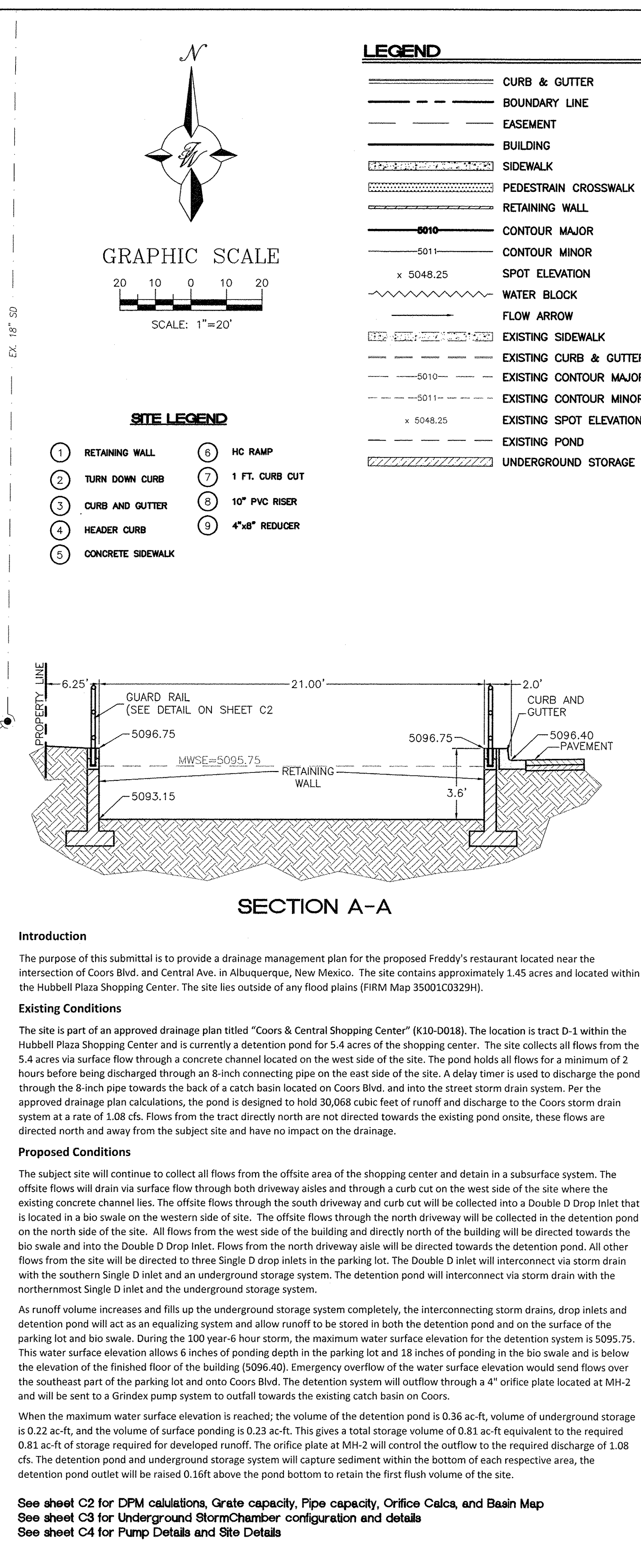
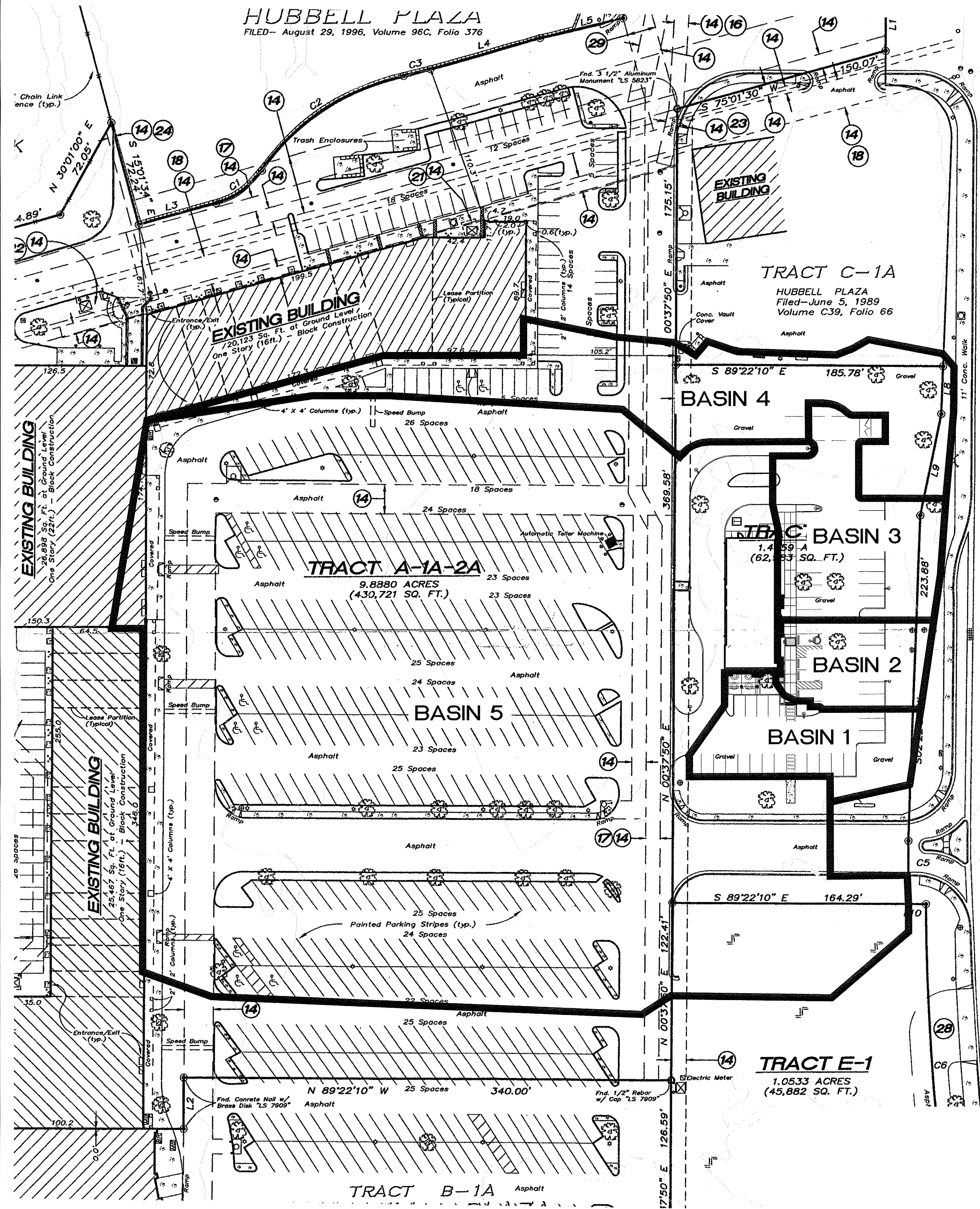






DPM Weighted E Method

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
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	13,033.50	0.299	0.00047	0%	0.000	15%	0.045	0%	0.000	85%	0.254	1.775	0.044	1.20	1.087	0.027	0.77
4	24,898.85	0.572	0.00089	0%	0.000	40%	0.229	0%	0.000	60%	0.343	1.450	0.069	1.96	0.832	0.040	1.16
5	182,085.40	4.180	0.00653	0%	0.000	10%	0.418	0%	0.000	90%	3.762	1.840	0.641	17.29	1.138	0.396	11.19
Total	235,224.21	5.400	0.00844									0.805	21.83			0.494	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	1.2	Single D	7.12	Capacity OK
5	17.29	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	17.29	24" RCP @ 0.7%	20.94	Capacity OK
MH-1	17.29	24" RCP @ 0.7%	20.94	Capacity OK
Basin 1 Single D Grate	18.09	24" RCP @ 0.7%	20.94	Capacity OK
Basin 2 Underground Storage Outlet	18.67	24" RCP @ 0.7%	20.94	Capacity OK
Basin 4 Pond Inlet	1.96	12" RCP @ 4.1%	7.98	Capacity OK
Basin 3 Single D Grate	3.16	12" RCP @ 3.7%	7.58	Capacity OK

CAPACITY OF SINGLE D GRATES

L = 40" - 2(2" ends) - 70(1/2" middle bars) = 32 1/2" = 2.7083'

W = 25" - 13(1/2" middle bars) = 18.5" = 1.54'

Area = 2.7083' x 1.54' = 18 ft^2

Effective Area = 4.18 - 4.18 (0.5 clogging factor) = 2.09 ft^2 at the grate

Orifice Equation:
Q = CA sqrt(2gh)
Q = 0.6 * 2.09 * sqrt(2 * 32.2 * 0.5)
Q = 7.12 cfs

CAPACITY OF DOUBLE D GRATE

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

W = 25" - 13(1/2" middle bars) = 18.5" = 1.54'

Area = 5.25' x 1.54' = 8.09 ft^2

Effective Area = 8.09 - 8.09 (0.5 clogging factor) = 4.04 ft^2 at the grate

Orifice Equation:
Q = CA sqrt(2gh)
Q = 0.6 * 4.04 * sqrt(2 * 32.2 * 1.0)
Q = 19.45 cfs

MAXIMUM CAPACITY OF 24" RCP @ 0.7%

Manning Equation:
Q = (1.49/n)AR^(2/3)S^(1/2)

Q = Discharge
n = Manning's roughness coefficient (0.013)
A = Pipe area (3.14 ft^2)
R = Hydraulic Radius (0.58 ft)
S = Pipe slope (0.007 ft/ft)

Q = (1.49/0.013) * 3.14 * (0.58)^(2/3) * sqrt(0.007)
Maximum Q = 20.94 cfs

MAXIMUM CAPACITY OF 12" RCP @ 4.1%

Manning Equation:
Q = (1.49/n)AR^(2/3)S^(1/2)

Q = Discharge
n = Manning's roughness coefficient (0.013)
A = Pipe area (0.785 ft^2)
R = Hydraulic Radius (0.29 ft)
S = Pipe slope (0.041 ft/ft)

Q = (1.49/0.013) * 0.785 * (0.29)^(2/3) * sqrt(0.041)
Maximum Q = 7.98 cfs

MAXIMUM CAPACITY OF 12" RCP @ 3.7%

Manning Equation:
Q = (1.49/n)AR^(2/3)S^(1/2)

Q = Discharge
n = Manning's roughness coefficient (0.013)
A = Pipe area (0.785 ft^2)
R = Hydraulic Radius (0.29 ft)
S = Pipe slope (0.037 ft/ft)

Q = (1.49/0.013) * 0.785 * (0.29)^(2/3) * sqrt(0.037)
Maximum Q = 7.58 cfs

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

Use weir equation:
Q = CL(H)^3/2

Q = discharge (16.77 cfs for offsite flows of Basin 5)
C = coefficient of discharge (2.95)
L = Length of curb cut
H = Height of curb cut (0.5 ft)

16.77 = 2.95 * L * (0.5)^3/2
16.77 = 1.04 * L
L = 16.13 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 = discharge (0.85 cfs for onsite flows of Basin 5)
C = coefficient of discharge (2.95)
L = Length of curb cut
H = Height of curb cut (0.5 ft)

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

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

Use weir equation:
Q = CL(H)^3/2

Q = discharge (1.40 cfs for flows from Basin 4, not including pond area)
C = coefficient of discharge (2.95)
L = Length of curb cut
H = Height of curb cut (0.98 ft)

1.40 = 2.95 * L * (0.98)^3/2
1.40 = 2.86 * L
L = 0.49 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 ft

Total impervious area = 33156.97 ft^2

Total volume = 33156.97 * 0.02833 = 939.34 ft^3

Retain first flush in north detention pond:
Pond Area = 6152 ft^2
Depth to retain = 939.34/6152 = 0.16 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 ac-ft

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

Total storage of volume of Stormchamber system = 0.11 + 0.11 = 0.22 ac-ft

ORIFICE PLATE IN MANHOLE 2 CALCULATIONS

Orifice Equation: Q = CA sqrt(2gh)

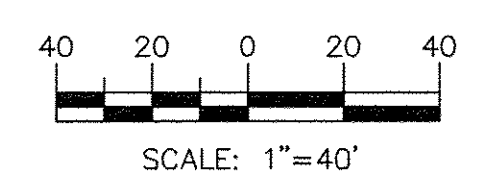
C = 0.6
A = Orifice Area (ft^2)
g = 32.2
H = Depth of water above center of orifice (ft)
Q = Flow (cfs)

Q = CA sqrt(2gh)
1.08 = 0.6 * A * sqrt(2 * 32.2 * 6.25)
1.08 = 12.037 A
A = 0.0897 ft^2

A = pi * r^2
0.0897 = pi * r^2
0.02855 = r^2
r = 0.169 ft
r = 2"

Use 4" dia. orifice plate

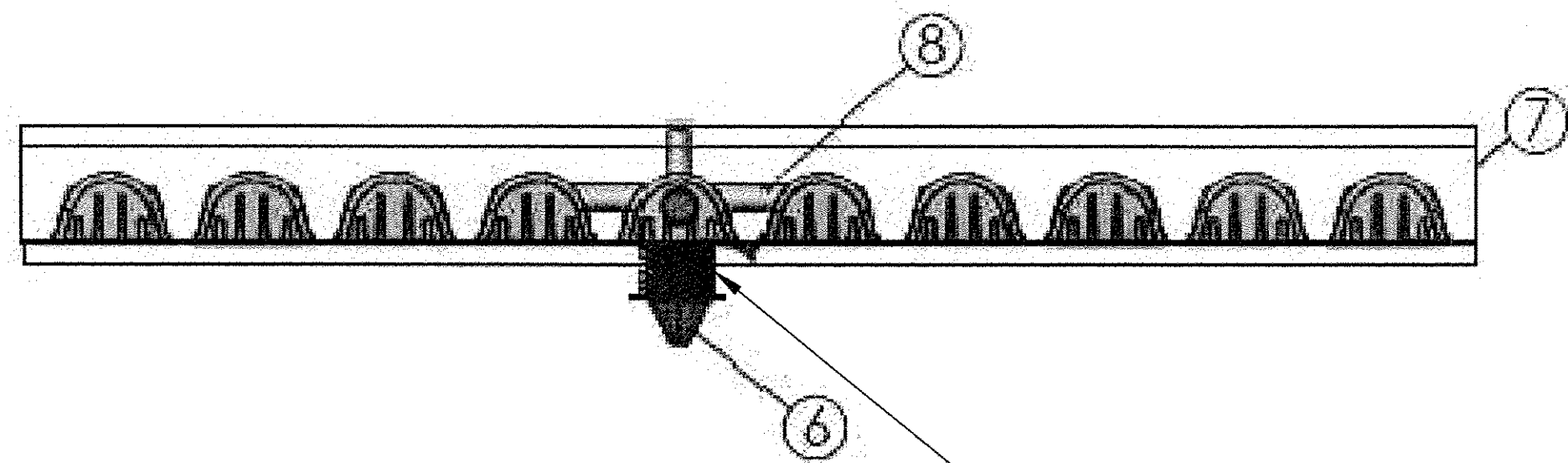
GRAPHIC SCALE



FREDDY'S AT
COORS AND CENTRAL
BASIN MAP
AND CALCULATIONS

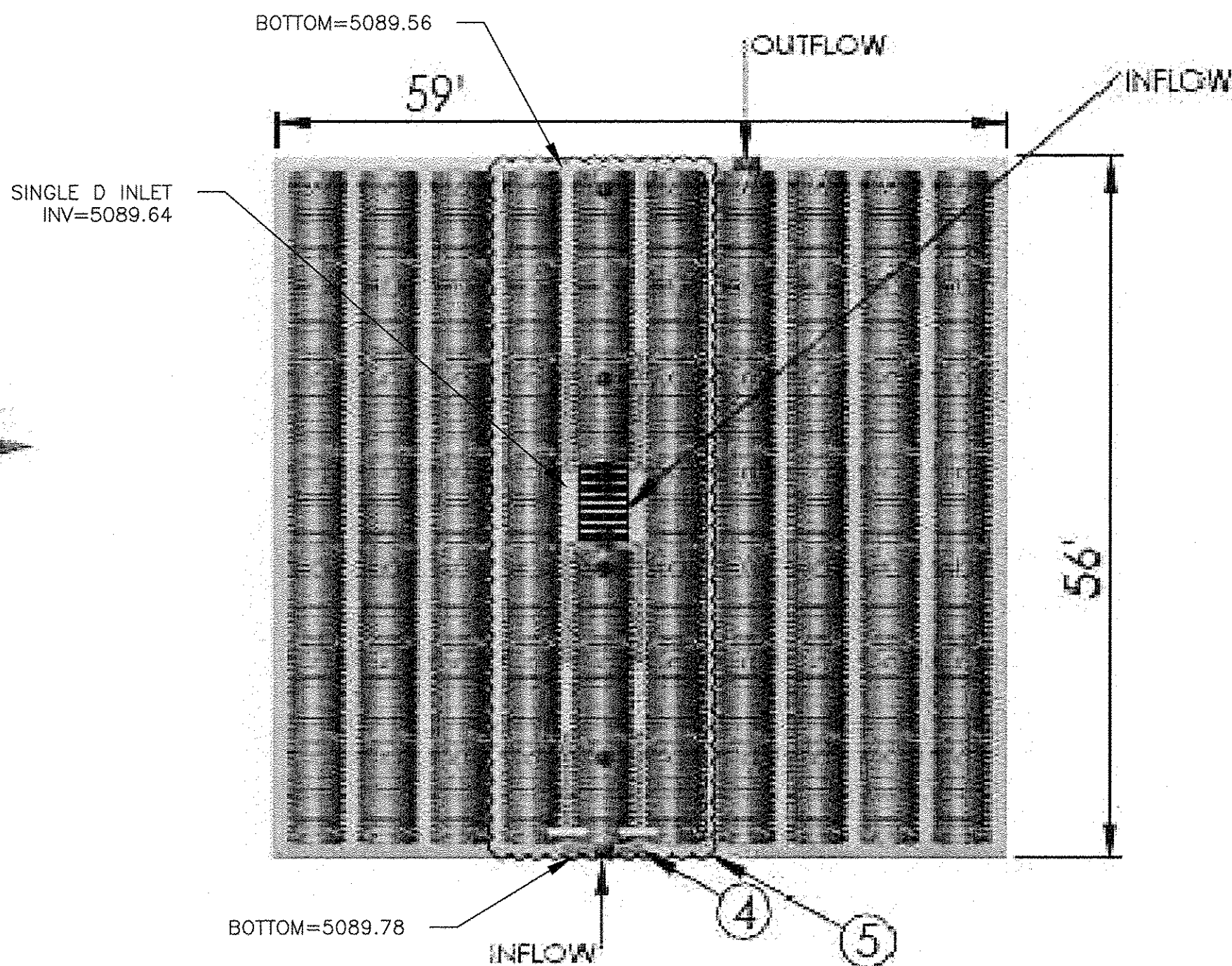
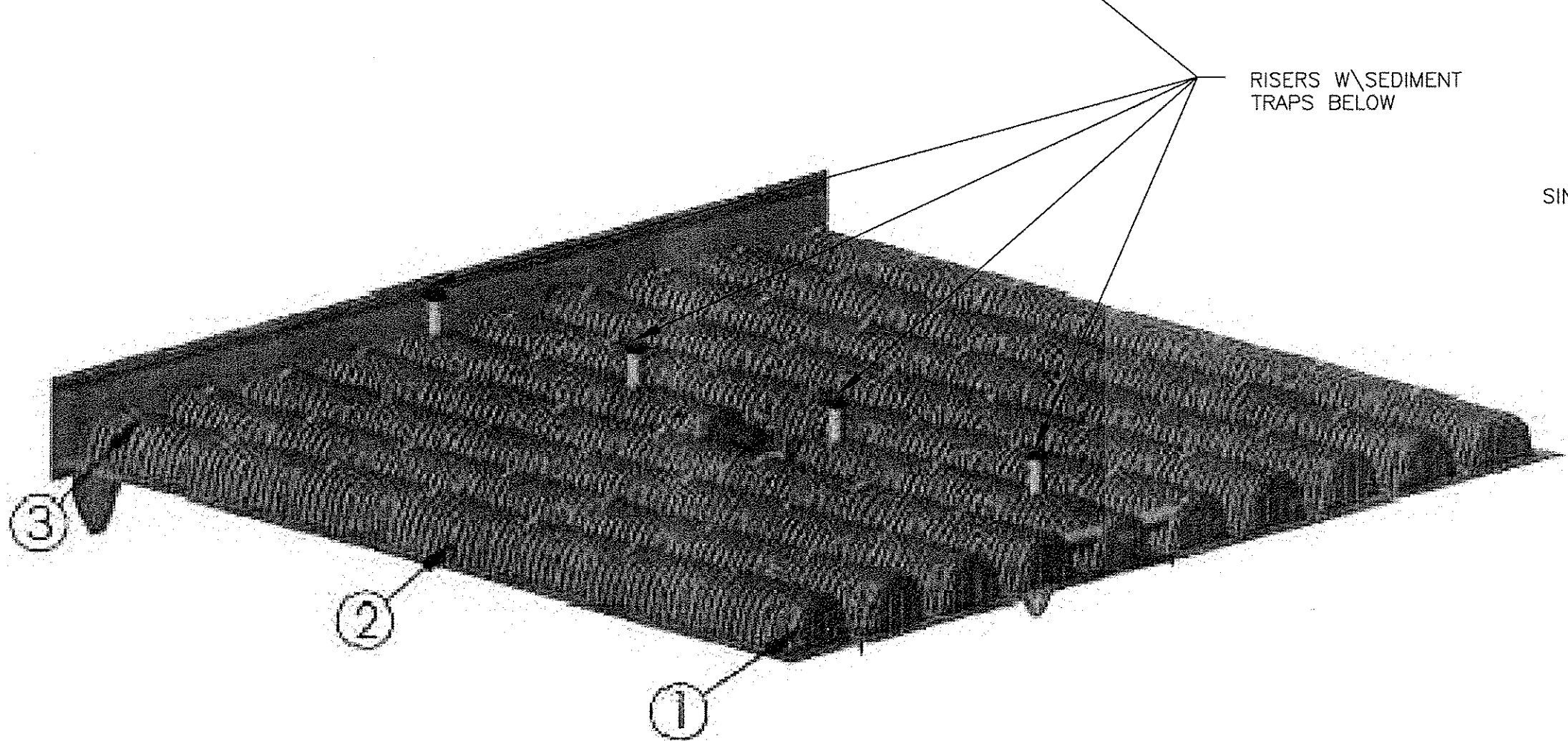
TIERRA WEST, LLC
5571 MIDWAY PARK PLACE NE
ALBUQUERQUE, NM 87109
(505) 858-3100
www.tierrawestllc.com

DRAWN BY
BUF
DATE
05/11/15
2015036-CRB-DETAILS
SHEET #
C2
JOB #
2015036



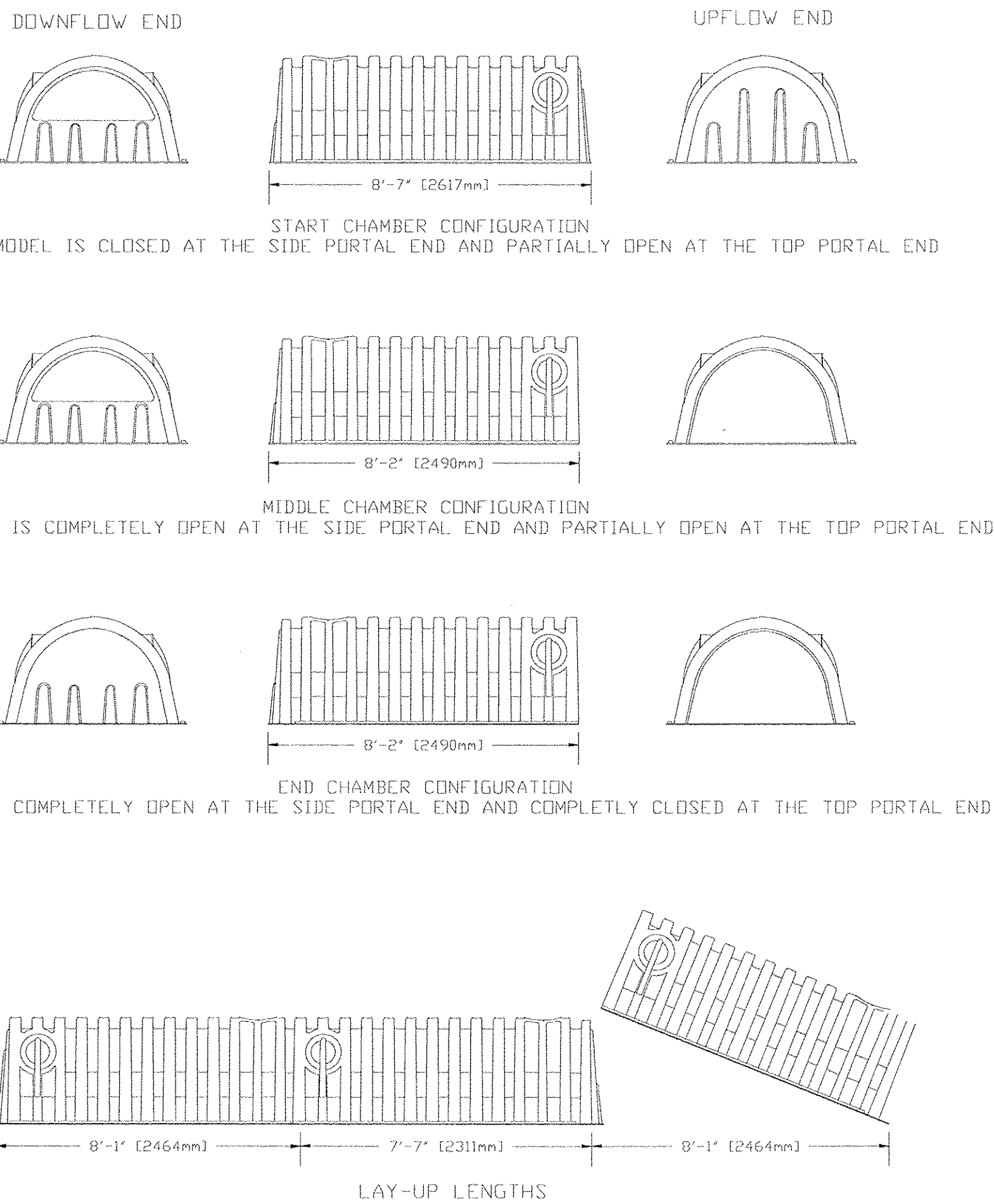
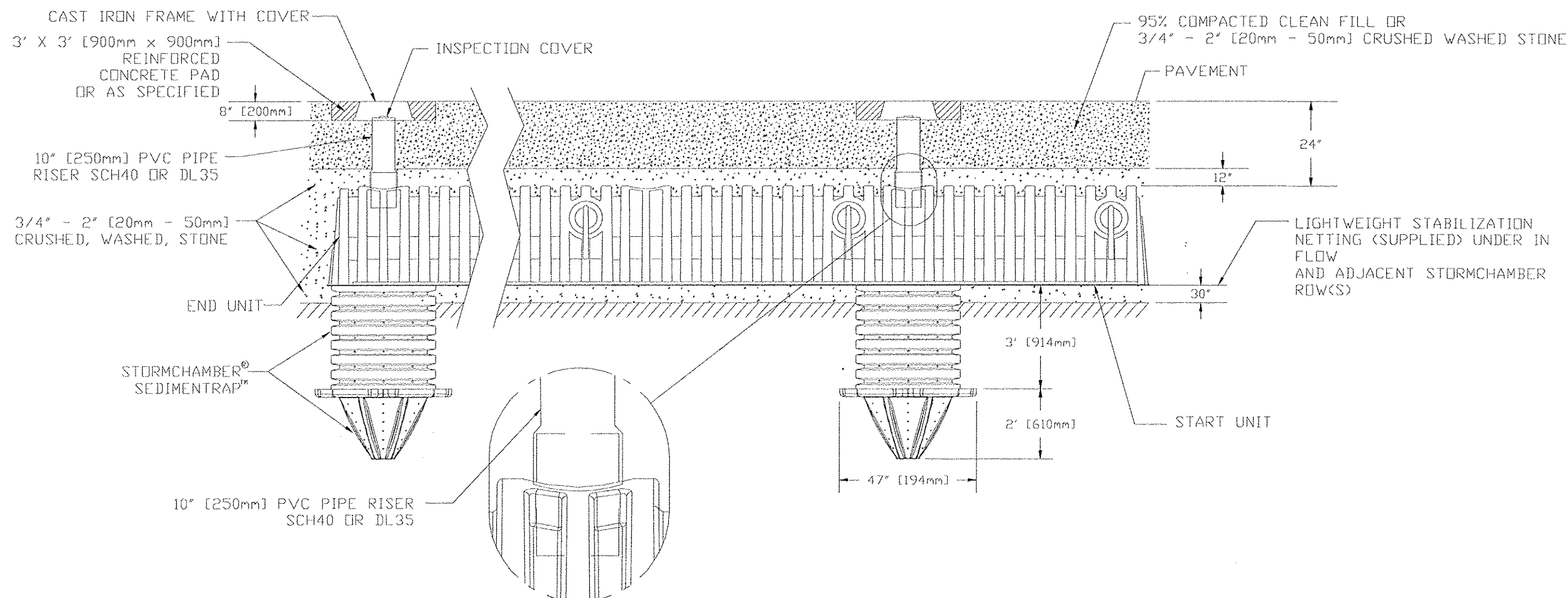
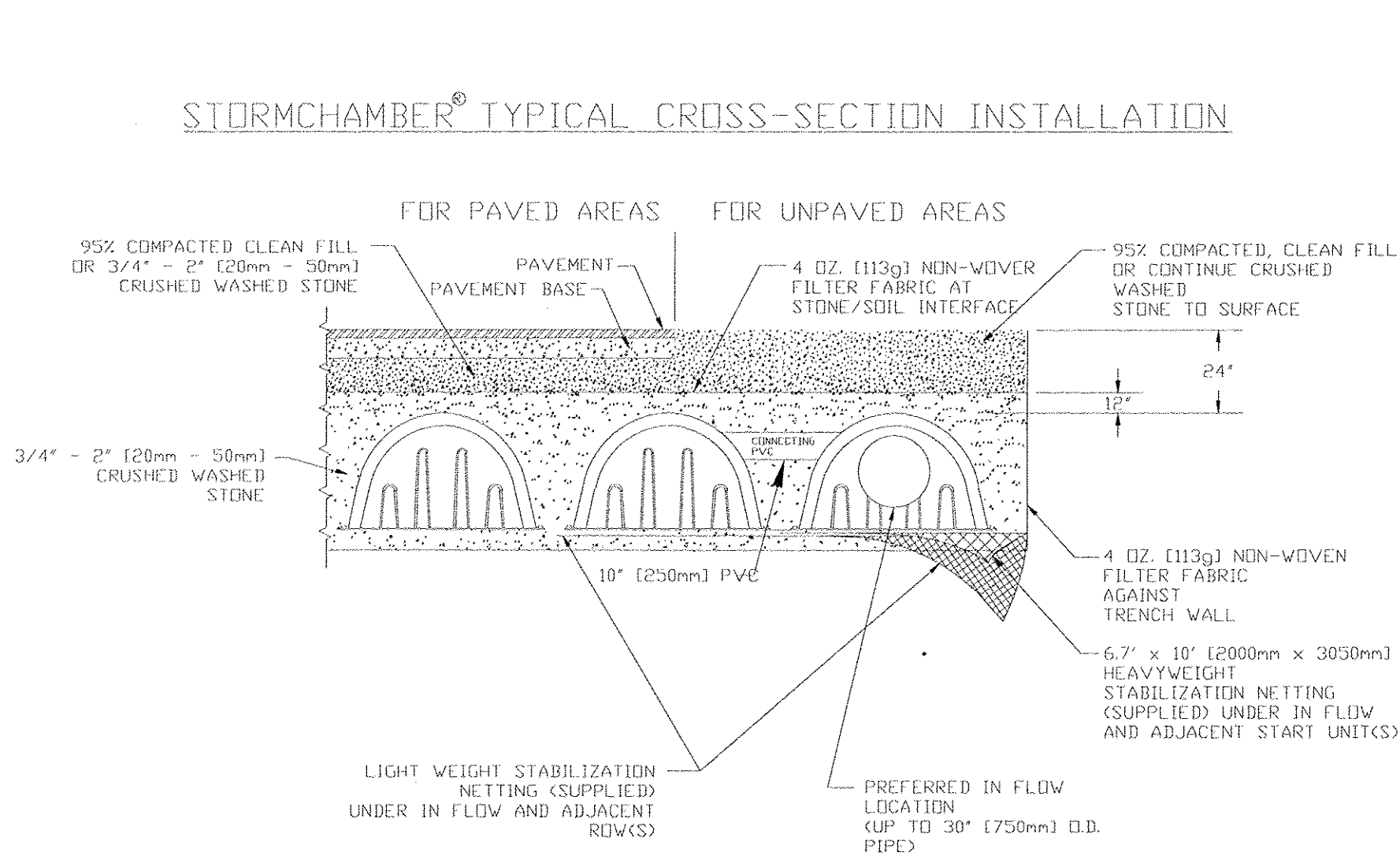
ITEM NO.	STORMCHAMBER PROPOSED LAYOUT DESCRIPTION	QTY
1	START UNITS	11
2	MIDDLE UNITS	47
3	END UNITS	11
4	7'X10' HEAVY DUTY NETTING (SUPPLIED)	3
5	LIGHTWEIGHTS STABILIZATION NETTING (INFLOW AND ADJACENT ROWS) (SUPPLIED)	1
6	10" PVC INSPECTION / CLEAN OUT RISER - (SUPPLIED BY OTHERS) W / FRAME AND LID 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

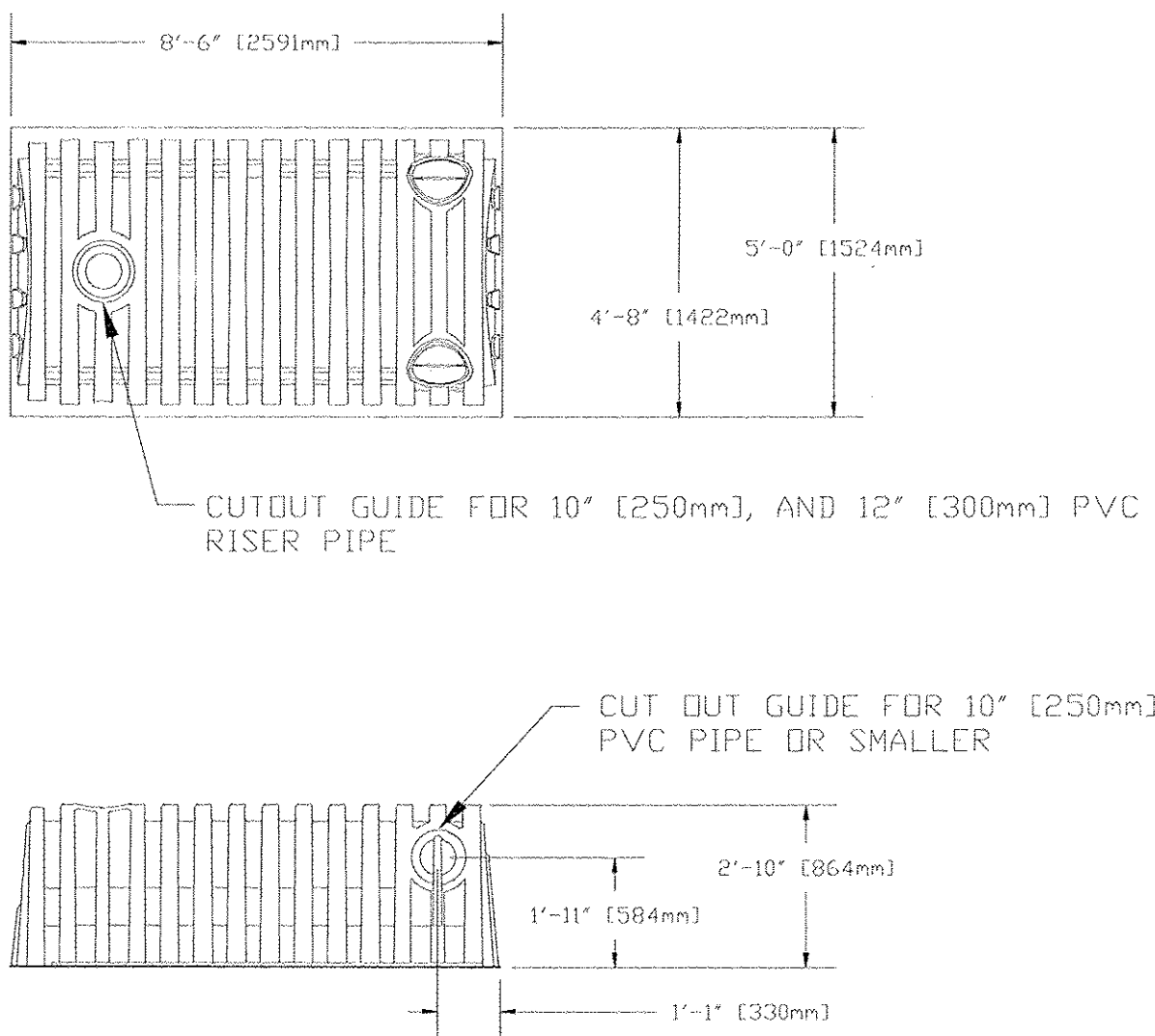


STORMCHAMBER® WITH SEDIMENTRAP™

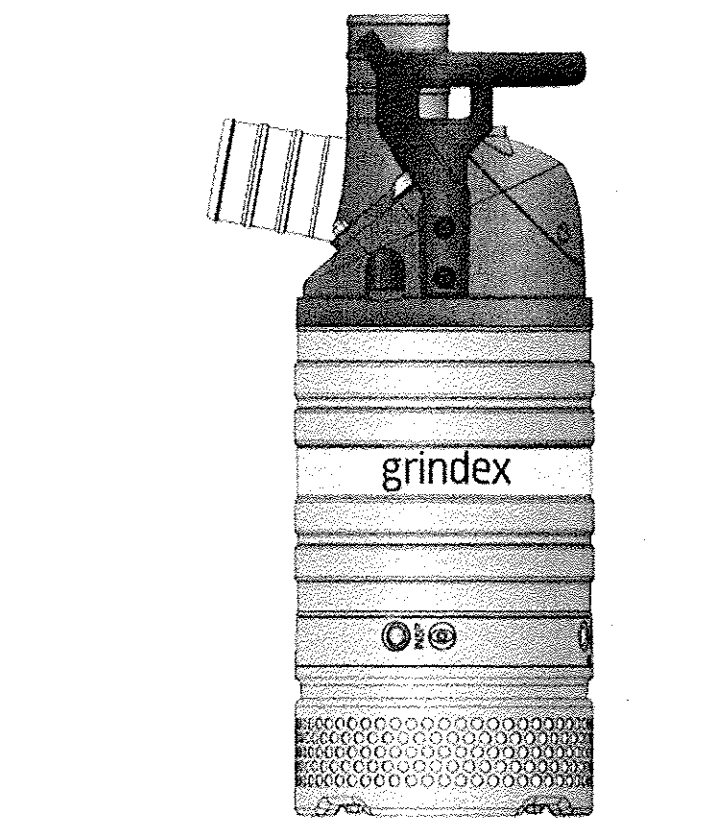
STORMCHAMBER® TYPICAL CROSS-SECTION INSTALLATION



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 BUF
		STORMCHAMBER STORAGE SYSTEM	DATE 05/11/15
		TIERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrawestllc.com	2015036-CRB-DETAILS
			SHEET # C3 JOB # 2015036



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 ₃ [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 3/4	768 / 30 3/4
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

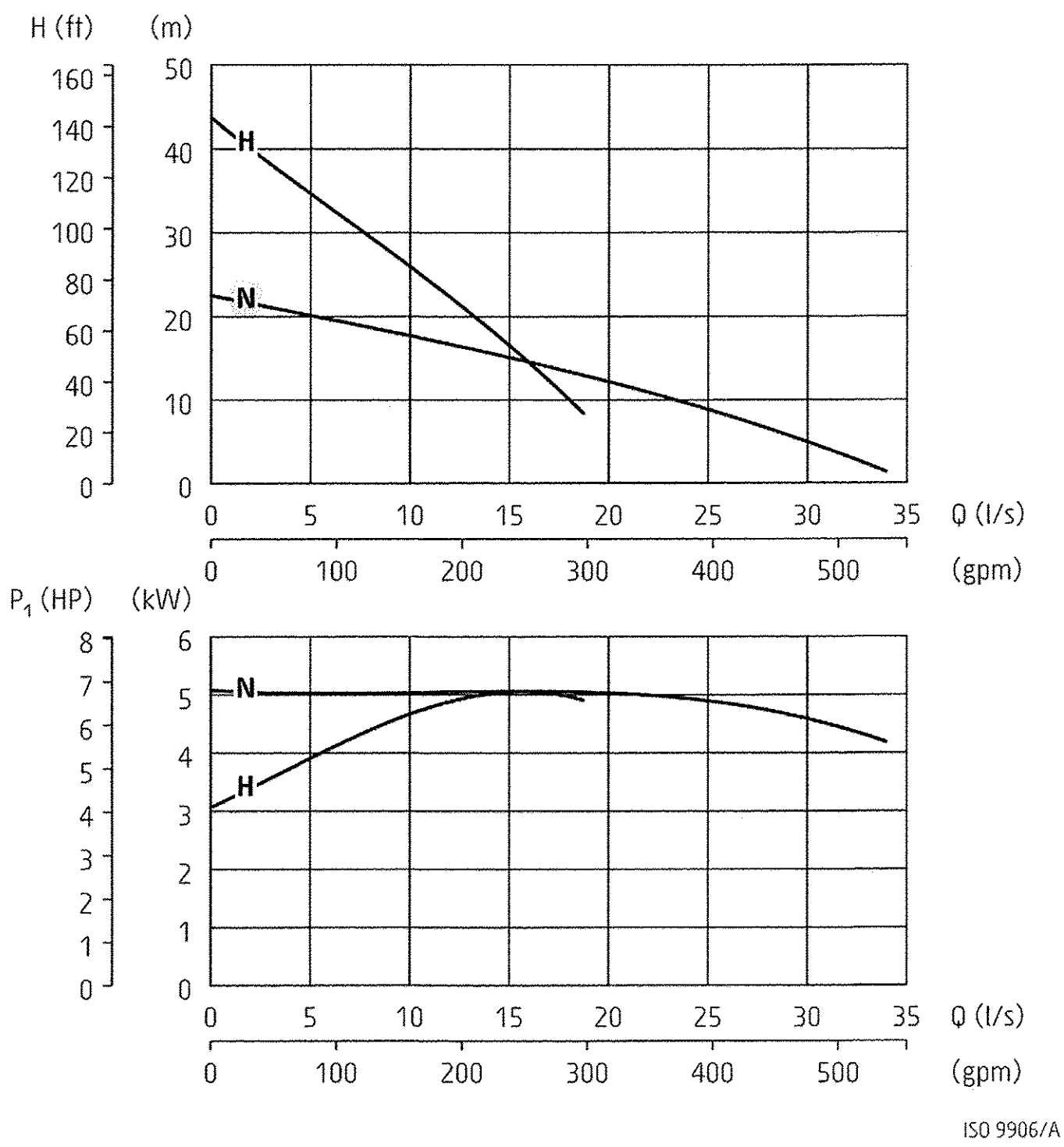
Phase sequence control, phase failure guard, temperature guard with thermal contacts in the stator opening temperature 140°C (284°F) (= SMART system), air valve

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

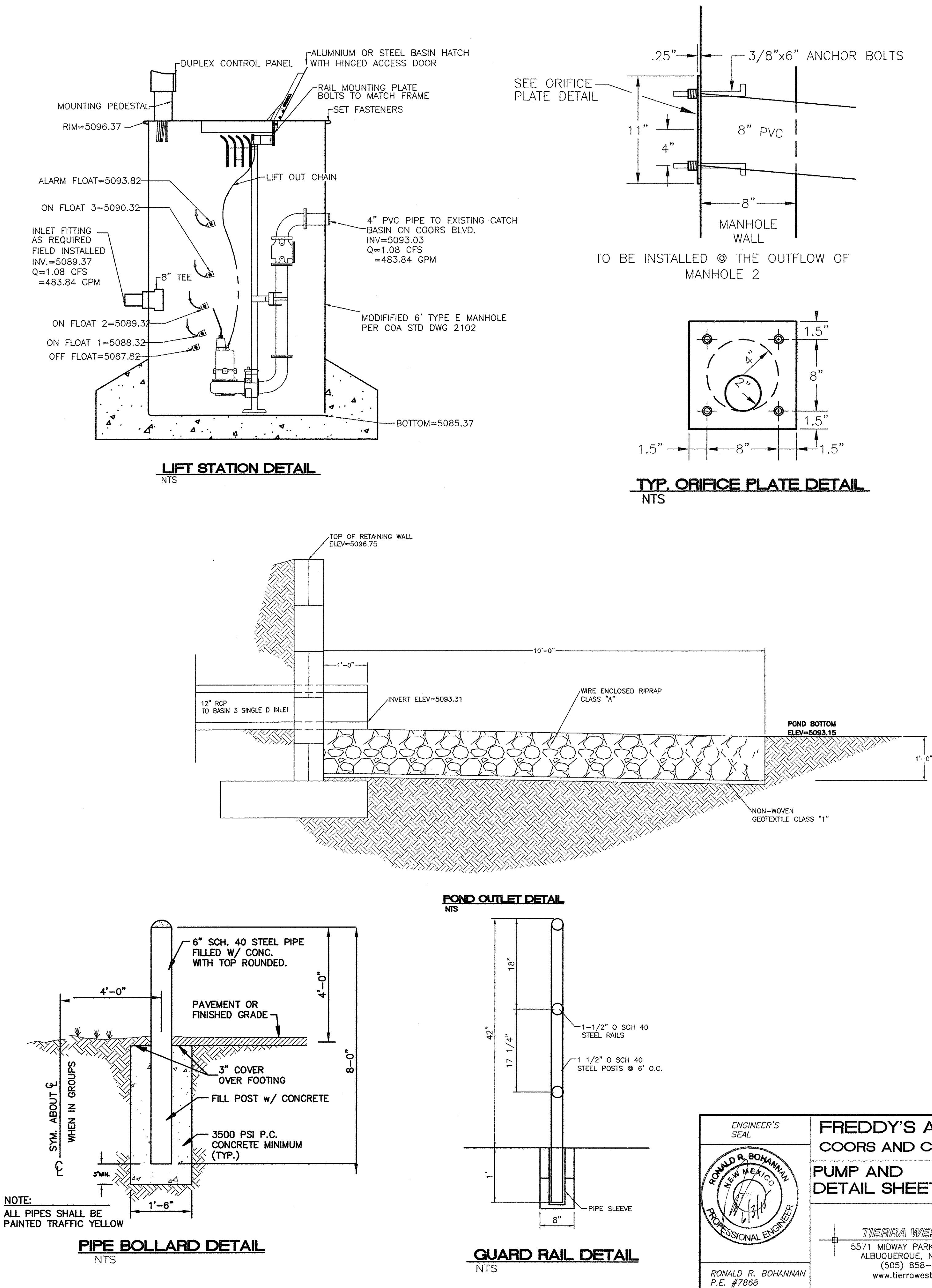
Casted parts: *Aluminium*
Outer casing: *Stainless steel*
Motor shaft: *Stainless steel*
Impeller and suction cover: *Hard-Iron™*
Diffusers: *Nitrile rubber*
Screws and nuts: *Stainless steel*
O-rings: *Nitrile rubber*

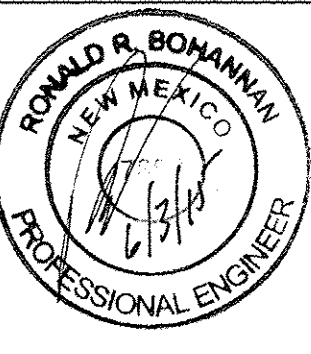
Accessories

Level regulator
Zinc anodes
Tandem connection
Low suction collar
Pump raft

GRINDEX PUMP DETAIL

NTS



 RONALD R. BOHANNAN P.E. #7868	FREDDY'S AT COORS AND CENTRAL PUMP AND DETAIL SHEET	DRAWN BY BJF
		DATE 05/11/15
	 TIERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrawestllc.com	2015036-GRB-DETAILS
		SHEET # C4 JOB # 2015036