



City of Albuquerque

Planning Department

Development & Building Services Division

RAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: Freddy's City Drainage #: _____

DRB#: 1004095 EPC#: _____ Work Order#: _____

Legal Description: TR D-1 Plat of Hubbell Plaza

City Address: 111 Coors Blvd NW Albuquerque, NM 87121

Engineering Firm: Tierra West, LLC Contact: Ronald R Bohannon

Address: 5571 Midway Park Place NE Albuquerque, NM 87109

Phone#: 505-858-3100 Fax#: 505-858-1118 E-mail: r rb@tierrawestllc.com

Owner: Oak Realty Partners, Inc Contact: Michael Bushell

Address: 5975 S Quebec Street, Suite 141 Greenwood Village, CO 80111

Phone#: 303-318-0100 Fax#: _____ E-mail: _____

Architect: _____ Contact: _____

Address: _____

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

Surveyor: _____ Contact: _____

Address: _____

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

Contractor: _____ Contact: _____

Address: _____

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

TYPE OF SUBMITTAL:

- DRAINAGE REPORT
- DRAINAGE PLAN 1st SUBMITTAL
- DRAINAGE PLAN RESUBMITTAL
- CONCEPTUAL G & D PLAN
- GRADING PLAN
- EROSION & SEDIMENT CONTROL PLAN (ESC)
- ENGINEER'S CERT (HYDROLOGY)
- CLOMR/LOMR
- TRAFFIC CIRCULATION LAYOUT (TCL)
- ENGINEER'S CERT (TCL)
- ENGINEER'S CERT (DRB SITE PLAN)
- ENGINEER'S CERT (ESC)
- SO-19
- OTHER (SPECIFY) _____

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

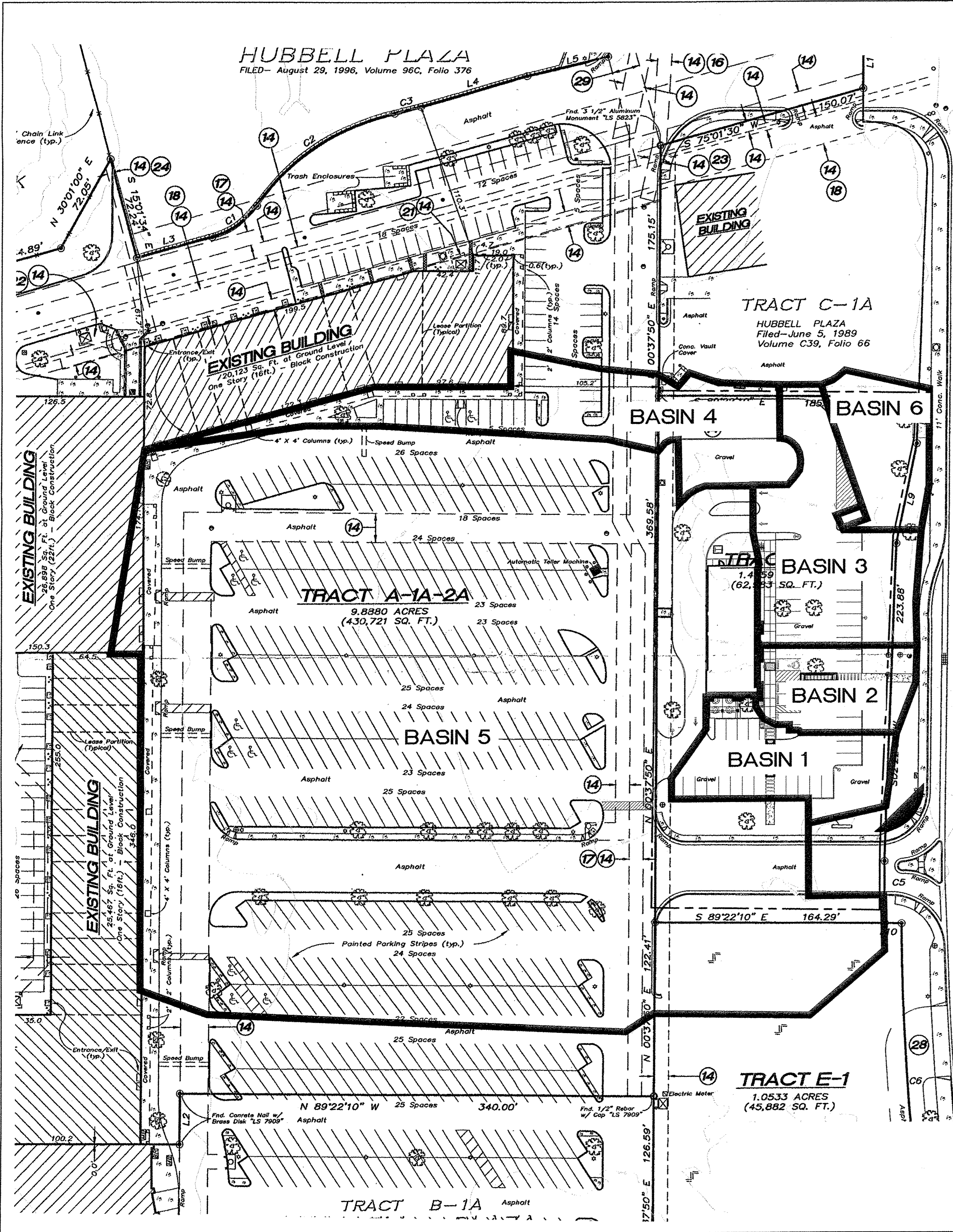
- SIA/FINANCIAL GUARANTEE RELEASE
- PRELIMINARY PLAT APPROVAL
- S. DEV. PLAN FOR SUB'D APPROVAL
- S. DEV. FOR BLDG. PERMIT APPROVAL
- SECTOR PLAN APPROVAL
- FINAL PLAT APPROVAL
- CERTIFICATE OF OCCUPANCY (PERM)
- CERTIFICATE OF OCCUPANCY (TCL TEMP)
- FOUNDATION PERMIT APPROVAL
- BUILDING PERMIT APPROVAL
- GRADING PERMIT APPROVAL
- PAVING PERMIT APPROVAL
- WORK ORDER APPROVAL
- GRADING CERTIFICATION
- SO-19 APPROVAL
- ESC PERMIT APPROVAL
- ESC CERT. ACCEPTANCE
- OTHER (SPECIFY) _____

WAS A PRE-DESIGN CONFERENCE ATTENDED: _____ Yes _____ No _____ Copy Provided

DATE SUBMITTED: 8/15/16 By: BF for RRB

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location, and scope to the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

- 1 **Conceptual Grading and Drainage Plan** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans
- 2 **Drainage Plans** Required for building permits, grading permits, paving permits and site plans less than five (5) acres
- 3 **Drainage Report** Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more
- 4 **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development



DPM Weighted E Method (Zone 1)

Existing Conditions

Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Basin Descriptions				100-Year, 6-Hr			10-Year, 6-Hr						
				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	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									1.580	0.711	19.81	0.934	0.420	12.16

Proposed Conditions

Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Basin Descriptions				100-Year, 6-Hr			10-Year, 6-Hr						
				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	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

CAPACITY OF SINGLE D GRATES
 $L = 40" - 2(2" \text{ ends}) - 7(3" \text{ middle bars}) = 32 \frac{1}{2}" = 2.7083'$
 $W = 25" - 13(1/2" \text{ middle bars}) = 18.5" = 1.54'$
 $\text{Area} = 2.7083' \times 1.54' = 4.18 - 4.18 (0.5 \text{ clogging factor}) = 2.09 \text{ ft}^2 \text{ at the grate}$
 Orifice Equation:
 $Q = CA \text{ sqrt}(2gH)$
 $Q = 0.6 \times 2.09 \text{ sqrt}(2 \times 32.2 \times 0.5)$
 $Q = 7.12 \text{ cfs}$

CAPACITY OF DOUBLE D GRATE
 $L = 80" - 2(2" \text{ ends}) - 14(3/4" \text{ middle bars}) - 6" \text{ (center piece)} = 63" = 5.25'$
 $W = 25" - 13(1/2" \text{ middle bars}) = 18.5" = 1.54'$
 $\text{Area} = 5.25' \times 1.54' = 8.09 \text{ ft}^2$
 $\text{Effective Area} = 8.09 - 8.09 (0.5 \text{ clogging factor}) = 4.04 \text{ ft}^2 \text{ at the grate}$
 Orifice Equation:
 $Q = CA \text{ sqrt}(2gH)$
 $Q = 0.6 \times 4.04 \text{ sqrt}(2 \times 32.2 \times 1.0)$
 $Q = 19.45 \text{ cfs}$

MAXIMUM CAPACITY OF 24" RCP @ 0.7%
 Manning Equation:
 $Q = (1.49/n)AR^{2/3} \text{ sqrt}(S)$
 $Q = \text{Discharge}$
 $n = \text{Manning's roughness coefficient} (0.013)$
 $A = \text{Pipe area} (3.14 \text{ ft}^2)$
 $R = \text{Hydraulic Radius} (0.58 \text{ ft})$
 $S = \text{Pipe slope} (0.007 \text{ ft/ft})$
 $Q = (1.49/0.013) \times 3.14 \times (0.58)^{2/3} \text{ sqrt}(0.007)$
 $\text{Maximum } Q = 20.94 \text{ cfs}$

MAXIMUM CAPACITY OF EQUALIZING 12" HDPE
 Orifice Equation: $Q = CA \text{ sqrt}(2gH)$
 $C = 0.6$
 $A = \text{Orifice Area} (0.785 \text{ ft}^2)$
 $G = 32.2 \text{ ft/s}^2$
 $H = \text{Depth of water above center of orifice} (2.1 \text{ ft})$
 $Q = \text{Flow (cfs)}$
 $Q = 0.6 \times 0.785 \text{ sqrt}(2 \times 32.2 \times 2.1)$
 $\text{Maximum } Q = 5.48 \text{ cfs}$

CURB CUT CAPACITY CALCULATIONS
OFFSITE FLOWS FROM SHOPPING CENTER TO DOUBLE D INLET
 Use weir equation:
 $Q = CL(H)^{3/2}$
 $Q = \text{discharge} (16.77 \text{ cfs for offsite flows of Basin 5})$
 $C = \text{coefficient of discharge} (2.95)$
 $L = \text{Length of curb cut}$
 $H = \text{Height of curb cut} (0.5 \text{ ft})$
 $16.77 = 2.95 \times L \times (0.5)^{3/2}$
 $16.77 = 1.04 \times L$
 $L = 16.13 \text{ ft, minimum curb cut length}$

CURB CUT CAPACITY CALCULATIONS
ONSITE FLOWS FROM WEST SIDE OF SITE TO DOUBLE D INLET
 Use weir equation:
 $Q = CL(H)^{3/2}$
 $Q = \text{discharge} (0.85 \text{ cfs for onsite flows of Basin 5})$
 $C = \text{coefficient of discharge} (2.95)$
 $L = \text{Length of curb cut}$
 $H = \text{Height of curb cut} (0.5 \text{ ft})$
 $0.85 = 2.95 \times L \times (0.5)^{3/2}$
 $0.85 = 1.04 \times L$
 $L = 0.82 \text{ ft, minimum curb cut length}$

CURB CUT CAPACITY CALCULATIONS
ONSITE/OFFSITE FLOWS TO CURB CUT ENTERING DETENTION POND 2
 Use weir equation:
 $Q = CL(H)^{3/2}$
 $Q = \text{discharge} (1.22 \text{ cfs for flows from Basin 4, not including pond area})$
 $C = \text{coefficient of discharge} (2.95)$
 $L = \text{Length of curb cut}$
 $H = \text{Height of curb cut} (0.98 \text{ ft})$
 $1.22 = 2.95 \times L \times (0.98)^{3/2}$
 $1.22 = 2.86 \times L$
 $L = 0.43 \text{ ft, minimum curb cut length}$

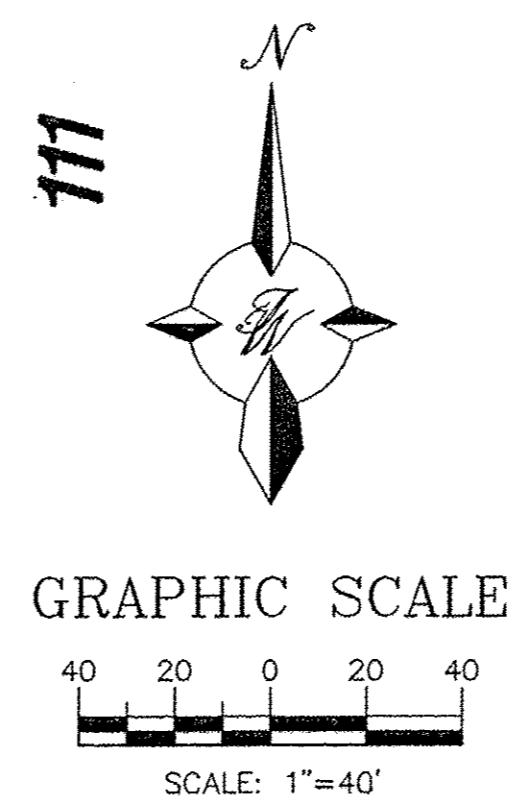
FIRST FLUSH VOLUME RETENTION
 Depth to be retained = 0.44" per city ordinance
 Initial abstractions = 0.1"
 $\text{Total depth} = 0.44" - 0.1" = 0.34" = 0.02833 \text{ ft}$
 $\text{Total impervious area} = 33156.97 \text{ ft}^2$
 $\text{Total volume} = 33156.97 \times 0.02833 = 939.34 \text{ ft}^3$
 Retain first flush in north detention pond:
 $\text{Pond Area} = 6179 \text{ ft}^2$
 $\text{Depth to retain} = 939.34/6179 = 0.16 \text{ ft}$

STORMCHAMBER VOLUME CALCULATION
 Total storage volume required = 0.22 ac-ft
 Total # of chambers = 69
 $\text{Volume per chamber} = 0.00172 \text{ ac-ft}$
 $\text{Volume inside chambers} = 0.00172 \times 69 = 0.11 \text{ ac-ft}$
 $\text{Area of chambers and surrounding stone} = 0.076 \text{ ac}$
 $\text{Volume of chambers and surrounding stone} = 0.076 \times 6.33 = 0.48 \text{ ac-ft}$
 $\text{Volume of only surrounding stone} = 0.48 - 0.11 = 0.37 \text{ ac-ft}$
 $\text{Volume of 30\% voids in stone} = 0.37 \times 0.3 = 0.11 \text{ ac-ft}$
 $\text{Total storage of volume of Stormchamber system} = 0.11 + 0.11 = 0.22 \text{ ac-ft}$

ORIFICE PLATE IN MANHOLE 2 CALCULATIONS
 Orifice Equation: $Q = CA \text{ sqrt}(2gH)$
 $C = 0.6$
 $A = \text{Orifice Area (ft}^2)$
 $g = 32.2$
 $H = \text{Depth of water above center of orifice (ft)}$
 $Q = \text{Flow (cfs)}$

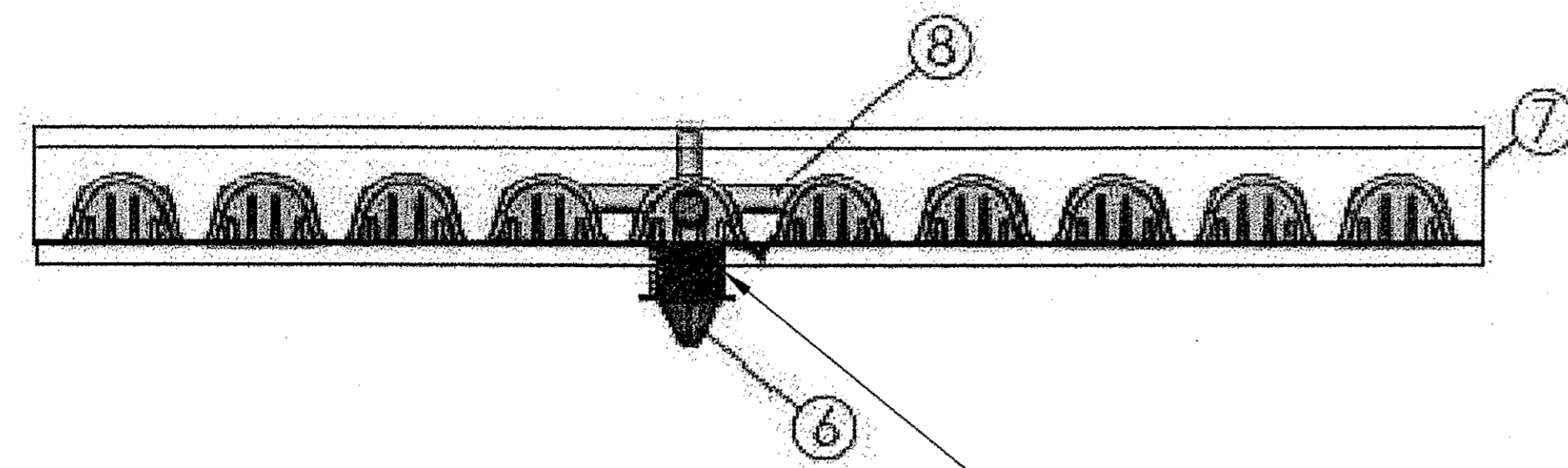
$Q = CA \text{ sqrt}(2gH)$
 $1.08 = 0.6 \times A \text{ sqrt}(2 \times 32.2 \times 6.25)$
 $1.08 = 12.037 A$
 $A = 0.0897 \text{ ft}^2$
 $A = \pi \times r^2$
 $0.0897 = \pi \times r^2$
 $0.02855 = r^2$
 $r = 0.169 \text{ ft}$
 $r = 2"$
 Use 4" dia. orifice plate

N.W. COORS BOULEVARD 111



FOR INFORMATION ONLY

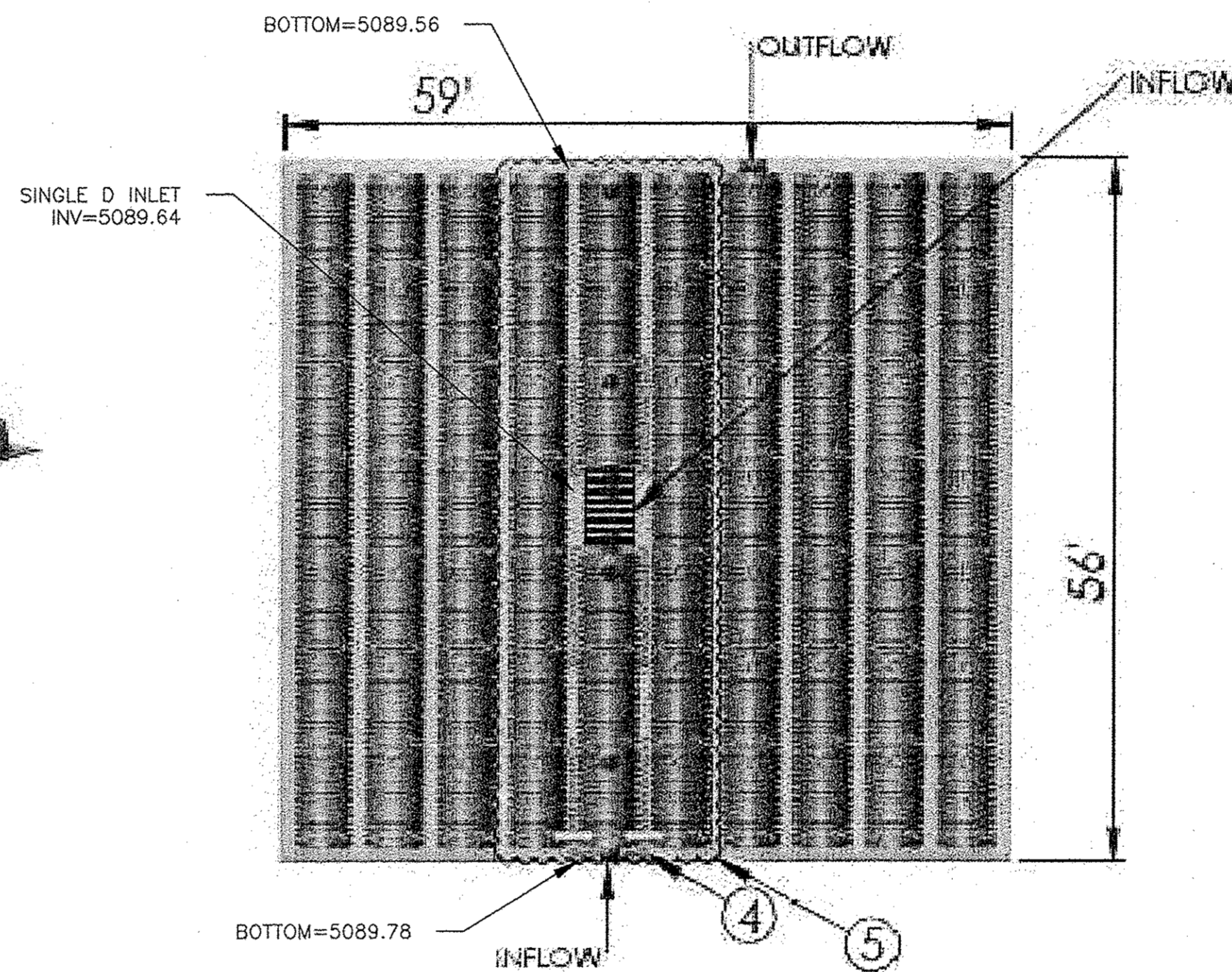
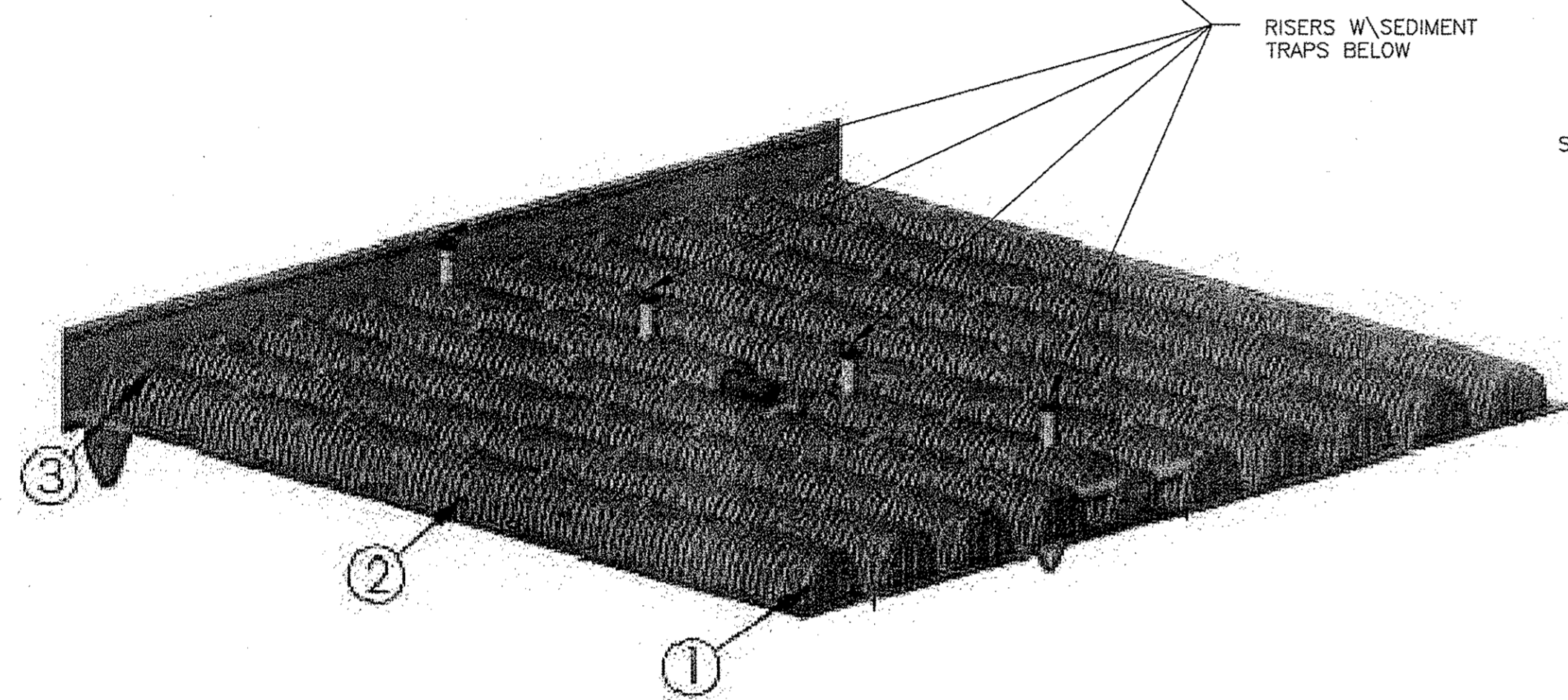
	FREDDY'S AT COORS AND CENTRAL BASIN MAP AND CALCULATIONS	DRAWN BY B.J.F. DATE 07/07/15
		SHEET # C2
TIERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrawestllc.com		JOB # 2015036



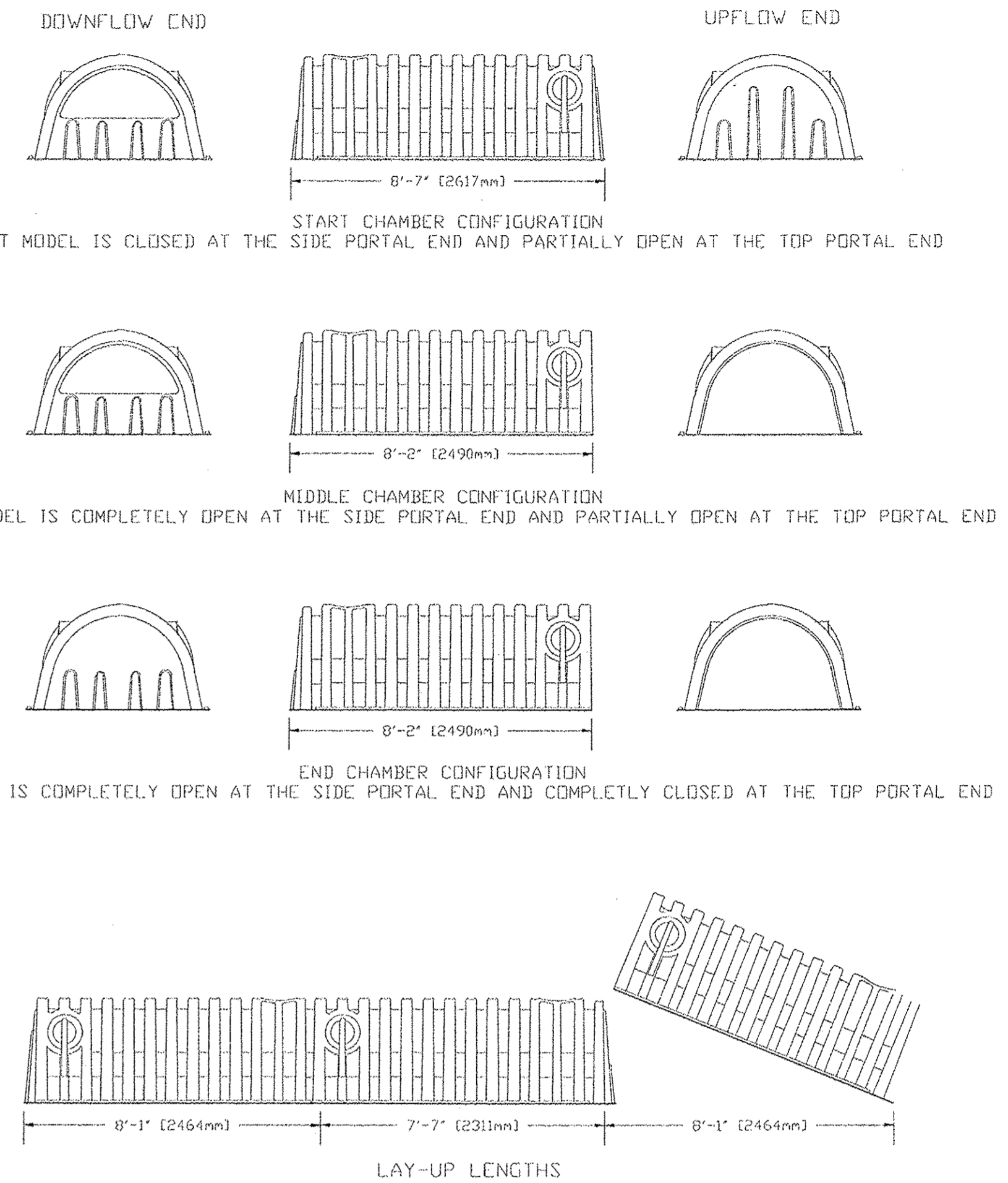
ITEM NO.	STORMCHAMBER PROPOSED LAYOUT DESCRIPTION	QTY
1	START UNITS	11
2	MIDDLE UNITS	47
3	END UNITS	11
4	7X10' HEAVY DUTY NETTING (SUPPLIED)	3
5	LIGHTWEIGHTS STABILIZATION NETTING (INFLOW AND ADJACENT ROWS) (SUPPLIED)	1
6	10" PVC INSPECTION / CLEAN OUT RISER - (SUPPLIED BY OTHERS) W / FRAME AND LID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

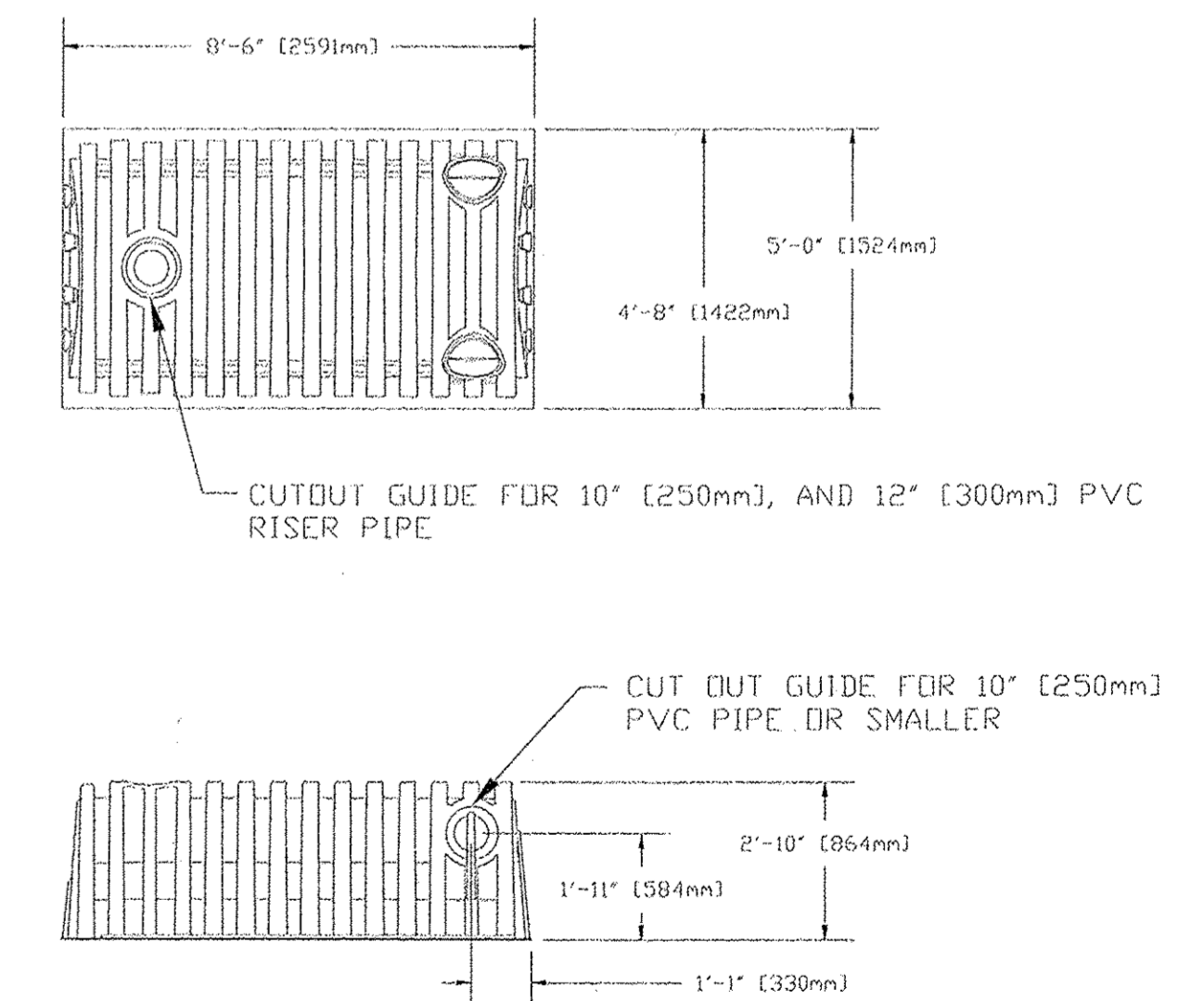
TOTAL # OF CHAMBERS (START, MIDDLE, AND END UNITS) = 69



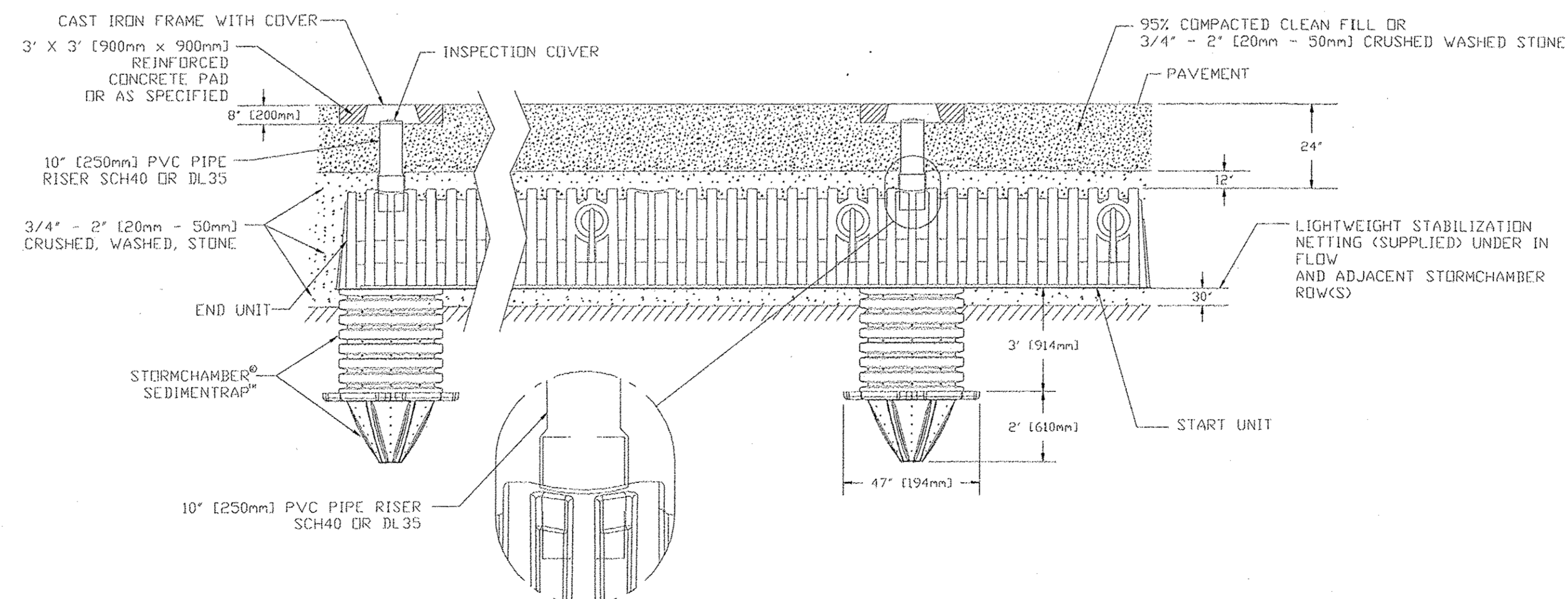
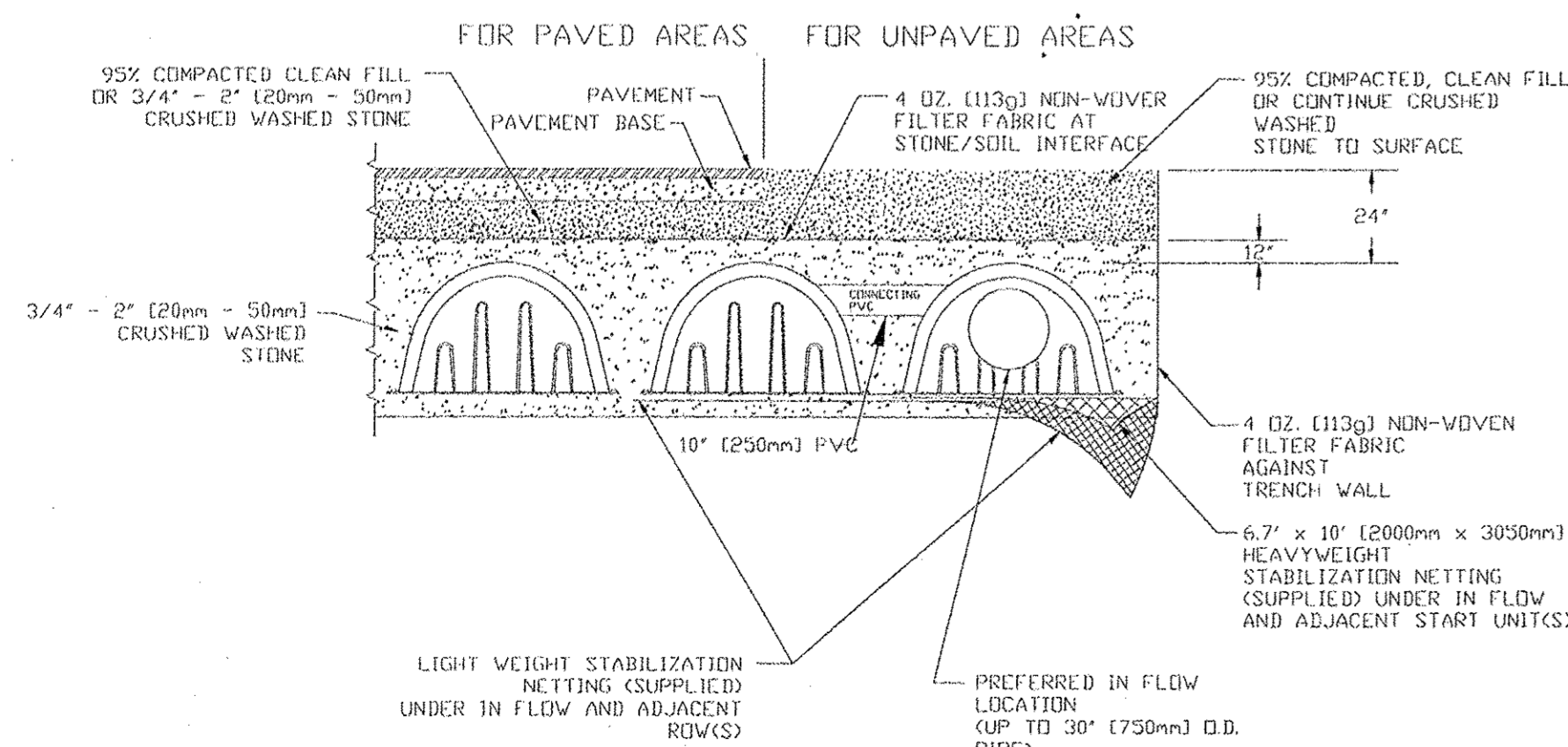
STORMCHAMBER® WITH SEDIMENTRAP™



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.



STORMCHAMBER® TYPICAL CROSS-SECTION INSTALLATION



FOR INFORMATION ONLY

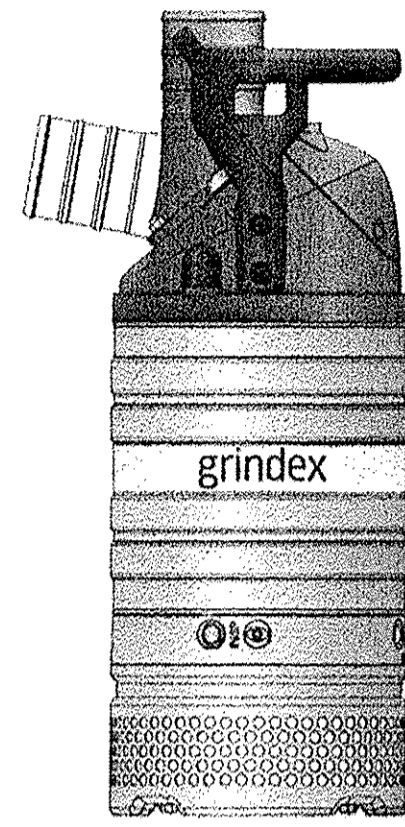
ENGINEER'S SEAL	FREDDY'S AT COORS AND CENTRAL	DRAWN BY BJF
	STORMCHAMBER STORAGE SYSTEM	DATE 07/07/15
	TERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrawestllc.com	2015036-GRB-DETAILS
RONALD R. BOHANNAN P.E. #7868		SHEET # C3
		JOB # 2015036

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

8103.181

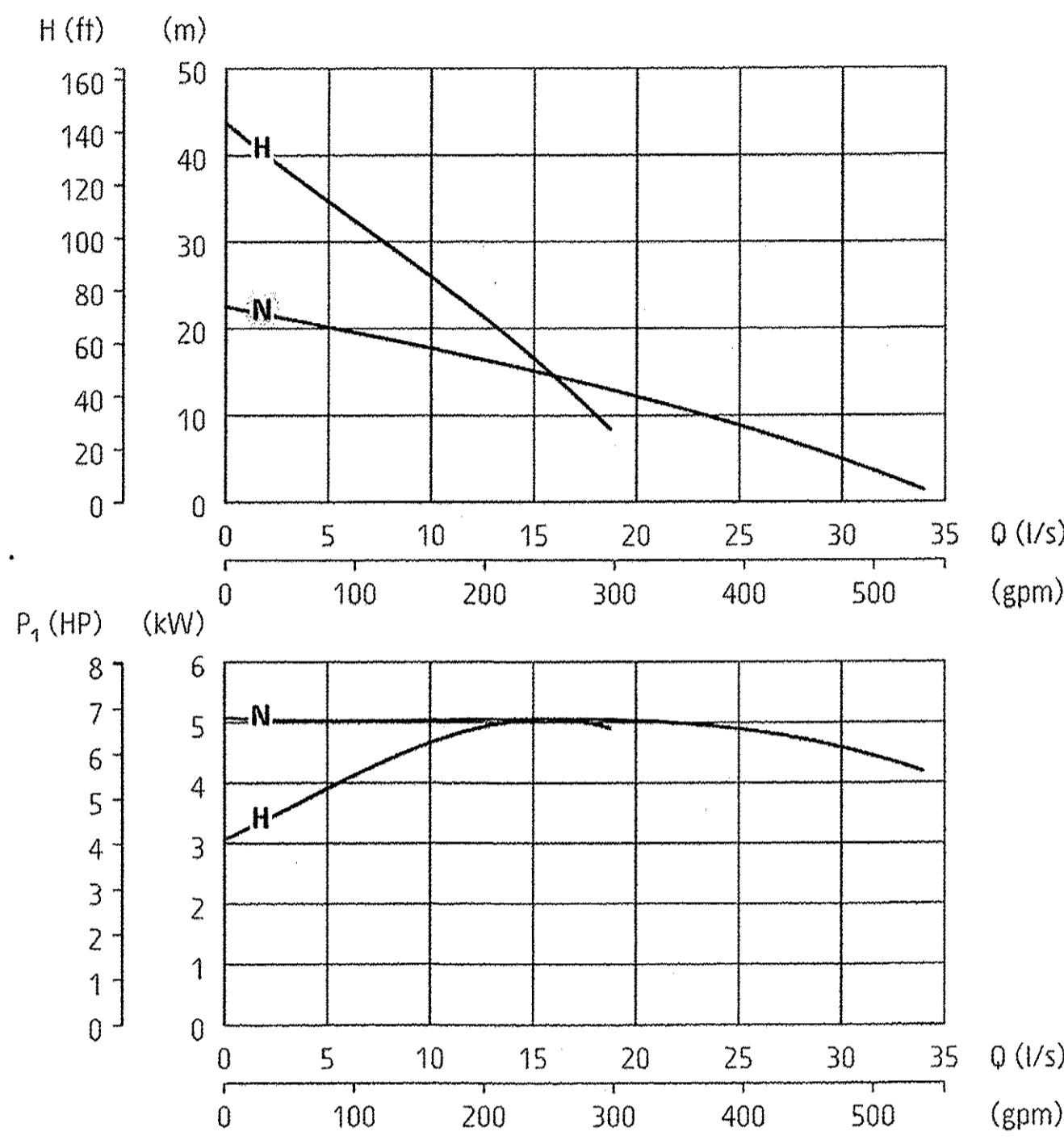
Minor

Electrical submersible drainage pump



60 Hz	N	H
Discharge connection	4"	3"
Rated power P _r [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 / 30.2	768 / 30.2
Diameter [mm/inch]	286 / 11.3	286 / 11.3
Weight [kg/lbs]	50 / 110	50 / 110

Other voltages on request



ISO 9906/A

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 seat: *silicon carbide - silicon carbide*
Material upper seat: *tungsten carbide - aluminium oxide*

Bearings

Ball bearings with C3 clearance

Discharge connection

3-4" hose, ISO-G or NPT

Materials

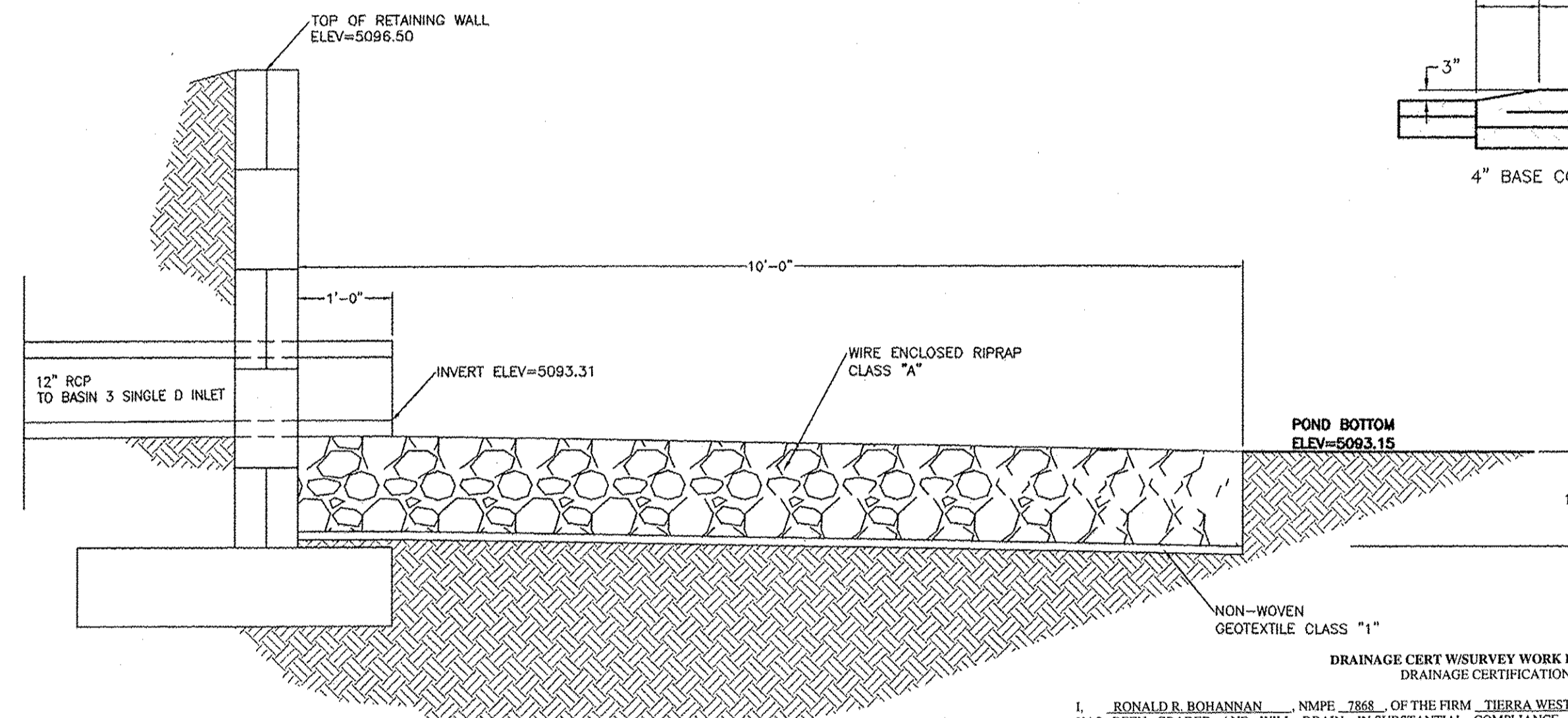
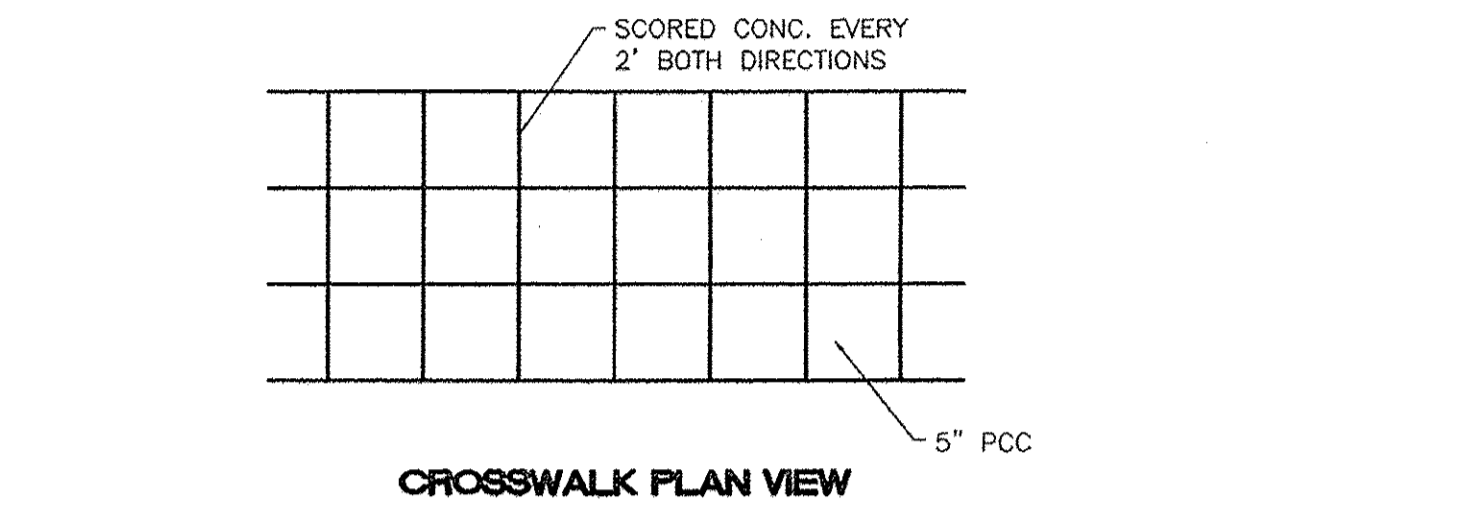
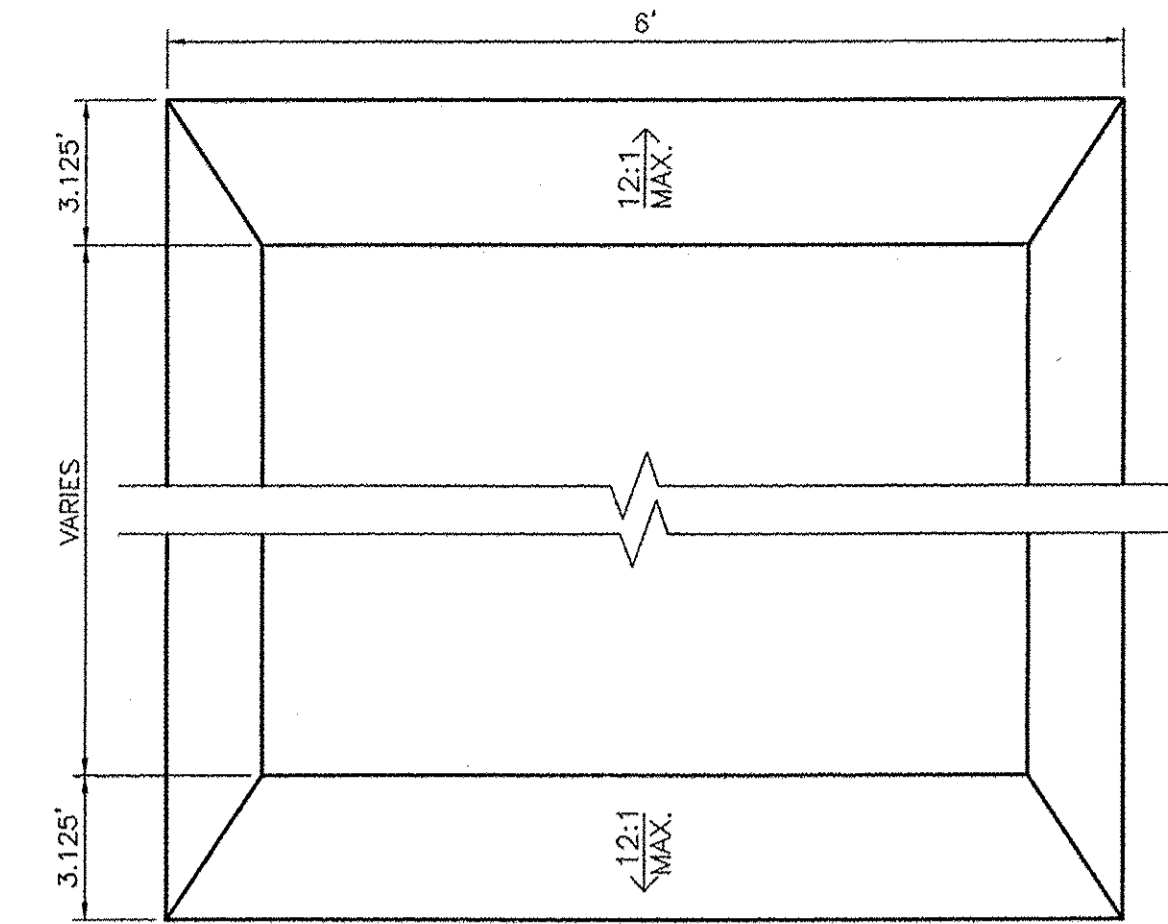
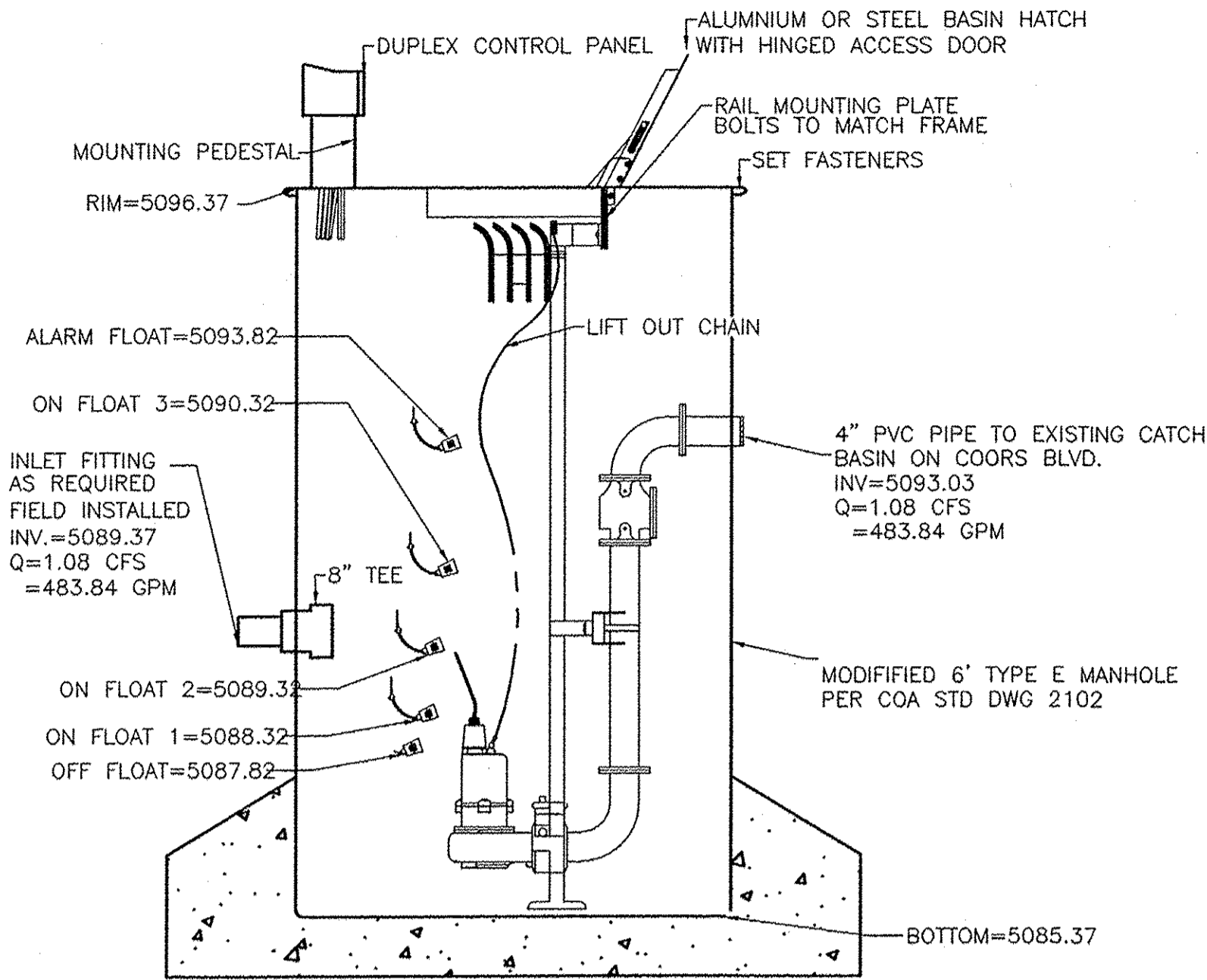
Casted parts: *Aluminium*
Outer casing: *Stainless steel*
Motor shaft: *Stainless steel*
Impeller and suction cover: *Hard-Iron™*
Diffusers: *Nitrile rubber*
Screws and nuts: *Stainless steel*
O-rings: *Nitrile rubber*

Accessories

Level regulator
Zinc anodes
Tandem connection
Low suction collar
Pump raft

GRINDEX PUMP DETAIL

NTS

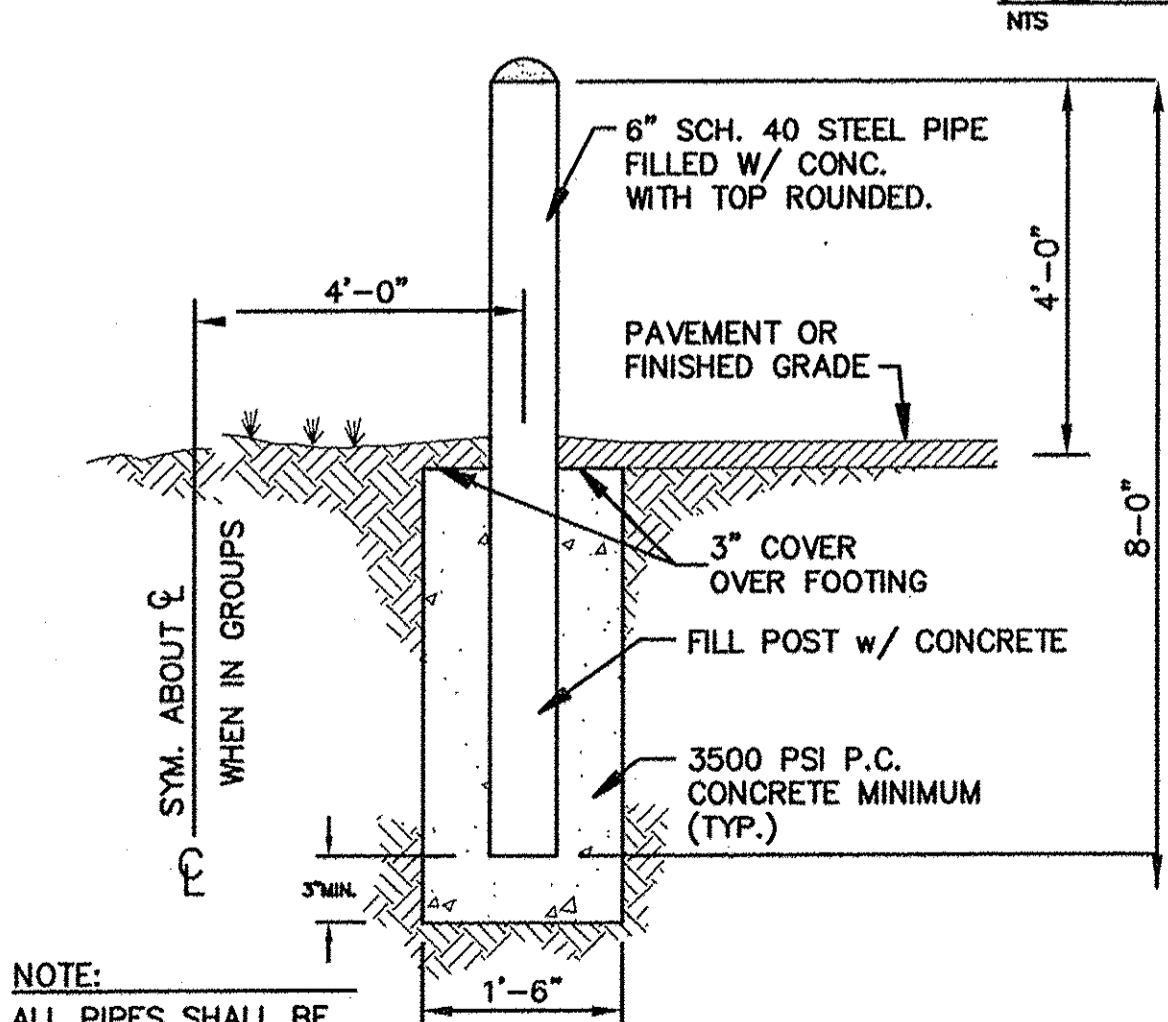
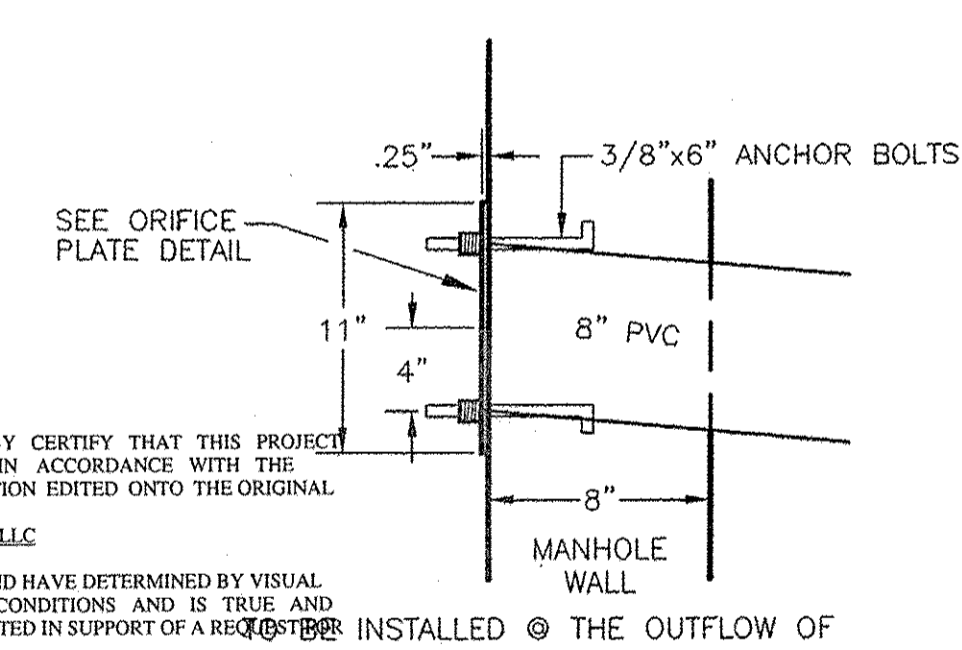


I, RONALD R. BOHANNAN, NMPE #7868, OF THE FIRM TIERRA WEST, LLC, HEREBY CERTIFY THAT THIS PROJECT HAS BEEN GRADED AND WILL DRAIN IN SUBSTANTIAL COMPLIANCE WITH AND IN ACCORDANCE WITH THE DESIGN INTENT OF THE APPROVED PLAN DATED 7/7/15. THE RECORD INFORMATION EDITED ONTO THE ORIGINAL DESIGN DOCUMENT HAS BEEN OBTAINED BY ANDREW S. MEDINA, NMPS #126490, OF THE FIRM SANDIA LAND SURVEYING, LLC.

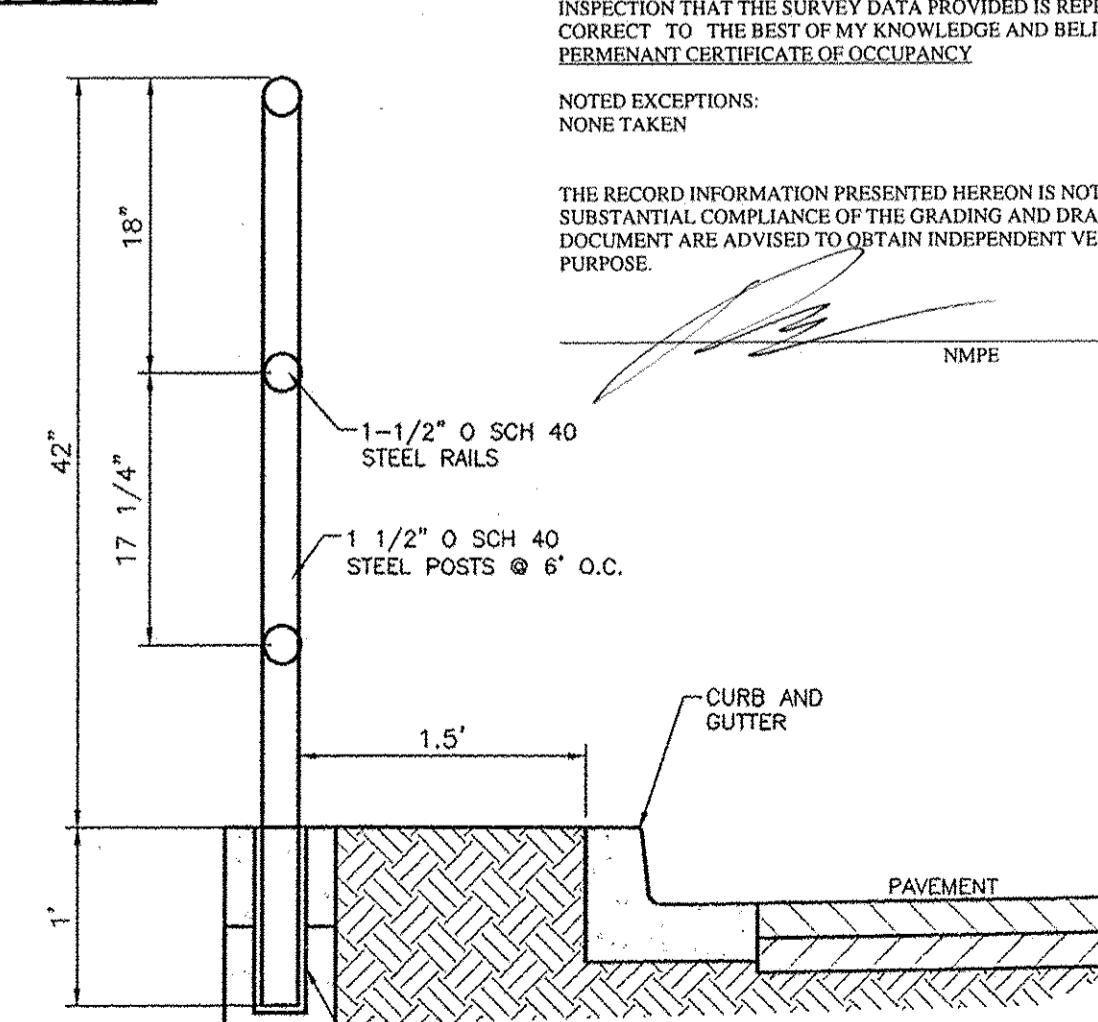
I FURTHER CERTIFY THAT I HAVE PERSONALLY VISITED THE PROJECT SITE ON 8/11/15 AND HAVE DETERMINED BY VISUAL INSPECTION THAT THE SURVEY DATA PROVIDED IS REPRESENTATIVE OF ACTUAL SITE CONDITIONS AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. THIS CERTIFICATION IS SUBMITTED IN SUPPORT OF A RECORD SET FOR PERMANENT CERTIFICATE OF OCCUPANCY.

NOTED EXCEPTIONS:
NONE TAKEN

THE RECORD INFORMATION PRESENTED HEREON IS NOT NECESSARILY COMPLETE AND IS INTENDED ONLY TO VERIFY SUBSTANTIAL COMPLIANCE OF THE GRADING AND DRAINAGE ASPECTS OF THE PROJECT. ENGINEERS RELYING ON THE RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF THE RECORD INFORMATION BY VISUAL INSPECTION AND BY USING IT FOR ANY OTHER PURPOSE.



NOTE:
ALL PIPES SHALL BE PAINTED TRAFFIC YELLOW



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