

# CITY OF ALBUQUERQUE

Planning Department  
Alan Varela, Director



Mayor Timothy M. Keller

November 13, 2025

Luis Noriega  
Tierra West LLC  
5571 Midway Park Place NE  
Albuquerque, NM 87109

**RE: KPSW Project**  
**5201 Hawking Dr SE**  
**Grading and Drainage Plans**  
**Engineer's Stamp Date: 10/23/2025**  
**Hydrology File: Q16DA5000D**  
**Case # HYDR-2025-00396**

Dear Mr. Noriega:

PO Box 1293

Based upon the information provided in your submittal received 11/03/2025, the Grading & Drainage Plan is approved for Building Permit. Please attach a copy of this approved plan in the construction sets for Building Permit processing along with a copy of this letter.

Albuquerque

**PRIOR TO CERTIFICATE OF OCCUPANCY:**

NM 87103

1. Engineer's Certification, per the DPM Part 6-14 (F): *Engineer's Certification Checklist For Non-Subdivision* is required.

www.cabq.gov

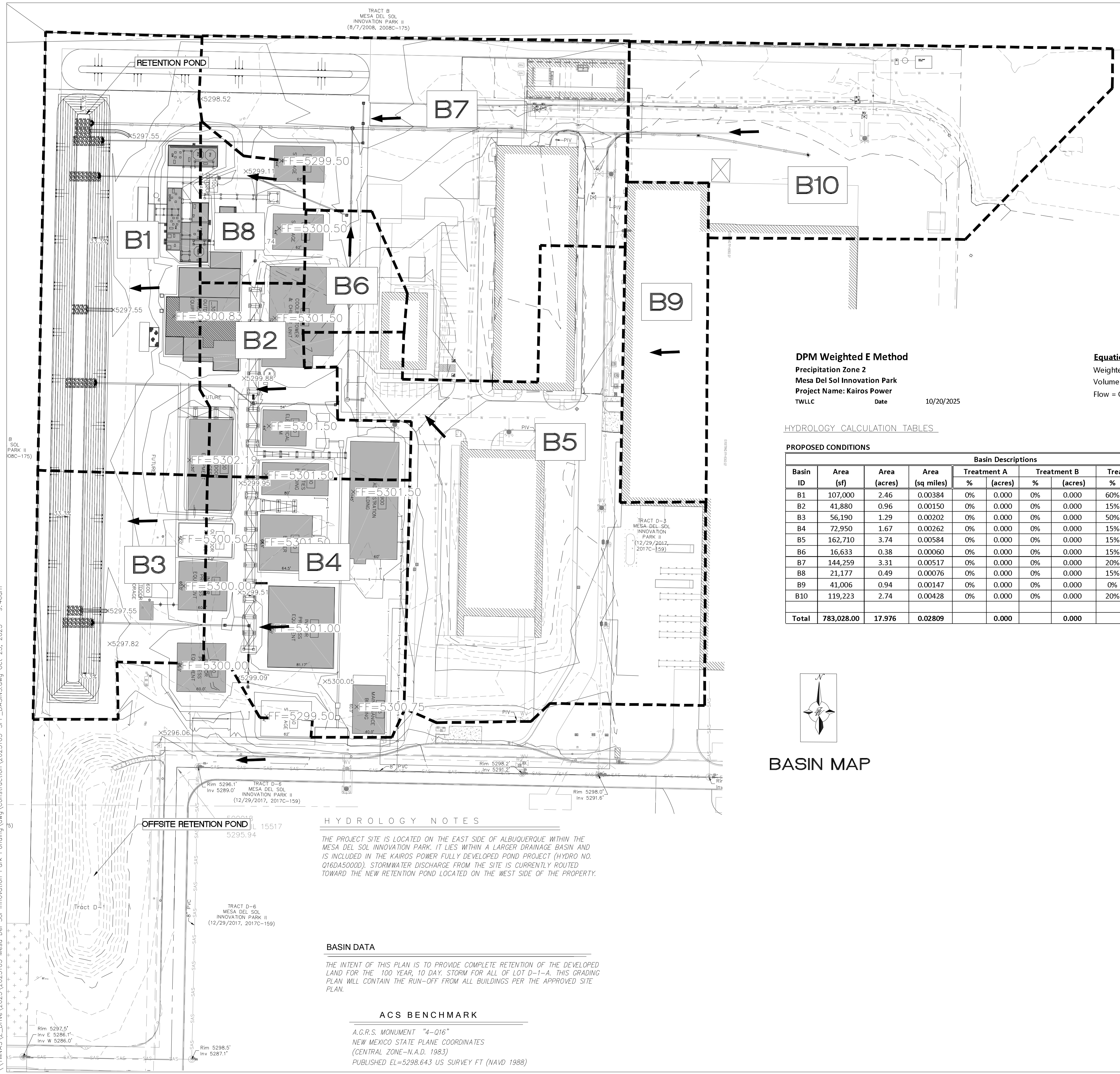
As a reminder, if the project total area of disturbance (including the staging area and any work within the adjacent Right-of-Way) is 1 acre or more, then an Erosion and Sediment Control (ESC) Plan and Owner's certified Notice of Intent (NOI) is required to be submitted to the Stormwater Quality Engineer (Doug Hughes, PE, [jhughes@cabq.gov](mailto:jhughes@cabq.gov), 505-924-3420) 14 days prior to any earth disturbance.

If you have any questions, please contact me at 505-924-3314 or [amontoya@cabq.gov](mailto:amontoya@cabq.gov).

Sincerely,

Anthony Montoya, Jr., P.E., CFM  
Senior Engineer, Hydrology  
Planning Department, Development Review Services

TRACT B  
MESA DEL SOL  
INNOVATION PARK II  
(8/7/2008, 2008C-175)



FIRM MAP: 35001C0363G

LEGAL DESCRIPTION  
TR D-1-A PLAT OF TRACT D-1-A MESA DEL SOL INNOVATION PARK II (BEING A REPLAT OF TRACT D-1 & D-3 MESA DEL SOL INNOVATION PARK II)

**DPM Weighted E Method**  
Precipitation Zone 2  
Mesa Del Sol Innovation Park  
Project Name: Kairos Power  
TWLLC Date 10/20/2025

**Equations:**  
Weighted E = Ea\*Aa + Eb\*Ab + Ec\*Ac + Ed  
Volume = Weighted E \* Total Area  
Flow = Qa\*Aa + Qb\*Ab + Qc\*Ac + Qd\*Ad

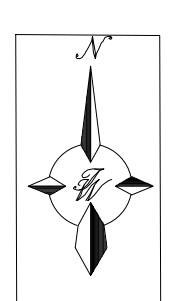
HYDROLOGY CALCULATION TABLES

PROPOSED CONDITIONS

Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Basin Descriptions				100-Year, 10-Day						
				Treatment A %	Treatment B %	Treatment C %	Treatment D %	Weighted E (in)	Volume (ac-ft)	Flow cfs				
B1	107,000	2.46	0.00384	0%	0.000	0%	0.000	60%	1.474	40%	0.983	1.550	0.426	8.76
B2	41,880	0.96	0.00150	0%	0.000	0%	0.000	15%	0.144	85%	0.817	2.135	0.262	3.99
B3	56,190	1.29	0.00202	0%	0.000	0%	0.000	50%	0.645	50%	0.645	1.680	0.252	4.77
B4	72,950	1.67	0.00262	0%	0.000	0%	0.000	15%	0.251	85%	1.423	2.135	0.456	6.94
B5	162,710	3.74	0.00584	0%	0.000	0%	0.000	15%	0.560	85%	3.175	2.135	1.016	15.49
B6	16,633	0.38	0.00060	0%	0.000	0%	0.000	15%	0.057	85%	0.325	2.135	0.104	1.58
B7	144,259	3.31	0.00517	0%	0.000	0%	0.000	20%	0.662	80%	2.649	2.070	0.865	13.52
B8	21,177	0.49	0.00076	0%	0.000	0%	0.000	15%	0.073	85%	0.413	2.135	0.132	2.02
B9	41,006	0.94	0.00147	0%	0.000	0%	0.000	0%	0.000	100%	0.941	2.330	0.287	4.09
B10	119,223	2.74	0.00428	0%	0.000	0%	0.000	20%	0.547	80%	2.190	2.070	0.715	11.17
<b>Total</b>	<b>783,028.00</b>	<b>17.976</b>	<b>0.02809</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>4.414</b>	<b>13.561</b>				<b>4.515</b>	<b>72.32</b>	

Retention Pond Volume Calculation

Top Elevation	5,297.50 Ft.
Top Area	49,764 Sq. Ft.
Bottom Elevation	5,288.50 Ft.
Bottom Area	8,400 Sq. Ft.
Total Volume	261,738.00 Cubic Ft.
Max Water Elevation	5,296.50 Ft.
Max Water Elevation Area	44,880.00 Sq. Ft.
Max Water Volume	213,120.00 Cubic Ft.
<b>Provided Volume</b>	<b>213,081.01 Cubic Ft.</b>
Design Free Board	1.00 Ft.
<b>Volume Required = 4.515 ac-ft = 196,679</b>	



BASIN MAP

OFFSITE RETENTION POND

HYDROLOGY NOTES

THE PROJECT SITE IS LOCATED ON THE EAST SIDE OF ALBUQUERQUE WITHIN THE MESA DEL SOL INNOVATION PARK. IT LIES WITHIN A LARGER DRAINAGE BASIN AND IS INCLUDED IN THE KAIROS POWER FULLY DEVELOPED POND PROJECT (HYDRO NO. Q16DA5000D). STORMWATER DISCHARGE FROM THE SITE IS CURRENTLY ROUTED TOWARD THE NEW RETENTION POND LOCATED ON THE WEST SIDE OF THE PROPERTY.

BASIN DATA

THE INTENT OF THIS PLAN IS TO PROVIDE COMPLETE RETENTION OF THE DEVELOPED LAND FOR THE 100 YEAR, 10 DAY, STORM FOR ALL OF LOT D-1-A. THIS GRADING PLAN WILL CONTAIN THE RUN-OFF FROM ALL BUILDINGS PER THE APPROVED SITE PLAN.

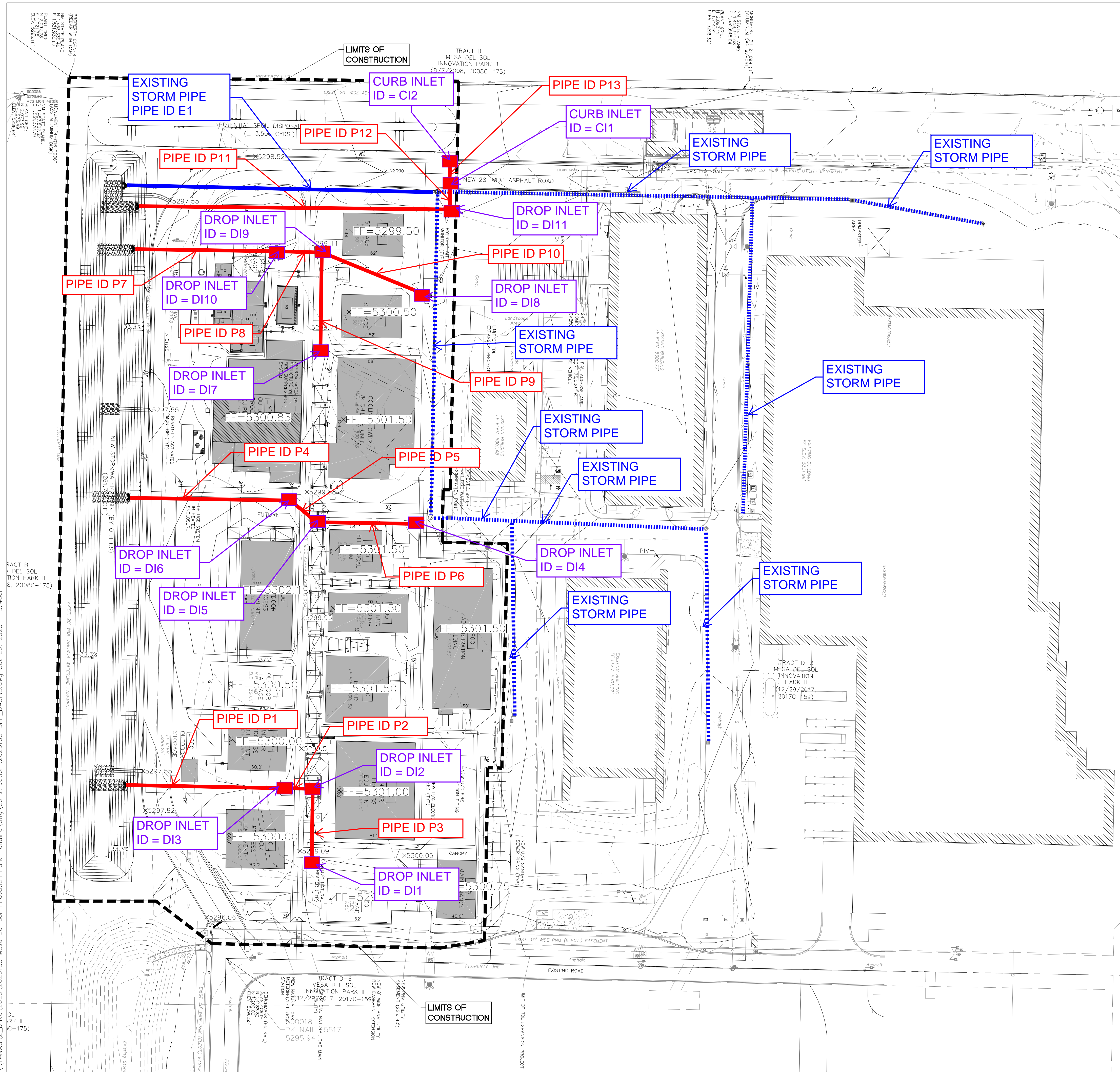
ACS BENCHMARK

A.G.R.S. MONUMENT "4-Q16"  
NEW MEXICO STATE PLANE COORDINATES  
(CENTRAL ZONE-N.A.D. 1983)  
PUBLISHED EL=5298.643 US SURVEY FT (NAVD 1988)

City of Albuquerque  
Planning Department  
Development Review Services  
**HYDROLOGY SECTION**  
**APPROVED**  
DATE: 11-13-2025  
BY: *[Signature]*  
HydroTeam # Q16DA5000D  
THE APPROVAL OF THESE PLANS REPORTS SHALL NOT BE CONSIDERED TO PERMIT VIOLATIONS OF ANY CITY ORDINANCE OR STATE LAW, AND SHALL NOT PREVENT THE CITY OF ALBUQUERQUE FROM REQUIRING CORRECTIVE ACTIONS FOR ERRORS OR DIMENSIONS IN PLANS, SPECIFICATIONS, OR CONSTRUCTION DOCUMENTS. SUCH APPROVED PLANS REPORTS SHALL NOT BE CHANGED, MODIFIED OR ALTERED WITHOUT AUTHORIZATION.  
THE APPROVAL OF THESE PLANS REPORTS SHALL EXPIRE TWO (2) YEARS AFTER THE APPROVAL DATE IF NO BUILDING PERMIT HAS BEEN FILED ON THE DEVELOPMENT.

	KPSW PROJECT ALBUQUERQUE, NM	DRAWN BY LN
	<b>GRADING AND DRAINAGE BASIN MAP</b>	DATE 10/23/2025
	5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrawestllc.com	2023103-SPF_BASINS
		SHEET # <b>GR-1</b>
		JOB # 2023103

\\TWNAS-VZ\_Drive\2023\2023103 Mesa Del Sol Innovation Park\_Ponding.dwg\_Construction\2023103-SPF\_BASINS.dwg Oct 23, 2025 - B: 46cm



**LEGEND**

	CURB & GUTTER		SPOT ELEVATION
	BOUNDARY LINE		FLOW ARROW
	EASEMENT		EXISTING CURB & GUTTER
	BUILDING		EXISTING BOUNDARY LINE
	SIDEWALK		EXISTING CONTOUR MAJOR
	STEM WALL		EXISTING CONTOUR MINOR
	CONTOUR MAJOR		EXISTING SPOT ELEVATION
	CONTOUR MINOR		GRADE BREAK
	LIMITS OF CONSTRUCTION		

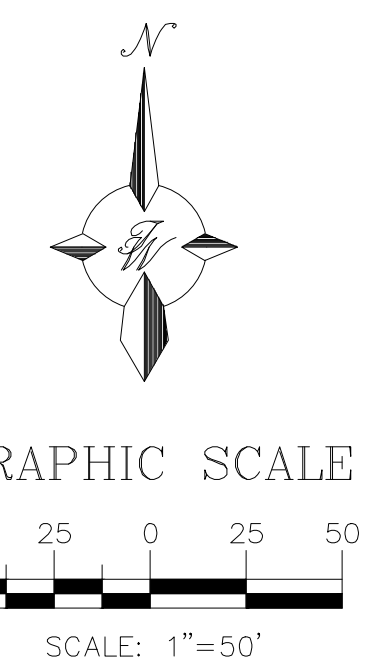
Pipe Capacity Tables

Pipe Number	Diameter (in)	Slope (%)	PIPE TYPE	Developed Q (cfs)	Q Capacity (cfs)
P1	18	0.50	HDPE	6.940	8.650
P2	18	0.50	HDPE	4.620	8.650
P3	12	0.50	HDPE	2.310	2.930
P4	12	1.00	HDPE	3.990	4.140
P5	12	1.00	HDPE	2.600	4.140
P6	12	1.00	HDPE	1.300	4.140
P7	12	1.00	HDPE	3.600	4.140
P8	12	1.00	HDPE	2.920	4.140
P9	12	1.00	HDPE	0.670	4.140
P10	12	1.00	HDPE	1.580	4.140
P11	18	1.30	HDPE	13.520	13.950
P12	18	1.30	HDPE	9.000	13.950
P13	18	1.30	HDPE	4.500	13.950
E1	30	0.40	HDPE	30.750	32.970

Drop Inlet Capacity Tables

Inlet Number	Grate Size (ft)	Head (ft)	Developed Q (cfs)	Q Capacity (cfs)
DI1	2x2	0.50	2.930	6.600
DI2	2x2	0.50	2.930	6.600
DI3	2x2	0.50	2.930	6.600
DI4	2x2	0.50	1.300	6.600
DI5	2x2	0.50	1.330	6.600
DI6	2x2	0.50	1.360	6.600
DI7	2x2	0.50	0.670	6.600
DI8	2x2	0.50	1.580	6.600
DI9	2x2	0.50	0.670	6.600
DI10	2x2	0.50	0.670	6.600
DI11	2x2	0.50	4.500	10.000
CI1	2x3	0.50	4.500	10.000
CI2	2x3	0.50	4.500	10.000

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 BY: *[Signature]*  
 HydroTeam # Q16DA5000D  
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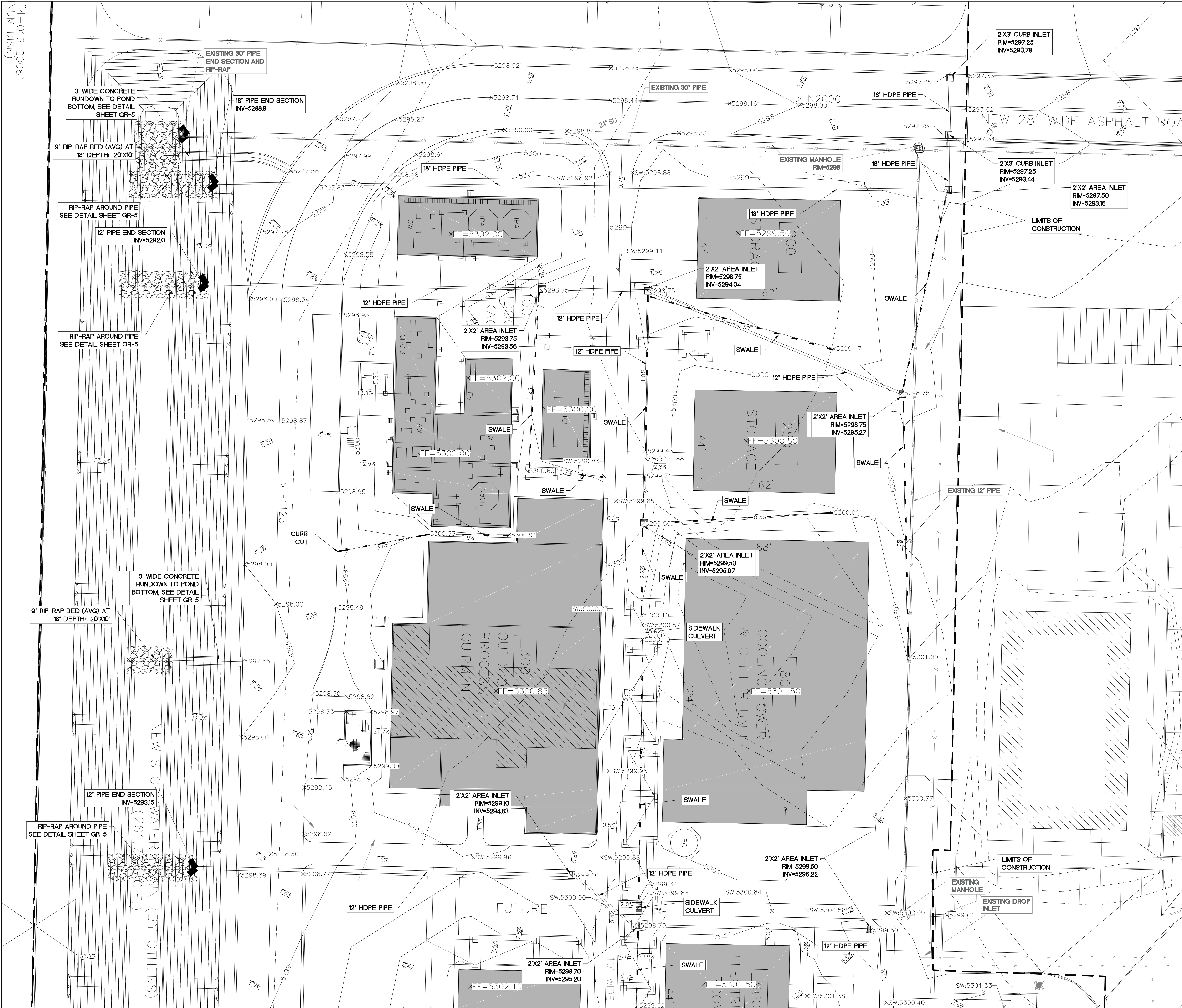


 RONALD R. BOHANNAN P.E. #7868	KPSW PROJECT ALBUQUERQUE, NM <b>GRADING AND DRAINAGE          STORM DRAIN PLAN</b>	DRAWN BY LN DATE 10/23/2025 2023103-SPF_BASINS
	 TIERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.terrawestllc.com	SHEET # <b>GR-2</b> JOB # 2023103

\\TWNASVZ\_Drive\2023\2023103 Mesa Del Sol Innovation Park\_Pending.dwg Construction\2023103-SPF\_BASINS.dwg Oct. 23, 2025 - 9:48am

4-016 2006  
NUM DISK)

\\TWNAS-VZ-Drive\2023\2023103 Mesa Del Sol Innovation Park\_Pending\dwg\Construction\2023103-SPF\_GRB.dwg Oct. 23, 2025 - 3:45pm



**LEGEND**

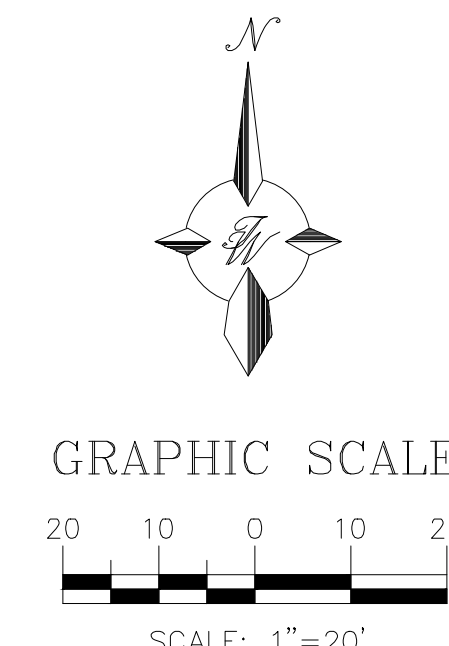
- CURB & GUTTER
- BOUNDARY LINE
- EASEMENT
- BUILDING
- SIDEWALK
- STEM WALL
- 5010 CONTOUR MAJOR
- 5011 CONTOUR MINOR
- x 5048.25 SPOT ELEVATION
- FLOW ARROW
- EXISTING CURB & GUTTER
- EXISTING BOUNDARY LINE
- 5010 EXISTING CONTOUR MAJOR
- 5011 EXISTING CONTOUR MINOR
- x 5048.25 EXISTING SPOT ELEVATION
- GRADE BREAK

**SPOT ELEVATION NOTE:**  
ALL SPOT ELEVATIONS ARE FLOW LINE UNLESS OTHERWISE NOTED.

FF = FINISH FLOOR ELEVATION  
 SW = SIDEWALK TOP ELEVATION  
 TW = FINISH GRADE NEAR TOP OF STEM WALL  
 FL = FLOW LINE ELEVATION  
 TC = TOP OF CURB ELEVATION

- COA NOTICE TO CONTRACTORS**
- TWO WORKING DAYS PRIOR TO ANY EXCAVATION, THE CONTRACTOR MUST CONTACT NEW MEXICO ONE CALL, DIAL "811" (OR (505) 260-1990) FOR THE LOCATION OF EXISTING UTILITIES.
  - PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE LOCATIONS OF ALL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
  - BACKFILL COMPACTION SHALL BE ACCORDING TO TRAFFIC/STREET USE.
  - MAINTENANCE OF THE FACILITY SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY BEING SERVED.
  - WORK ON ARTERIAL STREETS MAY BE REQUIRED ON A 24-HOUR BASIS.

**CAUTION**  
ALL EXISTING UTILITIES/TOPOGRAPHY 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.



**City of Albuquerque  
Planning Department  
Development Review Services  
HYDROLOGY SECTION  
APPROVED**

DATE: 11-13-2025  
 BY: *[Signature]*  
 HydroTeam #: Q16DA5000D

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 ENGINEER'S SEAL RONALD R. BOHANNAN P.E. #7868	<b>KPSW PROJECT ALBUQUERQUE, NM</b>	DRAWN BY LN
	<b>GRADING &amp; DRAINAGE PLAN NORTH</b>	DATE 10/23/2025
 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrawestllc.com	SHEET # <b>GR-3</b>	JOB # 2023103

MATCH LINE SHEET GR-4

**LEGEND**

	CURB & GUTTER
	BOUNDARY LINE
	EASEMENT
	BUILDING
	SIDEWALK
	STEM WALL
	CONTOUR MAJOR
	CONTOUR MINOR
	SPOT ELEVATION
	FLOW ARROW
	EXISTING CURB & GUTTER
	EXISTING BOUNDARY LINE
	EXISTING CONTOUR MAJOR
	EXISTING CONTOUR MINOR
	EXISTING SPOT ELEVATION
	GRADE BREAK

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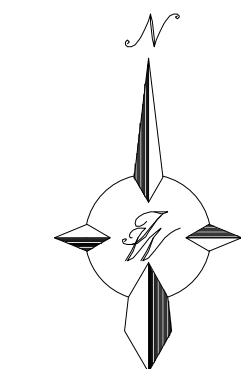
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**COA NOTICE TO CONTRACTORS**

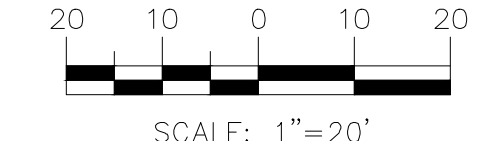
- TWO WORKING DAYS PRIOR TO ANY EXCAVATION, THE CONTRACTOR MUST CONTACT NEW MEXICO ONE CALL, DIAL "811" (OR (505) 260-1990) FOR THE LOCATION OF EXISTING UTILITIES.
- PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE LOCATIONS OF ALL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
- BACKFILL COMPACTION SHALL BE ACCORDING TO TRAFFIC/STREET USE.
- MAINTENANCE OF THE FACILITY SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY BEING SERVED.
- WORK ON ARTERIAL STREETS MAY BE REQUIRED ON A 24-HOUR BASIS.

**CAUTION**

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GRAPHIC SCALE



SCALE: 1"=20'

**City of Albuquerque  
Planning Department  
Development Review Services  
HYDROLOGY SECTION  
APPROVED**

DATE: 11-13-2025  
BY: *[Signature]*  
HydroTeam # Q16DA5000D

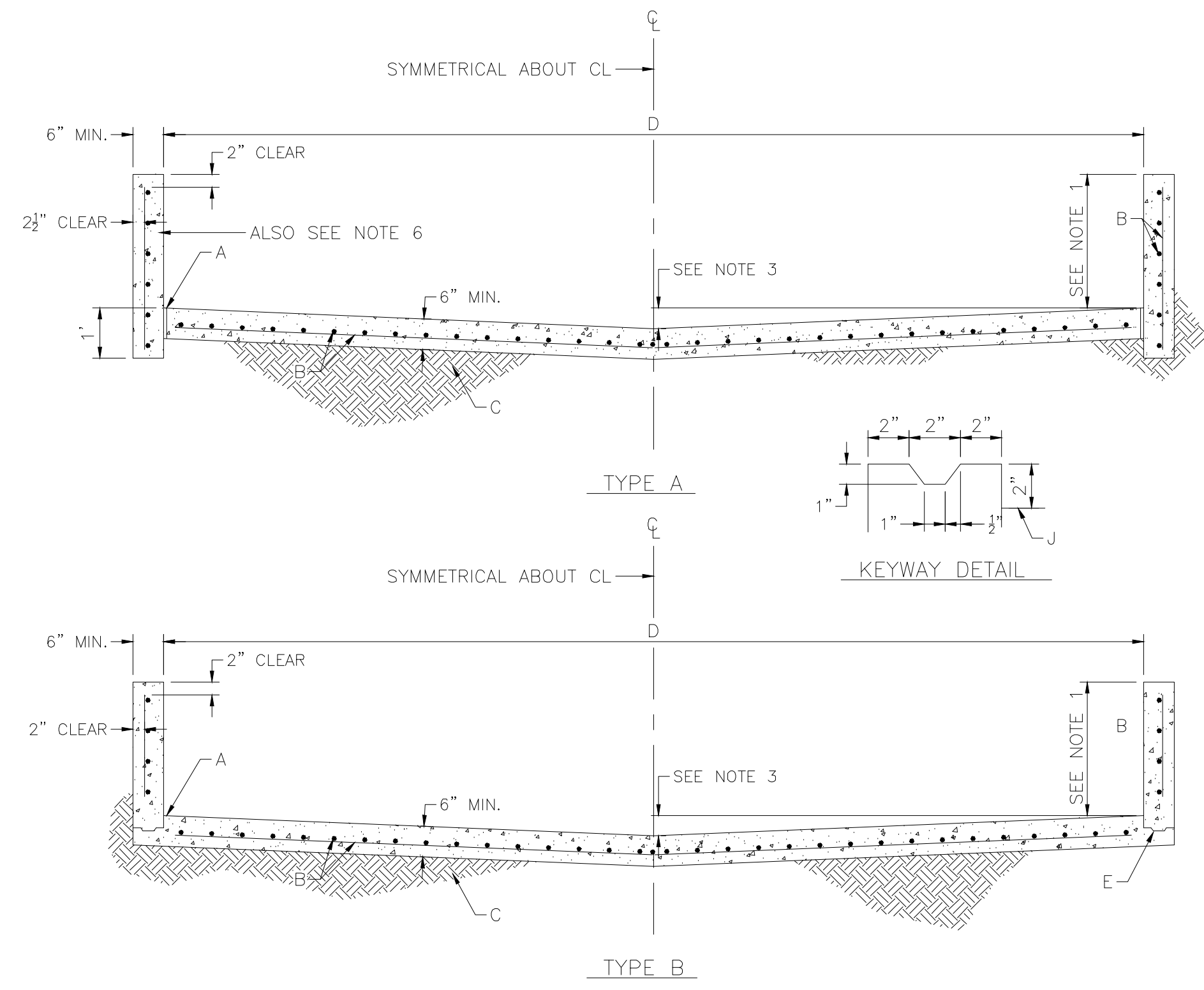
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ENGINEER'S SEAL  
  
RONALD R. BOHANNAN  
P.E. #7868

KPSW PROJECT ALBUQUERQUE, NM <b>GRADING &amp; DRAINAGE PLAN SOUTH</b>	DRAWN BY LN
	DATE 10/23/2025
 TIERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrawestllc.com	2023103-SPF_GRB
	SHEET # <b>GR-4</b>
	JOB # 2023103

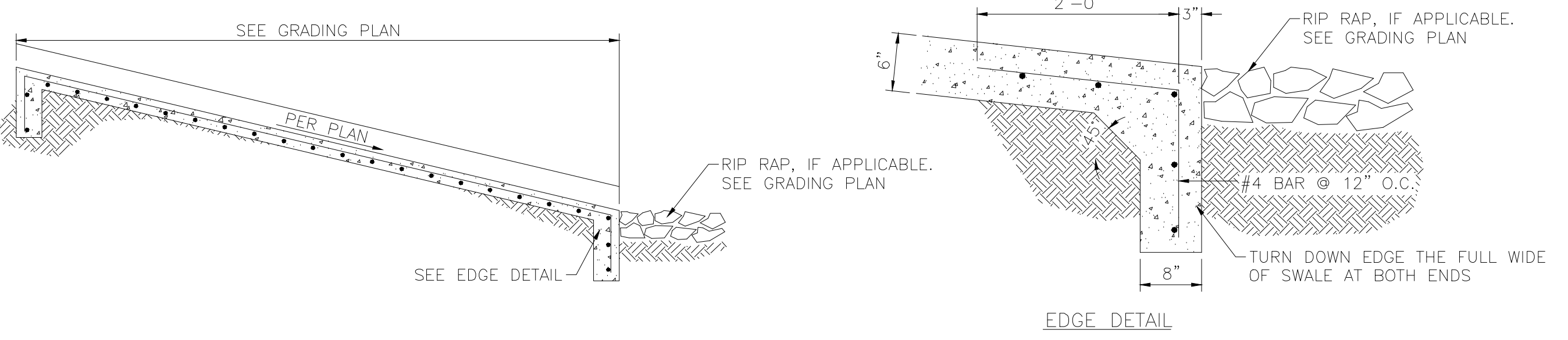


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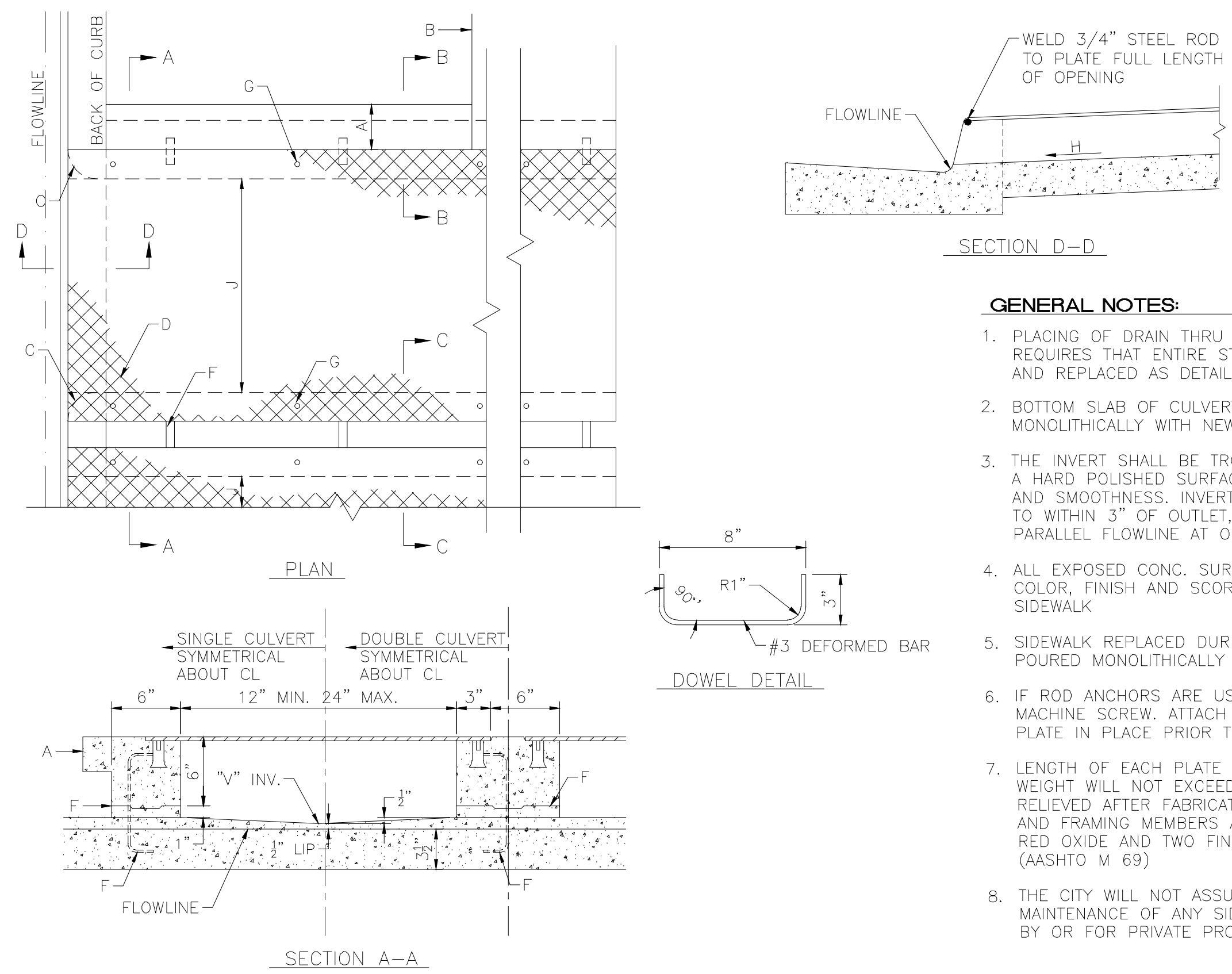


- GENERAL NOTES:**
1. CHANNEL DEPTHS EXCEEDING 2' WILL REQUIRE SEPARATE DESIGN FOR FLOOR AND WALLS.
  2. TYPE B LINING WILL BE USED ONLY WHERE NO UTILITIES ARE LOCATED OR PROPOSED.
  3. UP TO 16' WIDTH USE 4" INVERTED CROWN. 16' WIDTH AND OVER USE 6" INVERTED CROWN.
  4. WARNING: THESE WALLS ARE NOT DESIGNED TO SUPPORT THE ADDITION OF GARDEN OR RETAINING TYPE WALLS.
  5. THE OUTSIDE OF DRAINAGE WALLS SHALL NOT EXTEND BEYOND EASEMENT LINES OR ROW LINES.
  6. 6" CONC. BLOCK WITH CORES FILLED WITH CONC. AND #4 BARS INSERTED INTO CORES AT 1'-6" O.C. MAY BE SUBSTITUTED FOR FORMED CONC. WALLS.

- CONSTRUCTION NOTES:**
- A. EXPANSION JOINT
  - B. #4 REBARS @ 6" O.C. LONG AND 12" O.C. TRANSVERSE
  - C. 6" COMPACTED SOIL 95% ASTM D 1557
  - D. WIDTH OF CHANNEL
  - E. KEYED CONSTRUCTION JOINT



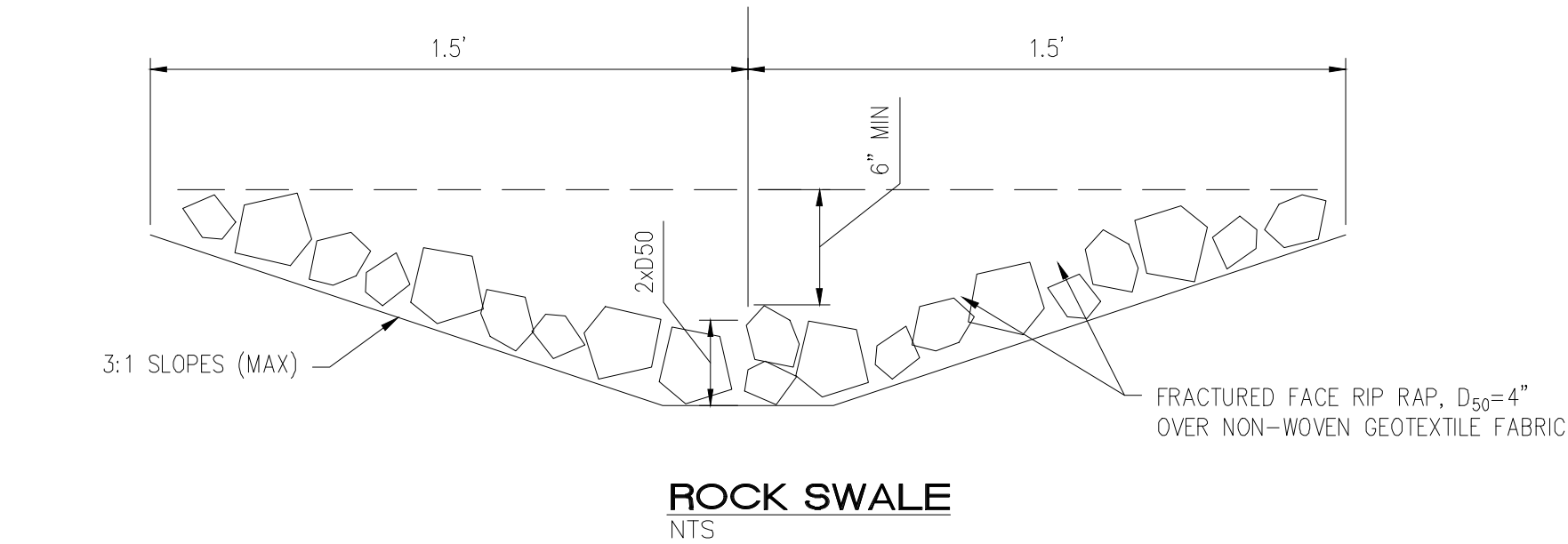
**CONCRETE DRAINAGE RUNDOWN**  
NTS



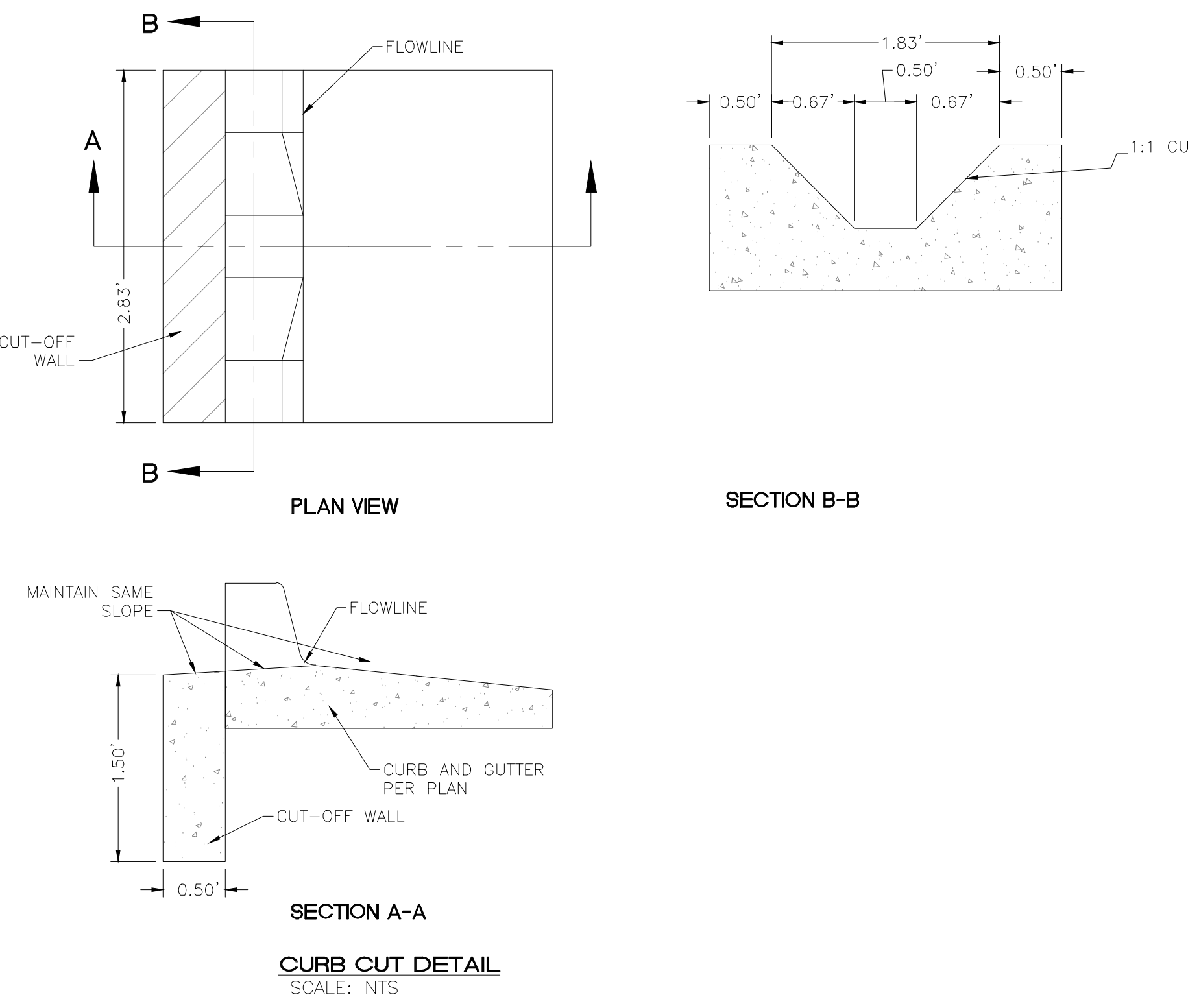
**2' WIDE SIDEWALK CULVERT DETAIL**  
NTS

- GENERAL NOTES:**
1. PLACING OF DRAIN THRU EX. SIDEWALK AND C&G REQUIRES THAT ENTIRE STONES BE REMOVED AND REPLACED AS DETAILED.
  2. BOTTOM SLAB OF CULVERT SHALL BE POURED MONOLITHICALLY WITH NEW GUTTER
  3. THE INVERT SHALL BE TROWELED TO PRODUCE A HARD POLISHED SURFACE OF MAX DENSITY AND SMOOTHNESS. INVERT SHALL BE V-SHAPED TO WITHIN 3" OF OUTLET, THEN WARPED TO PARALLEL FLOWLINE AT OUTLET.
  4. ALL EXPOSED CONC. SURFACE SHALL MATCH GRADE. COLOR, FINISH AND SCORING OF ADJACENT CURB AND SIDEWALK
  5. SIDEWALK REPLACED DURING CONSTRUCTION SHALL BE POURED MONOLITHICALLY WITH CULVERT WALLS.
  6. IF ROD ANCHORS ARE USED, DRILL & TAP FOR F.H. MACHINE SCREW. ATTACH ANCHORS TO PLATE AND SECURE PLATE IN PLACE PRIOR TO POURING WALLS.
  7. LENGTH OF EACH PLATE SHALL BE SUCH THAT THE WEIGHT WILL NOT EXCEED 300LBS. AND SHALL BE STRESS RELIEVED AFTER FABRICATION. CLEAN SURFACE OF PLATE AND FRAMING MEMBERS AND PAINT W/ONE SHOP COAT RED OXIDE AND TWO FINISH COATS ALUMINUM PAINT (AASHTO M 69)
  8. THE CITY WILL NOT ASSUME RESPONSIBILITY FOR MAINTENANCE OF ANY SIDEWALK CULVERT INSTALLED BY OR FOR PRIVATE PROPERTY OWNERS

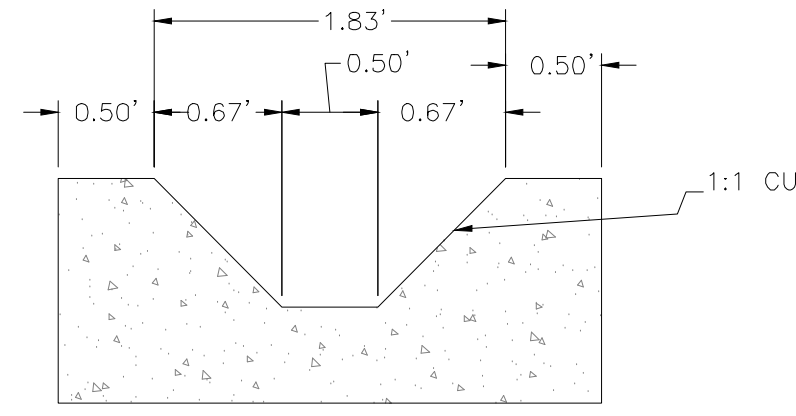
- CONSTRUCTION NOTES:**
- A. MATCH NEAREST CONTROL JOINT, INSTALL 1/2" EXPANSION JOINT
  - B. EDGE OF SIDEWALK OR SETBACK
  - C. 3" RADIUS
  - D. 3/8" CHECKERED STEEL PLATE (PAINT PER NOTE 7, ABOVE)
  - E. FOR SECURING PLATE USE 1"x5" S.S. ROD ANCHOR, "RED HEAD MULTI-SET II SRM-38 ANCHOR" OR APPROVED EQUAL. INSTALL PER MANUFACTURER'S INSTRUCTIONS AT MAX. 24" O.C. A MIN. OF 2 PER SIDE AND ONE WITHIN 6" OF EACH OTHER
  - F. CONSTRUCTION JOINT IS OPTIONAL. IF USED SPACE DOWELS AT 18" O.C. MAX. 1-1/2" MIN. FROM FACE OF CONC.
  - G. 3/8" - 16x1-1/4" COUNTERSUNK, F.H. STAINLESS STEEL, MACHINE SCREW.
  - H. SLOPE 1/4" PER FT. MIN.
  - J. DRAIN WIDTH PER PLAN (12" MIN, 24" MAX.)



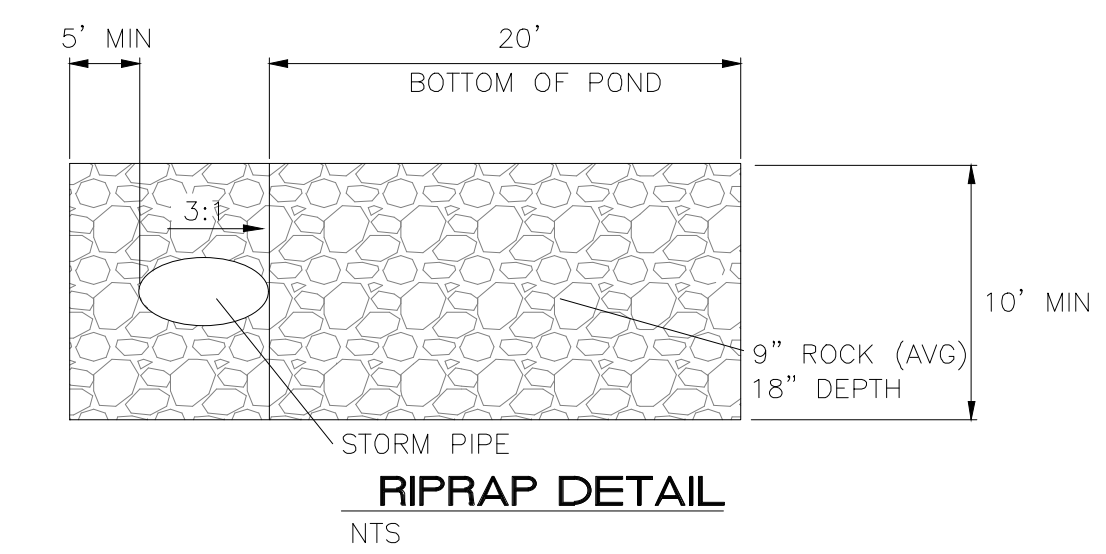
**ROCK SWALE**  
NTS



**CURB CUT DETAIL**  
SCALE: NTS



**SECTION B-B**



**RIPRAP DETAIL**  
NTS

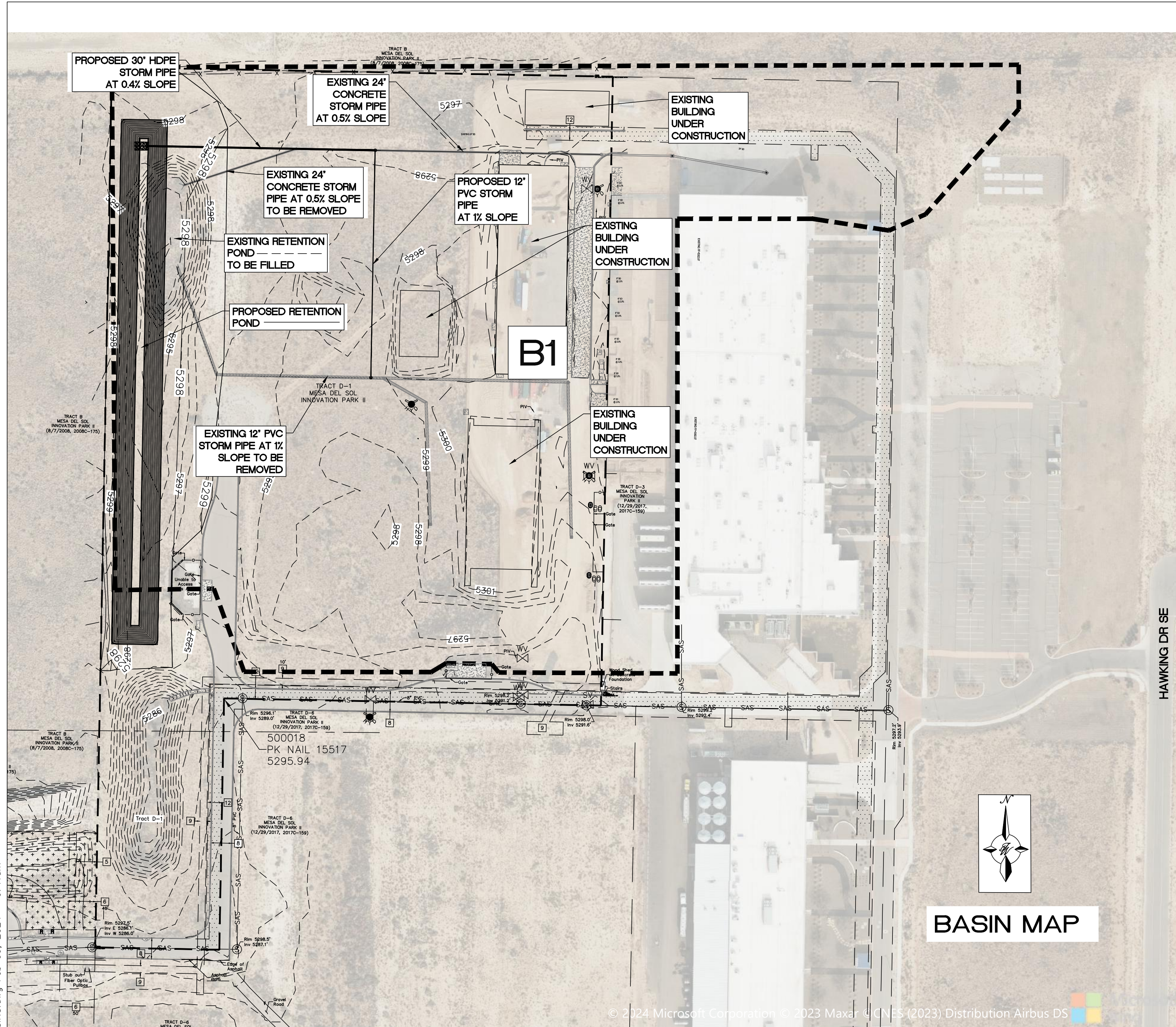
**City of Albuquerque  
Planning Department  
Development Review Services  
HYDROLOGY SECTION  
APPROVED**

DATE: 11-13-2025  
BY: *[Signature]*  
HydroTrans #: Q16DA5000D

THE APPROVAL OF THESE PLANS/REPORTS SHALL NOT BE CONSIDERED TO PERMIT VIOLATIONS OF ANY CITY ORDINANCE OR STATE LAW, AND SHALL NOT PREVENT THE CITY OF ALBUQUERQUE FROM ENFORCING ORDINANCES FOR ERRORS OR OMISSIONS IN PLANS, SPECIFICATIONS OR CONSTRUCTION DOCUMENTS. SUCH APPROVED PLANS/REPORTS SHALL NOT BE CHANGED, MODIFIED OR ALTERED WITHOUT AUTHORIZATION.  
THE APPROVAL OF THESE PLANS/REPORTS SHALL EXPIRE TWO (2) YEARS AFTER THE APPROVAL DATE IF NO BUILDING PERMIT HAS BEEN FILED ON THE DEVELOPMENT.

 RONALD R. BOHANNAN P.E. #7868	<b>KPSW PROJECT</b> <b>ALBUQUERQUE, NM</b> <b>GRADING &amp; DRAINAGE</b> <b>DETAILS</b>	DRAWN BY LN DATE 10/23/2025 2023103-SPF_GRB
	 <b>TERRA WEST, LLC</b> 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrowestllc.com	SHEET # <b>GR-5</b> JOB # 2023103

\\TWNAS\_VZ\_Drive\2023\2023103 Mesa Del Sol Innovation Park\_Pending\dwg\Construction\2023103-SPF\_GRB.dwg Oct. 23, 2025 -- 3:47pm



**LEGEND**

—	CURB & GUTTER	x 5048.25	SPOT ELEVATION
---	PROPERTY LINE	→	FLOW ARROW
---	EASEMENT	---	EXISTING CONCRETE STORM DRAIN PIPE
---	BUILDING	---	EXISTING PVC STORM DRAIN PIPE
---	SIDEWALK/CONCRETE	---	EXISTING CONTOUR MAJOR
---	STORM DRAIN	---	EXISTING CONTOUR MINOR
---	CONTOUR MAJOR	---	BASIN BOUNDARY LINE
---	CONTOUR MINOR	---	

**HYDROLOGY NOTES**

THE PROJECT SITE IS LOCATED ON THE EAST SIDE OF ALBUQUERQUE WITHIN THE MESA DEL SOL INNOVATION PARK. THE PROJECT BASIN AS OF 02/06/2024 HAS RECENTLY BEEN DEVELOPED AT ROUGHLY 50% WITH SEVERAL BUILDINGS AND INCLUDES PAVING, UTILITIES AND STORM DRAIN. STORM WATER WITHIN THE BASIN BOUNDARY CURRENTLY FLOWS TO A RETENTION POND LOCATED ON THE WEST SIDE OF THE BASIN BOUNDARY. THE INTEND OF THIS DRAINAGE REPORT IS TO IDENTIFY THE MINIMUM RETENTION POND SIZE REQUIRED TO CONTAIN THE 100 YR - 10 DAY STORM FOR FULLY DEVELOPED CONDITIONS.

THE SITE IS NOT LOCATED IN A 100YR FLOOD ZONE PER FEMA FIRM MAP



**LEGAL DESCRIPTION**

TR D-1 PLAT OF TRACTS D-1 THRU D-7 MESA DEL SOL INNOVATION PARK II (A SUBDIVISION OF TRACT D MESA DEL SOL INNOVATION PARK II) CONT 16.4161 AC

**ACS BENCHMARK**

A.G.R.S. MONUMENT "4-016"  
NEW MEXICO STATE PLANE COORDINATES  
(CENTRAL ZONE-N.A.D. 1983)  
PUBLISHED EL=5298.643 US SURVEY FT (NAVD 1988)

**DPM Weighted E Method**  
Precipitation Zone 2  
Area Vicinity  
Site Name and Address: Mesa Del Sol Kairos Pond  
TWLLC Date 2/6/2024

**Equations:**  
Weighted E = Ea\*Aa + Eb\*Ab + Ec\*Ac + Ed  
Volume = Weighted E + Total Area  
Flow = Qa\*Aa + Qb\*Ab + Qc\*Ac + Qd\*Ad

**HYDROLOGY CALCULATION TABLES**

**EXISTING CONDITIONS**

Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Basin Descriptions				100-Year, 10-Day							
				Treatment A %	Treatment B %	Treatment C %	Treatment D %	Weighted E (in)	Volume (ac-ft)	Flow cfs	Volume (cf)				
B1	783,028	17.98	0.02809	0%	0.000	0%	0.000	60%	10.786	40%	7.190	1.550	3.119	64.10	135855.046
<b>Total</b>	<b>783,028.00</b>	<b>17.976</b>	<b>0.02809</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>7.190</b>	<b>1.550</b>	<b>3.119</b>	<b>64.10</b>	<b>135855.05</b>

**FULLY DEVELOPED CONDITIONS**

Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Basin Descriptions				100-Year, 10-Day							
				Treatment A %	Treatment B %	Treatment C %	Treatment D %	Weighted E (in)	Volume (ac-ft)	Flow cfs	Volume (cf)				
B1	783,028	17.98	0.02809	0%	0.000	0%	0.000	15%	2.696	85%	15.279	2.135	4.892	74.54	213081.005
<b>Total</b>	<b>783,028.00</b>	<b>17.976</b>	<b>0.02809</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>15.279</b>	<b>2.135</b>	<b>4.892</b>	<b>74.54</b>	<b>213081.01</b>

**Retention Pond Volume Calculation**

Top Elevation	5,297.50	Ft.
Top Area	49,764	Sq. Ft.
Bottom Elevation	5,288.50	Ft.
Bottom Area	8,400	Sq. Ft.
Total Volume	261,738.00	Cubic Ft.
Max Water Elevation	5,296.50	Ft.
Max Water Elevation Area	44,880.00	Sq. Ft.
Max Water Volume	213,120.00	Cubic Ft.
Required Volume	213,081.01	Cubic Ft.
Design Free Board	1.00	Ft.

Note: Existing Pond Volume = 100,431 Cubic Ft.

**Pipe Sizing Calculation**

24" Conc Pipe Max Flow	16.00	CFS
12" PVC Pipe Max Flow	5.15	CFS
Combined Max Flow	21.15	CFS
30" HDPE Pipe Max Flow	28.10	CFS
Flow Required	21.15	CFS

Note: Previous Drainage Reports Q16DA5000A and Q16DA5000B indicate that the existing storm drain pipe system is flowing at max capacity.  
Note: See pipe capacity charts for additional pipe information.



\\TWNASVZ\_Drive\2023\2023103\_Mesa Del Sol Innovation Park\_Ponding.dwg Construction\2023103\_BASINS.dwg Feb 09, 2024 - 9:41 am

**24" CONCRETE PIPE CAPACITY**

Project Description	
Friction Method	Manning Formula
Solve For	Discharge
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.005 ft/ft
Normal Depth	24.0 in
Diameter	24.0 in
Discharge	16.00 cfs

v.1 H:1

**12" PVC PIPE CAPACITY**

Project Description	
Friction Method	Manning Formula
Solve For	Discharge
Input Data	
Roughness Coefficient	0.009
Channel Slope	0.010 ft/ft
Normal Depth	12.0 in
Diameter	12.0 in
Discharge	5.15 cfs

v.1 H:1

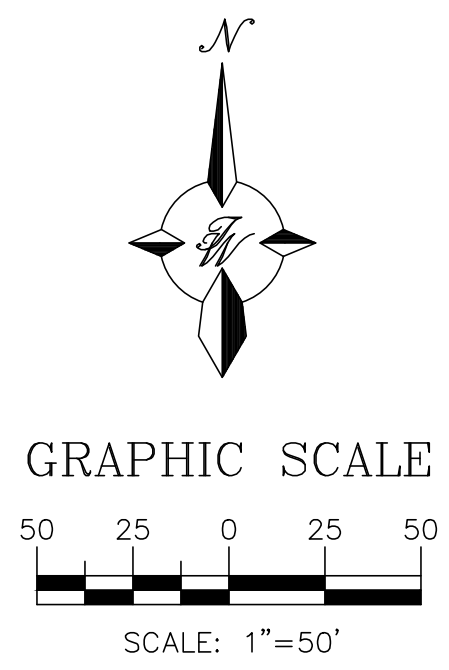
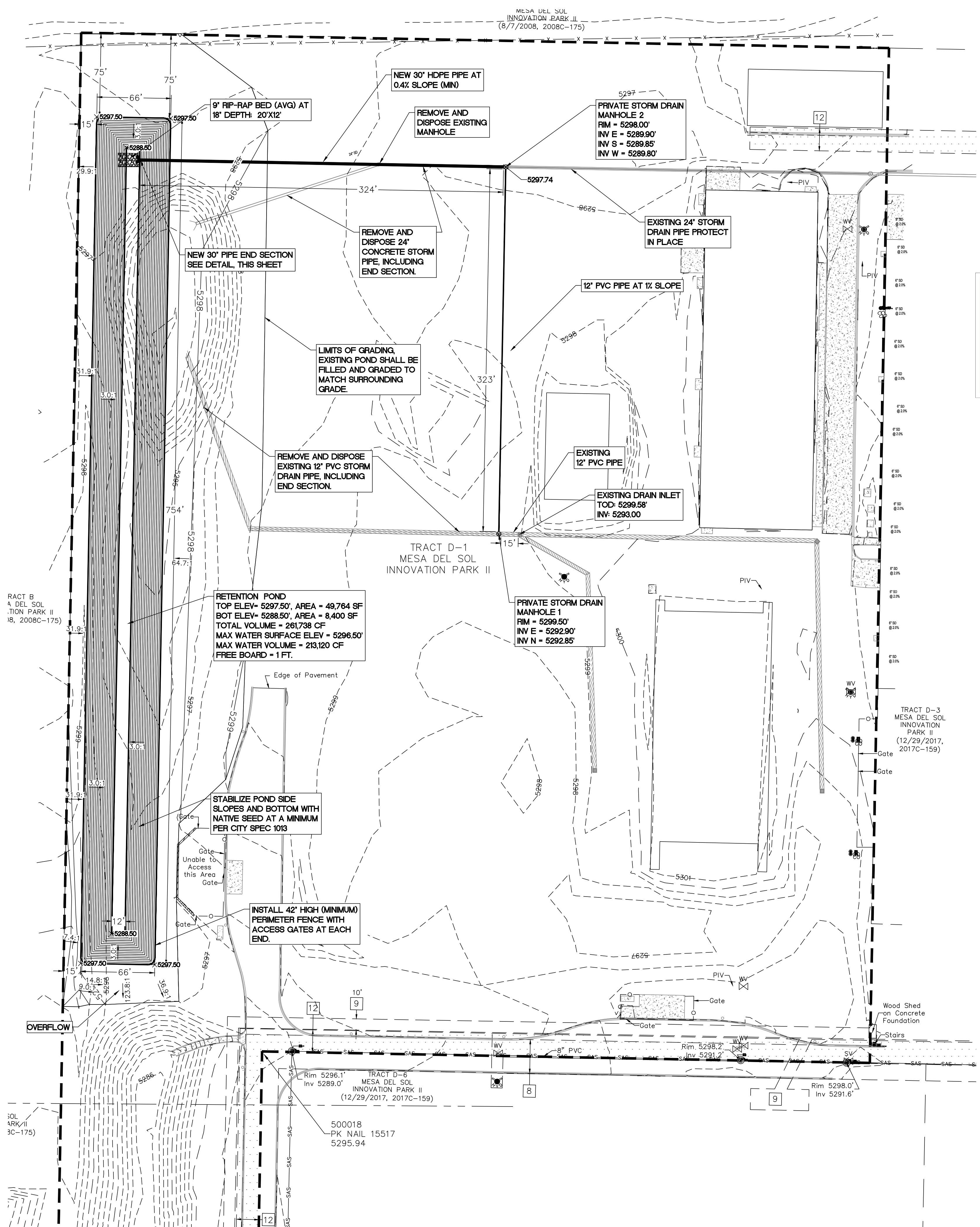
**30" HDPE PIPE CAPACITY**

Project Description	
Friction Method	Manning Formula
Solve For	Discharge
Input Data	
Roughness Coefficient	0.012
Channel Slope	0.004 ft/ft
Normal Depth	30.0 in
Diameter	30.0 in
Discharge	28.10 cfs

v.1 H:1

	<b>KAIROS FULLY DEVELOPED POND</b> <b>ALBUQUERQUE, NM</b> <b>GRADING AND DRAINAGE</b> <b>BASIN MAP</b>	DRAWN BY BF DATE 02/06/2024 2023103_BASINS
	 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrawestllc.com	SHEET # <b>GR-0</b> JOB # 2023103

\\TWNAS\Z\_Drive\2023\2023103 Mesa Del Sol Innovation Park Ponding.dwg Construction\2023103\_GRB.dwg Feb 09, 2024 - 9:43am



City of Albuquerque  
 Planning Department  
 Development Review Services  
**HYDROLOGY SECTION**  
**APPROVED**  
 DATE: 2/13/2024  
 BY: [Signature]  
 HydroTrans # R16DA5000D

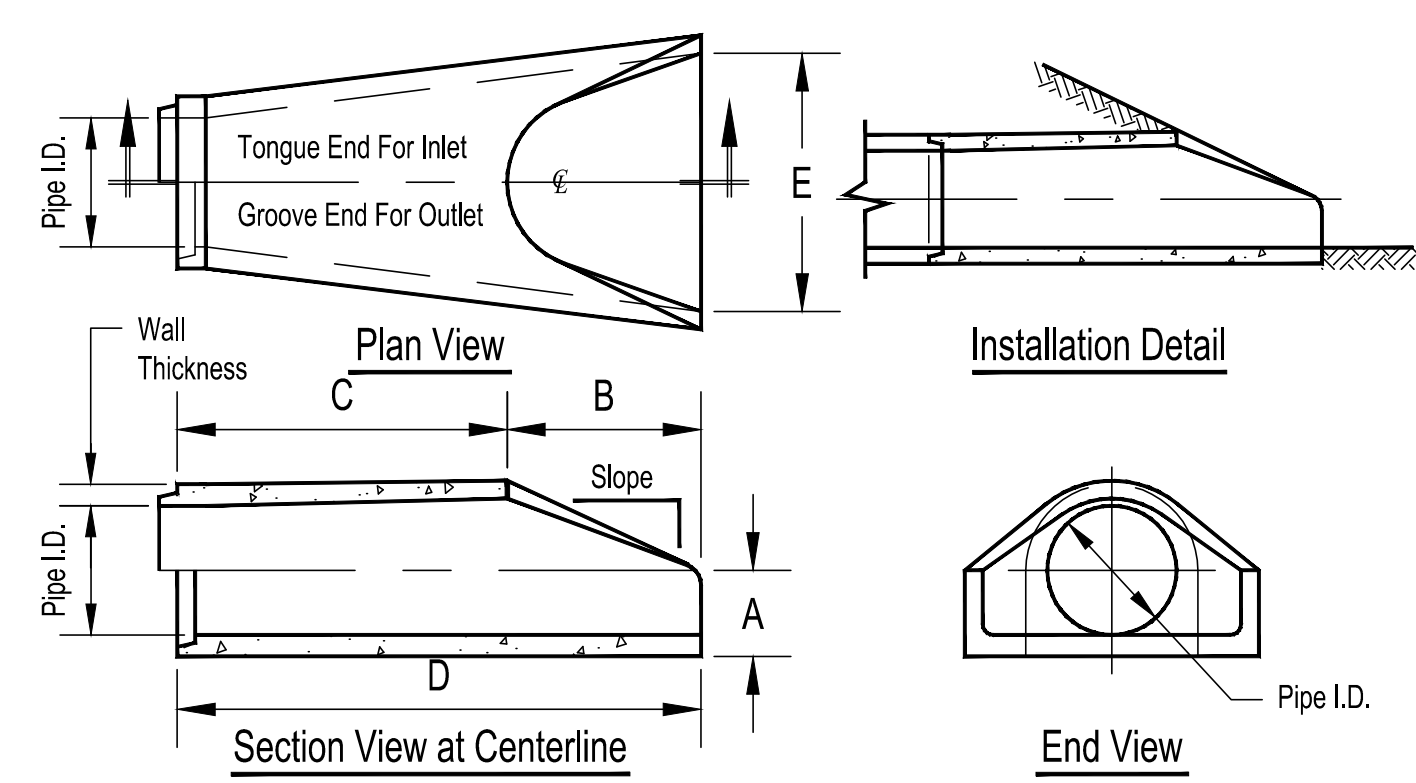
**LEGEND**

	CURB & GUTTER	x 5048.25	SPOT ELEVATION
	BOUNDARY LINE		FLOW ARROW
	EASEMENT		EXISTING CONCRETE STORM DRAIN PIPE
	BUILDING		EXISTING PVC STORM DRAIN PIPE
	SIDEWALK/CONCRETE		EXISTING CONTOUR MAJOR
	STORM DRAIN	-5010-	EXISTING CONTOUR MINOR
	CONTOUR MAJOR		
	CONTOUR MINOR		

**CAUTION**  
 ALL EXISTING UTILITIES/TOPOGRAPHY 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.

- EROSION CONTROL NOTES:**
- CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.
  - CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING ROADWAY.
  - REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
  - ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF ANY PROJECT.

**Flared End Section  
 12" - 72" Diameter Pipe**



Pipe Inner Diameter (inches)	Wall Thickness (inches)	A (inches)	B (inches)	C (inches)	D (inches)	E (inches)	Slope
12	2	4	24	48 7/8	72 7/8	30	3:1
15	2 1/4	6	27	46	73	30	3:1
18	2 1/2	9	27	46	73	36	3:1
24	3	9 1/2	43 1/2	30	73 1/2	48	3:1
30	3 1/2	12	54	19 3/4	73 3/4	60	3:1
36	4	15	63	34 3/4	97 3/4	72	3:1
42	4 1/2	21	63	35	98	78	3:1
48	5	24	72	26	98	84	3:1
54	5 1/2	27	65	35	100	90	2:1
60	6	30	60	39	99	96	2:1
66	6 1/2	32	78	21	99	102	2:1
72	7	34	78	21	99	108	2:1

- Notes:  
 1. Produced to meet ASTM specifications.  
 2. Contact a Concrete Pipe Division representative for details not listed on this sheet.

**FLARED END SECTION DETAIL**  
 NTS

	ENGINEER'S SEAL RONALD R. BOHANNAN NEW MEXICO 7868 PROFESSIONAL ENGINEER	KAIROS FULLY DEVELOPED POND ALBUQUERQUE, NM <b>GRADING &amp; DRAINAGE PLAN</b>	DRAWN BY BF DATE 02/06/2024 2023103_GRB
	TIERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrawestllc.com	SHEET # <b>GR-1</b> JOB # 2023103	