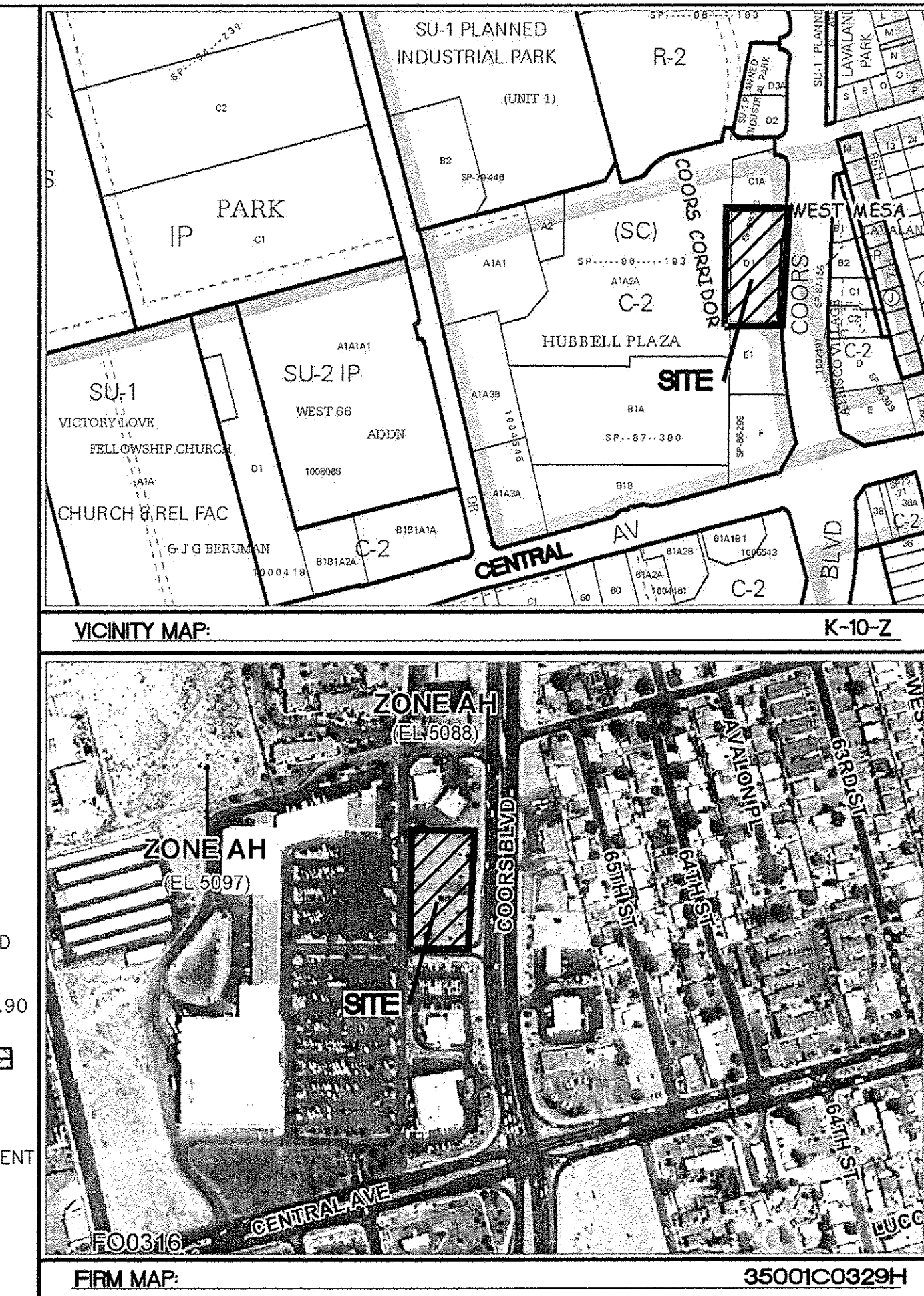
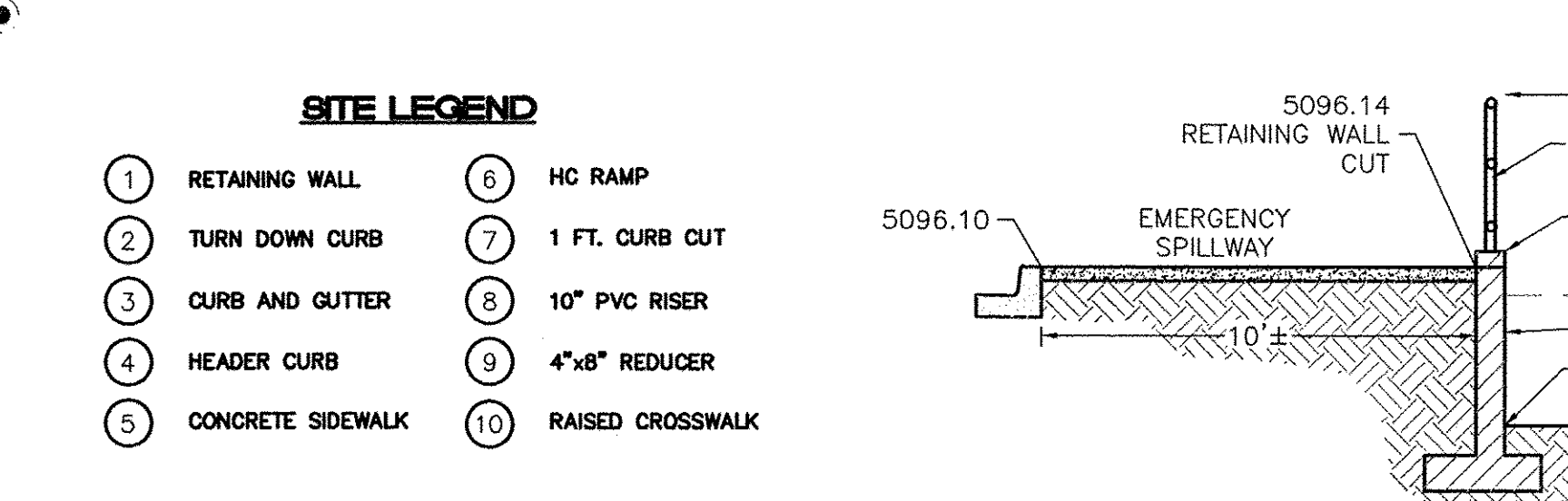
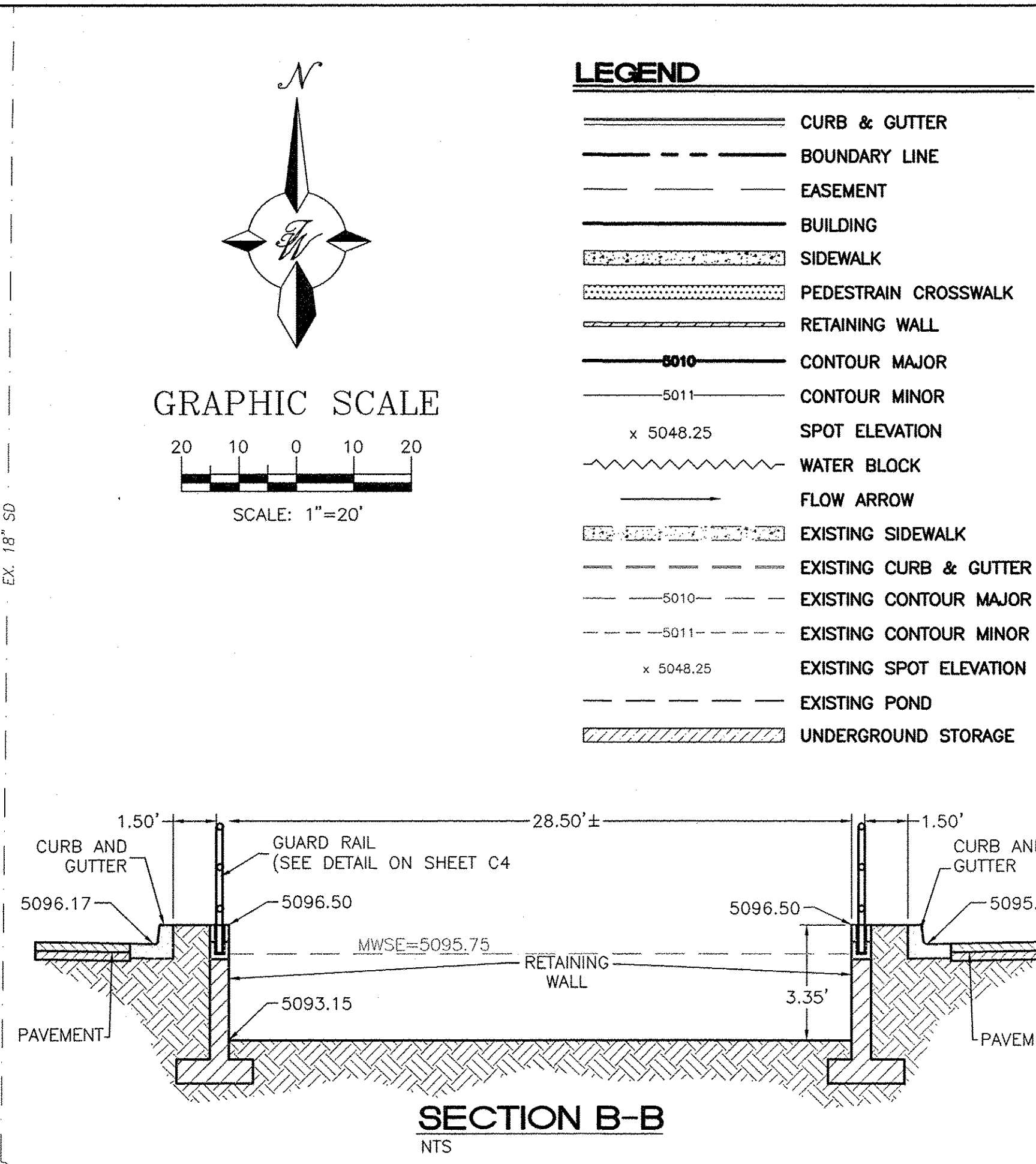
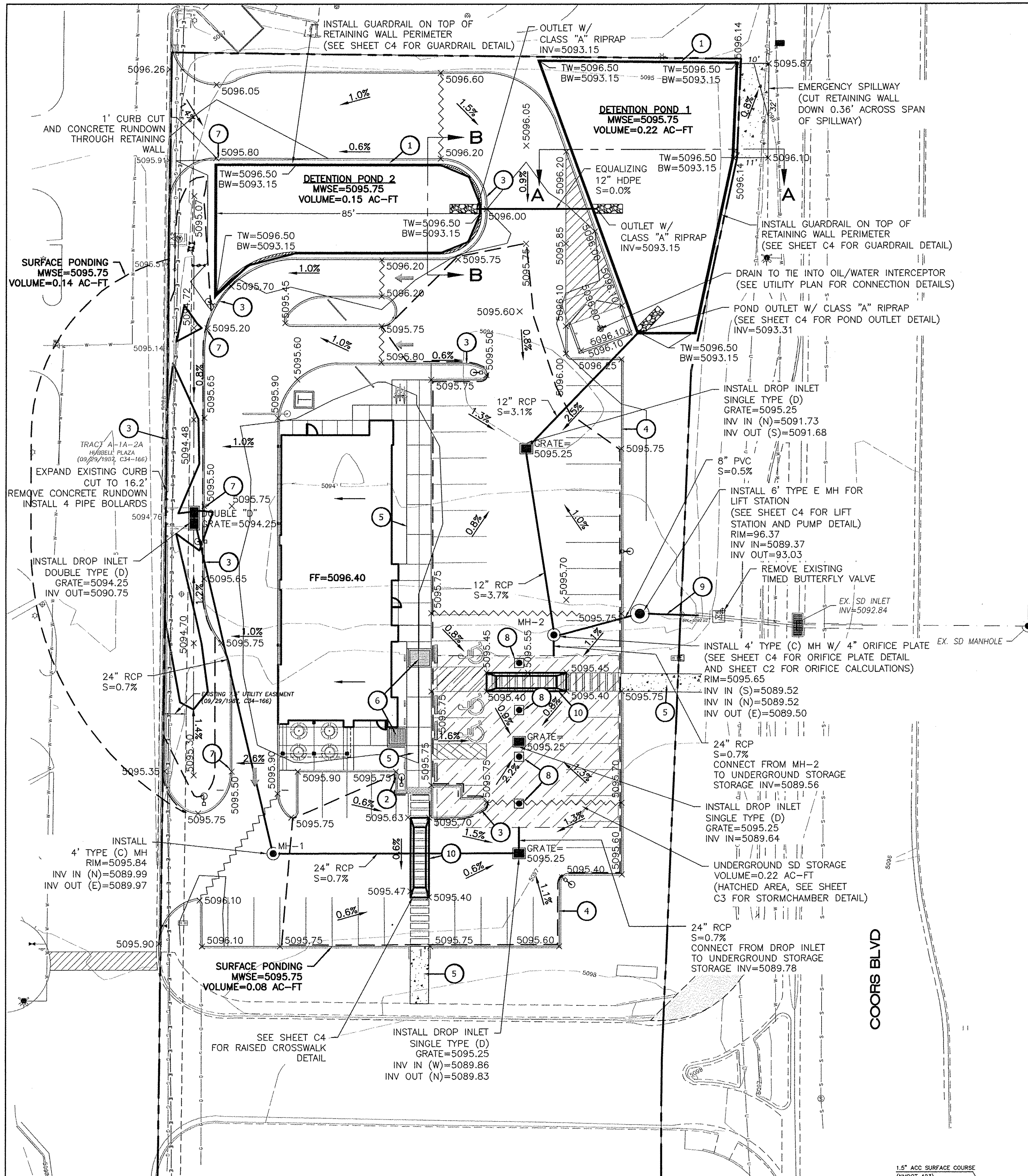




CAUTION:
ALL EXISTING UTILITIES SHOWN WERE OBTAINED FROM RESEARCH, AS-BUILTS, SURVEYS OR INFORMATION PROVIDED BY OTHERS. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO AND INCLUDING ANY EXCAVATION, TO DETERMINE THE ACTUAL LOCATION OF UTILITIES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

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 RIGHT-OF-WAY.
- 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.

STANDARD DUTY ASPHALT PAVING

1.5" ACC SURFACE COURSE (NMOT 423)
1.5" ACC BINDER COURSE (NMOT 423)
2" AGGREGATE BASE COURSE (NMOT 303)
10" COMPACTED SUBGRADE

Introduction

The purpose of this submittal is to provide a drainage management plan for the proposed Freddy's restaurant located near the intersection of Coors Blvd. and Central Ave. in Albuquerque, New Mexico. The site contains approximately 1.45 acres and is located within the Hubbell Plaza Shopping Center. The site lies outside of any flood plains (FIRM Map 35001C0329H).

Existing Conditions

The site is part of an approved drainage plan titled "Coors & Central Shopping Center" (K10-D018). The location is tract D-1 within the Hubbell Plaza Shopping Center and is currently a detention pond for 5.4 acres of the shopping center. The site collects all flows from the 5.4 acres via surface flow through a concrete channel located on the west side of the site. The pond holds all flows for a minimum of 2 hours before being discharged through an 8-inch connecting pipe on the east side of the site. A delay timer is used to discharge the pond through the 8-inch pipe towards the back of a catch basin located on Coors Blvd. and into the street storm drain system. Per the approved drainage plan calculations, the pond is designed to hold 30,068 cubic feet of runoff and discharge to the Coors storm drain system at a rate of 1.08 cfs. Flows from the tract directly north are not directed towards the existing pond onsite, these flows are directed north and away from the subject site and have no impact on the drainage.

Proposed Conditions

The subject site will continue to collect all flows from the offsite area of the shopping center and detain in a subsurface system. Two detention ponds (Detention Pond 1 and Detention Pond 2) will act as a singular detention pond system with a 12-inch equalizing pipe connecting the two together. The offsite flows will drain via surface flow through the north driveway aisle and through a curb cut on the west side of the site where the existing concrete channel lies. The offsite flows through the 16 ft curb cut will be collected into a Double D drop inlet that is located in a bio swale on the western side of the site. The offsite flows through the north driveway will be collected in Detention Pond 2. All flows from the west side of the building and directly north of the building will be directed towards the bio swale and into the Double D drop inlet. All other flows from the site will be directed to three Single D drop inlets in the parking lot. The Double D inlet will interconnect via storm drain with the southern Single D inlet and underground storage system. The two detention ponds will interconnect via storm drain with the northernmost Single D inlet and the underground storage system.

As runoff volume increases and fills up the underground storage system completely, the interconnecting storm drains, drop inlets and two detention ponds will act as an equalizing system and allow runoff to be stored in both the detention ponds and on the surface of the parking lot and bio swale. During the 100-year 6-hour storm, the maximum water surface elevation for the detention system is 5095.75. This water surface elevation allows 6 inches of ponding depth in the parking lot and 18 inches of ponding in the bio swale and is below the elevation of the finished floor of the building (5096.40). A 4" cut in the retaining wall of the NE corner of Detention Pond 1 will act as an emergency overflow to Coors Blvd., assuring that the MWSE will never reach the finished floor elevation. The detention system will outflow through a 4" orifice plate located in MH-2 and will be sent to a Grindex pump system to outfall towards the existing catch basin on Coors.

When the maximum water surface elevation is reached; the volume of the detention ponds is 0.37 ac-ft, volume of underground storage is 0.22 ac-ft, and the volume of surface ponding is 0.22 ac-ft. This gives a total storage volume of 0.81 ac-ft equivalent to the required 0.81 ac-ft of storage required for developed runoff. The orifice plate at MH-2 will control the outflow to the required discharge of 1.08 cfs. The detention ponds and underground storage system will capture sediment within the bottom of each respective area; the detention ponds' outlet will be raised 0.16 ft above the pond bottom to retain the first flush volume of the site.

See sheet C2 for DPM calculations, Grate capacity, Pipe capacity, Orifice Calcs, and Basin Map
See sheet C3 for Underground StormChamber configuration and details
See sheet C4 for Pump Details and Site Details

NOTICE TO CONTRACTORS

- AN EXCAVATION/CONSTRUCTION PERMIT WILL BE REQUIRED BEFORE BEGINNING ANY WORK WITHIN CITY RIGHT-OF-WAY.
- 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.
- TWO WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE, 765-1234, FOR LOCATION OF EXISTING UTILITIES.
- 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.
- BACKFILL COMPACTION SHALL BE ACCORDING TO TRAFFIC/STREET USE.
- 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.

APPROVAL	NAME	DATE
INSPECTOR		

ENGINEER'S SEAL

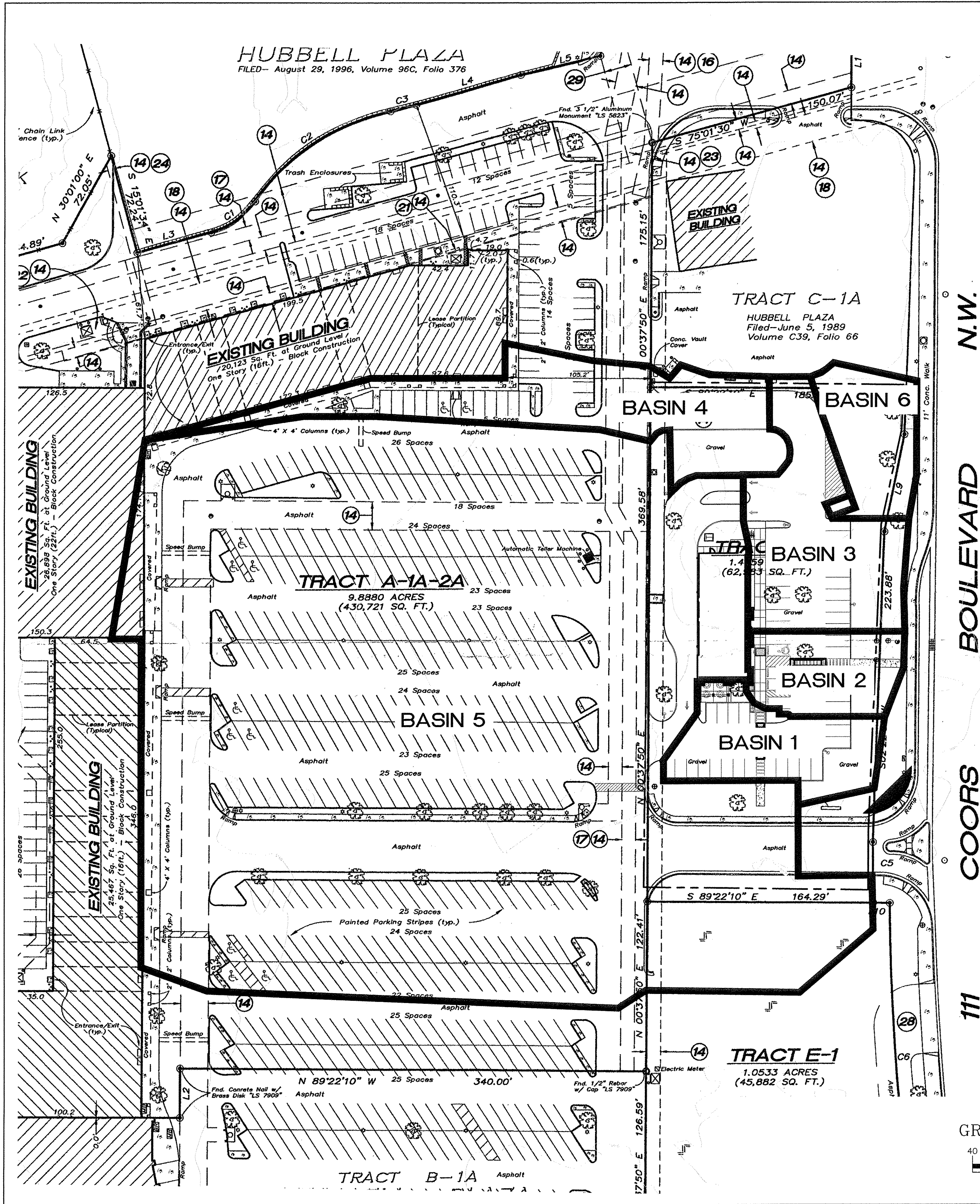
RONALD R. BOHANNAN
NEW MEXICO
P.E. #7868

FREDDY'S AT COORS AND CENTRAL

GRADING AND DRAINAGE PLAN

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

DRAWN BY
DY
DATE
7/07/15
2015036-GRE
SHEET #
C1
JOB #
2015036



DPM Weighted E Method (Zone 1)

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)						
1	235,224.00	5.400	0.00844	0%	0.000	30%	1.620	0%	0.000	70%	3.780	1.580	0.711	19.81	0.934	0.420	12.16
Total	235,224.00	5.400	0.00844										0.711	19.81		0.420	12.16

Proposed 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)						
1	8,908.63	0.205	0.00032	0%	0.000	20%	0.041	0%	0.000	80%	0.164	1.710	0.029	0.80	1.036	0.018	0.50
2	6,297.83	0.145	0.00023	0%	0.000	15%	0.022	0%	0.000	85%	0.123	1.775	0.021	0.58	1.087	0.013	0.37
3	14,479.94	0.332	0.00052	0%	0.000	15%	0.050	0%	0.000	85%	0.283	1.775	0.049	1.34	1.087	0.030	0.85
4	17,152.37	0.394	0.00062	0%	0.000	40%	0.158	0%	0.000	60%	0.236	1.450	0.048	1.35	0.832	0.027	0.80
5	181,825.49	4.174	0.00652	0%	0.000	10%	0.417	0%	0.000	90%	3.757	1.840	0.640	17.26	1.138	0.396	11.17
6	6,559.74	0.151	0.00024	0%	0.000	0%	0.000	0%	0.000	100%	0.151	1.970	0.025	0.66	1.240	0.016	0.44
Total	235,224.00	5.400	0.00844									0.812	21.99		0.500	0.00	

Grate Capacity (Based On Orifice Equation)				
Basin ID	Q Required (CFS)	Grate Type	Q Allow (CFS)	Result
1	0.8	Single D	7.12	Capacity OK
2	0.58	Single D	7.12	Capacity OK
3	1.34	Single D	7.12	Capacity OK
5	17.26	Double D	19.45	Capacity OK

Pipe Capacity (Based on Manning's Equation)				
Invert ID	Q Required (CFS)	Pipe Size	Q Allow (CFS)	Result
Basin 5 Double D Grate	17.26	24" RCP @ 0.7%	20.94	Capacity OK
MH-1	17.26	24" RCP @ 0.7%	20.94	Capacity OK
Basin 1 Single D Grate	18.06	24" RCP @ 0.7%	20.94	Capacity OK
Basin 2 Underground Storage Outlet	18.64	24" RCP @ 0.7%	20.94	Capacity OK
Equalizing Pipe	1.35	12" HDPE @ 0%	5.48	Capacity OK
Basin 6 Pond Inlet	2.01	12" RCP @ 3.1%	6.93	Capacity OK
Basin 3 Single D Grate	4.7	12" RCP @ 3.7%	7.58	Capacity OK

MAXIMUM CAPACITY OF EQUALIZING 12" HDPE

Orifice Equation: $Q = CA \sqrt{2gh}$

$C = 0.6$
 $A = \text{Orifice Area (0.785 ft}^2\text{)}$
 $G = 32.2 \text{ ft/s}^2$
 $H = \text{Depth of water above center of orifice (2.1 ft)}$

$Q = \text{Flow (cfs)}$
 $Q = 0.6 * 0.785 * \sqrt{2 * 32.2 * 2.1}$
Maximum Q = 5.48 cfs

CAPACITY OF SINGLE D GRATES

$L = 40" - 2(2" \text{ ends}) - 7(1/2" \text{ middle bars})$
 $= 32 1/2"$
 $= 2.7083'$

$W = 25" - 13(1/2" \text{ middle bars})$
 $= 18.5"$
 $= 1.54'$

Area = $2.7083' \times 1.54'$
 $= 18 \text{ ft}^2$

Effective Area = $4.18 - 4.18 (0.5 \text{ clogging factor})$
 $= 2.09 \text{ ft}^2 \text{ at the grate}$

Orifice Equation:
 $Q = CA \sqrt{2gh}$
 $Q = 0.6 * 2.09 * \sqrt{2 * 32.2 * 0.5}$
 $Q = 7.12 \text{ cfs}$

CAPACITY OF DOUBLE D GRATE

$L = 80" - 2(2" \text{ ends}) - 14(1/2" \text{ middle bars}) - 6" \text{ (center piece)}$
 $= 63"$
 $= 5.25'$

$W = 25" - 13(1/2" \text{ middle bars})$
 $= 18.5"$
 $= 1.54'$

Area = $5.25' \times 1.54'$
 $= 8.09 \text{ ft}^2$

Effective Area = $8.09 - 8.09 (0.5 \text{ clogging factor})$
 $= 4.04 \text{ ft}^2 \text{ at the grate}$

Orifice Equation:
 $Q = CA \sqrt{2gh}$
 $Q = 0.6 * 4.04 * \sqrt{2 * 32.2 * 1.0}$
 $Q = 19.45 \text{ cfs}$

CURB CUT CAPACITY CALCULATIONS
OFFSITE FLOWS FROM SHOPPING CENTER TO DOUBLE D INLET

Use weir equation:
 $Q = CL(H)^{3/2}$
 $Q = \text{discharge (16.77 cfs for offsite flows of Basin 5)}$
 $C = \text{coefficient of discharge (2.95)}$
 $L = \text{Length of curb cut}$
 $H = \text{Height of curb cut (0.5 ft)}$

$16.77 = 2.95 * L * (0.5)^{3/2}$
 $16.77 = 1.04 * L$
 $L = 16.13 \text{ ft, minimum curb cut length}$

CURB CUT CAPACITY CALCULATIONS
ONSITE FLOWS FROM WEST SIDE OF SITE TO DOUBLE D INLET

Use weir equation:
 $Q = CL(H)^{3/2}$
 $Q = \text{discharge (0.85 cfs for on-site flows of Basin 5)}$
 $C = \text{coefficient of discharge (2.95)}$
 $L = \text{Length of curb cut}$
 $H = \text{Height of curb cut (0.5 ft)}$

$0.85 = 2.95 * L * (0.5)^{3/2}$
 $0.85 = 1.04 * L$
 $L = 0.82 \text{ ft, minimum curb cut length}$

CURB CUT CAPACITY CALCULATIONS
ONSITE/OFFSITE FLOWS TO CURB CUT ENTERING DETENTION POND 2

Use weir equation:
 $Q = CL(H)^{3/2}$
 $Q = \text{discharge (1.22 cfs for flows from Basin 4, not including pond area)}$
 $C = \text{coefficient of discharge (2.95)}$
 $L = \text{Length of curb cut}$
 $H = \text{Height of curb cut (0.98 ft)}$

$1.22 = 2.95 * L * (0.98)^{3/2}$
 $1.22 = 2.86 * L$
 $L = 0.43 \text{ ft, minimum curb cut length}$

FIRST FLUSH VOLUME RETENTION

Depth to be retained = $0.44'$ per city ordinance
Initial abstractions = $0.1'$
Total depth = $0.44' - 0.1' = 0.34' = 0.02833 \text{ ft}$
Total impervious area = 33156.97 ft^2

Total volume = $33156.97 * 0.02833 = 939.34 \text{ ft}^3$

Retain first flush in north detention pond:
Pond Area = 6179 ft^2
Depth to retain = $939.34/6179 = 0.16 \text{ ft}$

STORMCHAMBER VOLUME CALCULATION

Total storage volume required = 0.22 ac-ft
Total # of chambers = 69
Volume per chamber = 0.00172 ac-ft
Volume inside chambers = $0.00172 * 69 = 0.11 \text{ ac-ft}$

Area of chambers and surrounding stone = 0.076 ac
Volume of chambers and surrounding stone = $0.076 * 6.33 = 0.48 \text{ ac-ft}$
Volume of only surrounding stone = $0.48 - 0.11 = 0.37 \text{ ac-ft}$
Volume of 30% voids in stone = $0.37 * 0.3 = 0.11 \text{ ac-ft}$

Total storage of volume of Stormchamber system = $0.11 + 0.11 = 0.22 \text{ ac-ft}$

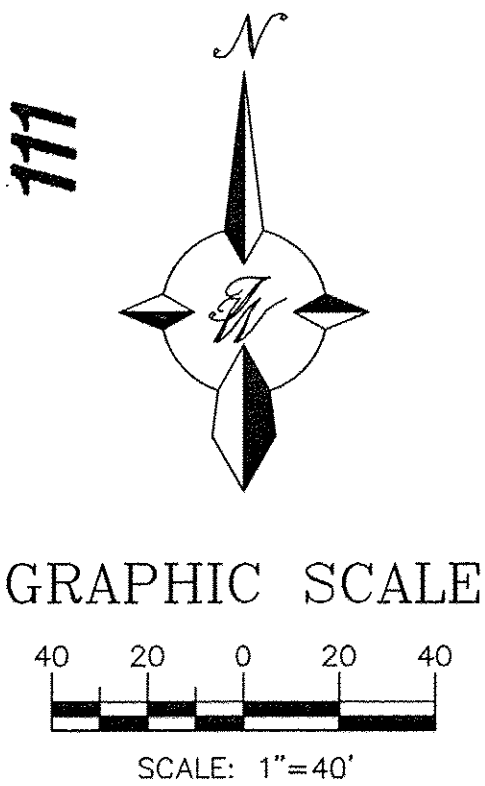
ORIFICE PLATE IN MANHOLE 2 CALCULATIONS

Orifice Equation: $Q = CA \sqrt{2gh}$

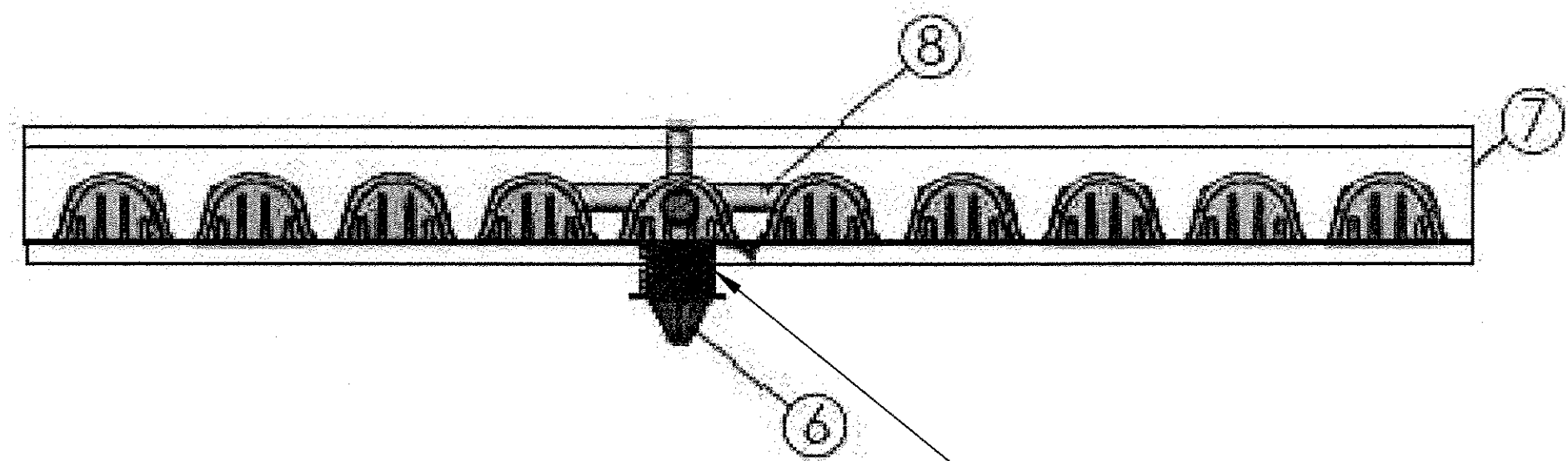
$C = 0.6$
 $A = \text{Orifice Area (ft}^2\text{)}$
 $g = 32.2$
 $H = \text{Depth of water above center of orifice (ft)}$
 $Q = \text{Flow (cfs)}$

$Q = CA \sqrt{2gh}$
 $1.08 = 0.6 * A * \sqrt{2 * 32.2 * 6.25}$
 $1.08 = 12.037 A$
 $A = 0.0897 \text{ ft}^2$

$A = \pi * r^2$
 $0.0897 = \pi * r^2$
 $0.02855 = r^2$
 $r = 0.169 \text{ ft}$
 $r = 2"$
Use 4" dia. orifice plate

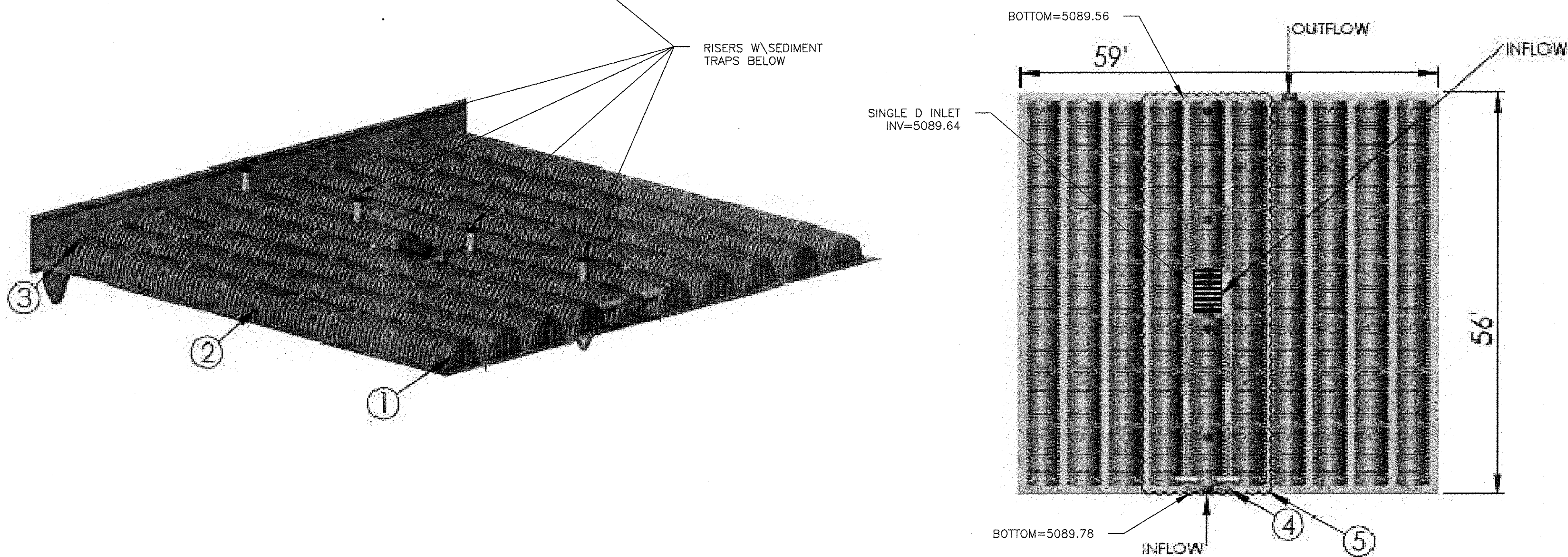


ENGINEER'S SEAL	FREDDY'S AT COORS AND CENTRAL	DRAWN BY BJF
	BASIN MAP AND CALCULATIONS	DATE 07/07/15
	TIERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrowestllc.com	2015036-GRB-DETAILS
RONALD R. BOHANNAN P.E. #7868		SHEET # C2
		JOB # 2015036



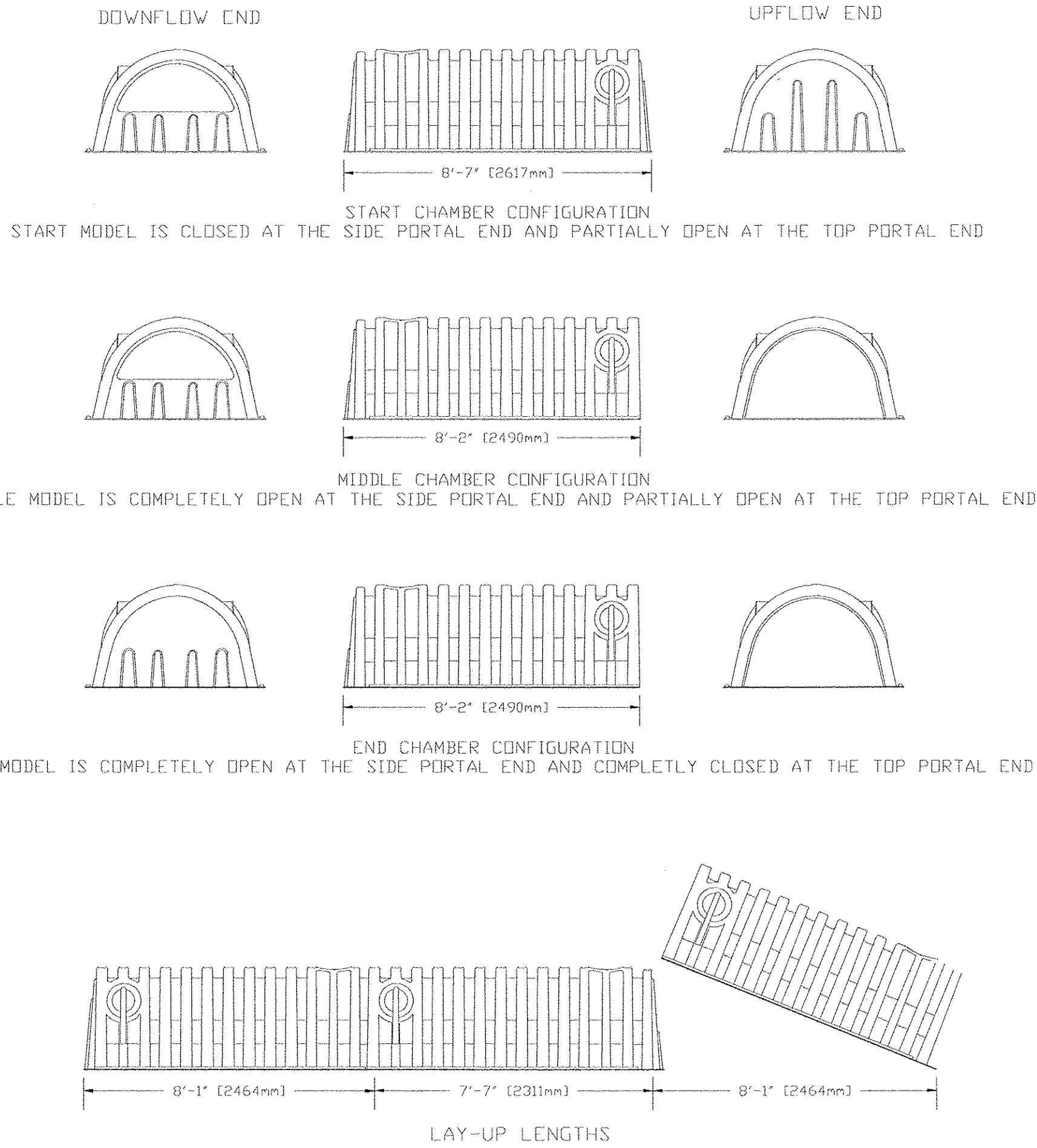
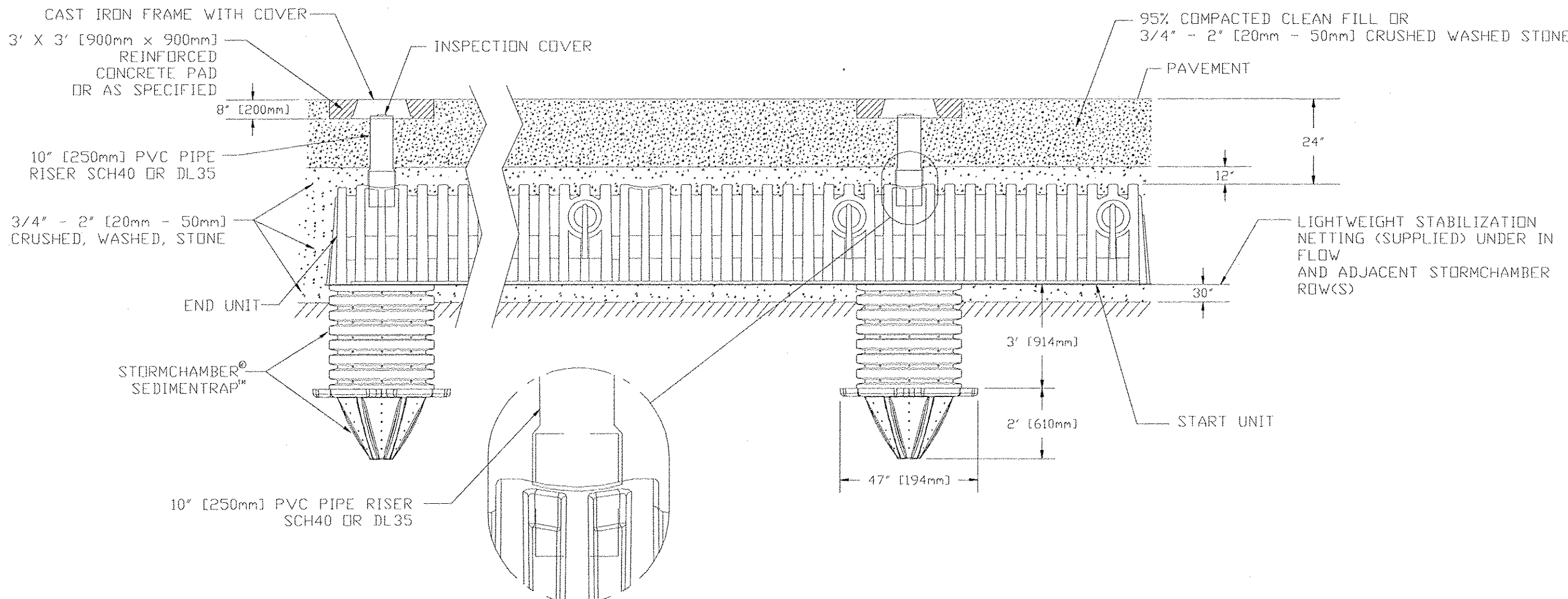
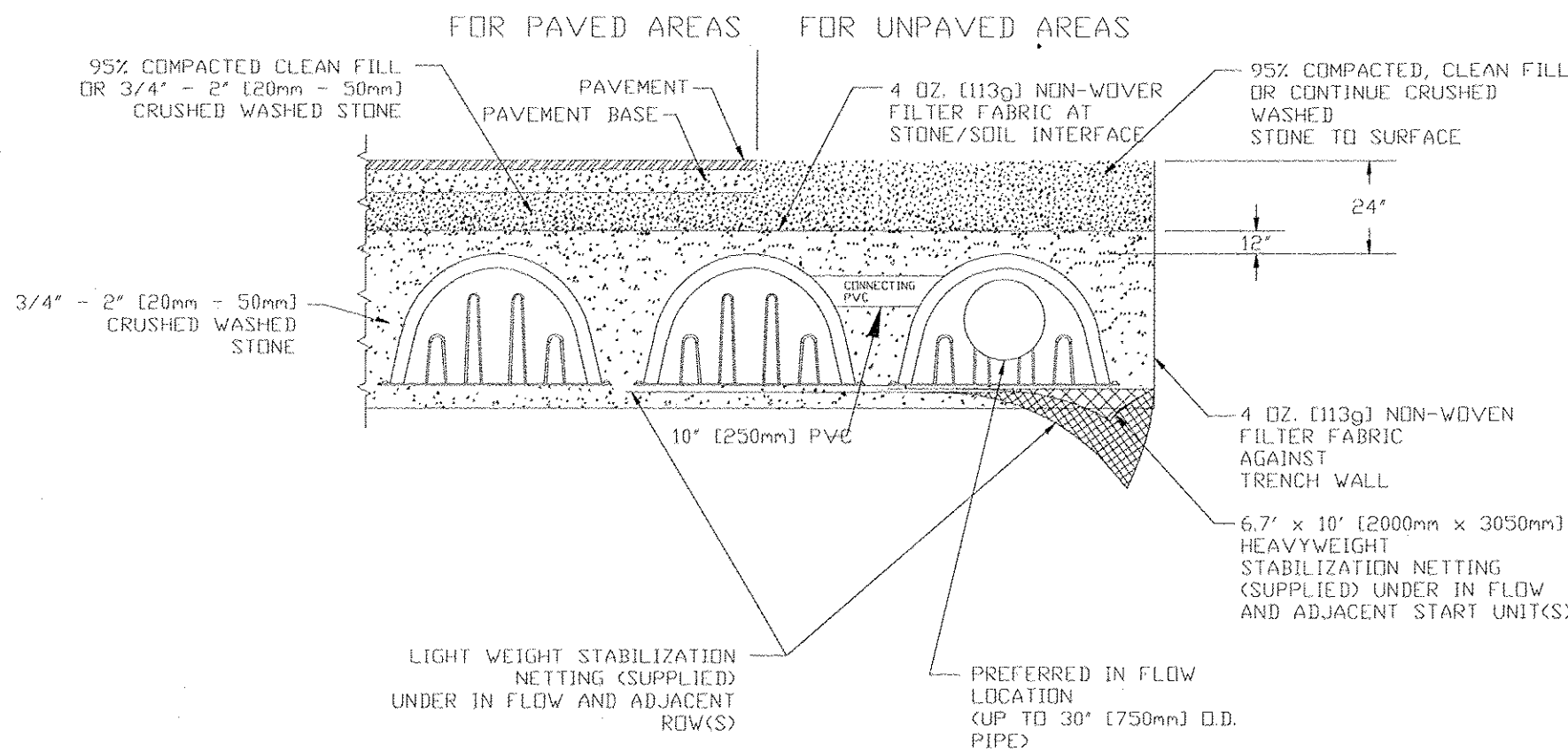
ITEM NO.	STORMCHAMBER PROPOSED LAYOUT DESCRIPTION	QTY
1	START UNITS	11
2	MIDDLE UNITS	47
3	END UNITS	11
4	7'X10' HEAVY DUTY NETTING (SUPPLIED)	3
5	LIGHTWEIGHTS STABILIZATION NETTING (INFLOW AND ADJACENT ROWS) (SUPPLIED)	1
6	10" PVC INSPECTION / CLEAN OUT RISER - (SUPPLIED BY OTHERS) W / FRAME AND LID AND SEDIMENTRAP (SUPPLIED)	4
7	4oz NON WOVEN STORMCHAMBER GEOTEXTILE FILTER FABRIC (SUPPLIED)	2
8	ROW CONNECTING 10" PVC (SUPPLIED BY OTHERS)	2
INSTALLED WITH 12" COVER STONE, 30" BASE STONE, 30% STONE VOID. INSTALLED SYSTEM VOLUME (PERIMETER STONE INCLUDED) = 9583 CF.		

TOTAL # OF CHAMBERS (START, MIDDLE, AND END UNITS) = 69

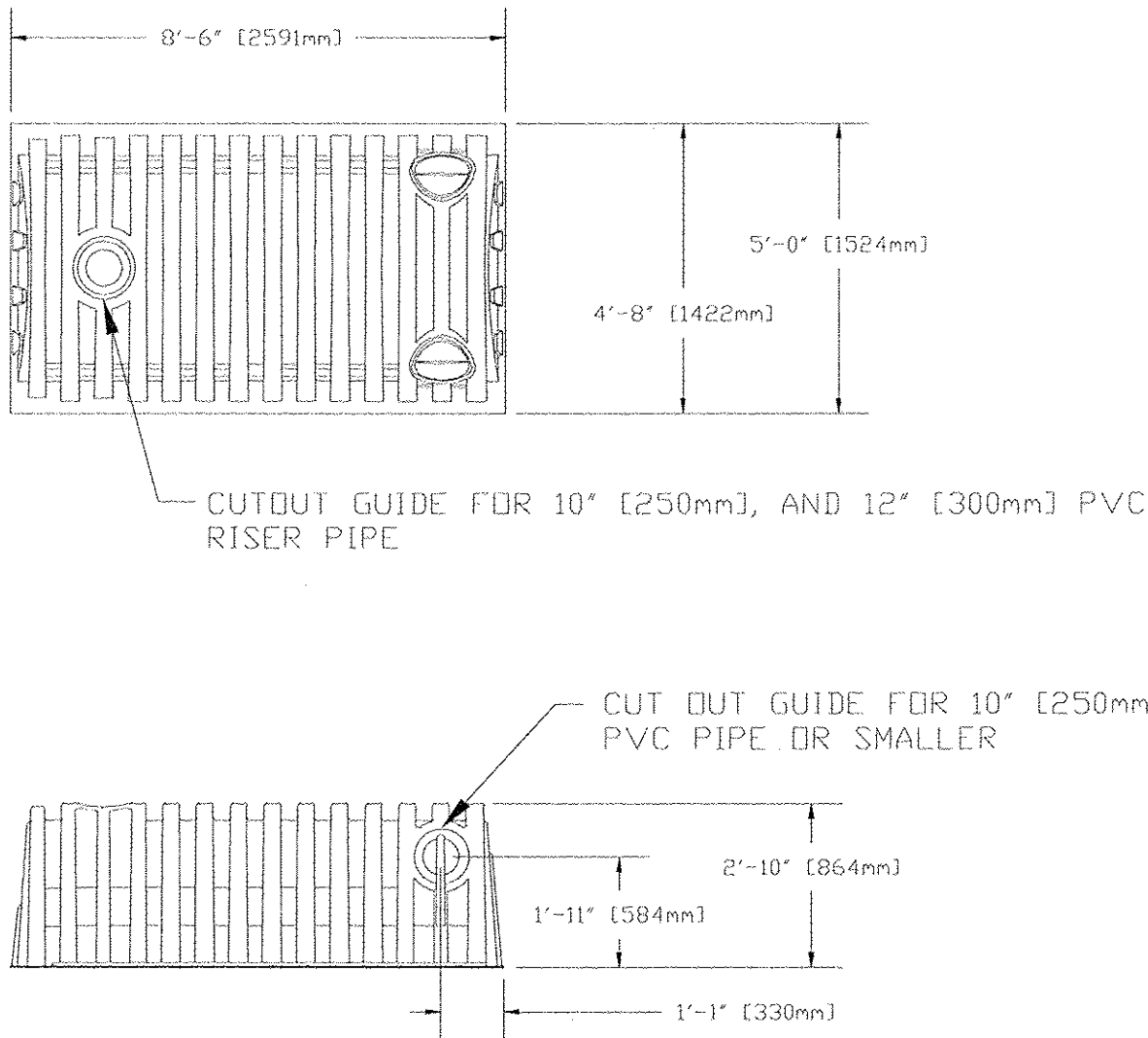


STORMCHAMBER® WITH SEDIMENTRAP™

STORMCHAMBER® TYPICAL CROSS-SECTION INSTALLATION



NOTE: 1. Start chambers (closed at the side portal end) are placed at the inflow end of the rows.
2. Begin placements with Start chambers and end rows with End chambers.
3. Place first rib of next chamber in the row over last rib of previous chamber.



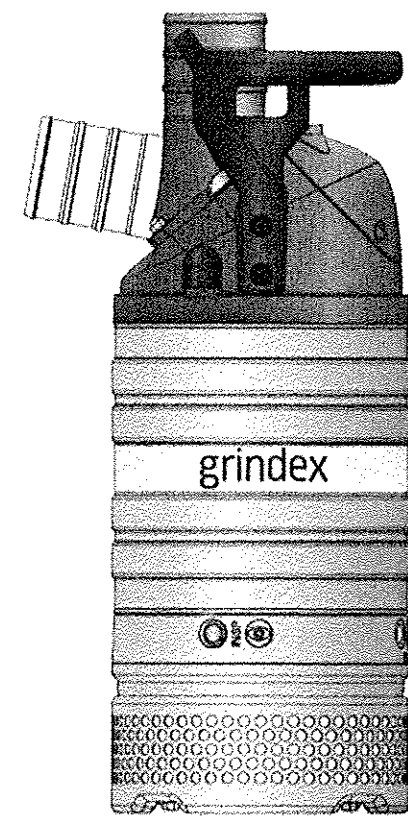
	ENGINEER'S SEAL	FREDDY'S AT COORS AND CENTRAL	DRAWN BY BJF
		STORMCHAMBER STORAGE SYSTEM	DATE 07/07/15
		TIERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrawestllc.com	2015036-GRB-DETAILS
			SHEET # C3
			JOB # 2015036

No: PD603181-INT | Revision 0 2014.02 | 60 Hz

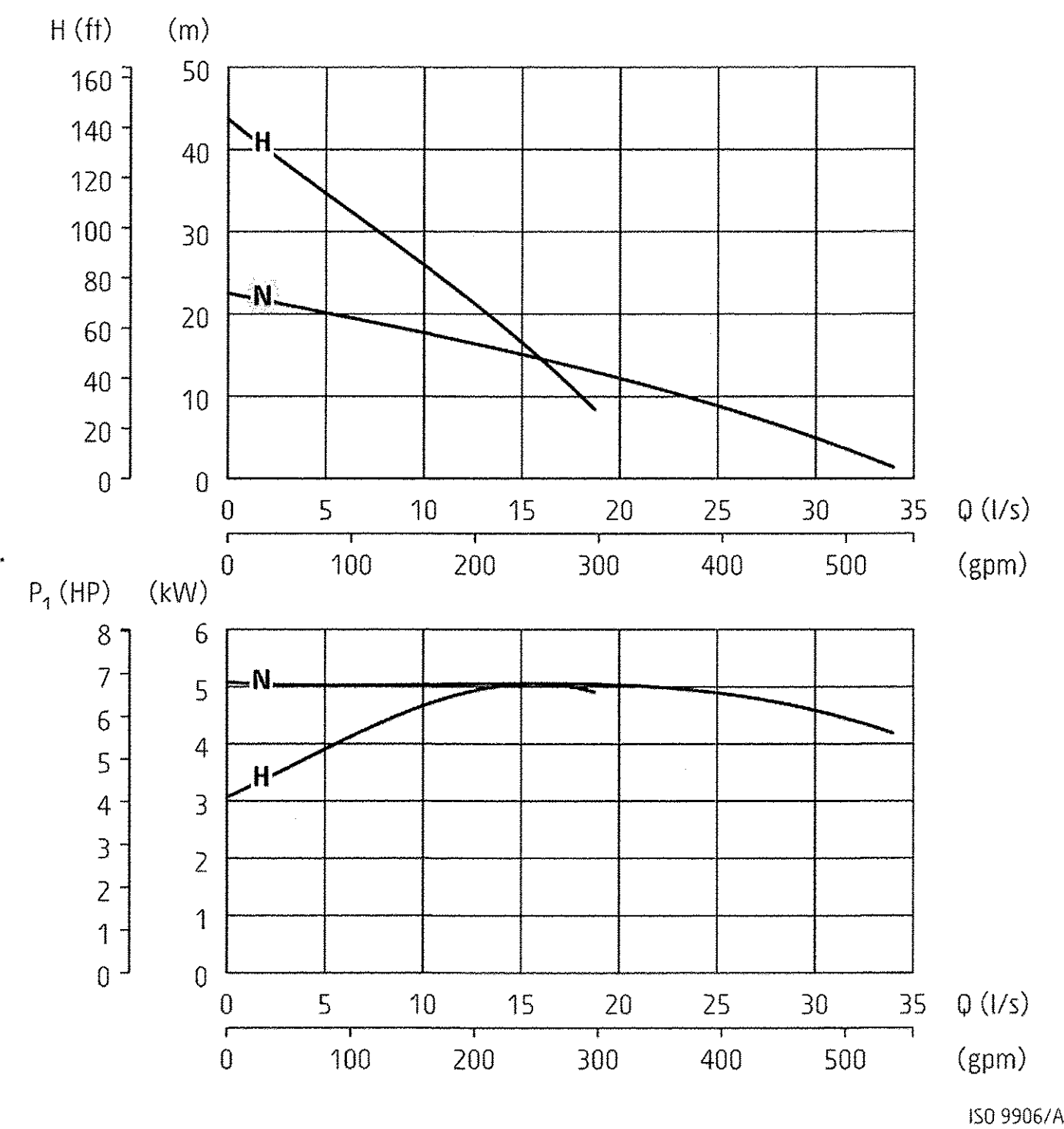
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Minor

Electrical submersible drainage pump



60 Hz	N	H
Discharge connection	4"	3"
Rated power P_2 [kW/HP]	4.4 / 6.0	4.4 / 6.0
Max. power consumption P_1 [kW]	5.2	5.2
Shaft speed [r.p.m.]	3480	3480
Rated current at 230V	15 A	15 A
Rated current at 460V	7.1 A	7.1 A
Rated current at 575V	5.5 A	5.5 A
Solids passage [mm/inch]	10 / 0.39	10 / 0.39
Height [mm/inch]	768 / 30 1/4	768 / 30 1/4
Diameter [mm/inch]	286 / 11 1/4	286 / 11 1/4
Weight [kg/lbs]	50 / 110	50 / 110
Other voltages on request		



Pump types

N: normal pressure
H: high pressure

Classification

Electrical submersible drainage pump
Protection class: IP 68

Electrical motor

Squirrel cage induction motor, insulation class: H (IEC 85)

Motor protection

Phase sequence control, phase failure guard, temperature guard with thermal contacts in the stator opening temperature 140°C (284°F) (= SMART system), air valve

Cable - SubCab

4G2,5mm², length 20 m or 14AWG/4, length 53 ft

Limitations

Max. submersion depth: 20 m (66 ft)
Max. liquid temperature: 40 °C (104 °F)
Allowed pH range: 5 - 8
Maximum liquid density: 1100 kg/m³ (68 lbs/ft³)

Shaft seals

Cartridge seal: pre-assembled double mechanical seal running in an oil compartment
Material lower seal: *silicon carbide - silicon carbide*
Material upper seal: *tungsten carbide - aluminium oxide*

Bearings

Ball bearings with C3 clearance

Discharge connection

3-4" hose, ISO-G or NPT

Materials

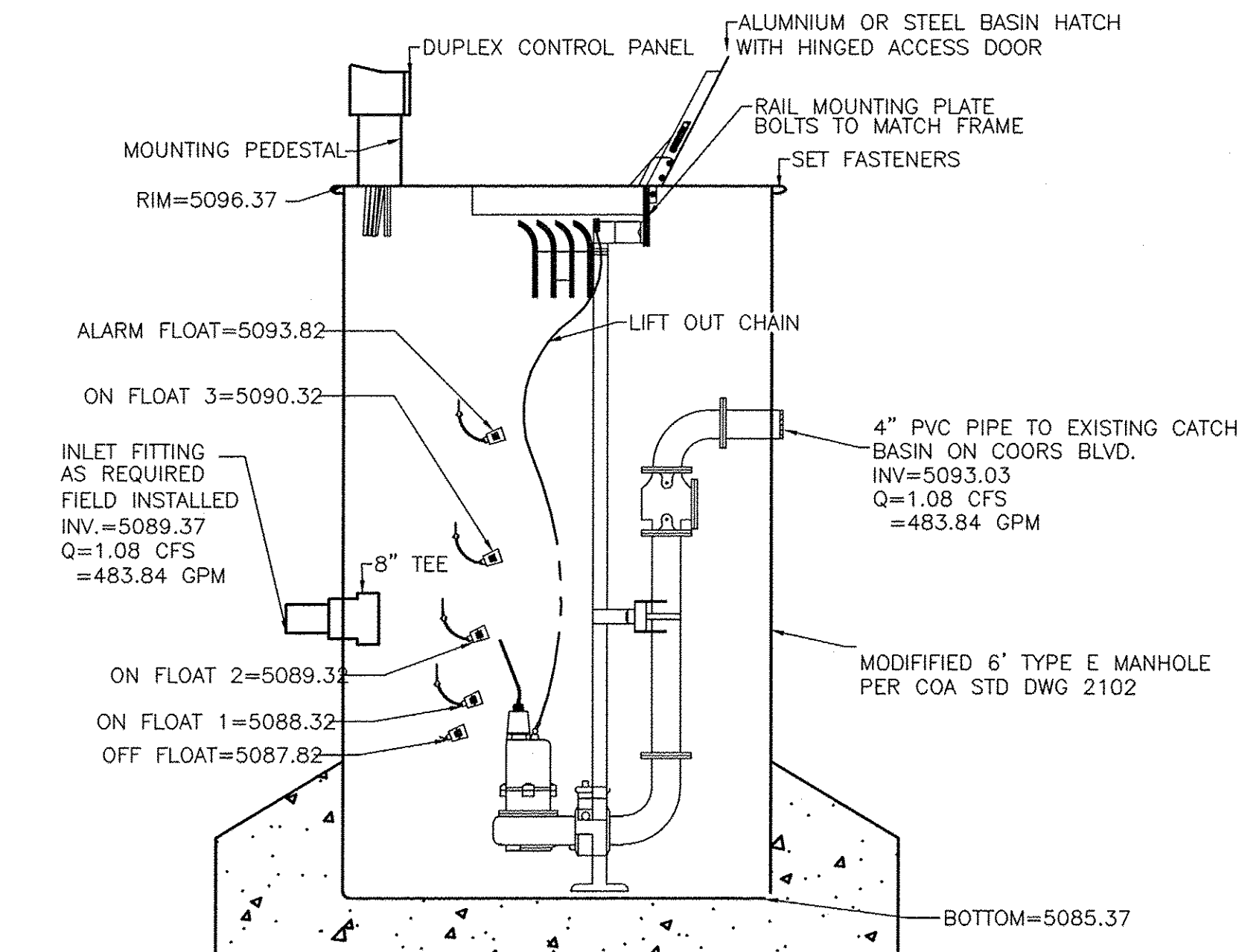
Casted parts: *Aluminium*
Outer casing: *Stainless steel*
Motor shaft: *Stainless steel*
Impeller and suction cover: *Hard-Iron™*
Diffusers: *Nitrile rubber*
Screws and nuts: *Stainless steel*
O-rings: *Nitrile rubber*

Accessories

Level regulator
Zinc anodes
Tandem connection
Low suction collar
Pump raft

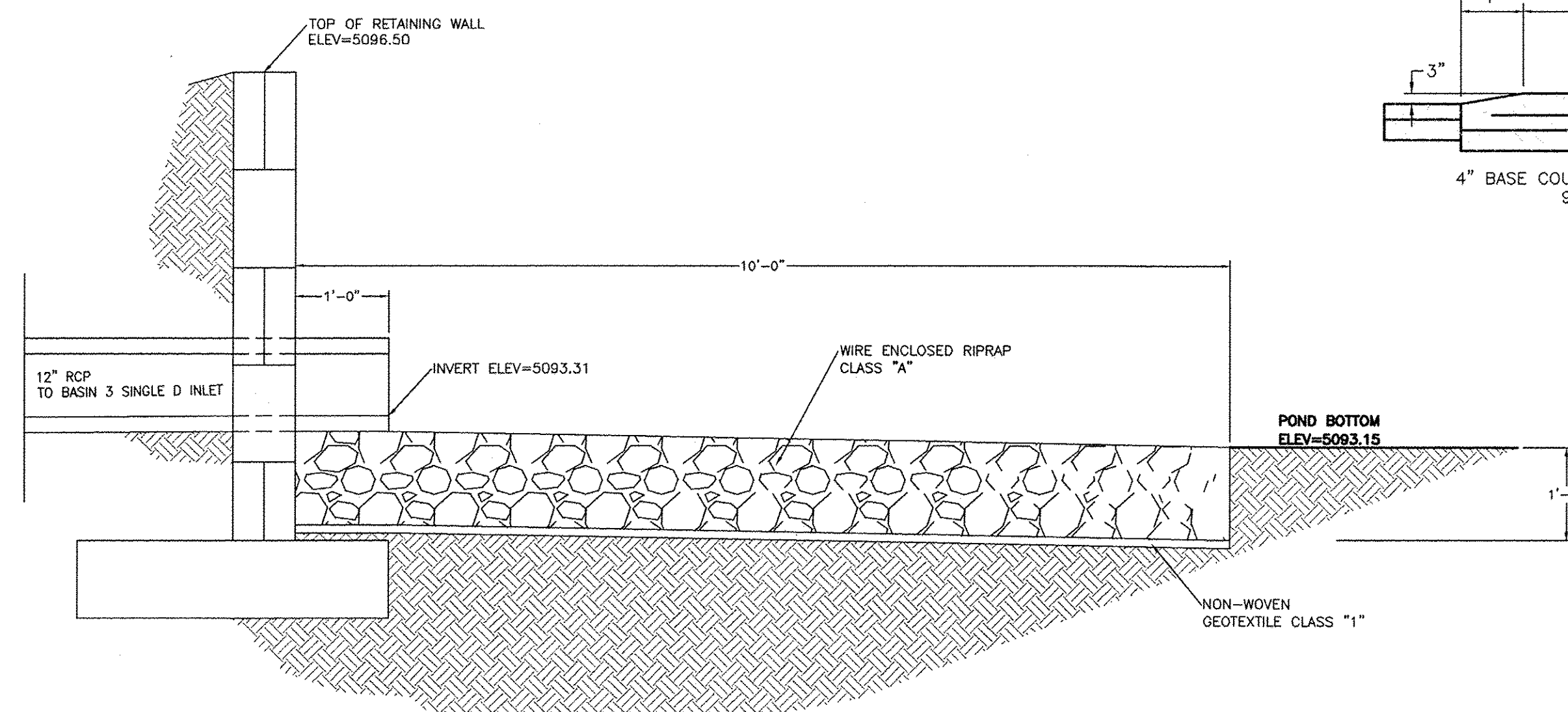
GRINDEX PUMP DETAIL

NTS



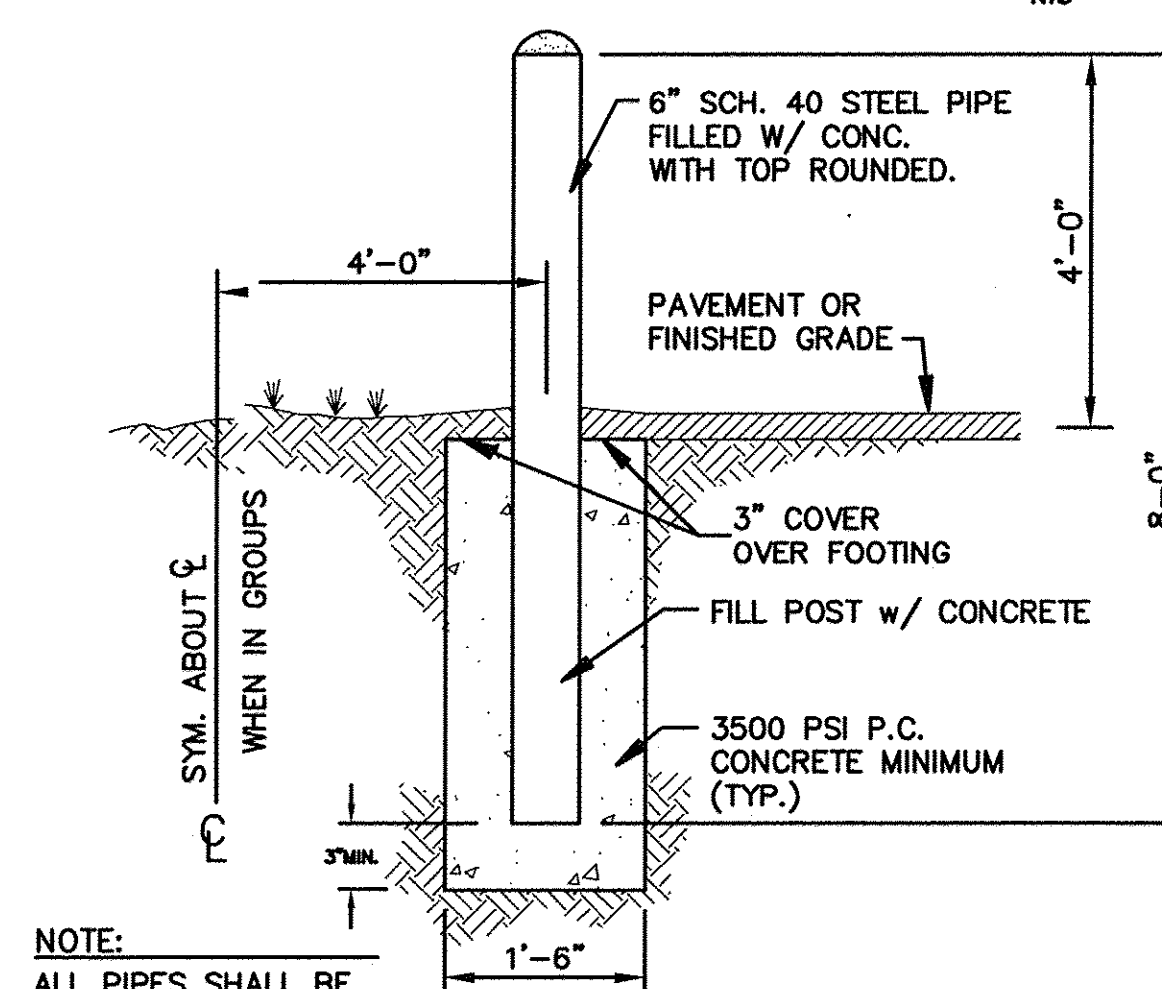
LIFT STATION DETAIL

NTS



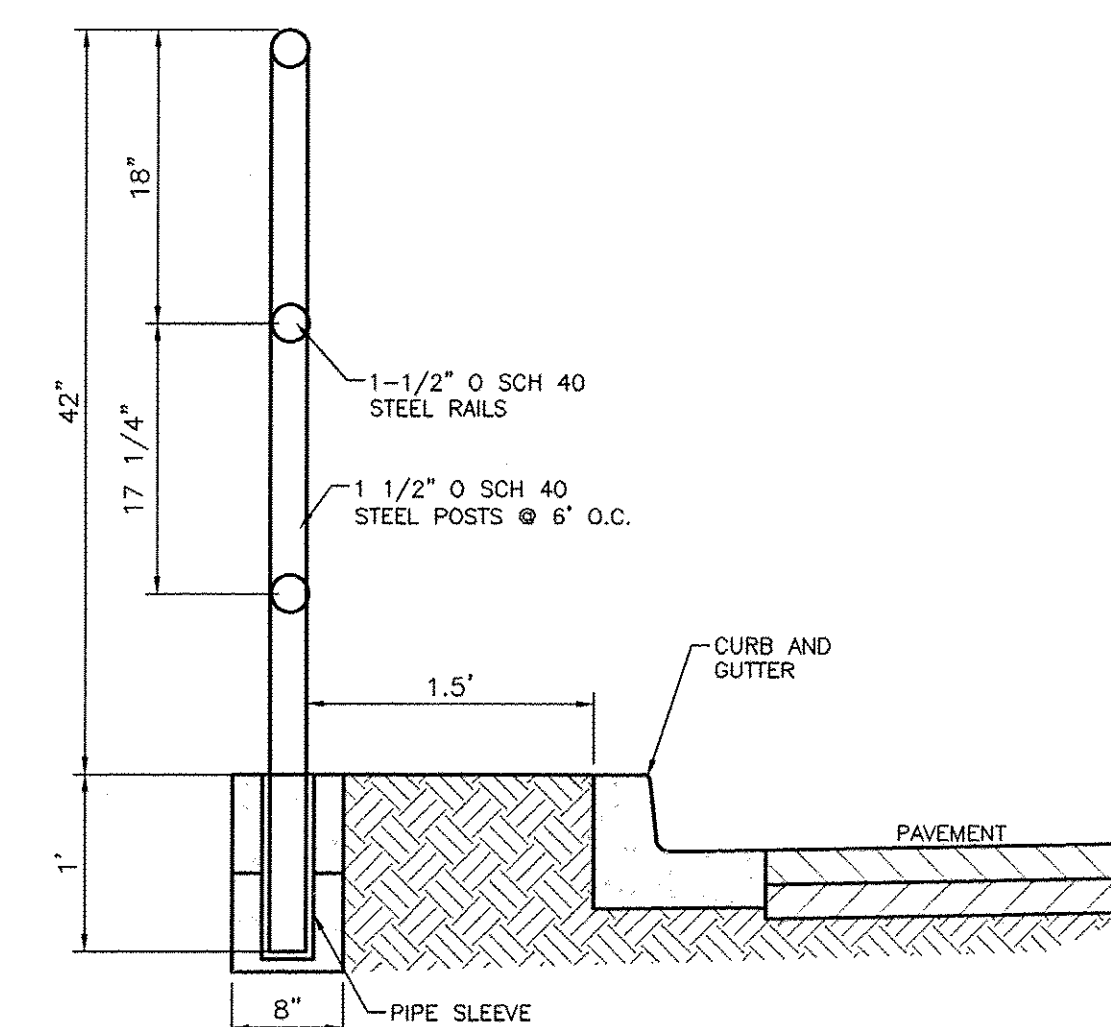
POND OUTLET DETAIL

NTS



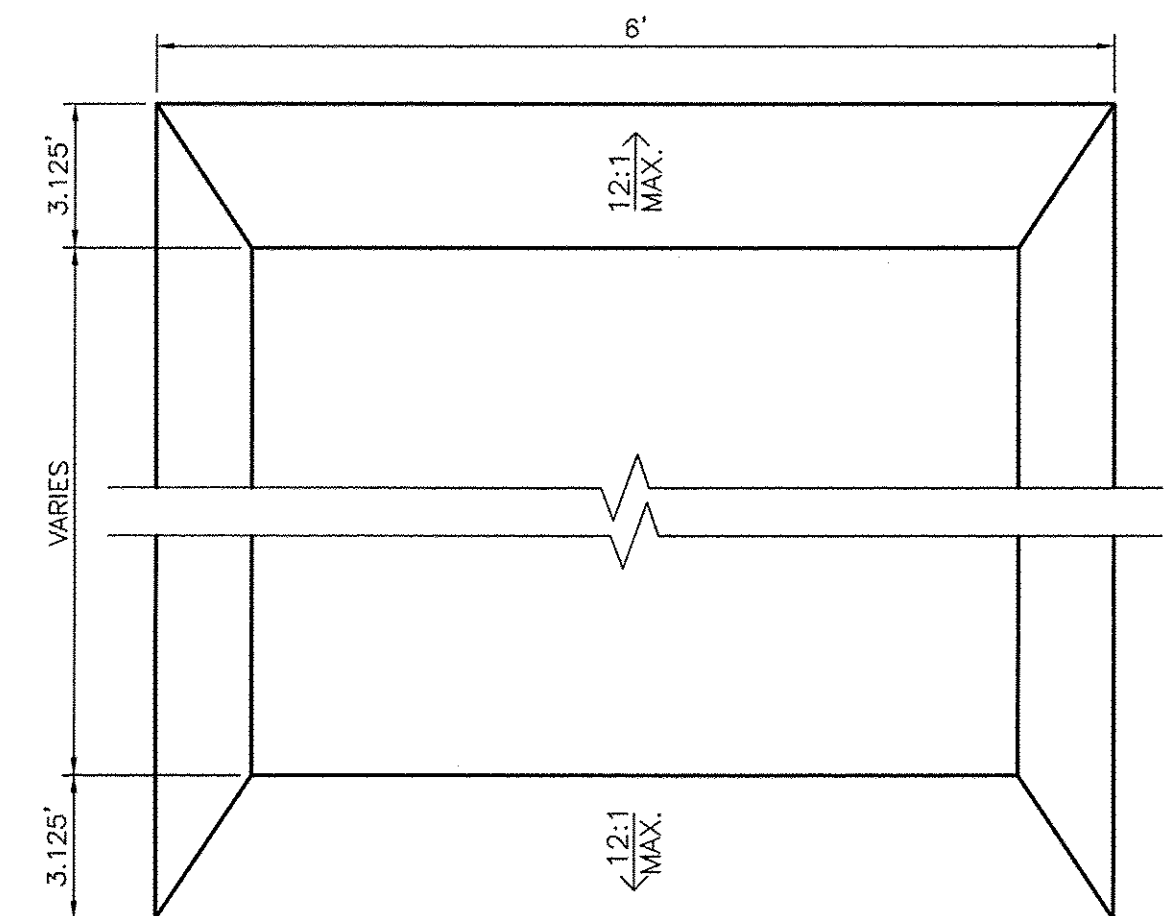
PIPE BOLLARD DETAIL

NTS

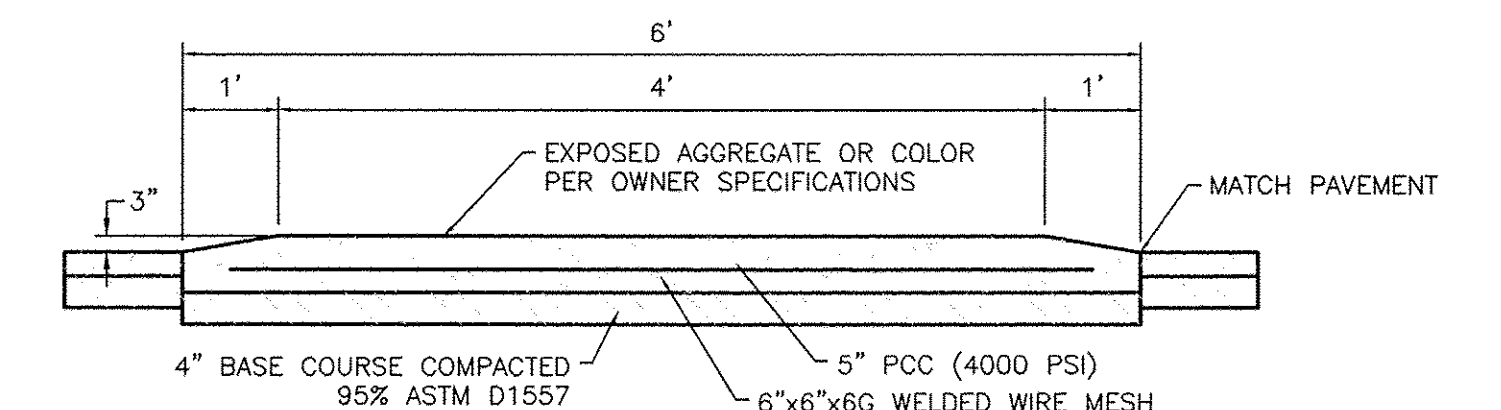


GUARD RAIL DETAIL

NTS

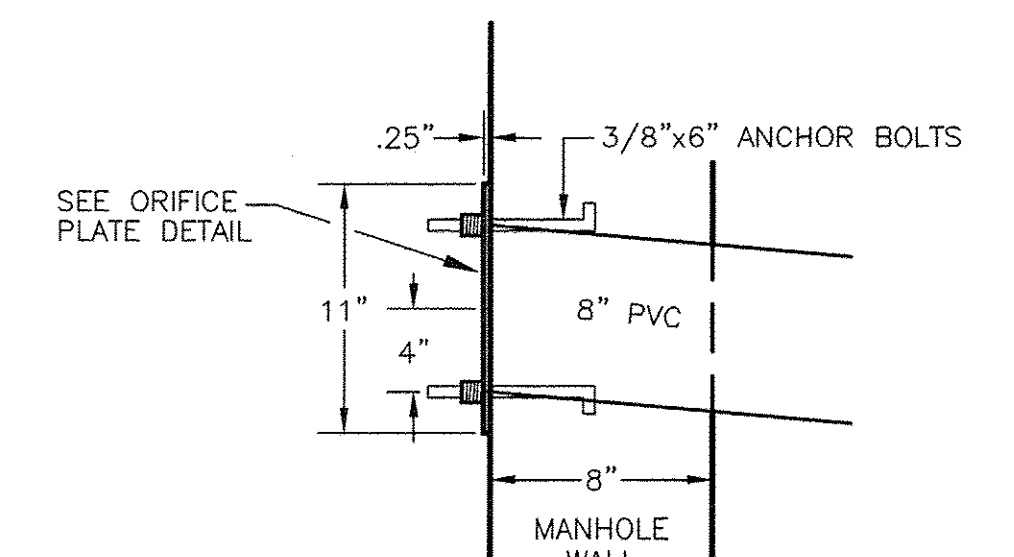


CROSSWALK PLAN VIEW

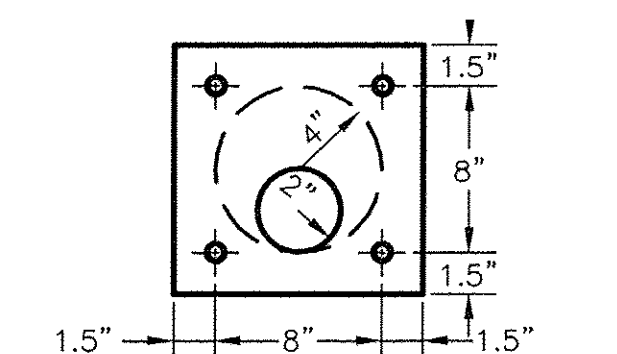


RAISED CROSSWALK

NTS

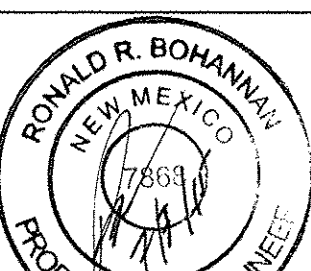


TO BE INSTALLED @ THE OUTFLOW OF MANHOLE 2



TYP. ORIFICE PLATE DETAIL

NTS

 RONALD R. BOHANNAN P.E. #7868	FREDDY'S AT COORS AND CENTRAL		DRAWN BY BJF
	PUMP AND DETAIL SHEET		DATE 7/07/15
2015036-GRB-DETAILS			
 <i>TIERRA WEST, LLC</i> 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrawestllc.com		SHEET # C4	
		JOB # 2015036	