CITY OF ALBUQUERQUE

June 16, 2015

Ronald Bohannan, PE
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM 87109

RE: **Freddy's (Formerly "Whataburger"), 111 Coors Blvd. NW**
      Grading and Drainage Plan
      Engineer's Stamp Date 6-03-2015 (File: K10-D001B)

Dear Mr. Bohannan:

Based upon the information provided in your submittal received 6-03-15, the above referenced Grading Plan cannot be approved for Building Permit until the following comments are addressed:

1) A new grading and drainage plan must be submitted based on the updated site plan which addresses EPC Comments. Ensure that the new site layout incorporates the same detention pond sizing as the old site layout.

2) The electronic submittal (Engineer's stamp date - 6/03/15) does not match the hard copy submittal (Engineer's stamp date - 5/18/15).   The 6/03/15 plan addresses the latest and greatest comments (e-mail dated 6/01/15) that ask for additional existing spot elevations at the accessways from the shopping center parking lot and the grease trap for the trash dumpster.

If you have any questions, you can contact me at 924-3924.

Sincerely,

Jeanne Wolfenbarger, P.E.
Senior Engineer, Planning Dept.
Development Review Services

Orig: Drainage file
c.pdf Addressee via Email

K10D001B_BP_Grading_Cmmt3

Albuquerque - Making History 1706-2006

City of Albuquerque

Planning Department

Development & Building Services Division

RAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: _____ City Drainage #: _____

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

Legal Description: _____

City Address: _____

Engineering Firm: _____ Contact: _____

Address: _____

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

Owner: _____ Contact: _____

Address: _____

Phone#: _____ 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   SO-19 APPROVAL
- PAVING PERMIT APPROVAL   ESC PERMIT APPROVAL
- WORK ORDER APPROVAL   ESC CERT. ACCEPTANCE
- GRADING CERTIFICATION   OTHER (SPECIFY)

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

DATE SUBMITTED: _____ By: _____

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 followin

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

TIERRA WEST, LLC

June 3, 2015

Ms. Jeanne Wolfenbarger, P.E.
Senior Engineer, Planning Dept.
City of Albuquerque
PO Box 1293
Albuquerque, NM 87103

RE: **FREDDY'S, 111 COORS BLVD. NW**
       GRADING AND DRAINAGE PLAN
       ENGINEER'S STAMP DATE 5-18-2015 (K10-D001B)

Dear Ms. Wolfenbarger:

Per your correspondence dated June 1, 2015, please find the following responses addressing the comments listed below:

1. An agreement from adjacent property owner to the west is required to acknowledge the increase in 100-year water surface elevation to what is shown on the plan at a distance of "x" above existing ground.
   Response: Included with this submittal is a signed agreement letter from the property owner of Tract A1-A-2A to the west stating that they acknowledge the change of the maximum water surface elevation in the parking lot of said tract.

2. Put back the spot elevations that were originally on the conceptual plan showing the relationship between top of water surface elevation and top of existing ground. Ensure that the added water surface depth does not adversely affect the property to the north or south and that drainage is still being directed toward the double "D" inlet.
   Response: Spot elevations along the curb on the western property line have been added along with flow arrows to assure that positive drainage is still directed towards the Double D inlet.

3. Add a grease trap connection for the dumpster with a couple of added spot elevations showing drainage to the grease trap.
   Response: The grease trap drain for the dumpster has been added to the grading plan and labeled. Spot elevations for the drain and dumpster area have been added to assure drainage is directed towards the drain. The connection to the grease trap has been accounted for in the utility plan.

If you have any questions or need additional information regarding this matter, please do not hesitate to contact me.

Sincerely,

Ronald R. Bohannan, P.E.
JN: 2015036
RRB/vp

Z:\2015\2015036 Freddy's at Coors and Central\Drainage\2015036 15-06-03 Response to JW Hydology Comments.docx

Vinny Perea

From:	Wolfenbarger, Jeanne <jwolfenbarger@cabq.gov>
Sent:	Monday, June 01, 2015 4:37 PM
To:	Vinny Perea
Subject:	Freddy's (Formerly Whataburger)

Follow Up Flag:	Follow up
Flag Status:	Completed

Vinny,

As discussed, prior to approval, we will need:
A. An agreement from adjacent property owner to the west acknowledging the increase in 100-year water surface elevation to what is shown on the plan at a distance of "X" above existing ground.
B. Put back the spot elevations that you had on the conceptual plan showing the relationship between top of water surface elevation and top of existing ground. Ensure that the added water surface depth does not adversely affect the property to the north or south and that drainage is still being directed toward the double "D" inlet.
C. Add a grease trap connection for the dumpster with a couple of added spot elevation showing drainage to the grease trap.

Thanks!

Jeanne

Oak Realty
Partners Inc.

5975 S. Quebec Street, Suite 141
Greenwood Village, CO 80111

June 2, 2015

Ms. Jeanne Wolfenbarger, P.E.
Senior Engineer, Planning Dept.
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

**RE: FREDDY'S AT COORS AND CENTRAL
AGREEMENT OF CHANGE IN CROSS LOT DRAINAGE**

Dear Ms. Wolfenbarger:

As property owner of Tract A-1A-2A of the Hubbell Plaza, this letter acknowledges the increase in water surface profile on the tract and is accepting of that increase. Shown on the Hubbell Plaza plat recorded on September 29, 1987 is the drainage agreement showing and providing for the existing cross-lot drainage on the development of Tract D-1 of the Hubbell Plaza. I acknowledge that the maximum water surface elevation of the ponding in the parking lot of Tract A-1A-2A will rise to a depth of twelve (12) inches from the existing six (6) inches during the 100-year, 6-hour storm event and will continue to outfall through Tract D-1.
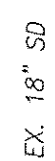
Michael Bushell
_____
Print Name

_____
Signature

Authorized Agent
_____
Title

6-2-15
_____
Date

LEGEND

▭▭▭	CURB & GUTTER
— — —	BOUNDARY LINE
— - —	EASEMENT
	BUILDING
░░░░	SIDEWALK
▨▨▨	PEDESTRAIN CROSSWALK
▨▨▨	RETAINING WALL
—5010—	CONTOUR MAJOR
—5011—	CONTOUR MINOR
x 5048.25	SPOT ELEVATION
∿∿∿	WATER BLOCK
→	FLOW ARROW
═══	EXISTING SIDEWALK
═══	EXISTING CURB & GUTTER
—5010—	EXISTING CONTOUR MAJOR
—5011—	EXISTING CONTOUR MINOR
x 5048.25	EXISTING SPOT ELEVATION
— — —	EXISTING POND
▨▨▨	UNDERGROUND STORAGE

SITE LEGEND

1. RETAINING WALL
2. TURN DOWN CURB
3. CURB AND GUTTER
4. HEADER CURB
5. CONCRETE SIDEWALK
6. HC RAMP
7. 1 FT. CURB CUT
8. 10" PVC RISER
9. 4"x8" REDUCER

GRAPHIC SCALE
SCALE: 1"=20'

SECTION A-A

PROPERTY LINE
6.25'
GUARD RAIL (SEE DETAIL ON SHEET C2)
5096.75
21.00'
MWSE=5095.75
RETAINING WALL
5093.15
2.0'
CURB AND GUTTER
5096.75
5096.40 PAVEMENT
3.6'

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 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. The offsite flows will drain via surface flow through both driveway aisles and through a curb cut on the west side of the site where the existing concrete channel lies. The offsite flows through the south driveway and curb cut will be collected into a Double D Drop Inlet that is located in a bio swale on the western side of site. The offsite flows through the north driveway will be collected in the detention pond on the north side of the site. 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. Flows from the north driveway aisle will be directed towards the detention pond. All other flows from the west side 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 an underground storage system. The detention pond 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 detention pond will act as an equalizing system and allow runoff to be stored in both the detention pond 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). Emergency overflow of the water surface elevation would send flows over the southeast part of the parking lot and onto Coors Blvd. The detention system will outflow through a 4" orifice plate located at 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 pond is 0.36 ac-ft, volume of underground storage is 0.22 ac-ft, and the volume of surface ponding is 0.23 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 pond and underground storage system will capture sediment within the bottom of each respective area, the detention pond outlet will be raised 0.16ft above the pond bottom to retain the first flush volume of the site.

See sheet C2 for DPM calulations, 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

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 ACCEPTANCE OF ANY PROJECT.

NOTICE TO CONTRACTORS:

1. AN EXCAVATION/CONSTRUCTION PERMIT WILL BE REQUIRED BEFORE BEGINNING ANY WORK WITHIN CITY RIGHT-OF-WAY.

2. 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.

3. TWO WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE, 765-1234, FOR LOCATION OF EXISTING UTILITIES.

4. 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.

5. BACKFILL COMPACTION SHALL BE ACCORDING TO TRAFFIC/STREET USE.

6. 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		

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.

STANDARD DUTY ASPHALT PAVING

1.5" ACC SURFACE COURSE (NMDOT 423)
1.5" ACC BINDER COURSE (NMDOT 423)
6" AGGREGATE BASE COURSE (NMDOT 303)
10" COMPACTED SUBGRADE

12"
P.C. CONC.

Title Block

ENGINEER'S SEAL

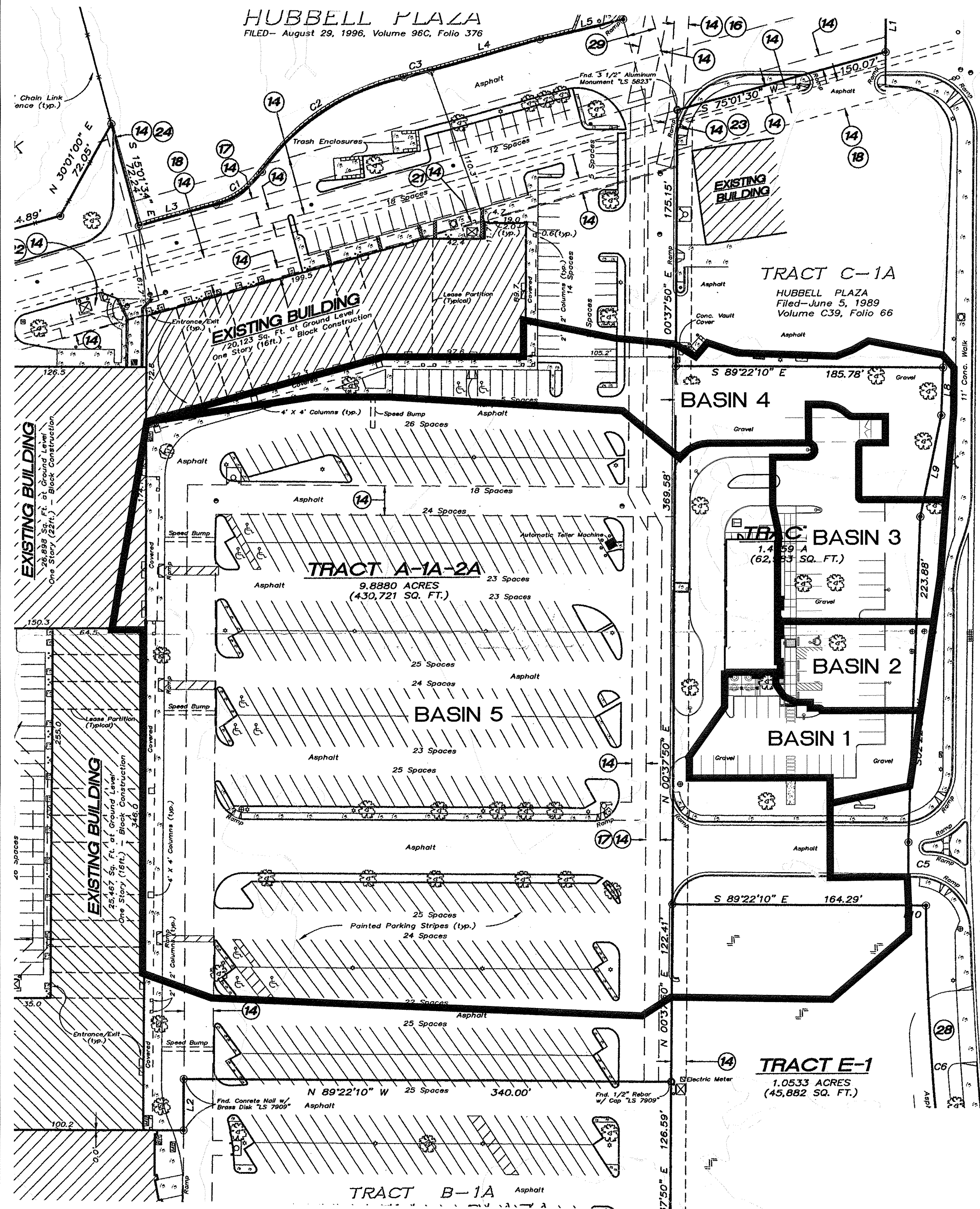RONALD R. BOHANNAN, NEW MEXICO, PROFESSIONAL ENGINEER
RONALD R. BOHANNAN
P.E. #7868

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.tierrawestllc.com

DRAWN BY: DY
DATE: 05/11/15
2015036-GRE
SHEET #: C1
JOB #: 2015036

Vicinity / Firm Map Labels

VICINITY MAP: K-10-Z
FIRM MAP: 35001C0329H
ZONE AH (EL 5088)
ZONE AH (EL 5097)
SITE

DPM Weighted E Method

Existing Conditions

Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Treatment A %	(acres)	Treatment B %	(acres)	Treatment C %	(acres)	Treatment D %	(acres)	100-Year, 6-Hr Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	10-Year, 6-Hr 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										0.711	19.81		0.420	12.16

Proposed Conditions

Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Treatment A %	(acres)	Treatment B %	(acres)	Treatment C %	(acres)	Treatment D %	(acres)	100-Year, 6-Hr Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	10-Year, 6-Hr 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) - 7(½" middle bars)
= 32 1/2"
= 2.7083'

W = 25" - 13(½" 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(½" middle bars) - 6"
(center piece)
=63"
= 5.25'

W = 25" - 13(½" 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^(⅔)*sqrt(S)
Q = Discharge
n = Manning's roughness coefficient (0.013)
A = Pipe area (3.14 ft2)
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^(⅔)*sqrt(S)
Q = Discharge
n = Manning's roughness coefficient (0.013)
A = Pipe area (0.785 ft2)
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^(⅔)*sqrt(S)
Q = Discharge
n = Manning's roughness coefficient (0.013)
A = Pipe area (0.785 ft2)
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

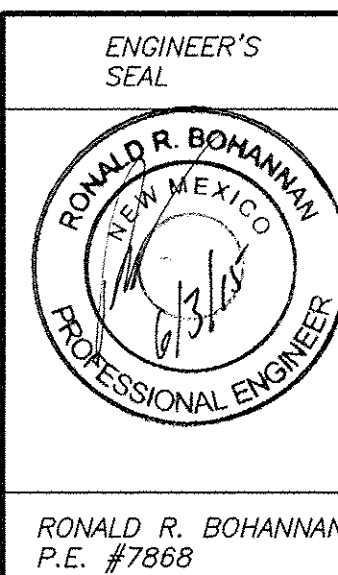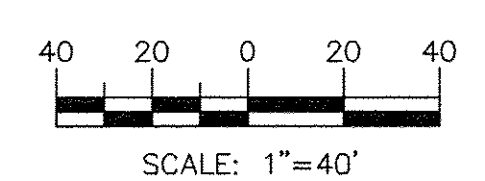**Total storage of volume of Stormchamber system = 0.11 + 0.11 = 0.22 ac-ft**

ORIFICE PLATE IN MANHOLE 2 CALCULATIONS

Orifice Equation: Q = CA sqrt(2gH)

C = 0.6
A = Orifice Area (ft2)
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
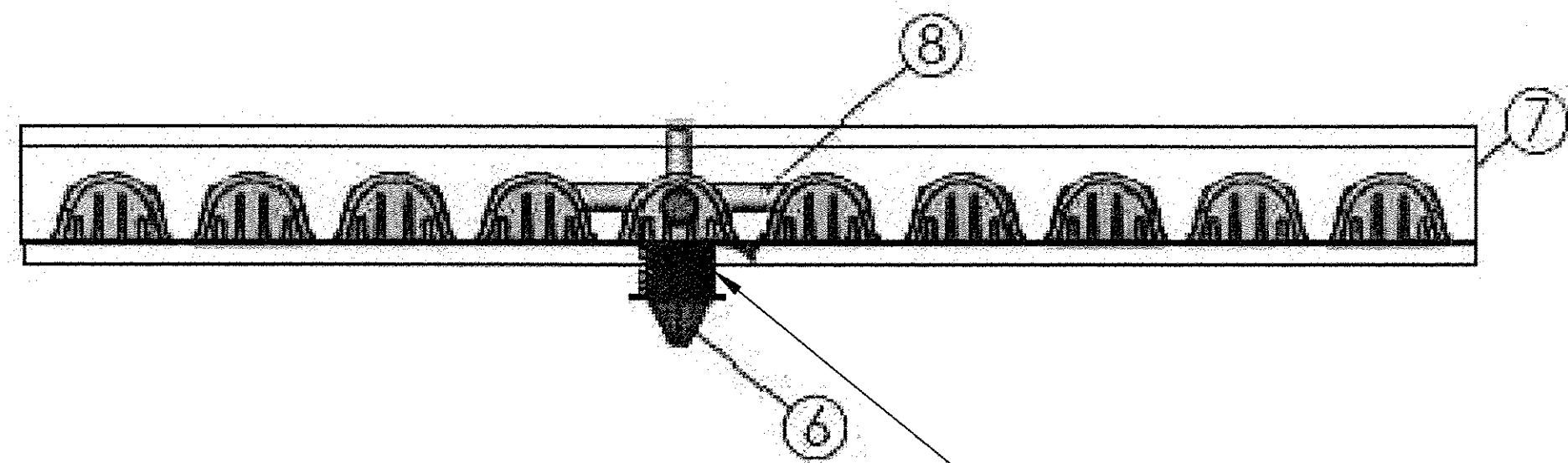r = 0.169 ft
r = 2"
Use 4" dia. orifice plate

Site Plan Labels

HUBBELL PLAZA
FILED— August 29, 1996, Volume 96C, Folio 376

TRACT C-1A
HUBBELL PLAZA
Filed—June 5, 1989
Volume C39, Folio 66

EXISTING BUILDING
20,123 Sq. Ft. at Ground Level
One Story (16ft.) – Block Construction

EXISTING BUILDING

BASIN 4
BASIN 3
BASIN 2
BASIN 1
BASIN 5

TRACT A-1A-2A
9.8880 ACRES
(430,721 SQ. FT.)

TRACT
1.4359 A
(62,593 SQ. FT.)

COORS BOULEVARD N.W.

TRACT E-1
1.0533 ACRES
(45,882 SQ. FT.)

TRACT B-1A

GRAPHIC SCALE
40 20 0 20 40
SCALE: 1"=40'

ENGINEER'S SEAL
RONALD R. BOHANNAN
NEW MEXICO
PROFESSIONAL ENGINEER

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

RONALD R. BOHANNAN
P.E. #7868

DRAWN BY
BJF
DATE
05/11/15
2015036-GRB-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

RISERS W\SEDIMENT TRAPS BELOW

SINGLE D INLET INV=5089.64

BOTTOM=5089.56

OUTFLOW

INFLOW

59'

56'

BOTTOM=5089.78 INFLOW

STORMCHAMBER® WITH SEDIMENTRAP™

DOWNFLOW END

UPFLOW END

8'-7" [2617mm]

START CHAMBER CONFIGURATION
START MODEL IS CLOSED AT THE SIDE PORTAL END AND PARTIALLY OPEN AT THE TOP PORTAL END

8'-2" [2490mm]

MIDDLE CHAMBER CONFIGURATION
MIDDLE MODEL IS COMPLETELY OPEN AT THE SIDE PORTAL END AND PARTIALLY OPEN AT THE TOP PORTAL END

8'-2" [2490mm]

END CHAMBER CONFIGURATION
END MODEL IS COMPLETELY OPEN AT THE SIDE PORTAL END AND COMPLETLY CLOSED AT THE TOP PORTAL END

8'-1" [2464mm]   7'-7" [2311mm]   8'-1" [2464mm]

LAY-UP LENGTHS

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.

8'-6" [2591mm]

5'-0" [1524mm]
4'-8" [1422mm]

CUTOUT GUIDE FOR 10" [250mm], AND 12" [300mm] PVC RISER PIPE

CUT OUT GUIDE FOR 10" [250mm] PVC PIPE OR SMALLER

2'-10" [864mm]
1'-11" [584mm]
1'-1" [330mm]

STORMCHAMBER® TYPICAL CROSS-SECTION INSTALLATION

FOR PAVED AREAS   FOR UNPAVED AREAS

95% COMPACTED CLEAN FILL OR 3/4" - 2" [20mm - 50mm] CRUSHED WASHED STONE

PAVEMENT
PAVEMENT BASE

4 OZ. [113g] NON-WOVEN FILTER FABRIC AT STONE/SOIL INTERFACE

95% COMPACTED, CLEAN FILL OR CONTINUE CRUSHED WASHED STONE TO SURFACE

24"
12"

3/4" - 2" [20mm - 50mm] CRUSHED WASHED STONE

10" [250mm] PVC

4 OZ. [113g] NON-WOVEN FILTER FABRIC AGAINST TRENCH WALL

LIGHT WEIGHT STABILIZATION NETTING (SUPPLIED) UNDER IN FLOW AND ADJACENT ROW(S)

PREFERRED IN FLOW LOCATION (UP TO 30" [750mm] O.D. PIPE)

6.7' X 10' [2000mm x 3030mm] HEAVYWEIGHT STABILIZATION NETTING (SUPPLIED) UNDER IN FLOW AND ADJACENT START UNIT(S)

CAST IRON FRAME WITH COVER

3' X 3' [900mm x 900mm] REINFORCED CONCRETE PAD OR AS SPECIFIED

8" [200mm]

INSPECTION COVER

10" [250mm] PVC PIPE RISER SCH40 OR DL35

3/4" - 2" [20mm - 50mm] CRUSHED, WASHED, STONE

END UNIT

STORMCHAMBER® SEDIMENTRAP™

10" [250mm] PVC PIPE RISER SCH40 OR DL35

95% COMPACTED CLEAN FILL OR 3/4" - 2" [20mm - 50mm] CRUSHED WASHED STONE

PAVEMENT

24"
12"

LIGHTWEIGHT STABILIZATION NETTING (SUPPLIED) UNDER IN FLOW AND ADJACENT STORMCHAMBER ROW(S)

30"

3' [914mm]

2' [610mm]

START UNIT

47" [194mm]

ENGINEER'S SEAL

RONALD R. BOHANNAN
NEW MEXICO
PROFESSIONAL ENGINEER

RONALD R. BOHANNAN
P.E. #7868

FREDDY'S AT COORS AND CENTRAL
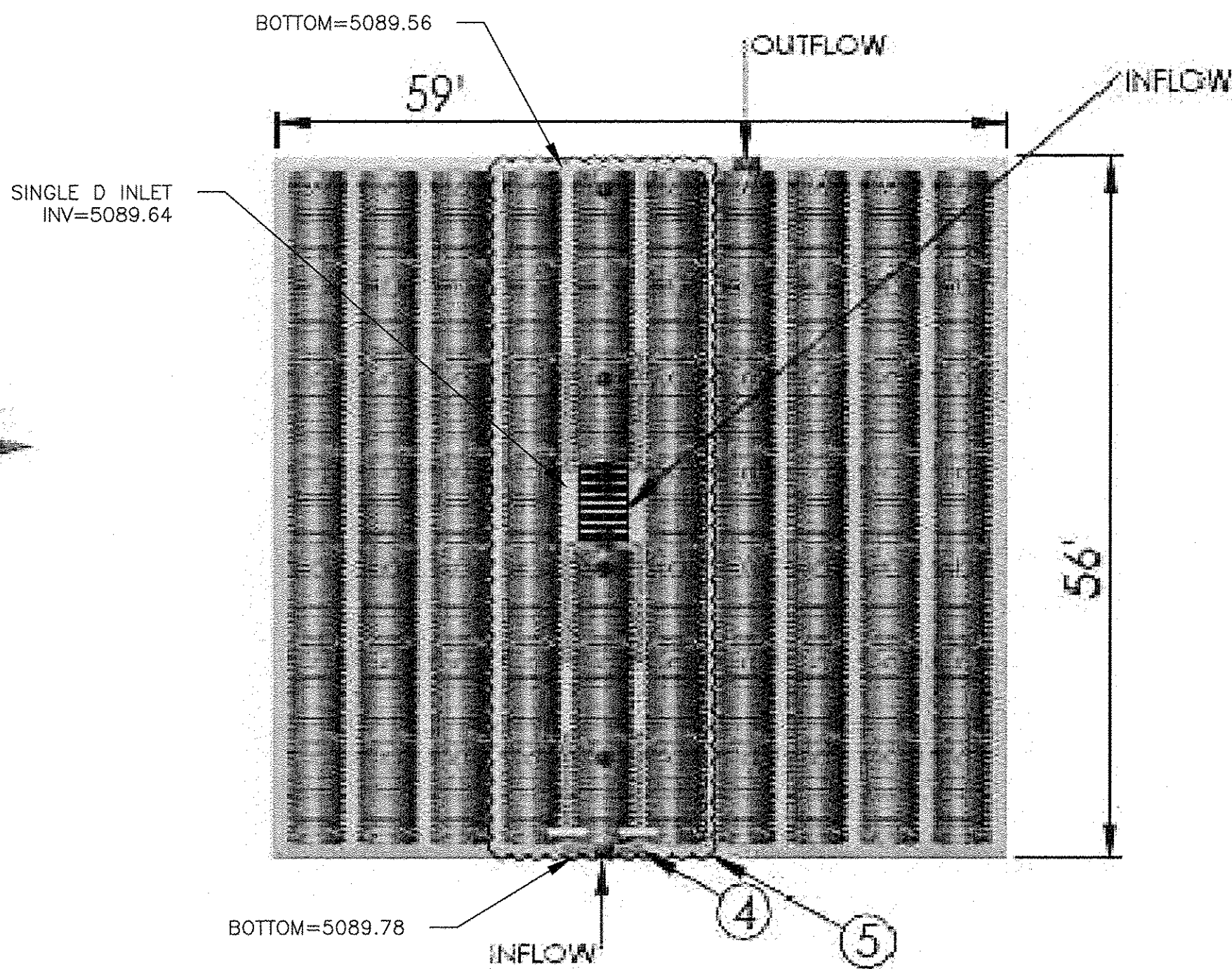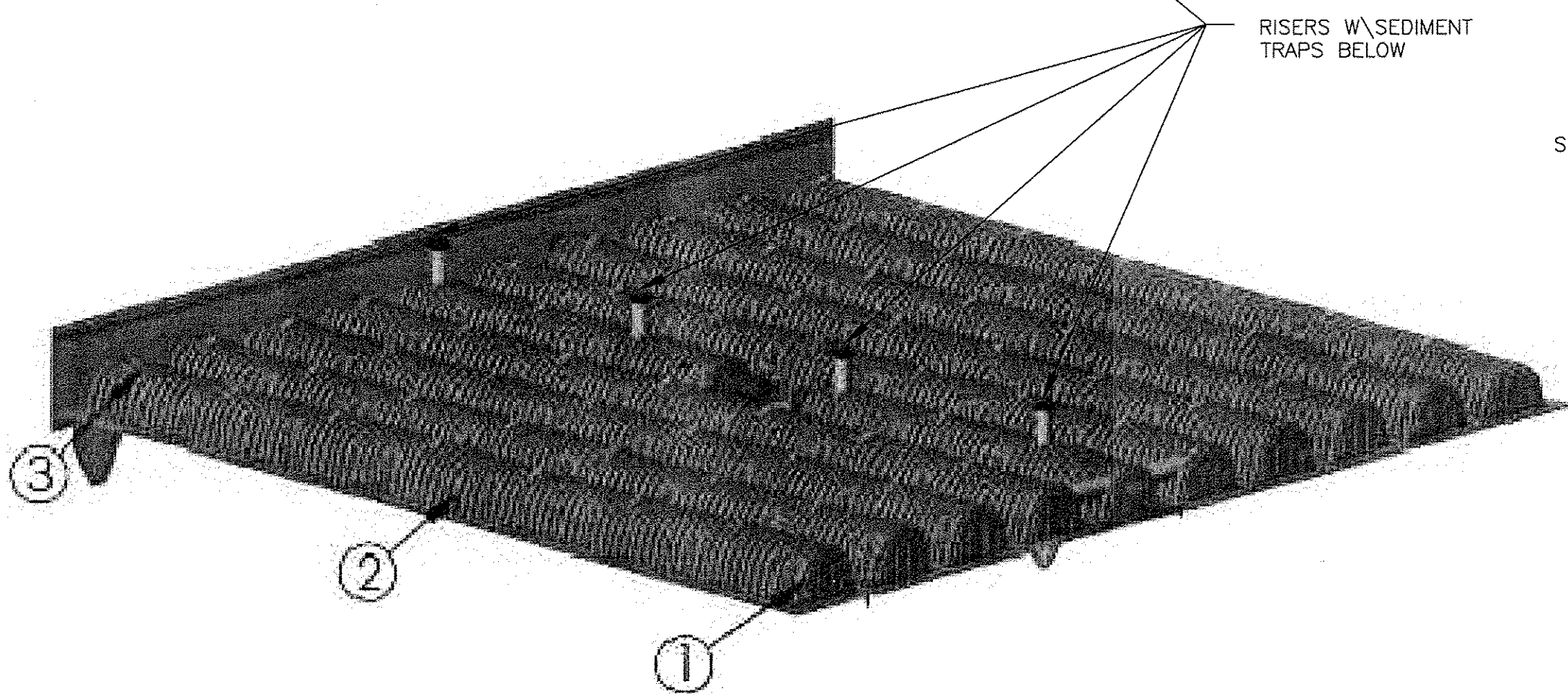
STORMCHAMBER STORAGE SYSTEM

TIERRA WEST, LLC
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ALBUQUERQUE, NM 87109
(505) 858-3100
www.tierrawestllc.com

DRAWN BY: BJF
DATE: 05/11/15
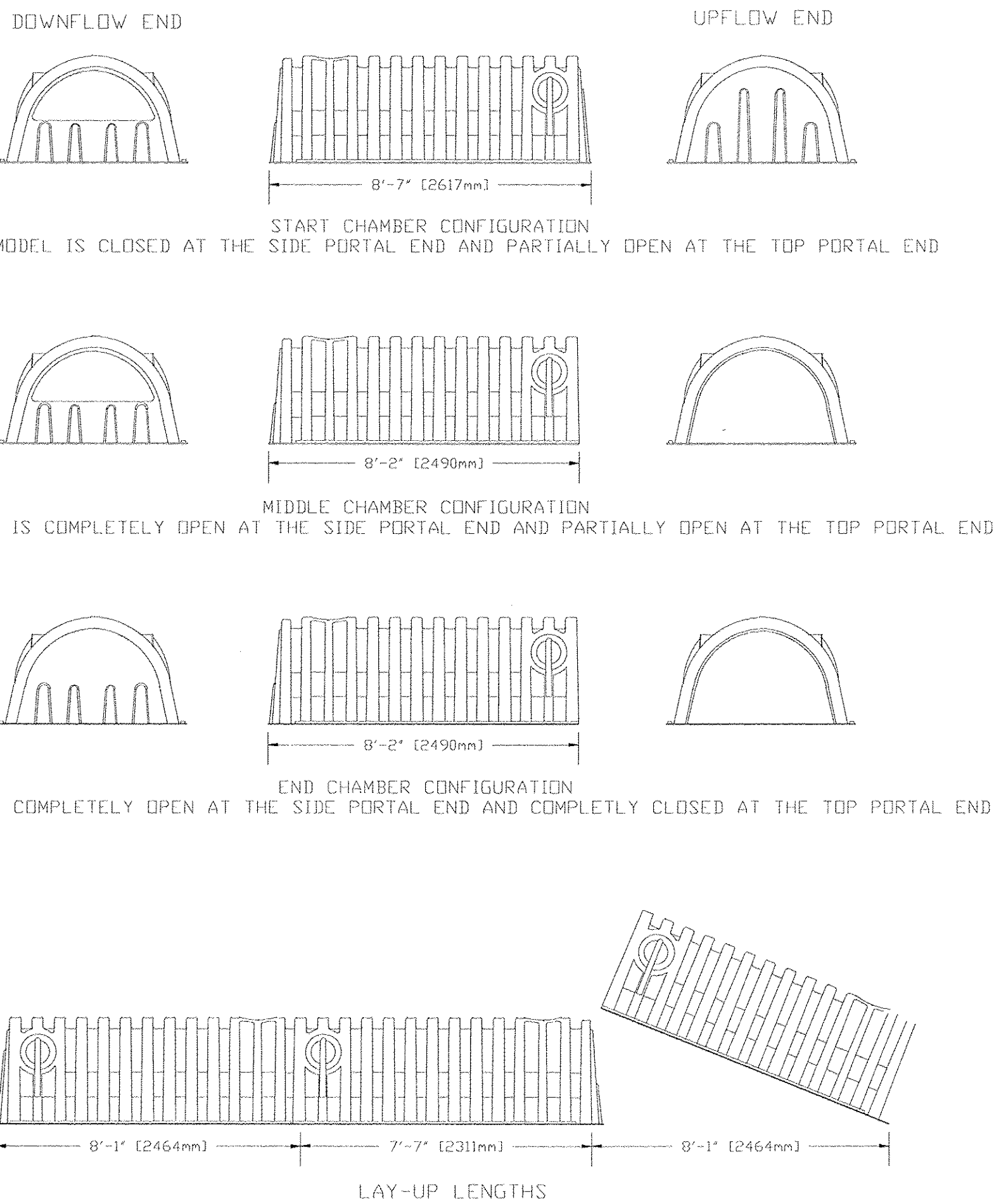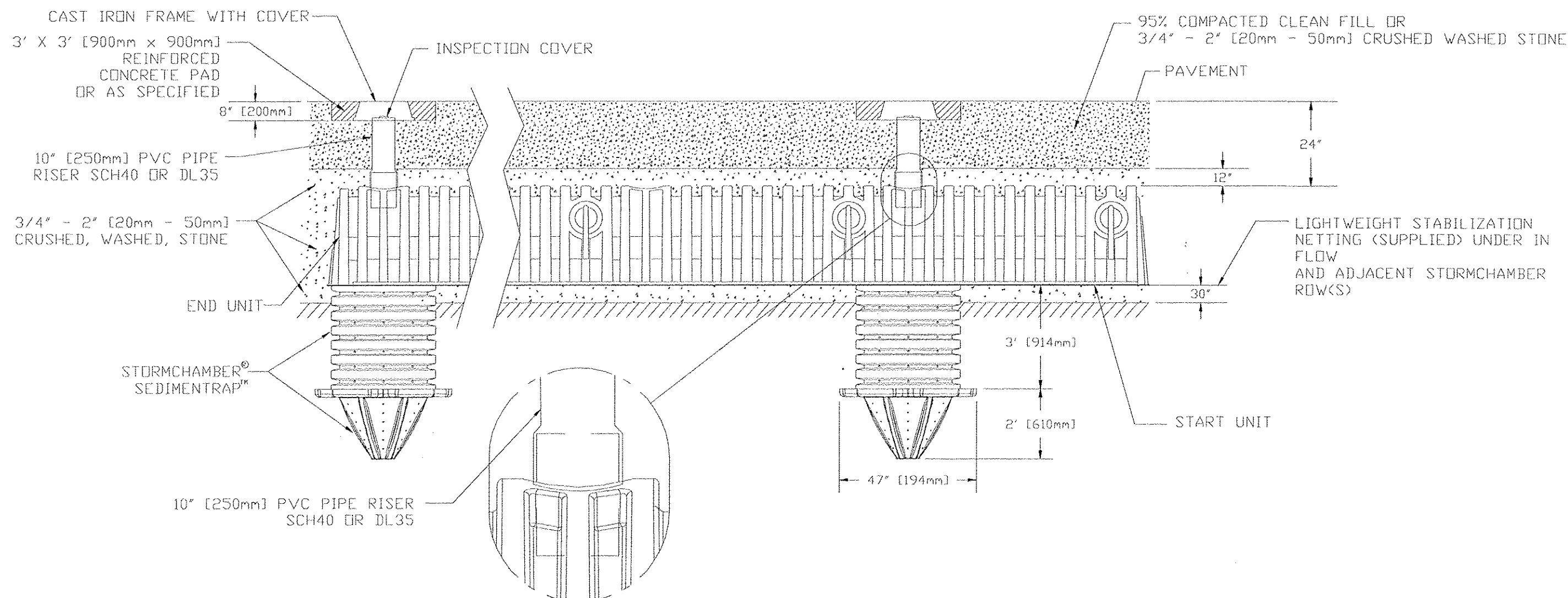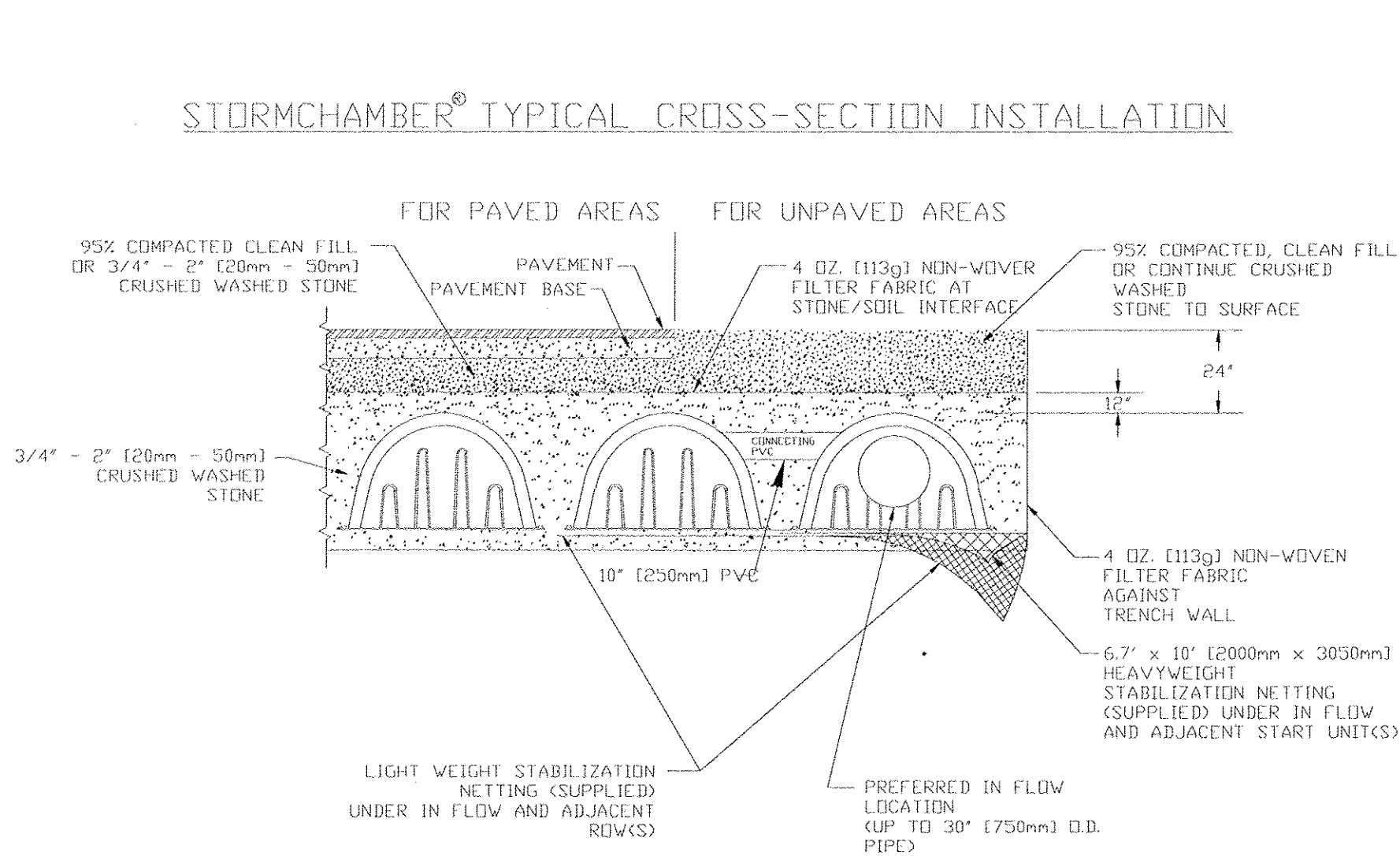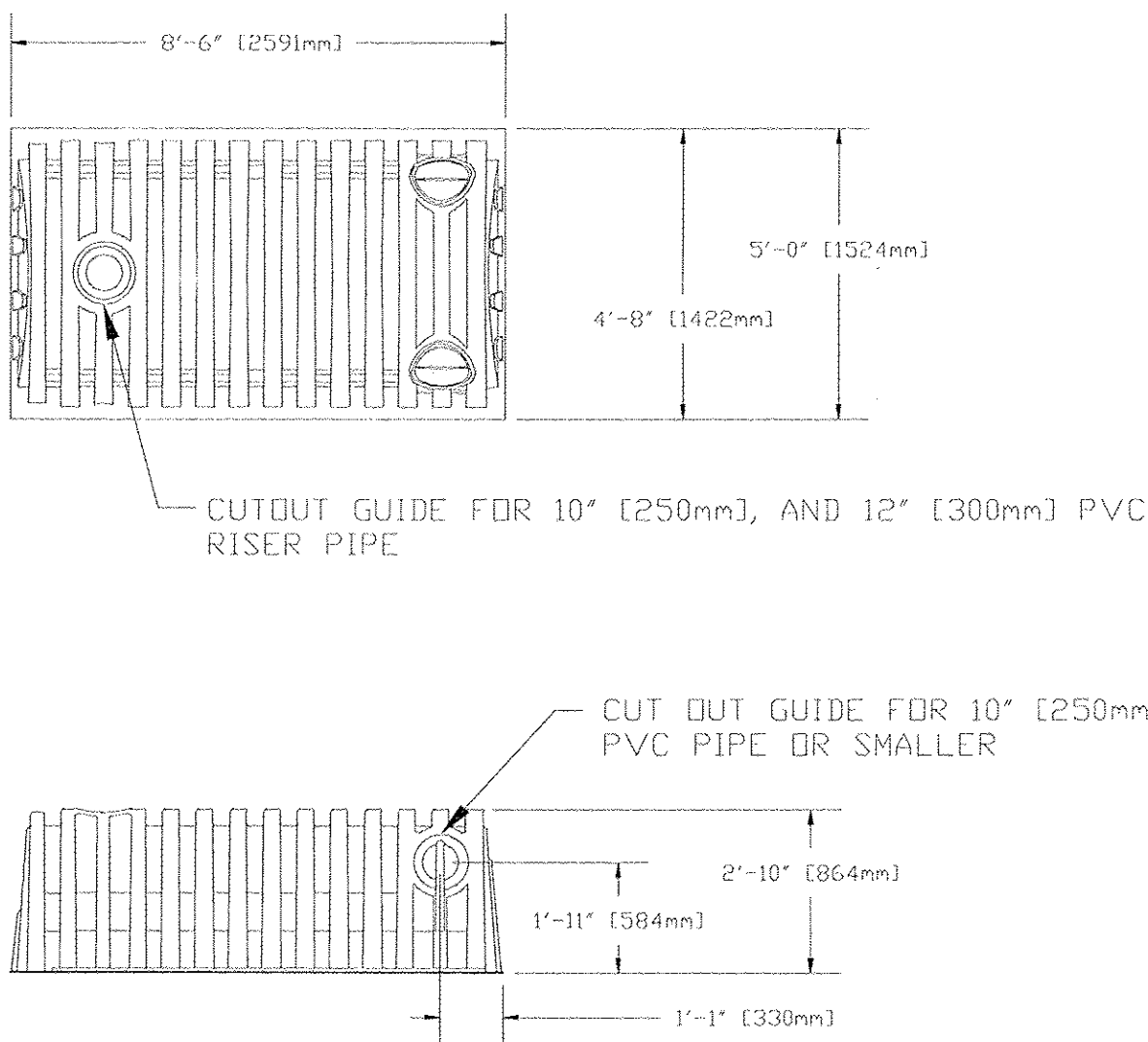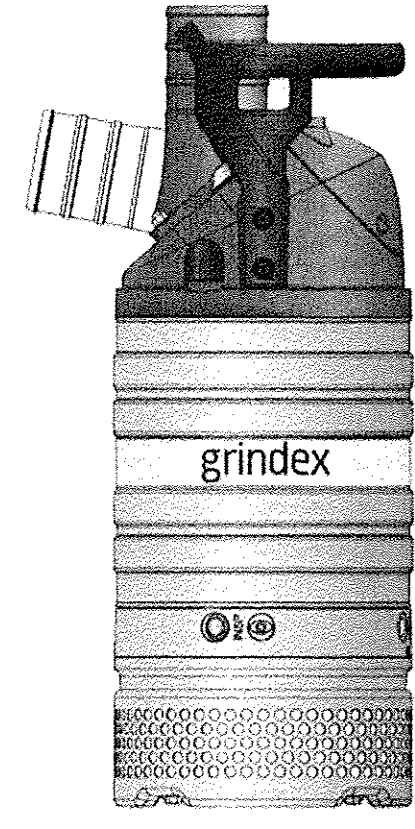2015036-GRB-DETAILS

SHEET #: C3

JOB #: 2015036

Minor

Electrical submersible drainage pump

grindex

GRINDEX PUMP DETAIL

H (ft) (m)

P₁ (HP) (kW)

ISO 9906/A

60 Hz	N	H
Discharge connection	4"	3"
Rated power P₂ [kW/HP]	4.4 / 6.0	4.4 / 6.0
Max. power consumption P₁ [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 / 30¼	768 / 30¼
Diameter [mm/inch]	286 / 11¼	286 / 11¼
Weight [kg/lbs]	50 / 110	50 / 110

Other voltages on request
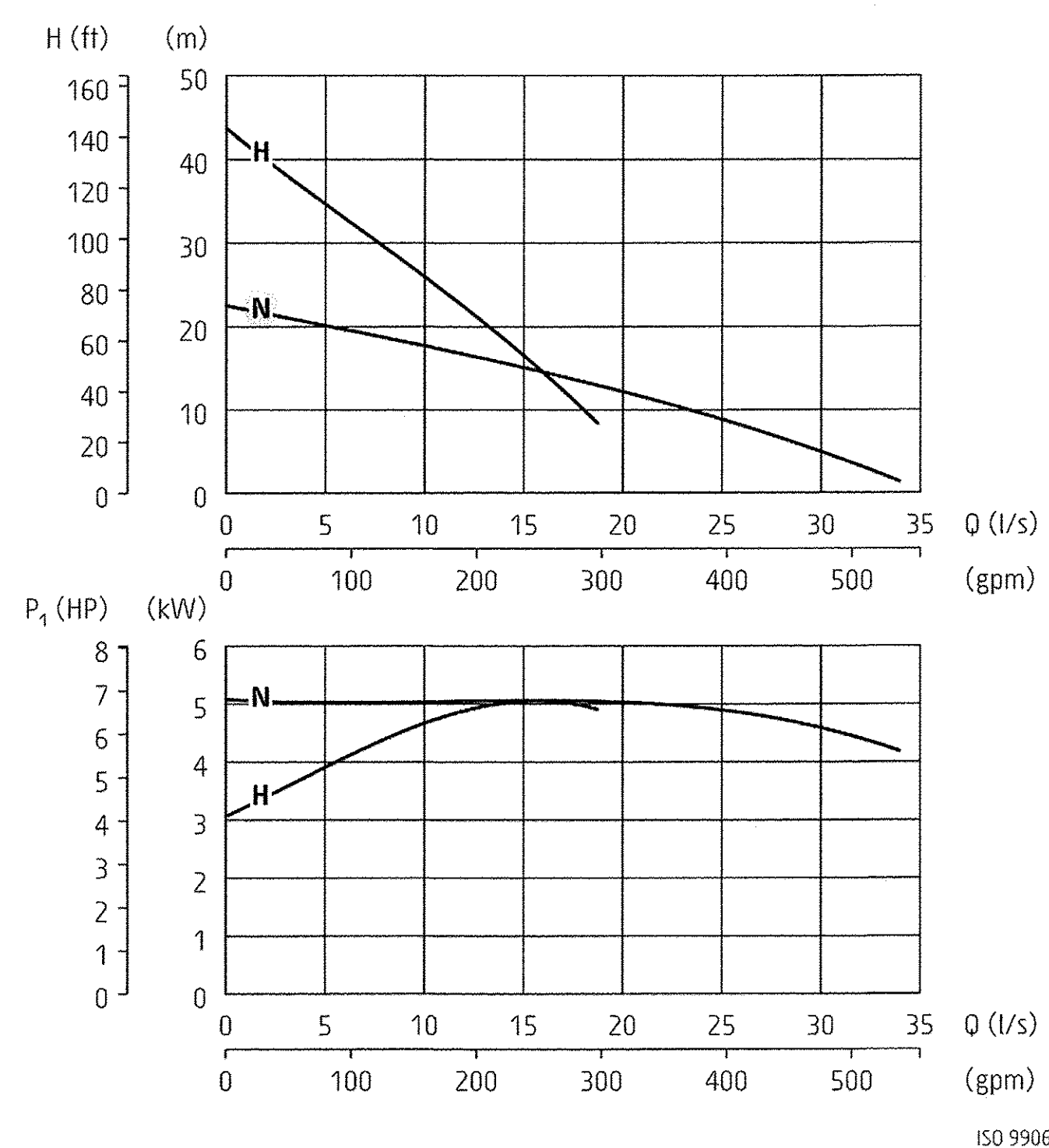
Pump types
N: normal pressure
H: high pressure

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 mechnical 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
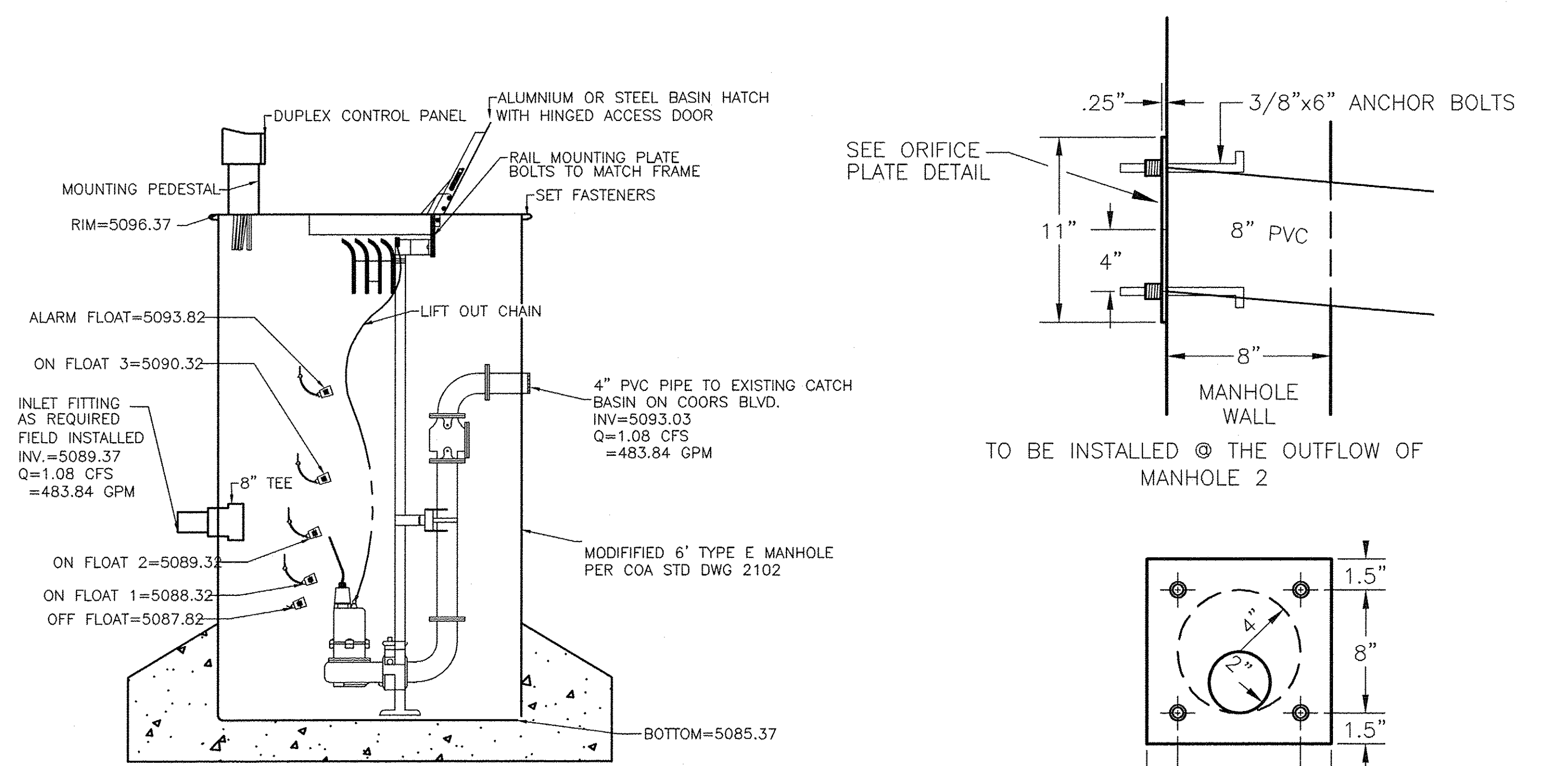3-4˝ hose, ISO-G or NPT

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
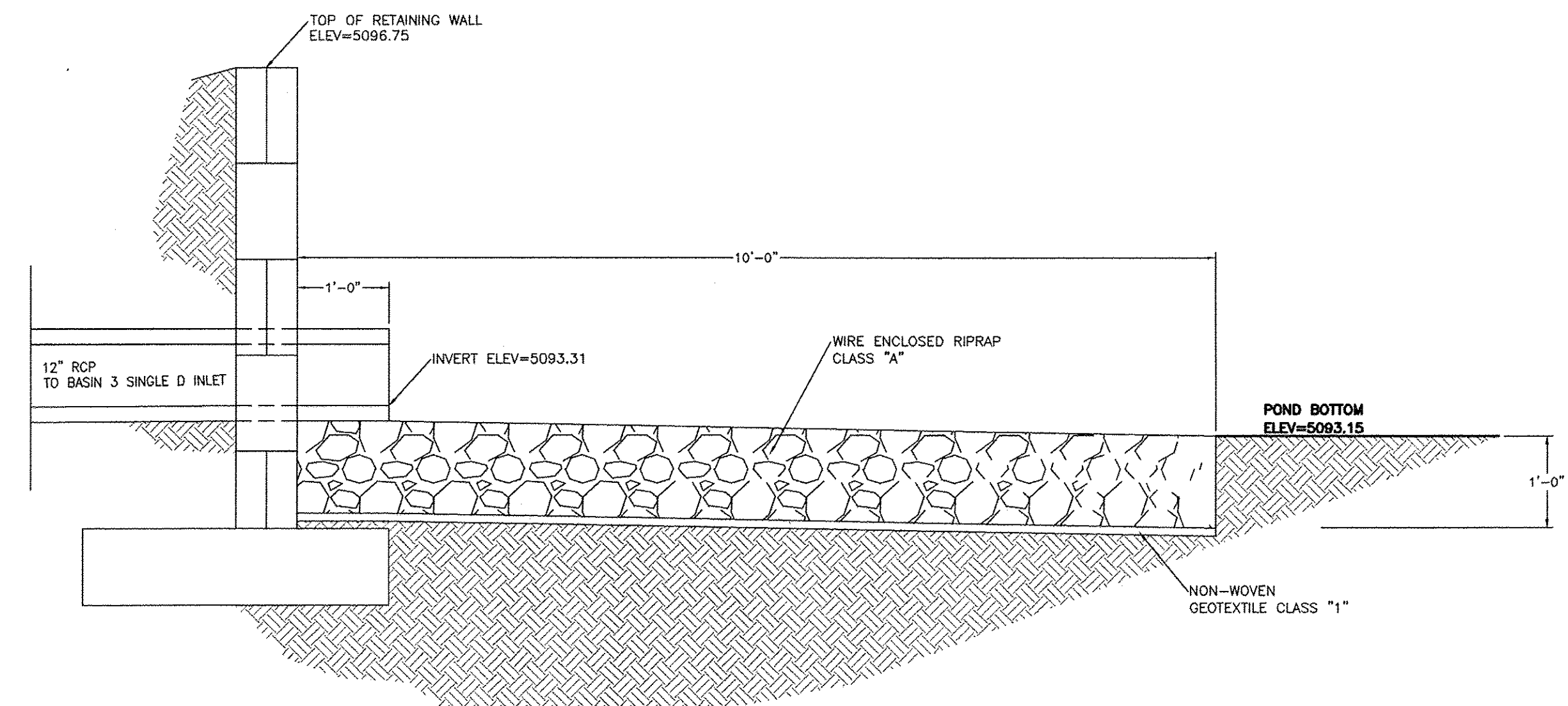Low suction collar
Pump raft

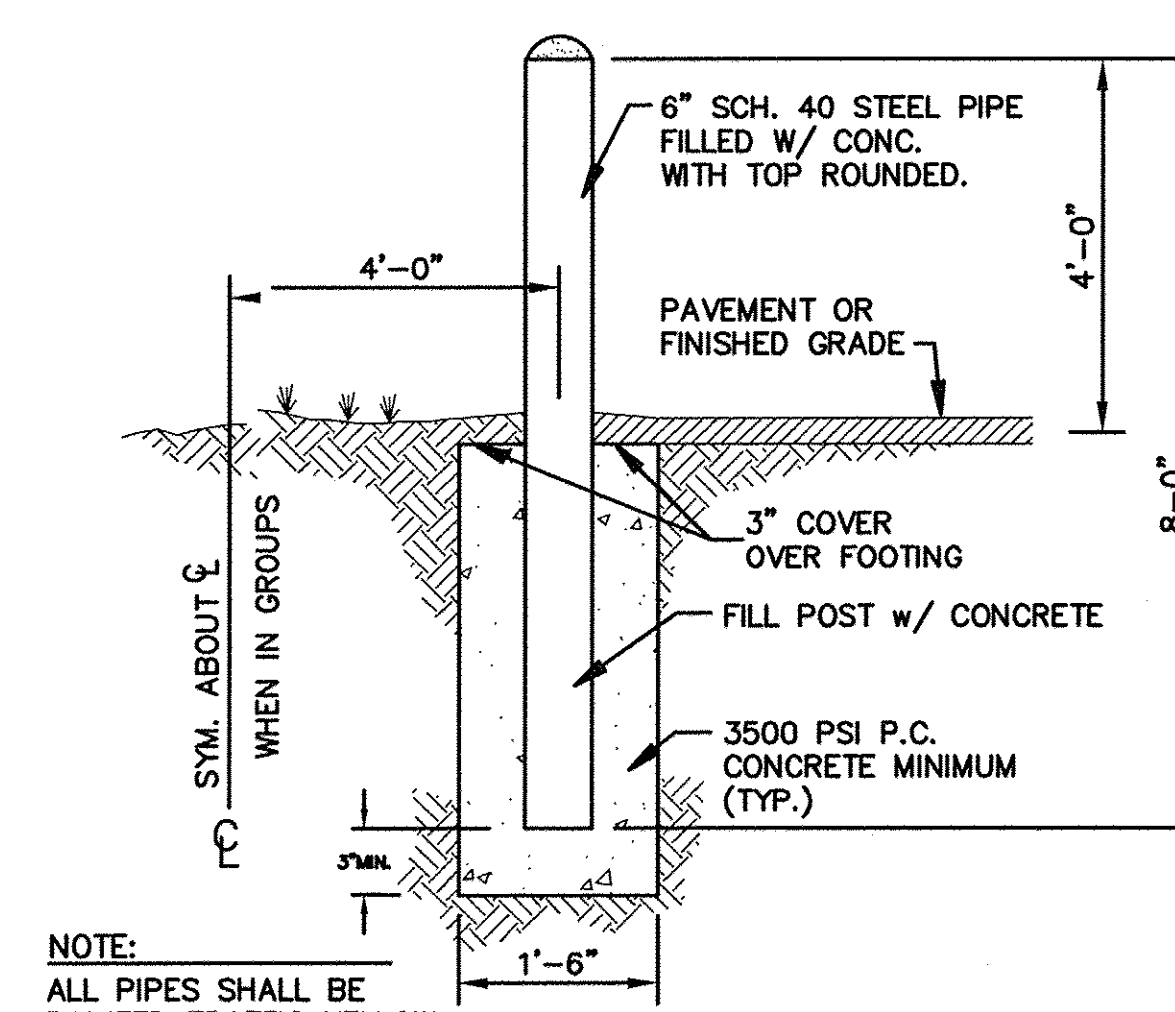### GRINDEX PUMP DETAIL
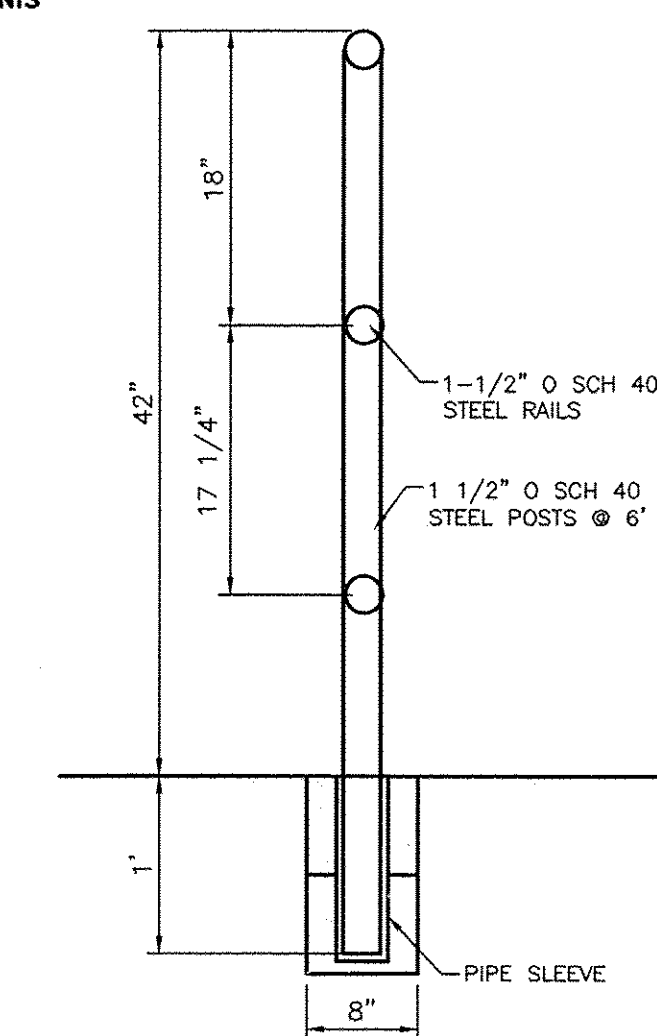NTS

LIFT STATION DETAIL
NTS

DUPLEX CONTROL PANEL
ALUMNIUM OR STEEL BASIN HATCH WITH HINGED ACCESS DOOR
RAIL MOUNTING PLATE BOLTS TO MATCH FRAME
SET FASTENERS
MOUNTING PEDESTAL
RIM=5096.37
ALARM FLOAT=5093.82
ON FLOAT 3=5090.32
INLET FITTING AS REQUIRED FIELD INSTALLED INV.=5089.37 Q=1.08 CFS =483.84 GPM
8" TEE
LIFT OUT CHAIN
4" PVC PIPE TO EXISTING CATCH BASIN ON COORS BLVD. INV.=5093.03 Q=1.08 CFS =483.84 GPM
ON FLOAT 2=5089.33
ON FLOAT 1=5088.32
OFF FLOAT=5087.82
MODIFIED 6' TYPE E MANHOLE PER COA STD DWG 2102
BOTTOM=5085.37

TYP. ORIFICE PLATE DETAIL
NTS

.25"
3/8"x6" ANCHOR BOLTS
SEE ORIFICE PLATE DETAIL
11"
4"
8" PVC
8"
MANHOLE WALL
TO BE INSTALLED @ THE OUTFLOW OF MANHOLE 2
1.5"
8"
1.5"
1.5" 8" 1.5"

POND OUTLET DETAIL
NTS

TOP OF RETAINING WALL ELEV=5096.75
1'-0"
10'-0"
12" RCP TO BASIN 3 SINGLE D INLET
INVERT ELEV=5093.31
WIRE ENCLOSED RIPRAP CLASS "A"
POND BOTTOM ELEV=5093.15
1'-0"
NON-WOVEN GEOTEXTILE CLASS "1"

PIPE BOLLARD DETAIL
NTS

6" SCH. 40 STEEL PIPE FILLED W/ CONC. WITH TOP ROUNDED.
4'-0"
4'-0"
PAVEMENT OR FINISHED GRADE
SYM. ABOUT ℄ WHEN IN GROUPS
3" COVER OVER FOOTING
FILL POST W/ CONCRETE
3500 PSI P.C. CONCRETE MINIMUM (TYP.)
8'-0"
1'-6"
NOTE:
ALL PIPES SHALL BE PAINTED TRAFFIC YELLOW

GUARD RAIL DETAIL
NTS

18"
42"
17 1/4"
1-1/2" O SCH 40 STEEL RAILS
1 1/2" O SCH 40 STEEL POSTS @ 6' O.C.
1"
PIPE SLEEVE
8"