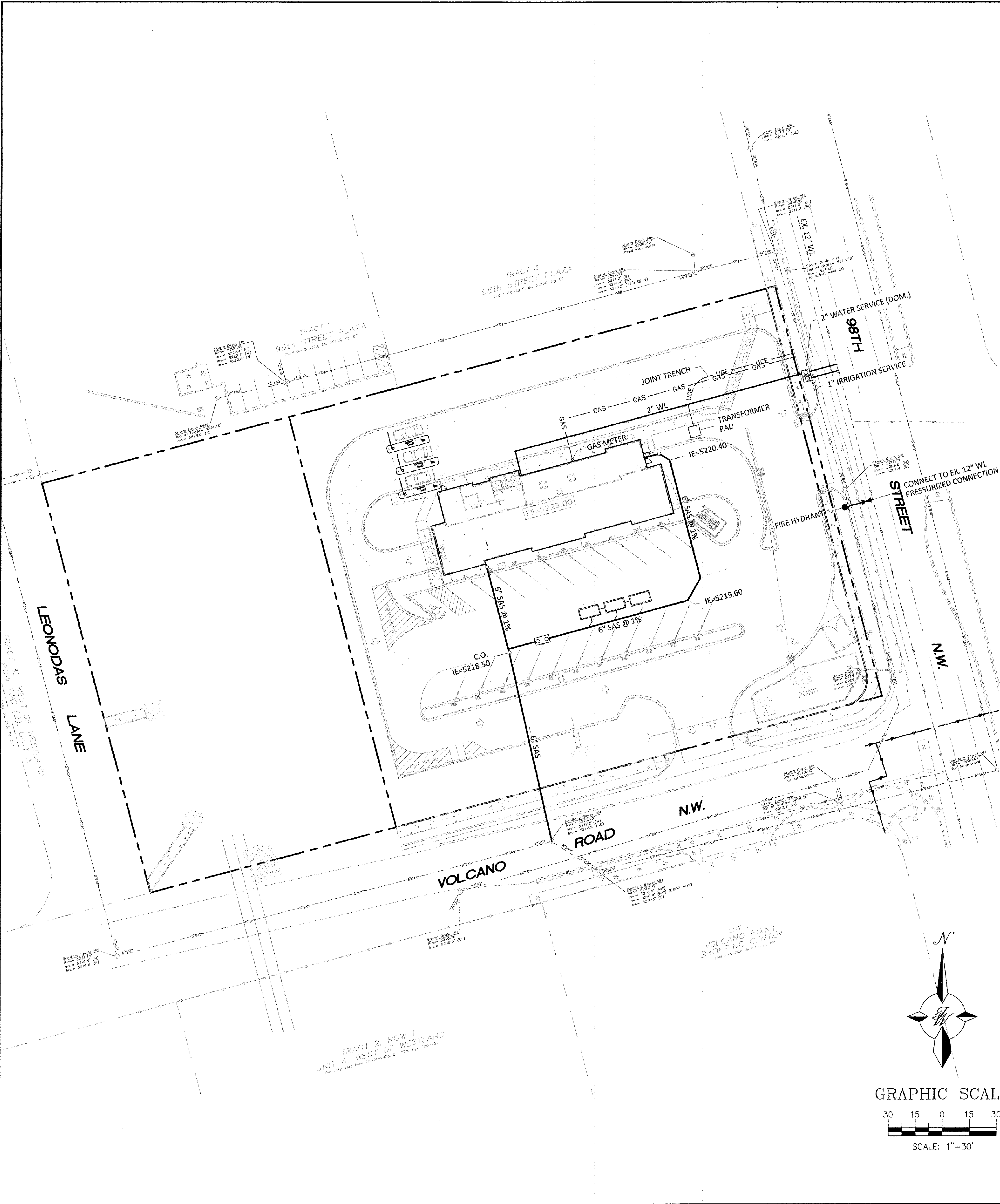
CAUTION:

ALL EXISTING UTILITIES SHOWN WERE OBTAINED FROM RESEARCH, AS-BUILTS, SURVEYS OR INFORMATION PROVIDED BY OTHERS. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO AND INCLUDING ANY EXCAVATION, TO DETERMINE THE ACTUAL LOCATION OF UTILITIES AND OTHER IMPROVEMENTS, PRIOR TO STARTING THE WORK. ANY CHANGES FROM THIS PLAN SHALL BE COORDINATED WITH AND APPROVED BY THE ENGINEER.

NOTICE TO CONTRACTORS

1. ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED, EXCEPT AS OTHERWISE STATED OR PROVIDED HERON, SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF ALBUQUERQUE INTERIM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1985.
2. TWO WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE, 765-1234, FOR LOCATION OF EXISTING UTILITIES.
3. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL CONNECTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
4. BACKFILL COMPACTION SHALL BE ACCORDING TO TRAFFIC/STREET USE.
5. MAINTENANCE OF THESE FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY SERVED. 7. WORK ON ARTERIAL STREETS SHALL BE PERFORMED ON A 24-HOUR BASIS.





GENERAL UTILITY NOTES:

1. ALL WATER AND SEWER UTILITY WORK TO BE DONE IN ACCORDANCE WITH TOWN OF BERNALILLO STANDARDS AND SPECIFICATIONS LATEST EDITION.
2. 4' MINIMUM BURY REQUIRED FOR ALL UTILITIES UNLESS OTHERWISE NOTED.
3. REFERENCE PLUMBING PLANS FOR WATER LINE RISER LOCATIONS.
4. CLEAN OUTS ARE TO BE BUILT PER UNIFORM PLUMBING CODE STANDARDS.
5. ALL PLUMBING PIPE MATERIAL TO BE USED PER UPC.
6. IRRIGATION AND DOMESTIC WATERLINE MUST HAVE BACKFLOW PREVENTORS PER UPC. IF BACKFLOW PREVENTOR IS INSTALLED EXTERIOR OF BUILDING A HOT BOX SHALL BE INSTALLED AND USED.
7. ALL EXCAVATION, TRENCHING AND SHORING ACTIVITIES MUST BE CARRIED-OUT IN ACCORDANCE WITH OSHA 29 CFR 1926.650 SUBPART P.
8. ALL UTILITY DISTANCES SHOWN ARE FOR REFERENCE ONLY.
9. PNM HAS NUMEROUS ELECTRIC FACILITIES AT THIS SITE CURRENTLY SERVING EXISTING CUSTOMERS. THE APPLICANT SHALL COORDINATE WITH PNM REGARDING THESE EXISTING FACILITIES. ANY RELOCATION, CHANGES OR REALIGNMENT OF EXISTING ELECTRIC UTILITIES WILL BE THE DEVELOPER EXPENSE. IN SOME CASES, RELOCATION OR CHANGES TO EXISTING FACILITIES MAY NOT BE FEASIBLE DUE TO PHYSICAL, USE OR SAFETY CLEARANCE CONSTRAINTS.
10. PNM WILL REVIEW ALL TECHNICAL NEEDS, ISSUES AND SAFETY CLEARANCES FOR ITS ELECTRIC POWER SYSTEMS. ANY EXISTING AND PROPOSED PUBLIC UTILITY EASEMENTS SHALL BE INDICATED ON THE SITE PLAN UTILITY SHEET.
11. SCREENING SHALL BE DESIGNED TO ALLOW FOR ACCESS TO UTILITY FACILITIES. IT IS NECESSARY TO PROVIDE ADEQUATE CLEARANCE OF TEN FEET SURROUNDING ALL GROUND-MOUNTED UTILITIES FOR SAFE OPERATION, MAINTENANCE AND REPAIR PURPOSES.

LEGEND

- CURB & GUTTER
- - - BOUNDARY LINE
- - - EASEMENT
- BUILDING
- SIDEWALK
- EXISTING CURB & GUTTER
- EXISTING BOUNDARY LINE
- 36" SD — STORM SEWER LINE
- 8" SAS — SANITARY SEWER LINE
- 8" WL — WATERLINE
- SINGLE CLEAN OUT
- ⊗ DOUBLE CLEAN OUT
- ⊙ EXISTING SD MANHOLE
- ⊙ EXISTING INLET
- ⊙ EXISTING SAS MANHOLE
- ⊙ EXISTING FIRE HYDRANT
- ⊙ EXISTING WATER VALVE
- ⊙ EXISTING WATER METER
- ⊙ EXISTING POWER POLE
- ⊙ EXISTING GAS VALVE
- ⊙ EXISTING OVERHEAD UTILITIES
- ⊙ EXISTING UNDERGROUND UTILITIES
- EX. 2" GAS — EXISTING GAS
- EX. 8" SAS — EXISTING SANITARY SEWER LINE
- EX. 10" WL — EXISTING WATER LINE
- EX. 18" RCP — EXISTING STORM SEWER LINE

RESPONSIBILITY OF ELECTRICAL UTILITY SERVICE

	ELECTRIC UTILITY COMPANY (PNM)	GENERAL CONTRACTOR
PRIMARY CONDUIT		X
PRIMARY CONDUCTORS	X	
TRANSFORMER PAD		X
TRANSFORMER	X	
SECONDARY CONDUIT TO METER/CT		X
SECONDARY CONDUCTORS TO METER/CT		X
SECONDARY CONDUCTORS FROM METER TO MAIN PANEL		X
SECONDARY CONDUCTORS FROM METER TO MAIN PANEL		X

* TRENCHING AND BACKFILL FOR PRIMARY CONDUIT BY GENERAL CONTRACTOR

CAUTION:

ALL EXISTING UTILITIES SHOWN WERE OBTAINED FROM RESEARCH, AS-BUILTS, SURVEYS OR INFORMATION PROVIDED BY OTHERS. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO AND INCLUDING ANY EXCAVATION, TO DETERMINE THE ACTUAL LOCATION OF UTILITIES AND OTHER IMPROVEMENTS, PRIOR TO STARTING THE WORK. ANY CHANGES FROM THIS PLAN SHALL BE COORDINATED WITH AND APPROVED BY THE ENGINEER.

ENGINEER'S SEAL



RONALD R. BOHANNAN
P.E. #7868

MISTER CAR WASH
98TH ST & VOLCANO RD
MASTER UTILITY PLAN

**TERRA WEST, LLC**
5571 MIDWAY PARK PLACE NE
ALBUQUERQUE, NM 87109
(505) 858-3100
www.tierrawestllc.com

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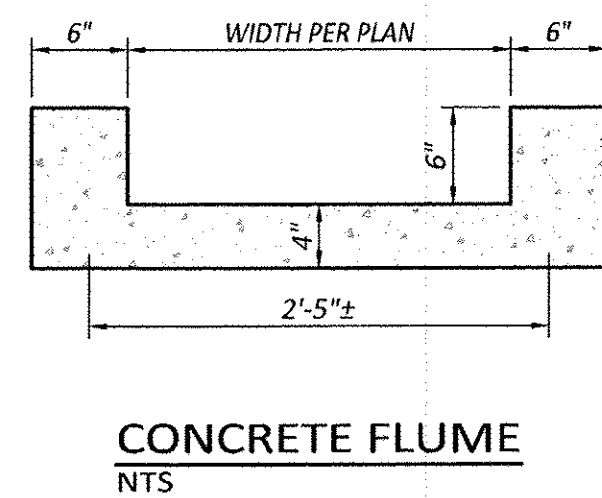
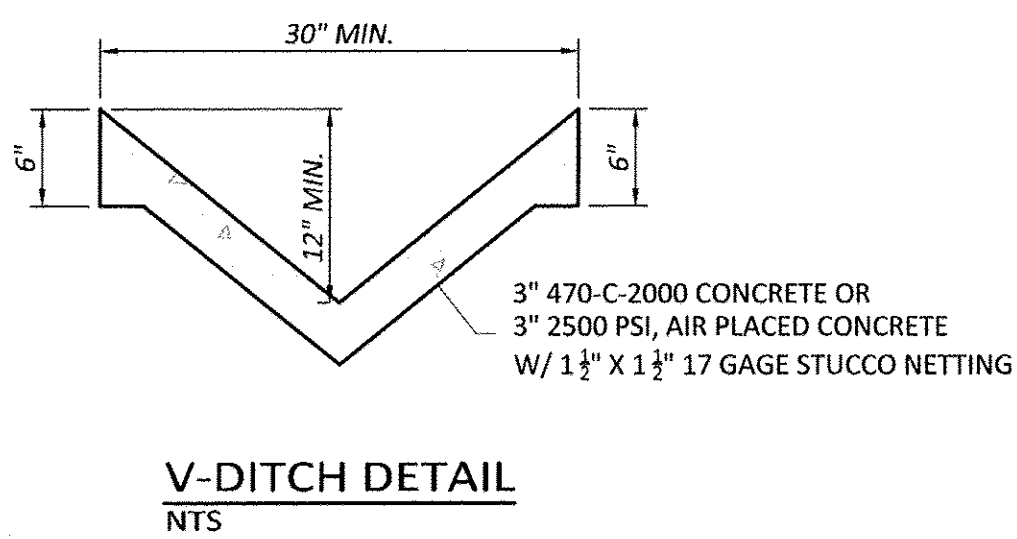
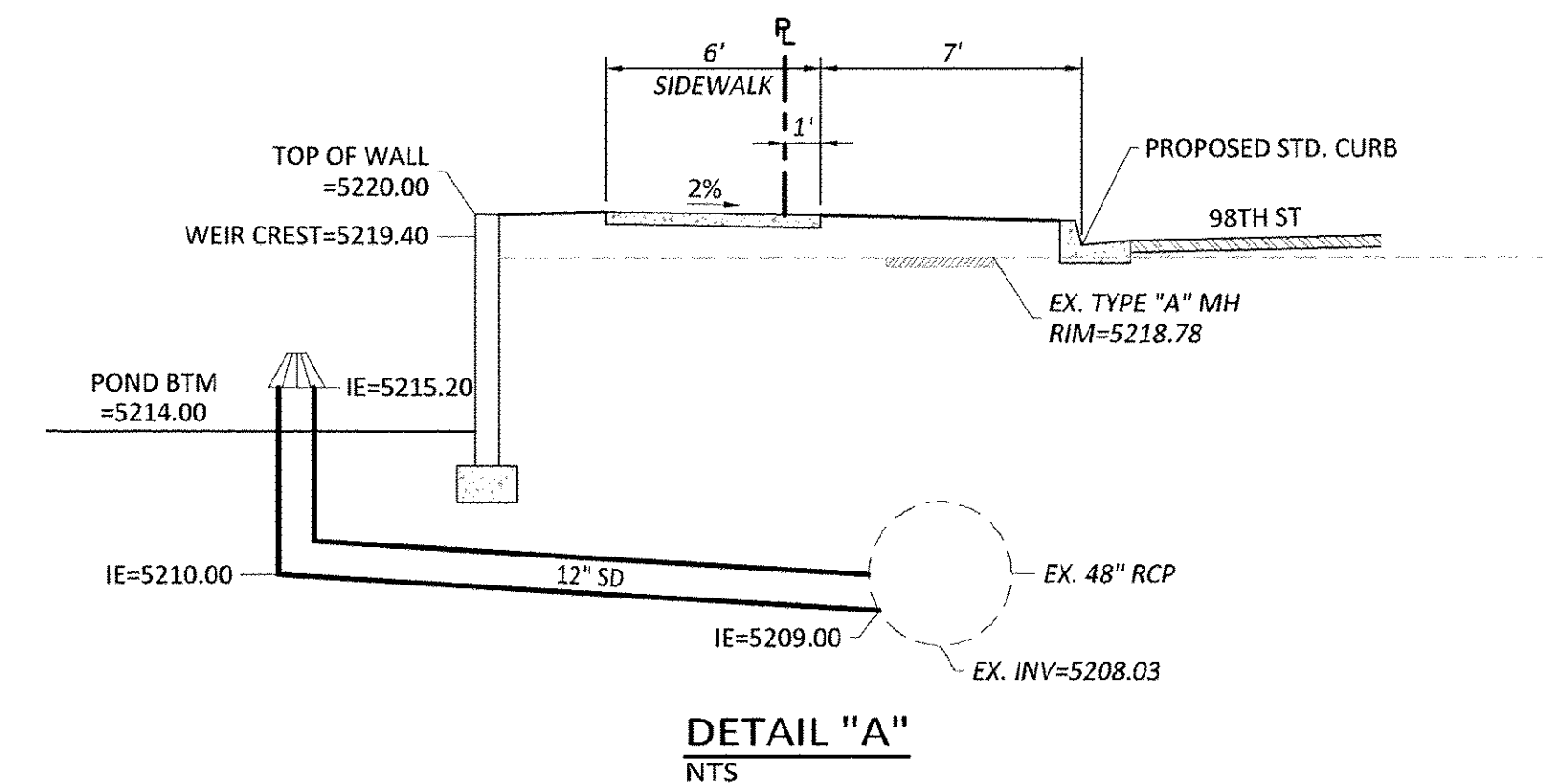
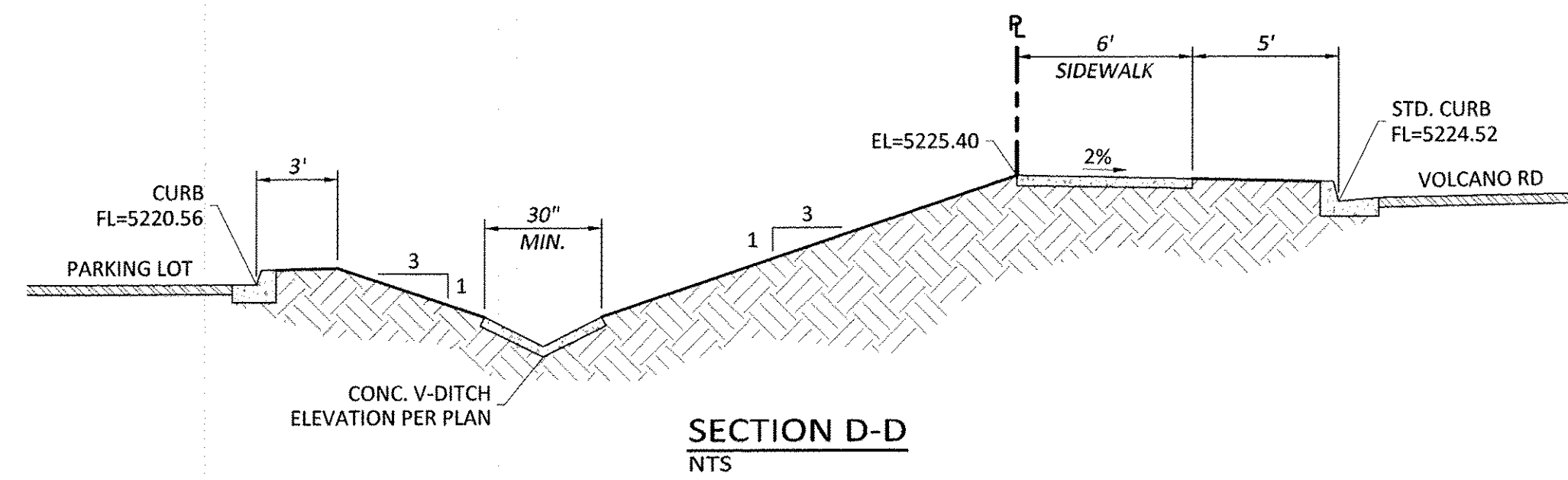
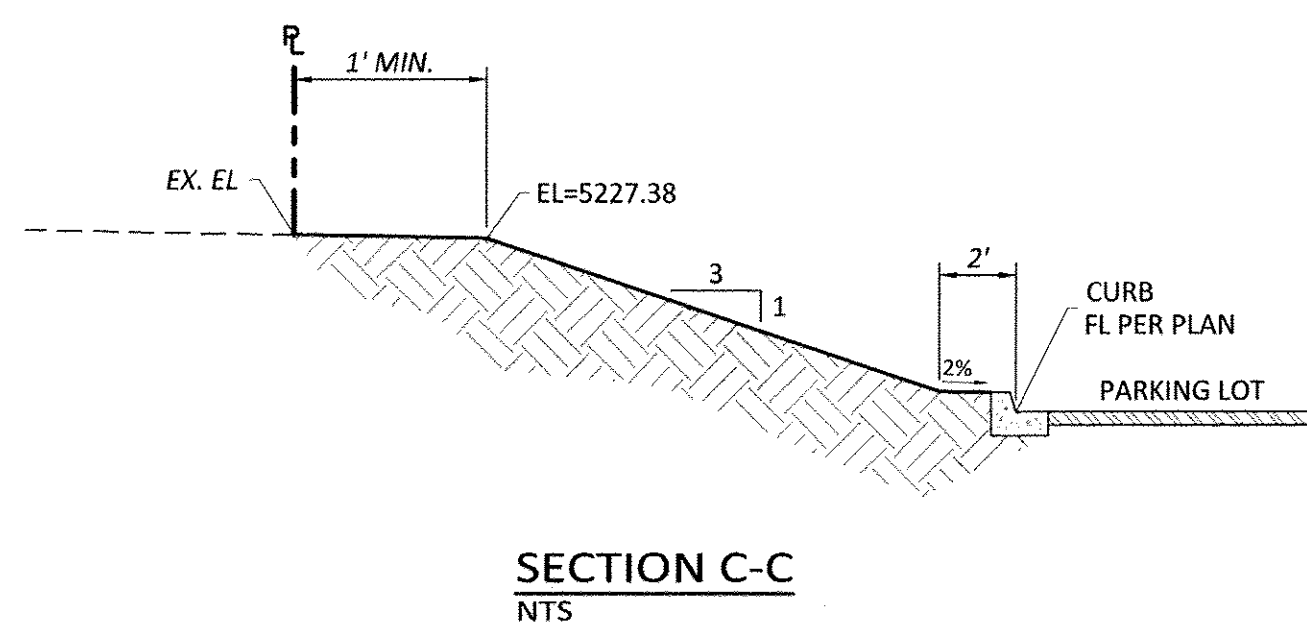
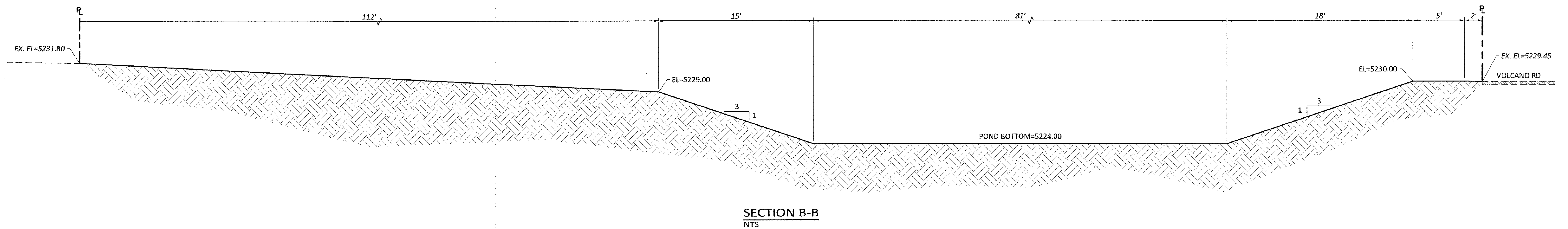
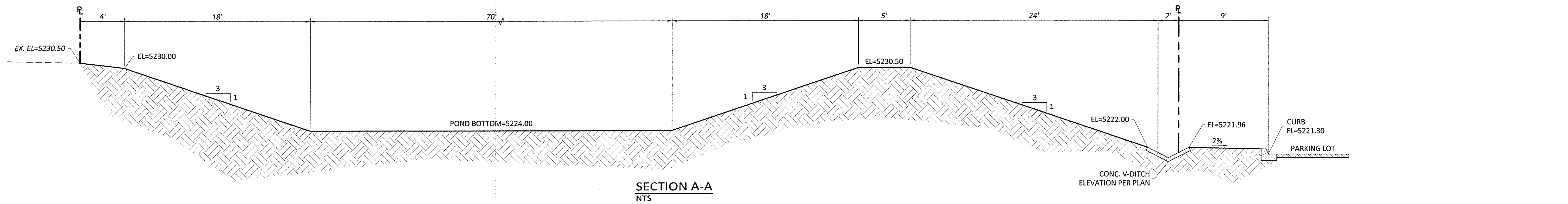
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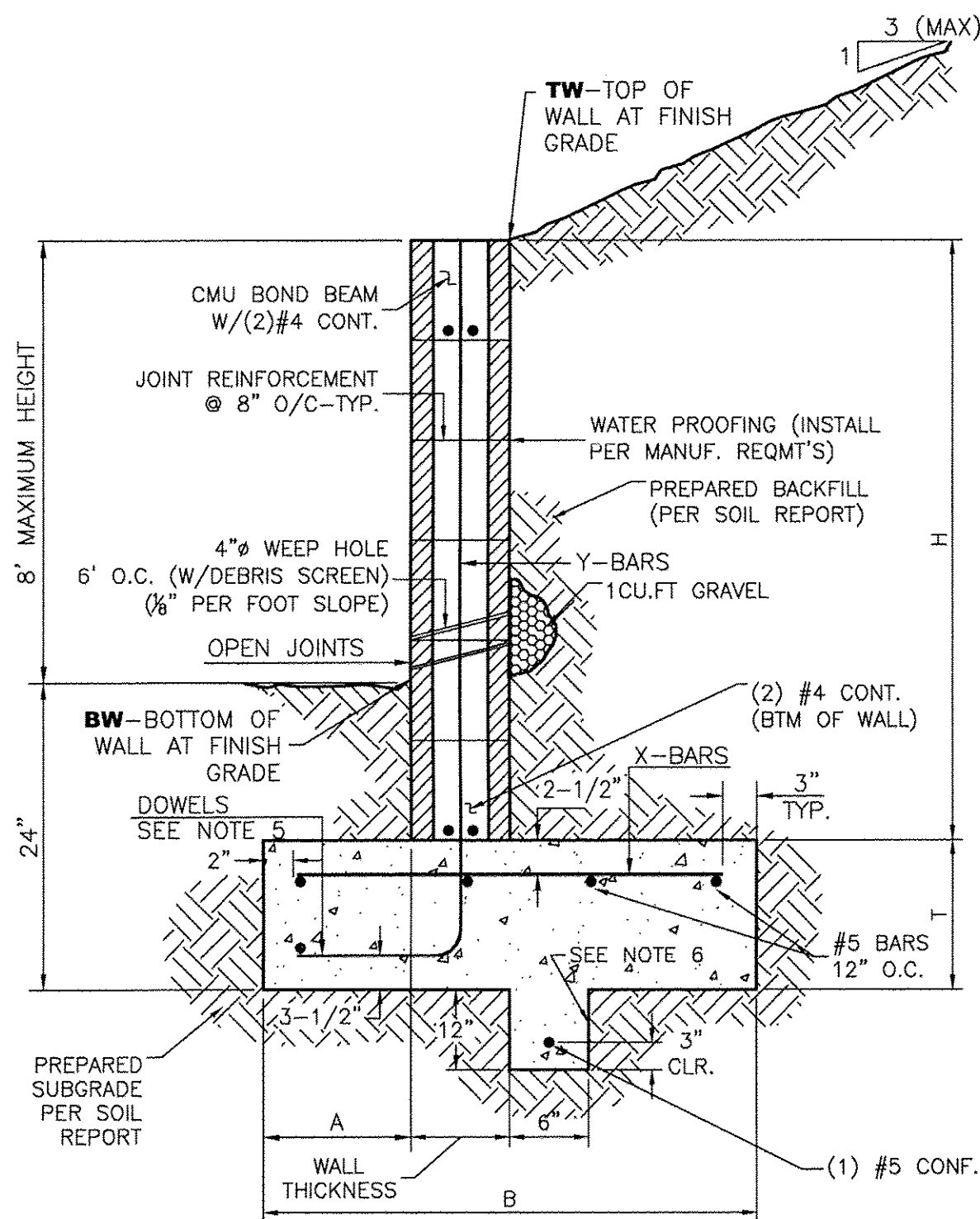
SHEET #
C3

JOB #
2018058

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<div>ENGINEER'S SEAL</div> <div></div> <div>RONALD R. BOHANNAN P.E. #7868</div>	<div>MISTER CAR WASH</div> <div>98TH ST & VOLCANO RD</div> <div>SECTIONS AND DETAILS</div> <div><div>TIERRA WEST, LLC</div><div>5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrawestllc.com</div></div>	<div>DRAWN BY</div> <div>DY</div>
		<div>DATE</div> <div>3/05/19</div>
		<div>2018058-X-SECTIONS</div>
		<div>SHEET #</div> <div>C4</div>
		<div>JOB #</div> <div>2018058</div>



8 INCH REINFORCED CONCRETE MASONRY WALL

H	A	B	T	Y-BARS	X-BARS
ft.-in.	in.	ft.-in.	in.		
2'-0"	10"	2'-4"	10"	#4 @24" O.C.	#4 @24" O.C.
2'-8"	10"	2'-4"	10"	#4 @24" O.C.	#4 @24" O.C.
3'-4"	10"	2'-4"	10"	#4 @24" O.C.	#4 @24" O.C.
4'-0"	12"	2'-8"	10"	#4 @16" O.C.	#4 @24" O.C.
4'-8"	16"	3'-4"	12"	#5 @16" O.C.	#4 @18" O.C.
5'-4"	19"	3'-10"	12"	#5 @8" O.C.	#5 @24" O.C.
6'-0"	20"	4'-8"	12"	#6 @8" O.C.	#5 @24" O.C.

Y-BARS EDGE (2 3/4")
FROM RETAINING FACE

12 INCH REINFORCED CONCRETE MASONRY WALL

H	A	B	T	Y-BARS	X-BARS
ft.-in.	in.	ft.-in.	in.		
5'-4"	16"	3'-8"	12"	#5 @16" O.C.	#5 @24" O.C.
6'-0"	19"	4'-2"	12"	#5 @8" O.C.	#5 @24" O.C.
6'-8"	21"	4'-6"	12"	#5 @8" O.C.	#5 @16" O.C.
7'-4"	23"	4'-10"	12"	#6 @8" O.C.	#6 @18" O.C.
8'-0"	26"	5'-4"	12"	#6 @8" O.C.	#6 @18" O.C.
8'-8"	28"	5'-8"	12"	#6 @8" O.C.	#6 @12" O.C.

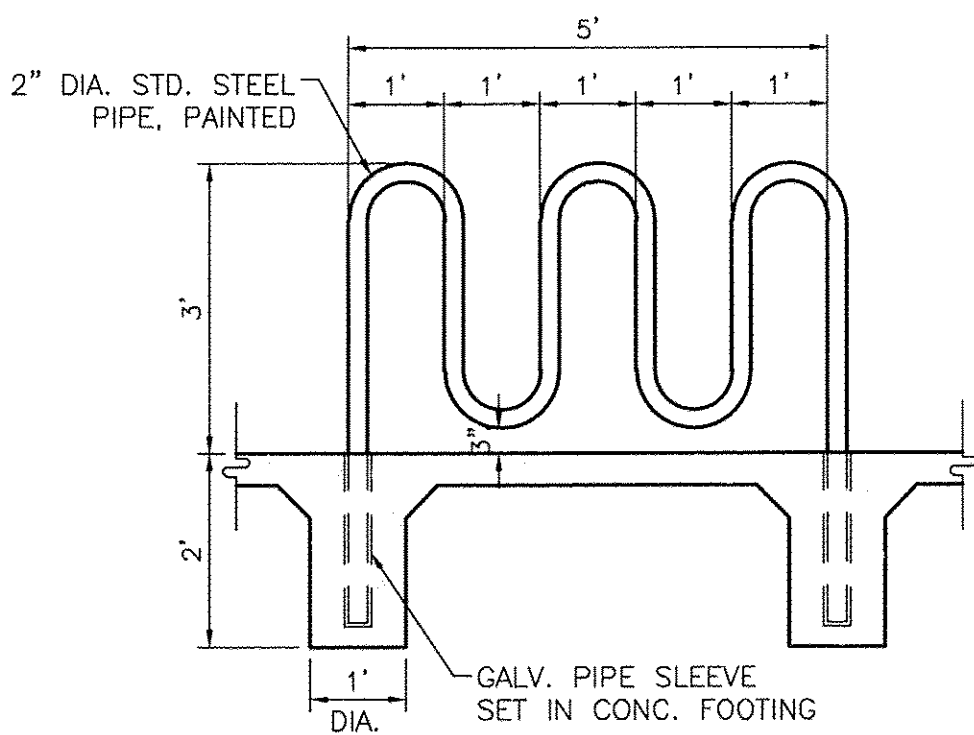
Y-BARS EDGE (3")
FROM RETAINING FACE

GENERAL NOTES:

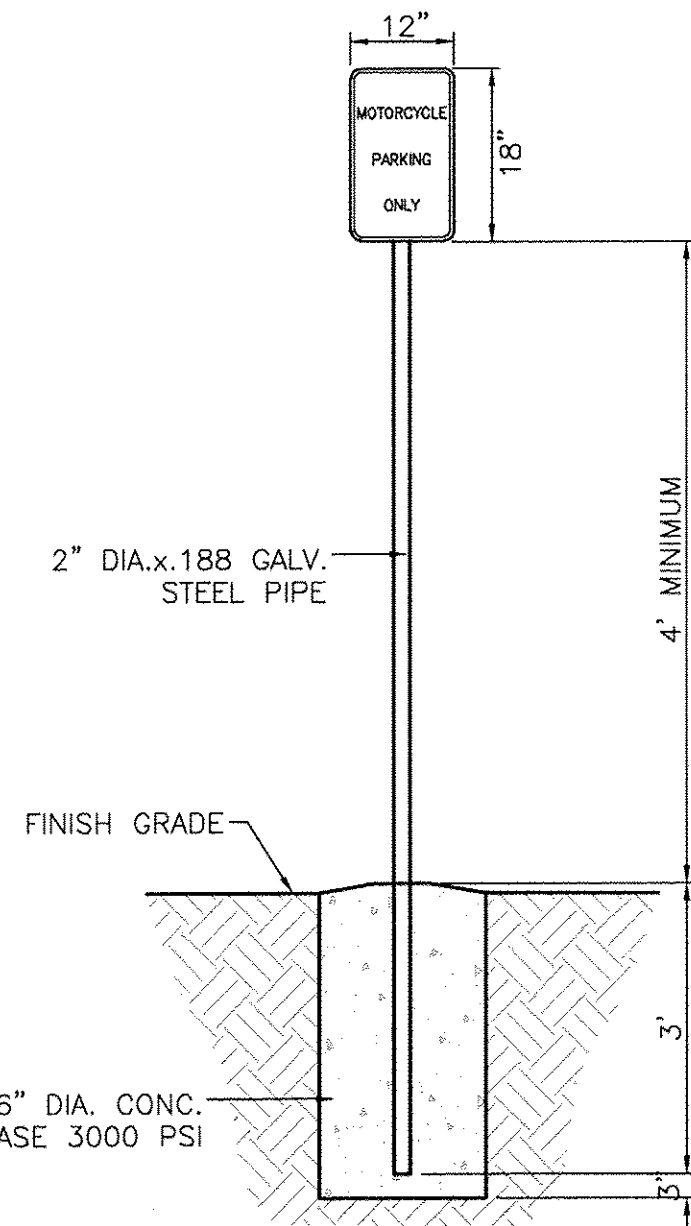
- ALL CONCRETE IS TO BE 4000 PSI @ 28 DAYS.
- MINIMUM COMPACTION UNDER FOOTINGS IS TO BE 95% PER ASTM. D 1557 FOR A DEPTH OF 12" MOISTURE CONTENT IS TO BE \pm 2.0%.
- BACK FILL AGAINST WALLS IS TO BE HAND-PLACED AND COMPACTED.
- ALL BARS ARE TO BE GRADE 60, ASTM 615.
- DOWELS SHALL BE EQUAL IN SIZE AND SPACING TO Y-BARS, SHALL PROJECT A MINIMUM OF #4-24", #5-30", #6-36" INTO THE FILLED BLOCK CORES, AND SHALL EXTEND TO THE TOE OF THE FOOTING.
- PROVIDE KEY FOR 8" AND 12" WALLS WHERE H EXCEEDS 6'.
- USE EITHER EXPANSION JOINTS ON 20' CENTERS OR PILASTERS EVERY 16'.

RETAINING WALL DETAIL
NTS

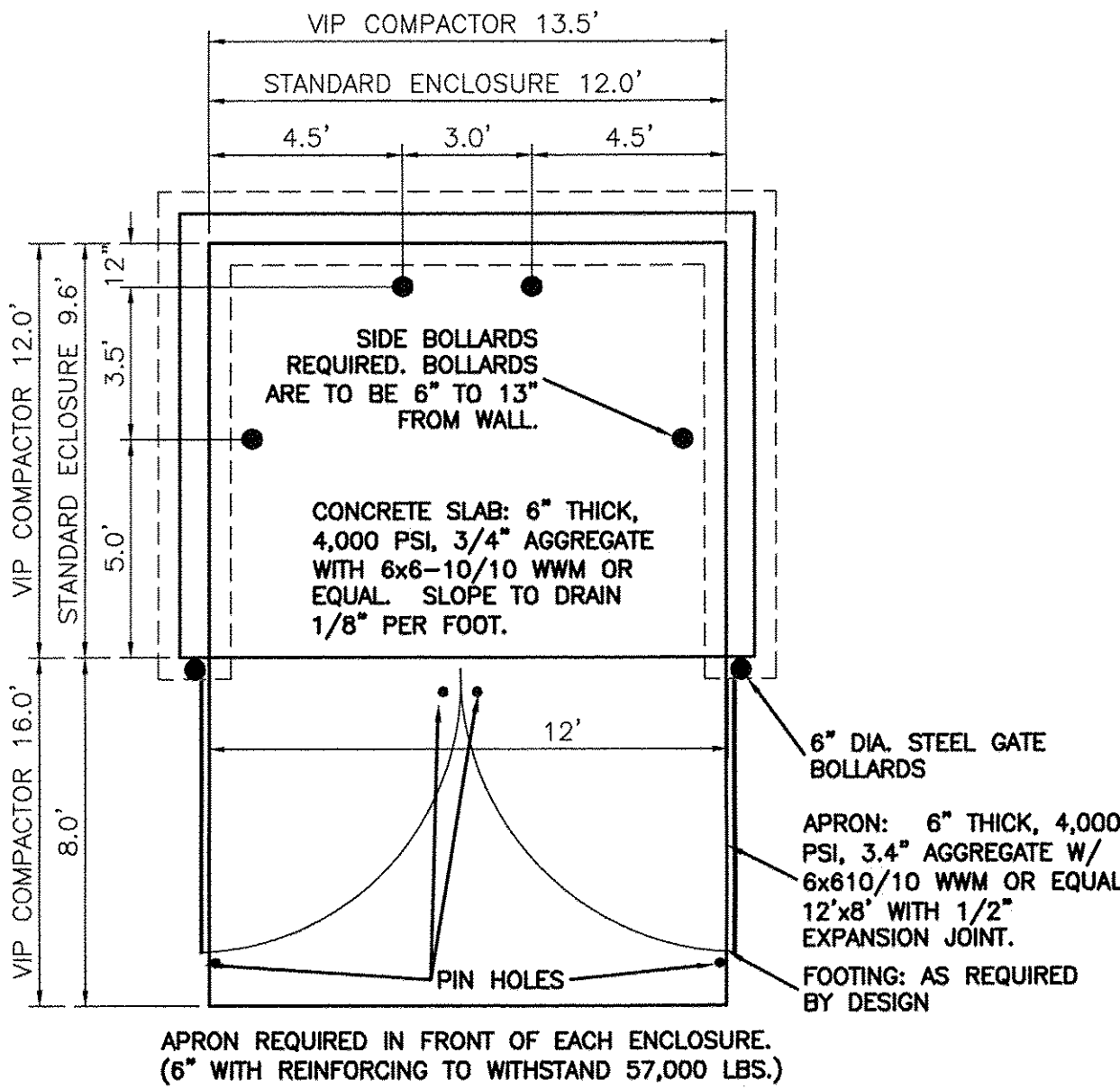
- $f'm = 1500$ PSI
- SOIL ALLOWABLE 2000 PSF (VERIFY W/SOILS REPORT)
- ACTIVE SOIL PRESSURE - 35 PSF/FT (VERIFY W/SOILS REPORT)
- PASSIVE SOIL PRESSURE - 250 PSF/FT (VERIFY W/SOILS REPORT)
- SOIL FRICTION FACTOR - 0.4 (VERIFY W/SOILS REPORT)



BIKE RACK DETAIL
SCALE: 1/2"=1'

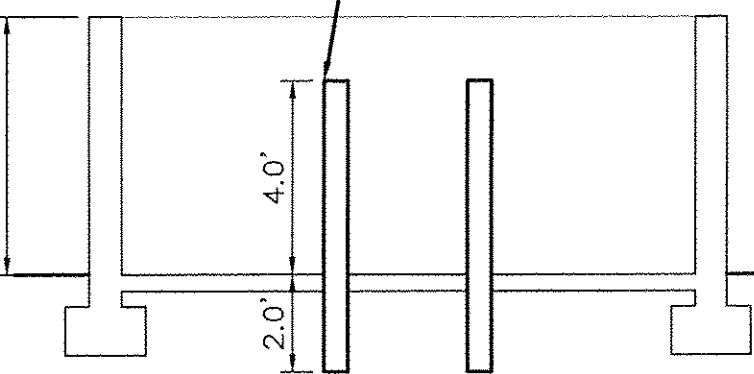


MOTORCYCLE PARKING SIGN
NTS



APRON REQUIRED IN FRONT OF EACH ENCLOSURE.
(6" WITH REINFORCING TO WITHSTAND 57,000 LBS.)

6" OUTSIDE DIA. CONCRETE
FILLED STEEL PIPE SHALL BE
ENCASED IN 12" CONCRETE ALL
AROUND AND EMBEDDED 2.0'



NOTE: THESE ARE THE MINIMUM REQUIREMENTS
FOR TRASH ENCLOSURES. DESIGNS MAY VARY
TO FIT THE SELECTED ENCLOSURE.

DUMPSTER ENCLOSURE DETAIL
NTS

<p>ENGINEER'S SEAL</p> <p>RONALD R. BOHANNAN P.E. #7868</p>	<p>MISTER CAR WASH 98TH ST & VOLCANO RD DETAILS</p>	<p>DRAWN BY DY</p>
		<p>DATE 3/01/19</p>
	<p>TIERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrowestllc.com</p>	<p>2018058-DETAILS</p>
		<p>SHEET # C6</p>

JOB #
2018058