

CITY OF ALBUQUERQUE



July 1, 2008

James D. Hughes, P.E.
URS
6501 Americas Parkway NE #900
Albuquerque, NM 87110

Re: Mesa Del Sol Sustainability Cistern Installation Plan
Engineer's Stamp dated 6-23-08 (R16/DA3007)

Dear Mr. Hughes,

Based upon the information provided in your submittal received 6-26-08, the above referenced plan is approved for Grading Permit.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Curtis A. Cherne, P.E.
Engineering Associate, Planning Dept.
Development and Building Services

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

C: file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 12/2005)

PROJECT TITLE: Mesa Del Sol - Sustainability Cistern ZONE MAP: R 16 / DA3007
 DRB#: N/A EPC#: N/A WORK ORDER#: N/A

LEGAL DESCRIPTION: Tract 05-1 Innovation Park Plat
 CITY ADDRESS: _____

ENGINEERING FIRM: URS Corp. CONTACT: 855-7535
 ADDRESS: 6501 Americas Parkway, NE #900 PHONE: Doug Hughes
 CITY, STATE: Albuquerque NM 87110 ZIP CODE: 87110

OWNER: Mesa del Sol LLC b, FCC CONTACT: Manny Barrera
 ADDRESS: 801 University Blvd SE, Suite 105 PHONE: 400-13021
 CITY, STATE: Albuquerque NM ZIP CODE: 87106

ARCHITECT: N/A CONTACT: _____
 ADDRESS: _____ PHONE: _____
 CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: N/A CONTACT: _____
 ADDRESS: _____ PHONE: _____
 CITY, STATE: _____ ZIP CODE: _____

CONTRACTOR: Unknown CONTACT: _____
 ADDRESS: _____ PHONE: _____
 CITY, STATE: _____ ZIP CODE: _____

TYPE OF SUBMITTAL:

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

CHECK TYPE OF APPROVAL 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
- ☐ FOUNDATION PERMIT APPROVAL
- ☐ BUILDING PERMIT APPROVAL
- ☒ CERTIFICATE OF OCCUPANCY (PERM)
- ☐ CERTIFICATE OF OCCUPANCY (TEMP)
- ☒ GRADING PERMIT APPROVAL
- ☐ PAVING PERMIT APPROVAL
- ☐ WORK ORDER APPROVAL
- ☐ OTHER (SPECIFY) _____

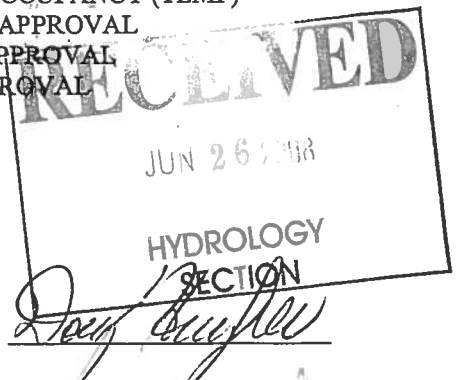
WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☐ YES
- ☒ NO
- ☐ COPY PROVIDED

DATE SUBMITTED: 6-26-08 BY: Doug Hughes

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.



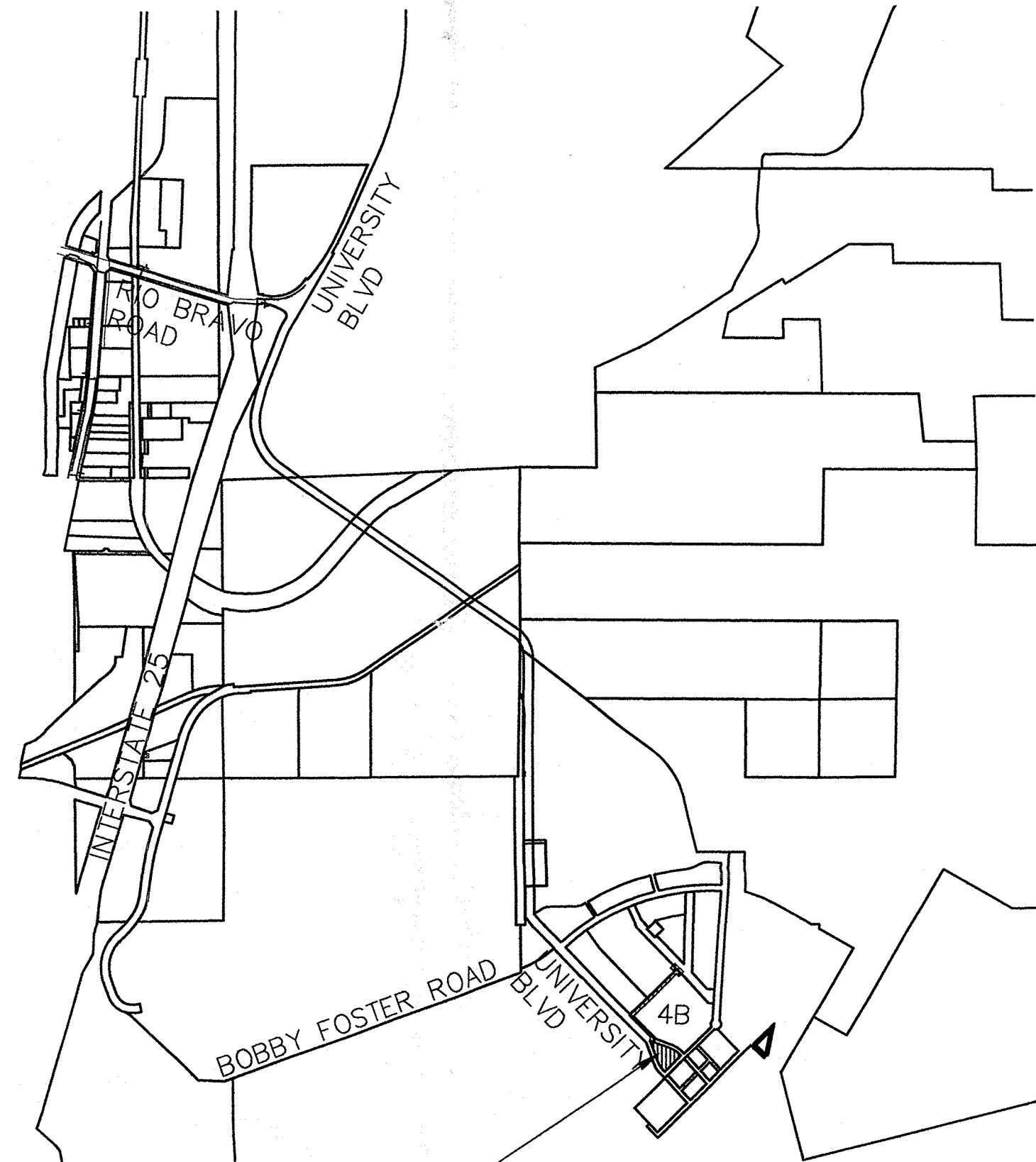
NOTICE TO CONTRACTORS

- ALL WORK DETAILED THIS SHEET TO BE PERFORMED UNDER CONTRACT SHALL, EXCEPT AS OTHERWISE STATED OR PROVIDED HEREON, BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1986 EDITION AS REVISED THROUGH UPDATE No. 7, AMENDMENT #1.
- TWO WORKING DAYS PRIOR TO ANY EXCAVATION, THE CONTRACTOR MUST CONTACT NEW MEXICO ONE CALL SYSTEM (260-1990) FOR LOCATION OF EXISTING UTILITIES.
- PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OR SURVEYOR IMMEDIATELY SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
- FIVE (5) WORKING DAYS PRIOR TO BEGINNING CONSTRUCTION THE CONTRACTOR SHALL SUBMIT TO CONSTRUCTION COORDINATION DIVISION A DETAILED CONSTRUCTION SCHEDULE. TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A BARRICADING PERMIT FROM THE CONSTRUCTION COORDINATION DIVISION. CONTRACTOR SHALL NOTIFY BARRICADE ENGINEER (924-3400) PRIOR TO OCCUPYING AN INTERSECTION. REFER TO SECTION 19 OF THE STANDARD SPECIFICATIONS.
- CONTRACTOR SHALL MAINTAIN A GRAFFITI-FREE WORK SITE. CONTRACTOR SHALL PROMPTLY REMOVE ANY GRAFFITI FROM ALL EQUIPMENT, WHETHER PERMANENT OR TEMPORARY.
- CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL CONSTRUCTION SIGNING UNTIL THE PROJECT HAS BEEN ACCEPTED BY THE OWNER.
- SOIL BORINGS - TWO SOIL BORINGS SHALL BE PROVIDED BY THE CONTRACTOR (GEOTEST OR OTHER APPROVED QUALIFIED EXPERT SUB CONTRACTOR) TO VERIFY THE ABSENCE OF CALECHE TO A DEPTH OF 20' BELOW THE BOTTOM OF THE TANK, TO INSURE THE DISPERSEMENT OF GROUND WATER TO PREVENT BULDPUP OF HYDROSTATIC GROUND WATER PRESSURE AROUND THE TANK. AN OPTIONAL DEADMAN ANCHOR WILL BE ADDED TO THE TANK CONSTRUCTION IF ANYTHING OTHER THAN FREE DRAINING SAND IS ENCOUNTERED IN THE SOIL BORINGS. CONTRACTOR TO SUPPLY SUBGRADE AND BACKFILL COMPACTION TEST TO VERIFY COMPLIANCE WITH STANDARDS AND SPECIFICATIONS.
- PUMP OPERATIONS - CONTRACTOR IS TO PROVIDE
 - A. MANUAL PUMP OVERRIDE SWITCH FOR NON-USE DURING WINTER.
 - B. FLOAT OVERRIDE (SHUTS PUMP OFF WHEN TANK IS EMPTY).
 - C. PRESSURE TRANSDUCER SIGNALS PUMP TO VARY SPEED OF PUMP TO MAINTAIN DESIRED PRESSURE (70psi AT APERTURE PARK AT 25gpm TO BE FIELD TESTED BY CONTRACTOR).
 - D. LOCKABLE ENCLOSURE FOR PUMP CONTROLS
- CONTRACTOR TO PRESSURE TEST WATER LINES PER COA STANDARDS AND SPECIFICATIONS.
- CONTRACTOR TO PROVIDE AS-BUILT PLANS CERTIFIED BY REGISTERED PROFESSIONAL SURVEYOR.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING CONSTRUCTION FROM STORMWATER RELATED DAMAGE. NO CONSTRUCTION ALLOWED DURING RAINY SEASON (JULY 15 - OCTOBER 15).
- CISTERN HYDROSTATIC TEST - CONTRACTOR IS TO FILL TANK TO 1' ABOVE TOP OF TANK AS MEASURED AT MANWAY. LEAKAGE SHALL NOT EXCEED 2" IN 24 HOURS AS MEASURED AT MANWAY. LEAKS ARE TO BE PATCHED PER MANUFACTURER RECOMMENDATIONS AND TEST REPEATED UNTIL IT PASSES.
- WINTER SHUT DOWN - SHUT DOWN PUMP AND DRAIN LINES AND PNEUMATIC TANK DURING WINTER (DECEMBER - MARCH). INSPECT FOR LEAKS AT SPRING START UP.
- THE BASIS FOR THIS PLANNED GEOMETRY IS THE INNOVATION BULK PLATE FILED 9-13-07. ALL EXISTING FEATURES SHOWN HEREON ARE TAKEN FROM AS-BUILT RECORDS. NO SURVEY WAS PROVIDED FOR THE DESIGN OF THIS PROJECT. CONTRACTOR TO VERIFY LOCATION OF EXISTING FEATURES PRIOR TO CONSTRUCTION.
- ALL ELECTRICAL, TELEPHONE, CABLE TV, GAS AND OTHER UTILITY LINES, CABLES AND APPURTENANCES ENCOUNTERED DURING CONSTRUCTION THAT REQUIRE RELOCATION, SHALL BE COORDINATED WITH THAT UTILITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF ALL NECESSARY UTILITY ADJUSTMENTS. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR DELAYS OR INCONVENIENCES CAUSED BY UTILITY COMPANY WORK CREWS. THE CONTRACTOR MAY BE REQUIRED TO RESCHEDULE HIS ACTIVITIES TO ALLOW UTILITY CREWS TO PERFORM THEIR REQUIRED WORK.
- DISPOSAL SITE FOR ALL EXCESS EXCAVATION MATERIAL, AND UNSUITABLE MATERIAL SHALL BE OBTAINED BY THE CONTRACTOR IN COMPLIANCE WITH APPLICABLE ENVIRONMENTAL REGULATIONS AND APPROVED BY THE CONSTRUCTION OBSERVER. ALL COSTS INCURRED IN OBTAINING A DISPOSAL SITE AND HAUL THERETO SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE.
- THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE EXISTING UTILITY LINES WITHIN THE CONSTRUCTION AREA. ANY DAMAGE TO EXISTING FACILITIES CAUSED BY CONSTRUCTION ACTIVITY SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE AND APPROVED BY THE CONSTRUCTION OBSERVER.
- CONSTRUCTION ACTIVITY SHALL BE LIMITED TO THE PROPERTY AND/OR PROJECT LIMITS. ANY DAMAGE TO ADJACENT PROPERTIES RESULTING FROM THE CONSTRUCTION PROCESS IS THE RESPONSIBILITY OF THE CONTRACTOR. ANY COSTS INCURRED FOR REPAIRS SHALL BE THE COST OF THE CONTRACTOR.
- OVERNIGHT PARKING OF CONSTRUCTION EQUIPMENT SHALL NOT OBSTRUCT DRIVEWAYS OR DESIGNATED TRAFFIC LANES. THE CONTRACTOR SHALL NOT STORE ANY EQUIPMENT OR MATERIAL WITHIN THE PUBLIC RIGHT OF WAY.
- THE CONTRACTOR SHALL OBTAIN ALL THE NECESSARY PERMITS FOR THE PROJECT PRIOR TO COMMENCING CONSTRUCTION (I.E. BARRICADING, SURFACE DISTURBANCE).
- THE CONTRACTOR SHALL BE RESPONSIBLE TO REPLACE AT HIS EXPENSE ANY AND ALL PROPERTY CORNERS DESTROYED DURING CONSTRUCTION. ALL PROPERTY CORNERS MUST BE RESET BY A REGISTERED LAND SURVEYOR.

MESA DEL SOL
SUSTAINABILITY CISTERN

INDEX TO DRAWINGS

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LOCATION OF PROJECT
ZONE ATLAS MAP #R16

VICINITY MAP

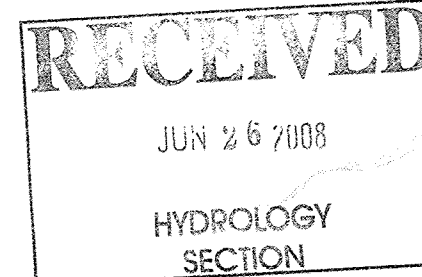
1" = 2500'-0"

LEGAL DESCRIPTION

- IRRIGATION TO SERVE TRACT 23
- CISTERN LOCATION TRACT OS-1
- IRRIGATION LINE ON TRACTS 21 & 22 AND A PORTION OF UNIVERSITY BLVD RIGHT OF WAY (ALL AS SHOWN ON INNOVATION PARK PLAT FILED 9-13-07.)

BENCH MARKS

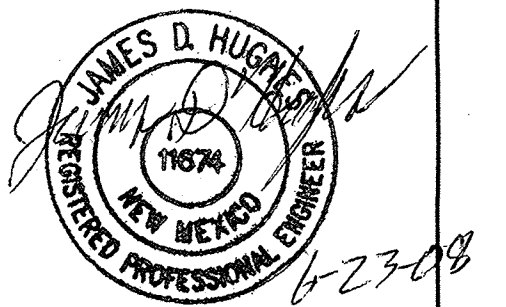
ACS 3-1/4" ALUMINUM CAP RIVETED TO A TUBE SET IN A CONCRETE BASE IN THE GROUND STAMPED "5-Q-14, 1987". FROM THE RIO BRAVO BLVD AND BROADWAY INTERSECTION, GO SOUTH 0.9 MILES AND PROCEED 123' WEST OF THE CENTERLINE. STATE PLANE COORDINATES (CENTRAL ZONE, NAD83/NAVD88) N=1480471.432, E=1521388.180 (GROUND) ELEVATION=4981.17



DATE: JUNE 11, 2008

SHEET TITLE:
COVER

SHEET NUMBER:
SHEET 1 OF 11

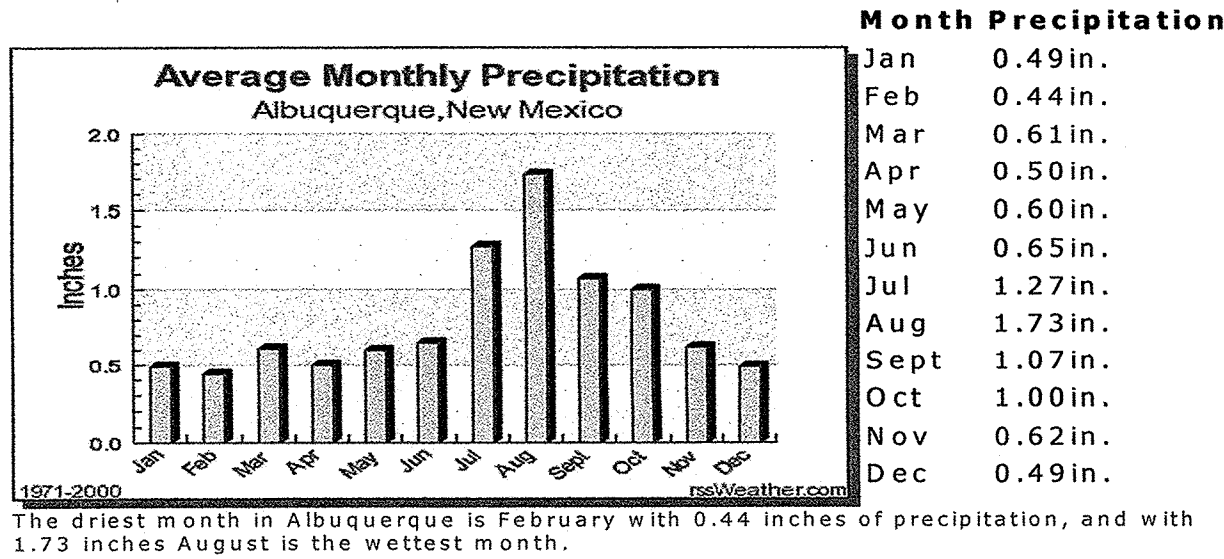


Approved for Construction

City Hydrology

Date

Average Rainfall for Albuquerque



Aperture Park
Water Harvesting Calculations

(Average Annual Reuse=88% of Demand Supplied by Cistern)

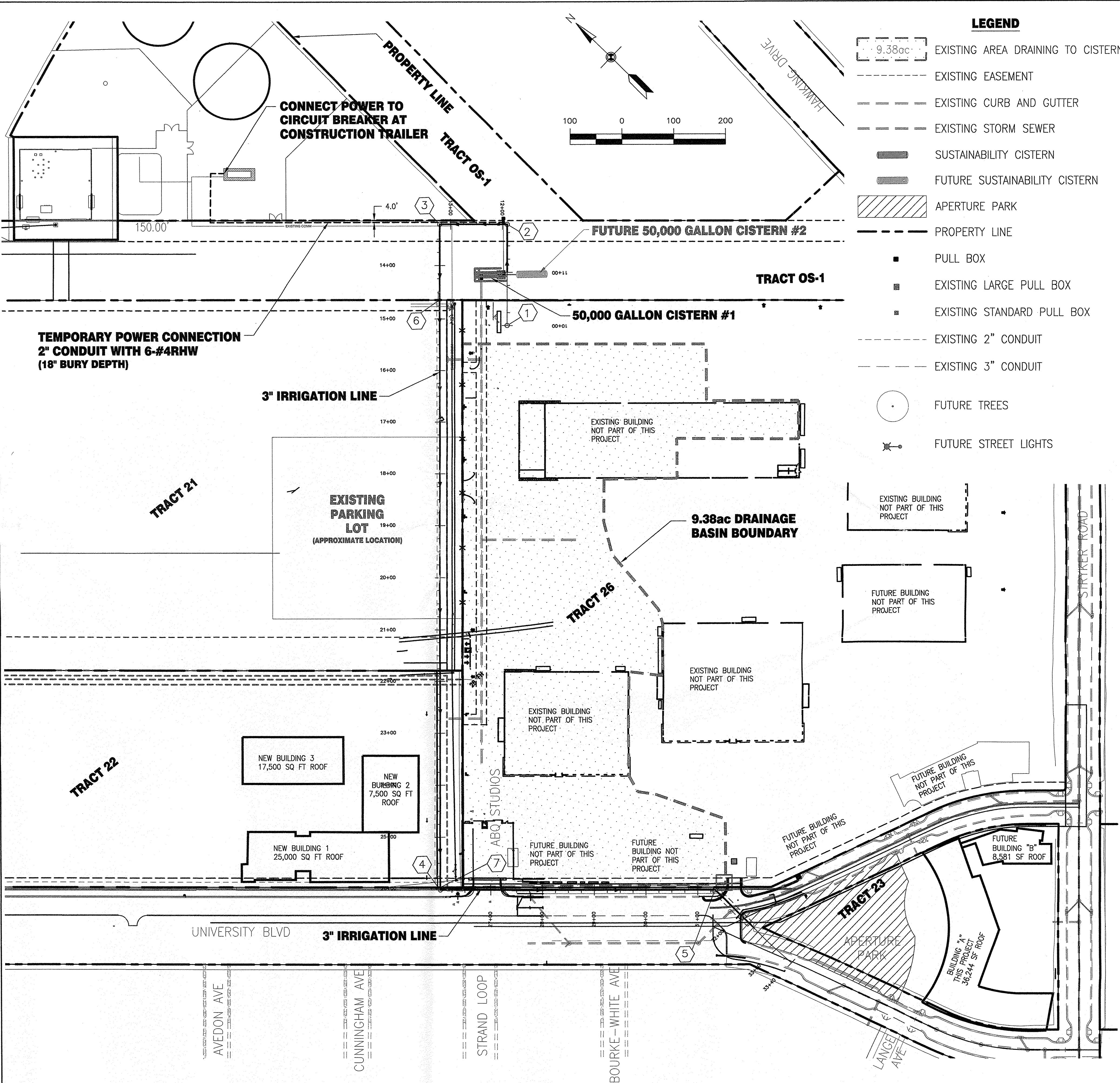
Month	Precipitation (inches)	Runoff volume (gal)	Water Demand (gal) ⁽¹⁾	Volume Supplied by Cistern ⁽²⁾
Jan	0.49	124,798	0	0
Feb	0.44	112,063	0	0
Mar	0.61	155,361	51,627	51,627
Apr	0.50	127,345	100,684	100,684
May	0.60	152,814	167,935	167,935
Jun	0.65	165,548	234,298	165,548
Jul	1.27	323,456	261,579	261,579
Aug	1.73	440,613	233,205	233,205
Sep	1.07	272,518	160,511	160,511
Oct	1.00	254,690	90,595	90,595
Nov	0.62	157,907	32,794	32,794
Dec	0.49	124,798	0	0
TOTAL	9.47	2,411,910	1,333,228	1,174,478

(1) Water budget furnished by EDAW, Inc. December, 2007 based on Aperture Park Plans.

(2) On the average there are 61 rain days in Albuquerque per year, thus indicating an average rainfall is 0.16 inches per event based on 9.47 inches per year (average annual). That is 40,750 gallon of runoff once every 6 days on the average from the existing 9.38 acre developed drainage basin, and on the average it will take 9 days to pump the water out after an average rainfall of 0.16 inches.

POINT TABLE

PI	STATION	NORTHING	EASTING
1	10+00.00	1,452,624.087	1,532,328.873
2	11+91.04	1,452,756.466	1,532,466.613
3	13+21.61	1,452,850.368	1,532,375.884
4	26+01.88	1,451,961.985	1,531,454.003
5	31+33.39	1,451,579.392	1,531,822.954
6	PROP. LINE	1,452,751.656	1,532,273.440
7	CROSSING	1,451,965.455	1,531,457.603



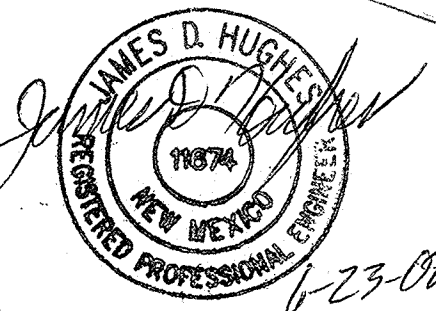
LEGEND

- 9.38ac EXISTING AREA DRAINING TO CISTERN
- EXISTING EASEMENT
- EXISTING CURB AND GUTTER
- EXISTING STORM SEWER
- SUSTAINABILITY CISTERN
- FUTURE SUSTAINABILITY CISTERN
- APERTURE PARK
- PROPERTY LINE
- PULL BOX
- EXISTING LARGE PULL BOX
- EXISTING STANDARD PULL BOX
- EXISTING 2" CONDUIT
- EXISTING 3" CONDUIT
- FUTURE TREES
- FUTURE STREET LIGHTS

URS

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MESA DEL SOL
SUSTAINABILITY CISTERN
ALBUQUERQUE, NEW MEXICO

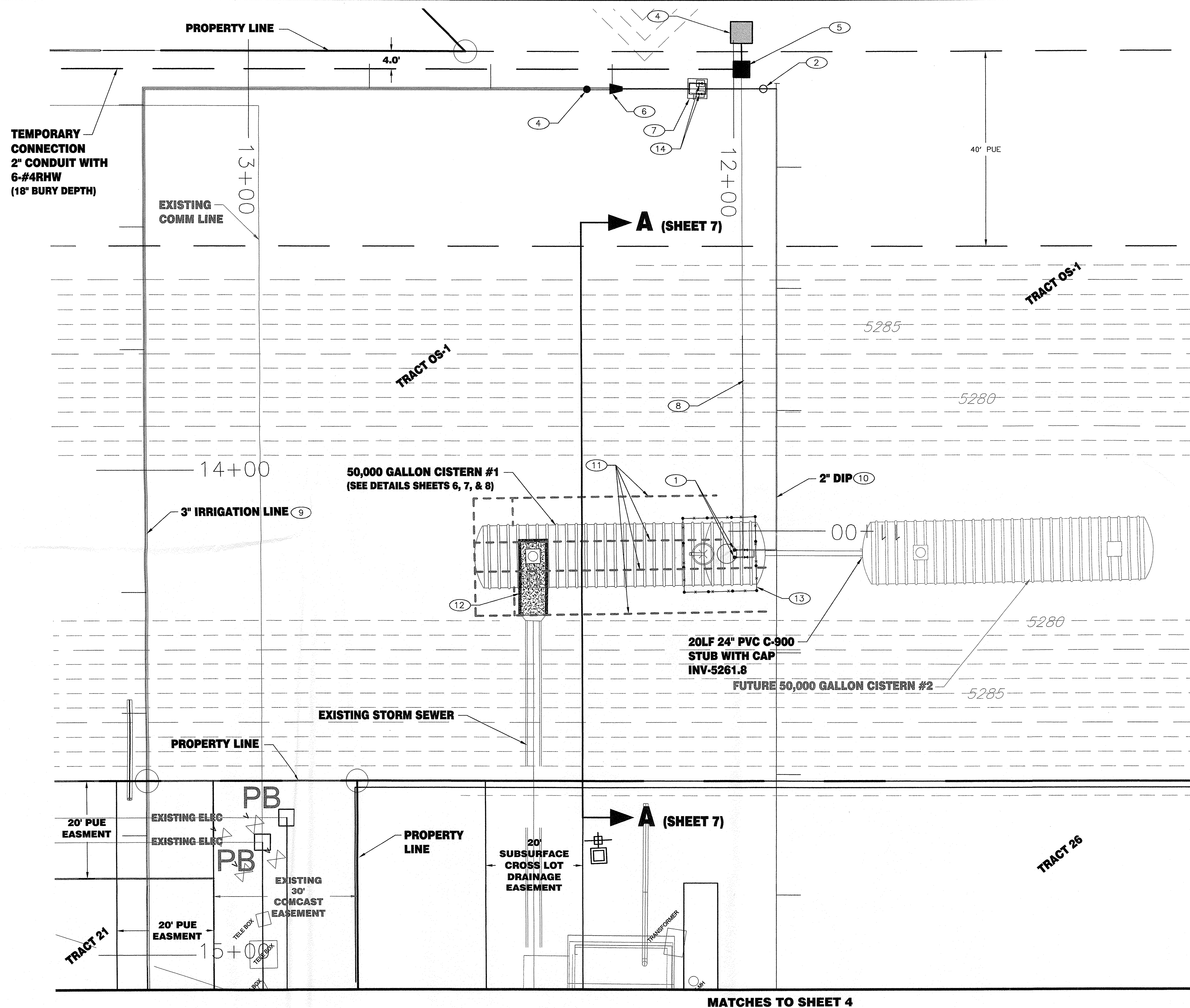


DATE: JUNE 11, 2008

SHEET TITLE:
MASTER PLAN

SHEET NUMBER:
SHEET 2 OF 11

24342665 P:\07 Drawings\07.06 Working\SUSTAINABILITY POND\CMUTCSP_WT101.dwg PLOTTED: 6/23/08 - 3:38pm ed_krause



NOTES

1. PUMPING SYSTEM TO BE 4" GRUNDFOS CONSTANT PRESSURE SMART FLOW SYSTEMS, MODEL 3 1PH 3HP 25S30-15 OR APPROVED EQUAL, INCLUDING: ITEMS 1-4

(1) PUMP AND MOTOR ASSEMBLY

(2) PRESSURE TANK MODEL WITH GRANTOS KIT (SEE SHEET 6)

(3) PRESSURE TRANSDUCER

(4) SMART CONTROLLER AND VARIABLE FREQUENCY DRIVER CONTROLS: CONTROLS INCLUDE SENSORS OF AVAILABLE WATER LEVEL IN TANK WITH PUMP SHUTOFF FOR LOW LEVEL. ENCLOSURE: CONTROLS AND VFD TO BE MOUNTED ON A CONCRETE PAD IN A MARINE GRADE ENCLOSURE, TAN IN COLOR, AS CONSTRUCTED BY RAINBIRD OR APPROVED EQUAL.

(5) PULL BOX (SEE SHEET 6)

(6) 3"x2" REDUCER

(7) 4'x4' CONCRETE PAD WITH 2" COMPACT DISK KLEAN NETOFIM MODEL 26ASK221TLF-140

(8) DIRECT BURY PUMP CONTROL WIRING SUPPLIED BY PUMP MANUFACTURER. WATER TIGHT WITH NO SPLICES

(9) 3" PLUMBING IS TO BE DUCTILE IRON PIPE PER COA STANDARDS AND SPECIFICATIONS.

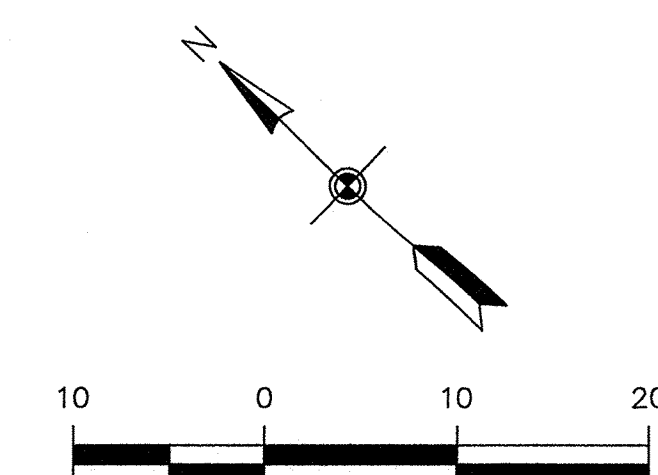
(10) 2" PLUMBING TO BE PER UNIFORM PLUMBING CODE.

(11) 2@50LF AND 2@60LF FRENCH DRAINS, 6" PERFORATED PIPE IN 3' WIDE TRENCH ON 9' CENTERS.

(12) 6' WIDE CONCRETE CHANNEL WITH 12" HIGH WALLS PER COA STD DWG 2260

(13) 15'x15' 3 WIRE 3' HIGH FENCE ENCLOSURE WITH WIRE GATE.

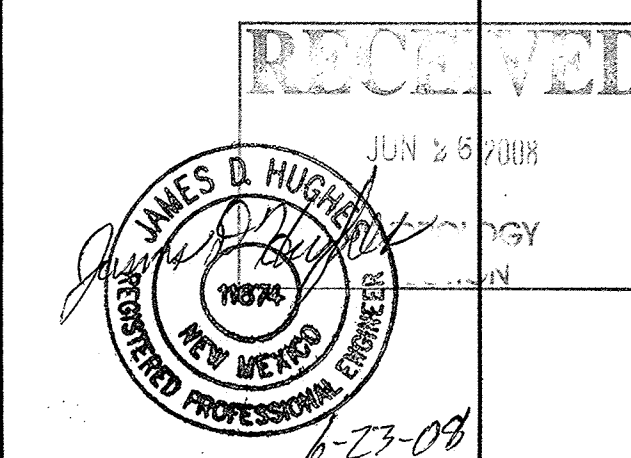
(14) ISOLATION VALVES



URS

6501 americas parkway ne
suite 900
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505 855 7500 p
505 855 7555 f

MESA DEL SOL
SUSTAINABILITY CISTERN
ALBUQUERQUE, NEW MEXICO

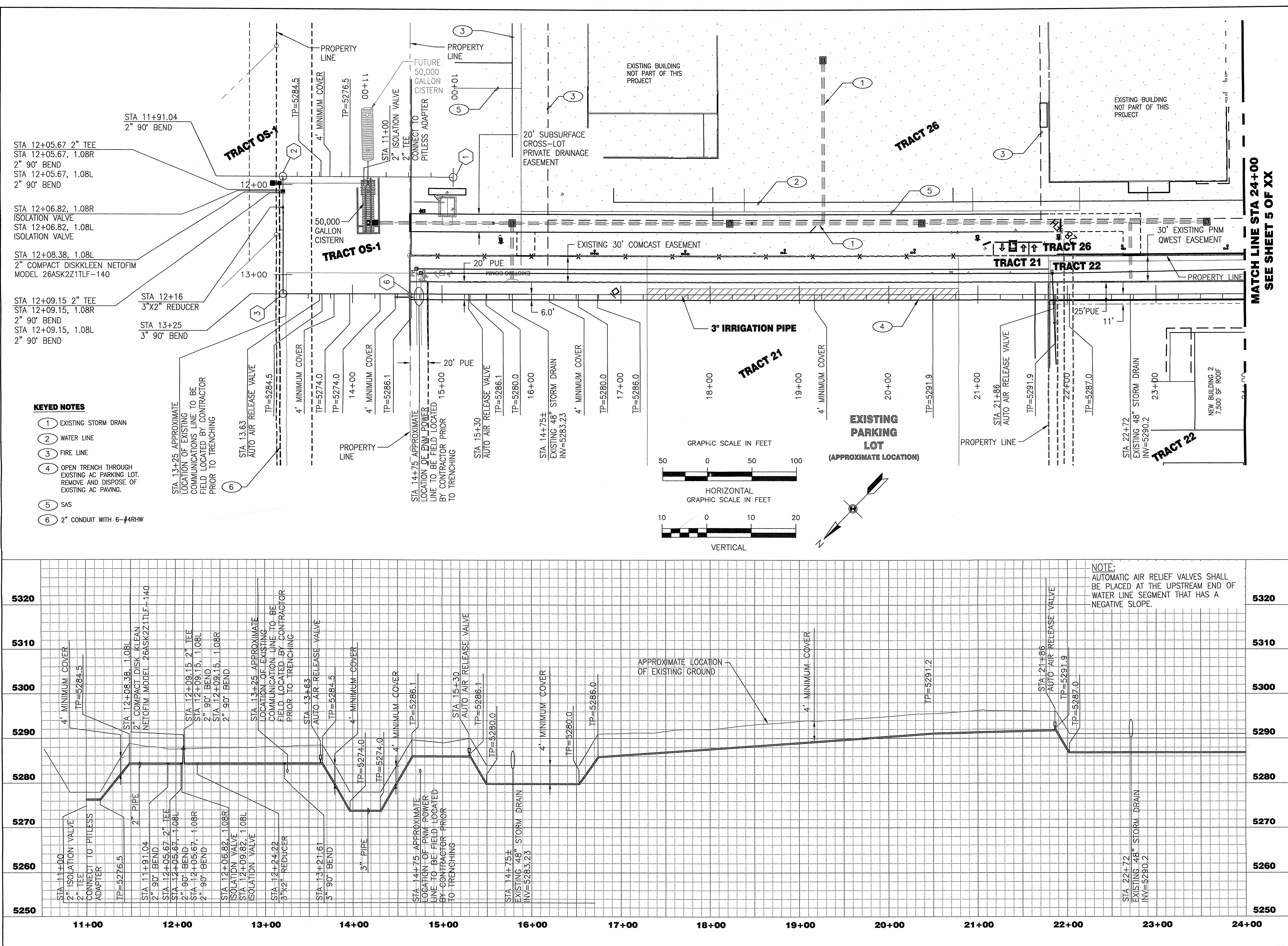


DATE: JUNE 11, 2008

SHEET TITLE:
CISTERN SITE PLAN

SHEET NUMBER:
SHEET 3 OF 11

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6501 americas parkway ne
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albuquerque, nm 87110
505 855 7500 p
505 855 7555 f

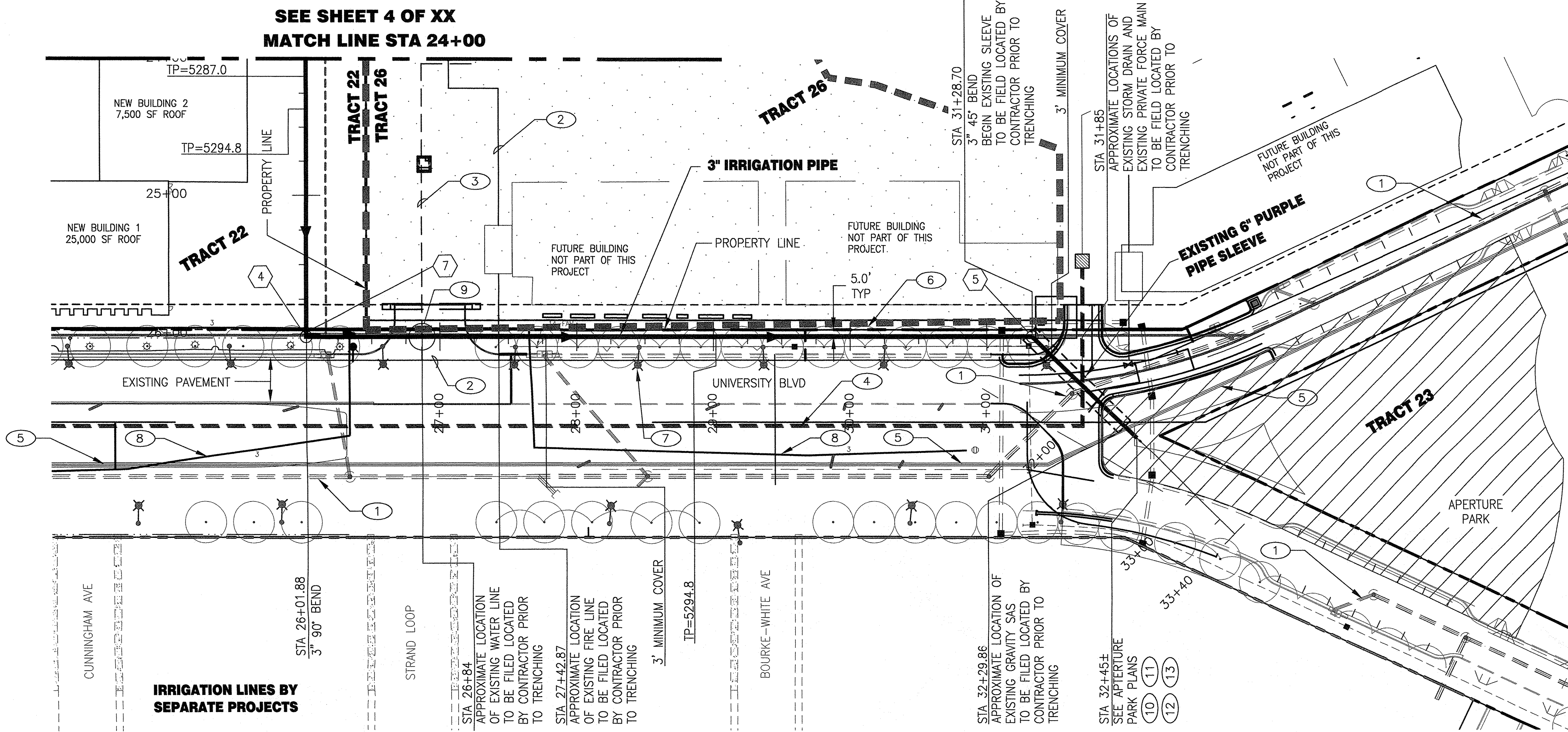
**MESA DEL SOL
SUSTAINABILITY CISTERN
ALBUQUERQUE, NEW MEXICO**

DESIGNED BY
JAMES D. HUGHES
10374
NEW MEXICO
REGISTERED PROFESSIONAL ENGINEER

DATE: JUNE 11, 2008
SHEET TITLE:
IRRIGATION LINES
SHEET NUMBER:
SHEET 4 OF 11

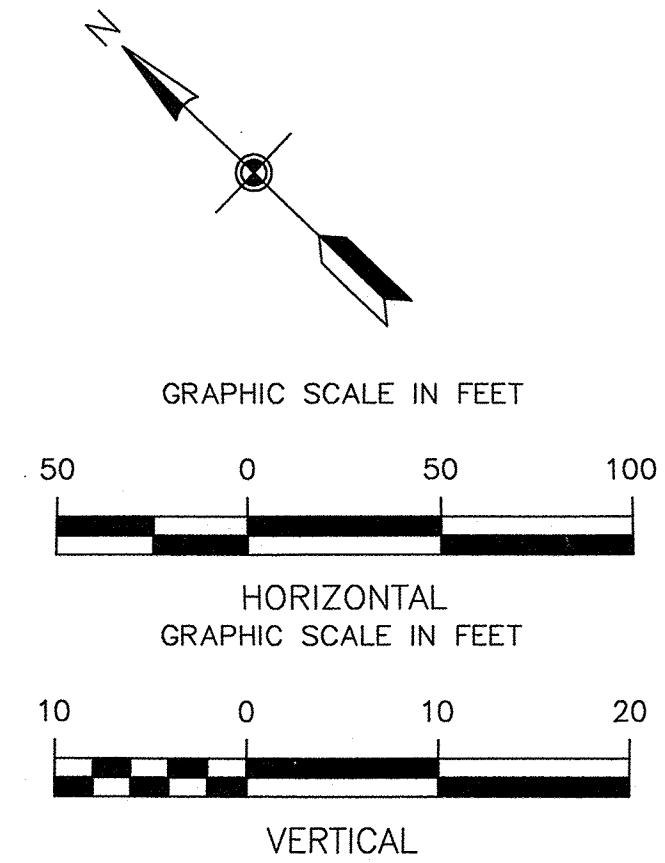
RECEIVED
JUN 28 2008
HYDROLOGY
SECTION

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KEYED NOTES

- 1 EXISTING STORM DRAIN
- 2 WATER LINE
- 3 FIRE LINE
- 4 PRIVATE FORCE MAIN
- 5 24\"/>

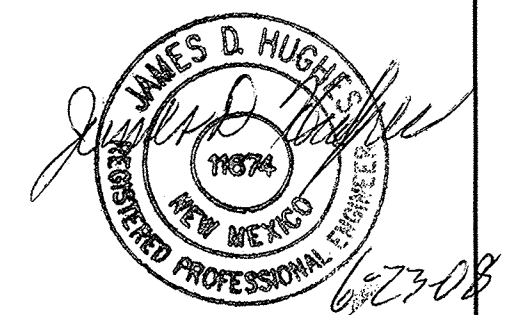


NOTE:
AUTOMATIC AIR RELIEF VALVES SHALL
BE PLACED AT THE UPSTREAM END OF
WATER LINE SEGMENT THAT HAS A
NEGATIVE SLOPE.

URS

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505 855 7500 p
505 855 7555 f

MESA DEL SOL SUSTAINABILITY CISTERN ALBUQUERQUE, NEW MEXICO



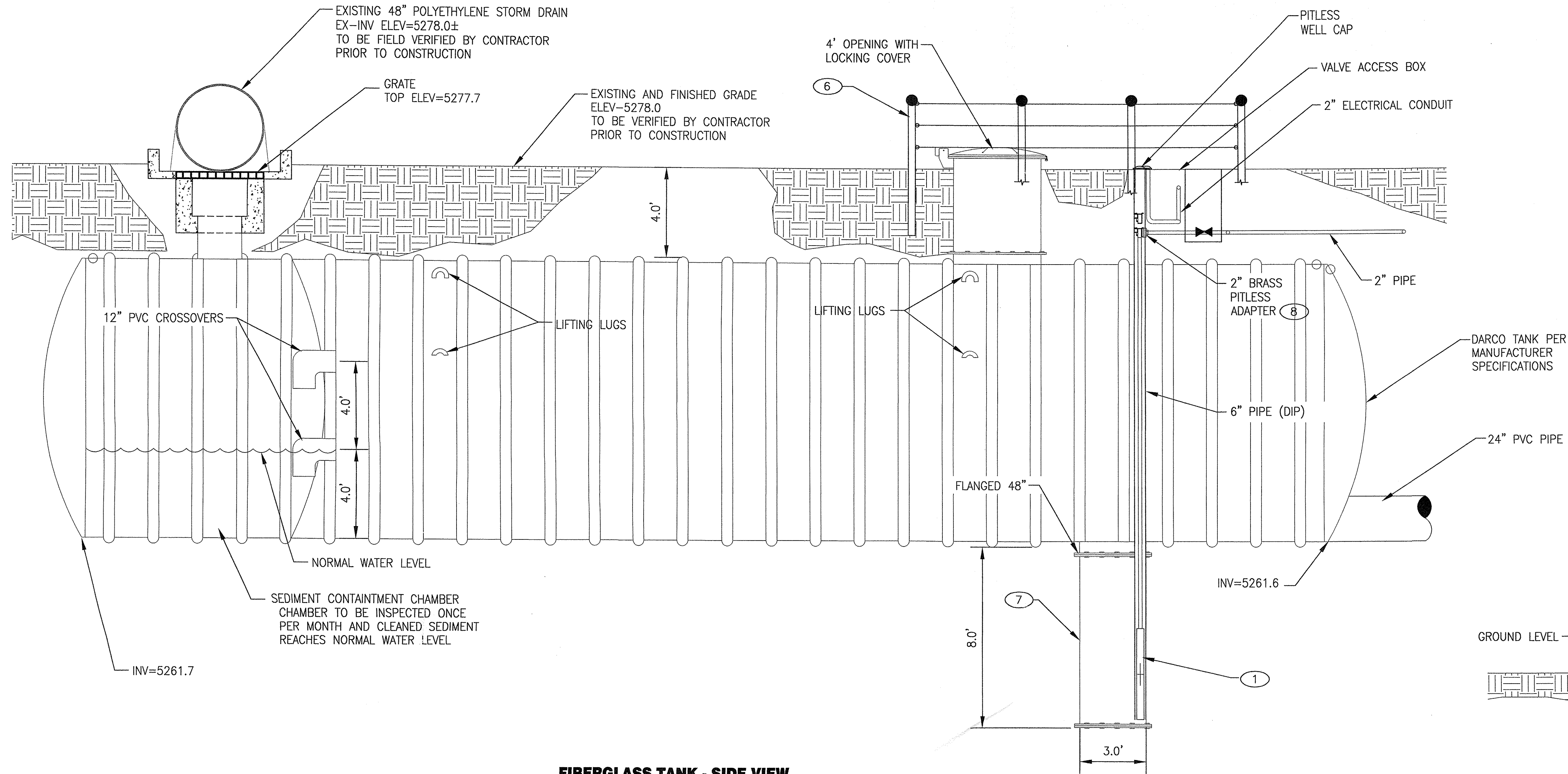
DATE: JUNE 11, 2008

SHEET TITLE:
IRRIGATION LINES

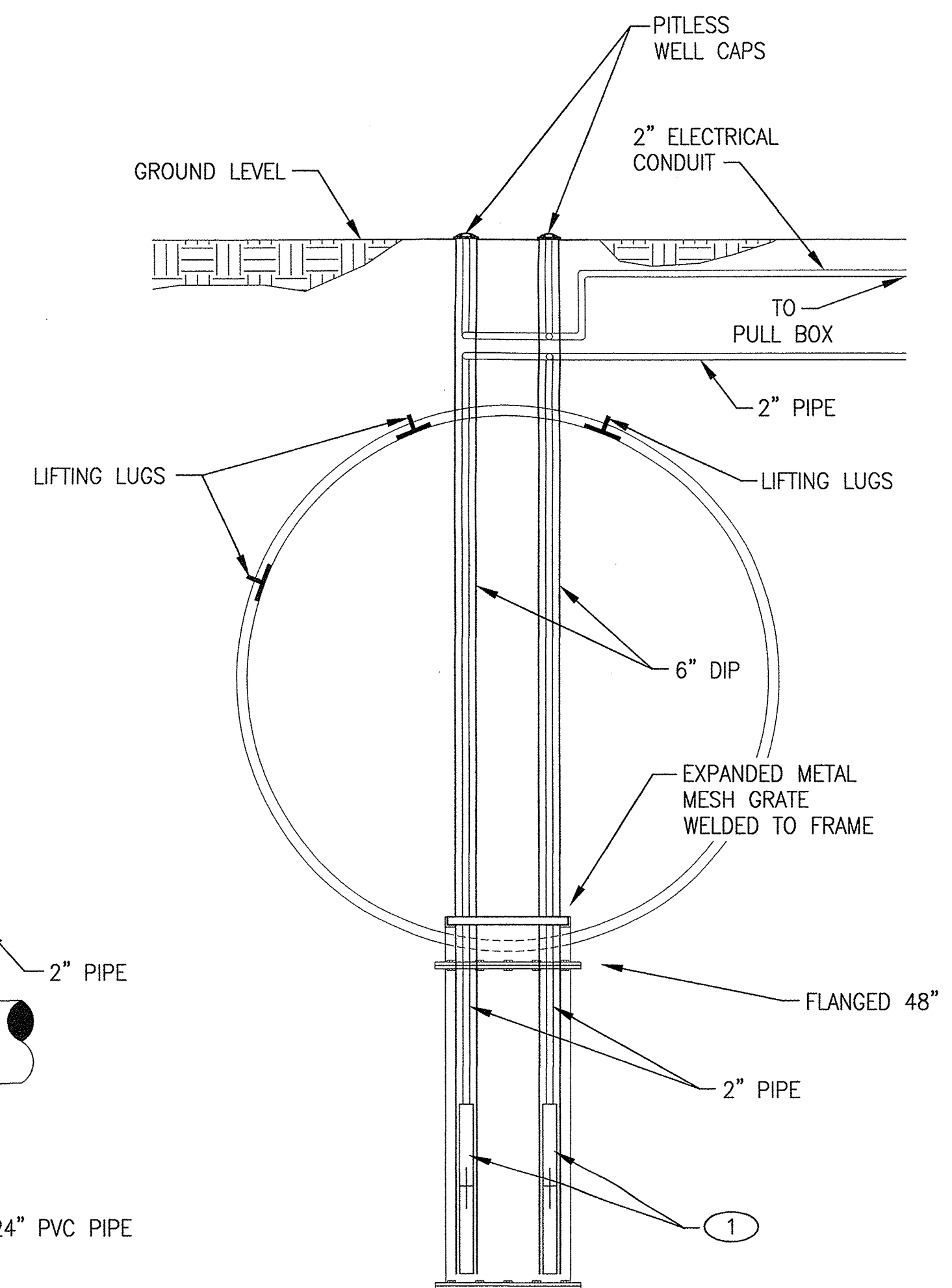
SHEET NUMBER:
SHEET 5 OF 11

HYDROLOGY
SECTION

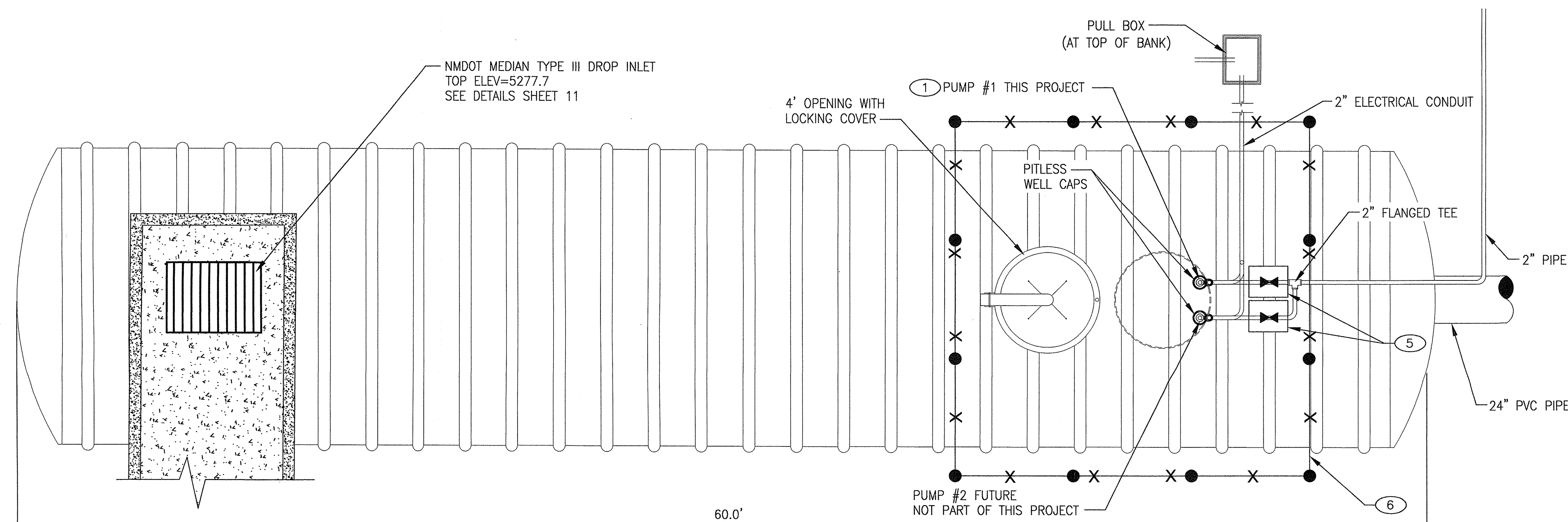
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FIBERGLASS TANK - SIDE VIEW



FIBERGLASS TANK - END VIEW



FIBERGLASS TANK - TOP VIEW

NOTES

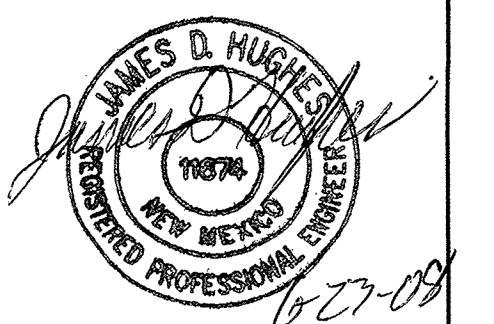
1. PUMPING SYSTEM TO BE 4" GRUNDFOS
CONSTANT PRESSURE SMART FLOW SYSTEMS,
MODEL 3 1PH 3HP 25S30-15 OR APPROVED
EQUAL, INCLUDING: ITEMS 1-4

- (1) PUMP AND MOTOR ASSEMBLY
- (2) PRESSURE TANK (SEE SHEET 3)
- (3) SMART CONTROLLER (SEE SHEET 3)
- (4) PRESSURE TRANSDUCER
- (5) ISOLATION VALVE PER
COA DWG 2707
- (6) 15'X15' THREE WIRE FENCE, 36" HIGH
- (7) BEVELED SUMP PER DARCO
SEE NOTE "S" SHEET 8
- (8) PITLESS ADAPTER (SEE SHEET 7)

URS

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MESA DEL SOL
SUSTAINABILITY CISTERN
ALBUQUERQUE, NEW MEXICO

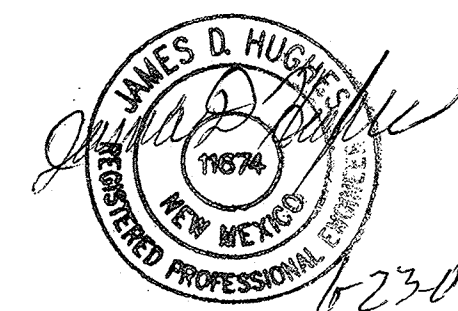


DATE: JUNE 11, 2008

SHEET TITLE:
CISTERN DETAILS

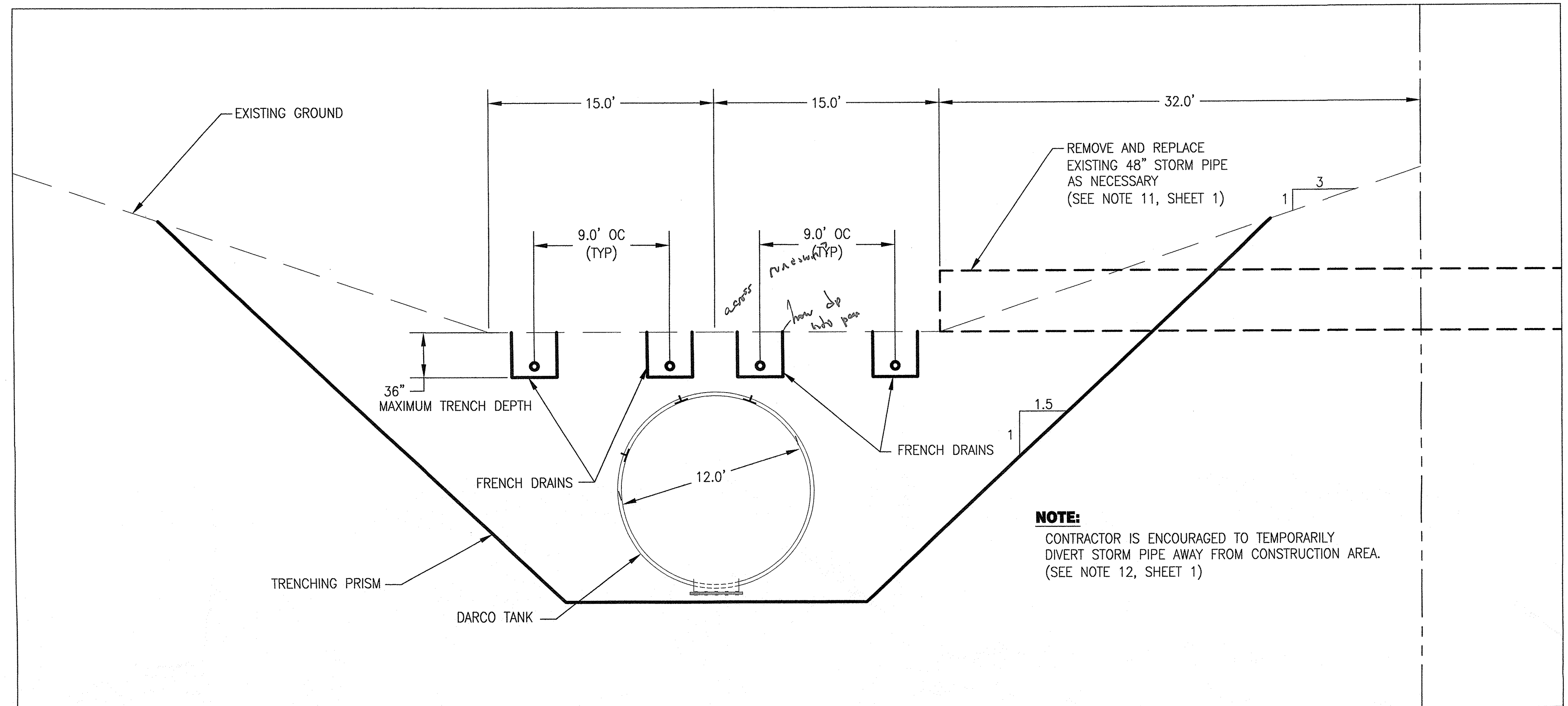
SHEET NUMBER:
SHEET 6 OF 11

MESA DEL SOL
SUSTAINABILITY CISTERN
ALBUQUERQUE, NEW MEXICO



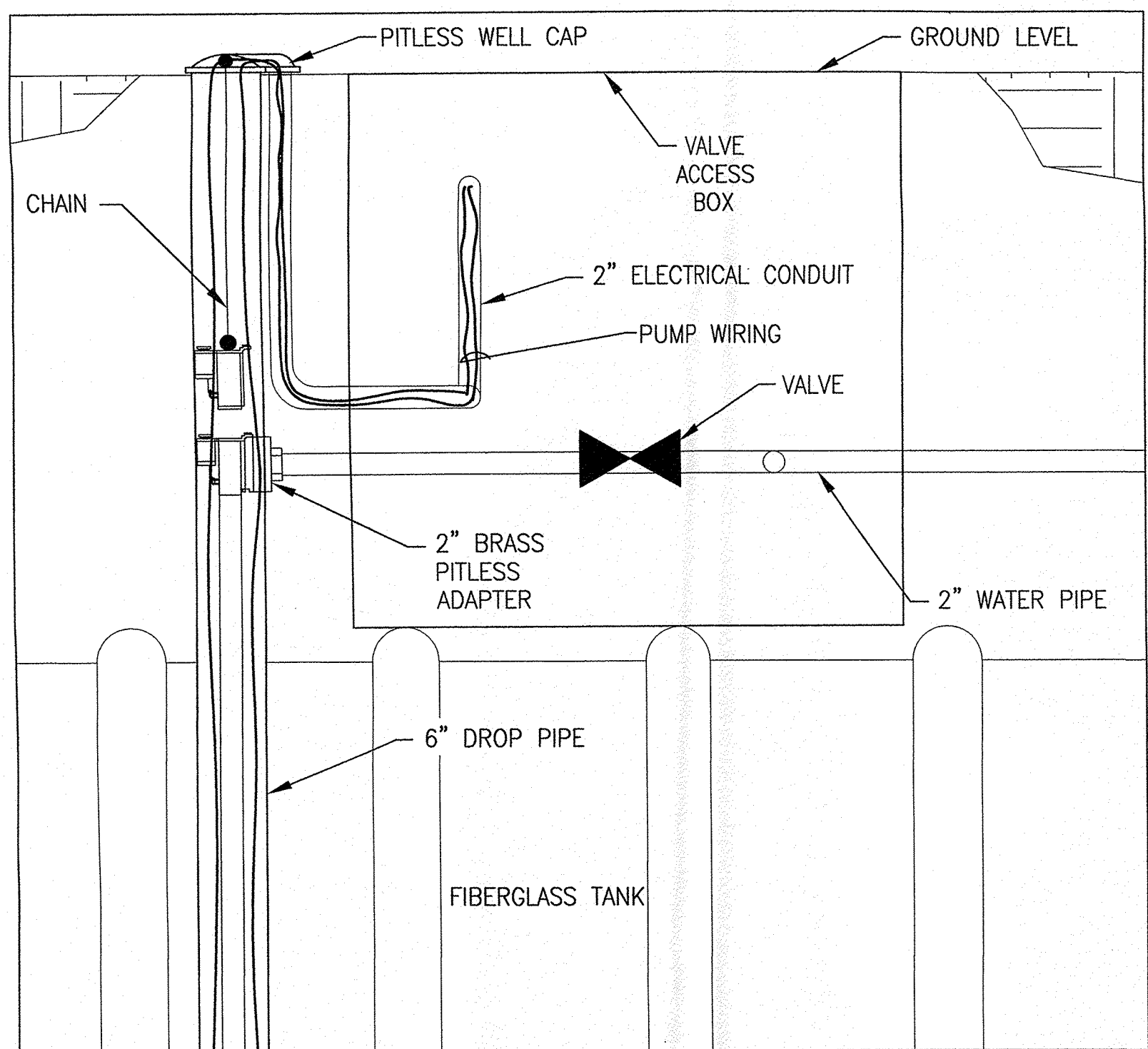
DATE: JUNE 11, 2008

SHEET TITLE:
WELL AND FRENCH
DRAIN DETAIL
SHEET NUMBER:
SHEET 7 OF 11

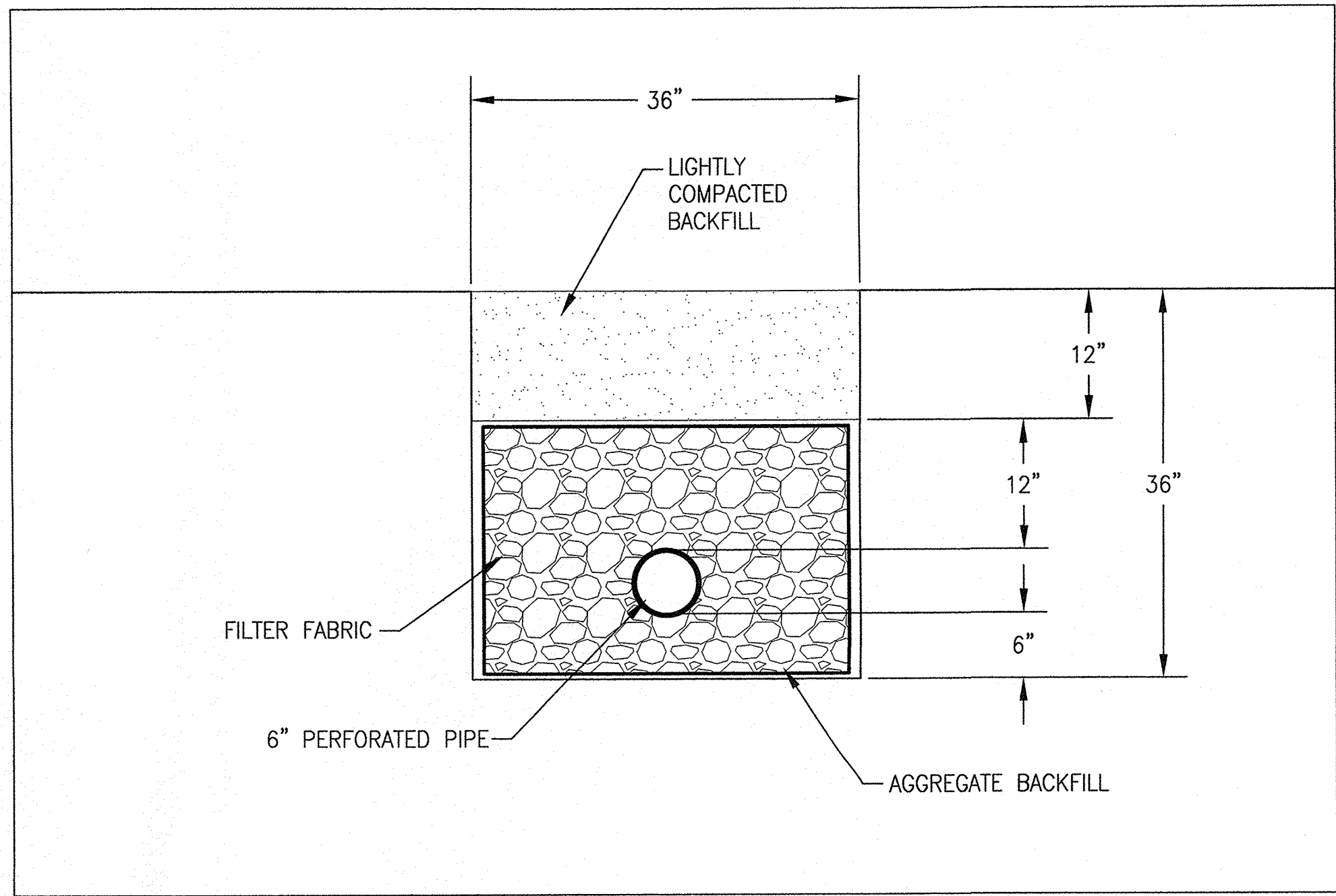


NOTE:
CONTRACTOR IS ENCOURAGED TO TEMPORARILY
DIVERT STORM PIPE AWAY FROM CONSTRUCTION AREA.
(SEE NOTE 12, SHEET 1)

SECTION A-A
NTS



PITLESS WELL DETAIL



FRENCH DRAIN DETAIL
NTS

SPECIFICATIONS FOR FIBERGLASS UNDERGROUND WATER STORAGE TANKS

Preferred Supplier: Darco Incorporated - 980 Darco Drive - Bennett, CO 80102

Phone number 800-232-8660, Fax 303-644-5001, Internet - www.darcoinc.com

GUIDING DESIGN PUBLICATIONS (as specifically designated below)

ASTM D3299 / 95 - Only those sections pertaining to materials, general construction techniques, and workmanship as applicable to underground water storage service.

ASTM D4021 / 92 - Only the following sections pertaining to design & testing for vented underground water storage service - 6.4.1 Earth Loading & 6.4.3.2 Hydrostatic Testing.

ENGINEERING APPROVAL

When requested (at additional cost) structural design calculations and job specific sealed drawings shall be provided by a Registered P. E. representing the manufacturer.

DESIGN BASIS FOR STANDARD TANKS

- External Hydrostatic Pressure:** In empty condition, anchored, backfilled, and totally submerged below 5 feet of water flooded gravel; the tank must maintain structural shape, defect in diameter less than 2%, and remain water tight during a 24 hour test.
- Traffic Loading:** When installed according to the Darco Instructions, incorporating an approved traffic slab on grade, the tank must withstand H-20 vehicle axle loads.
- Specific Gravity:** Design for potable water or domestic sewage at 1.2 S.G.
- Temperature:** Design for maximum hot water impingement temperature of 150 F.
- Venting:** Design for internal atmospheric pressure, including fill & discharge cycles.
- Bury Depth:** Design for standard tanks using a soil cover depth up to 5 feet maximum, with deeper bury designs available upon request.

FACTORY TESTING

All tanks shall be tested for buckling resistance to 10 inches of mercury vacuum and also low air pressure tested under a soapy water spray for pinhole leak detection.

INTERNAL FINISH AND FIT

All internal seams and fitting penetrations shall be overlaid and smooth leaving no crevices, exposed edges, or protruding glass fibers.

GLASS FIBER TO RESIN RATIO

The structural glass fiber content shall be 35% minimum with no addition of sand fillers.

POTABLE WATER STANDARDS

The tank and fitting internal water contact resin layer shall meet FDA standards and be listed under NSF 61 as suitable for culinary or domestic food and water contact.

TANK FITTINGS

Standard fittings shall be of compatible fiberglass construction with a flat faced flange or female tapered pipe thread design. Fittings over 3 inch diameter shall withstand 300 foot pounds of torque if threaded or a moment load of 2000 foot pounds if flanged.

LIFTING LUGS

The combined capacity of designated lifting lugs shall be 2 times the empty tank weight.

CAPACITY AND SIZE REQUIREMENTS

- The nominal volume of the tank shall be _____ gallons.
- The nominal tank diameter shall be _____ feet by a nominal length of _____ feet.

LIMITED WARRANTY

A standard 2 year structural and corrosion warranty shall become effective upon tank delivery. An optional extended warranty program must be available at time of purchase.

HOLE SIZE RECOMMENDATIONS

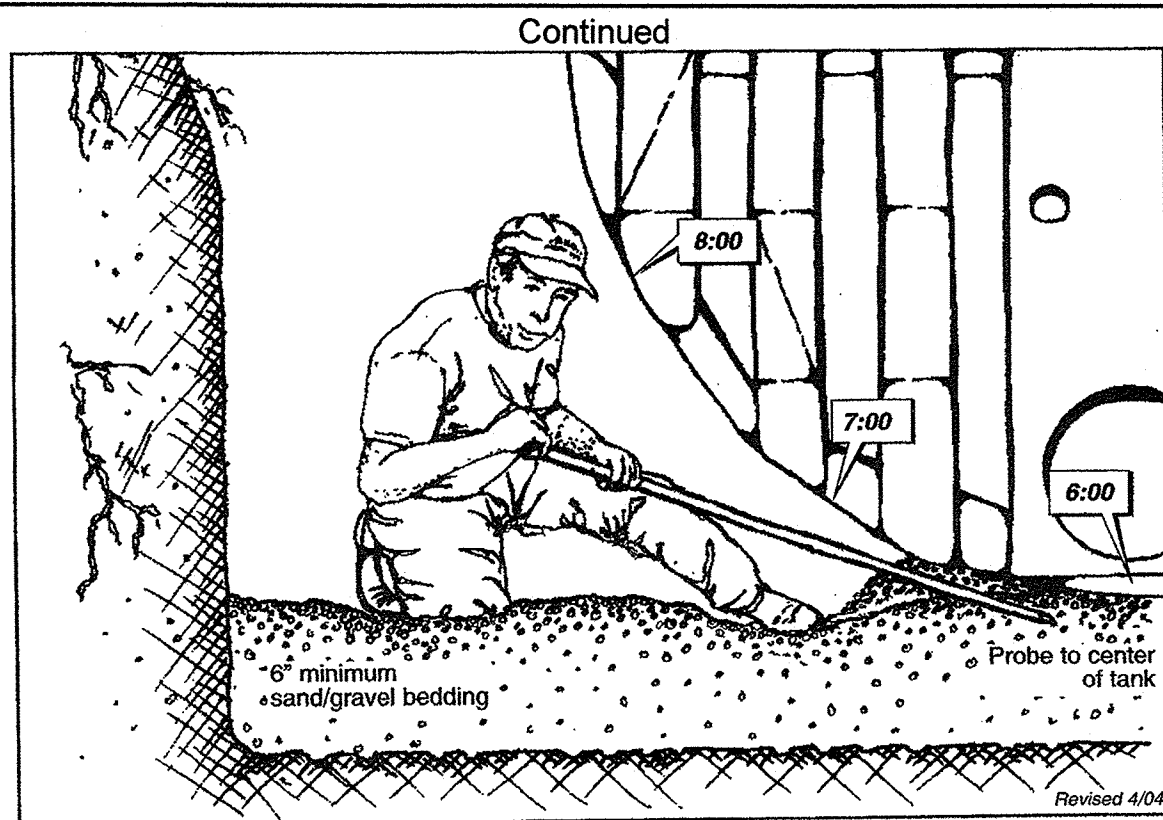
WARNING: Review OSHA 1926.650/P EXCAVATIONS

- Allow a minimum of 18 inches between tanks and the excavation walls.
- Tank rows in manifolded assemblies should be spaced 18 inches apart.
- Bedding depth underneath modules must be at least 6 inches deep.

FULL BURY INSTALLATION PROCEDURE

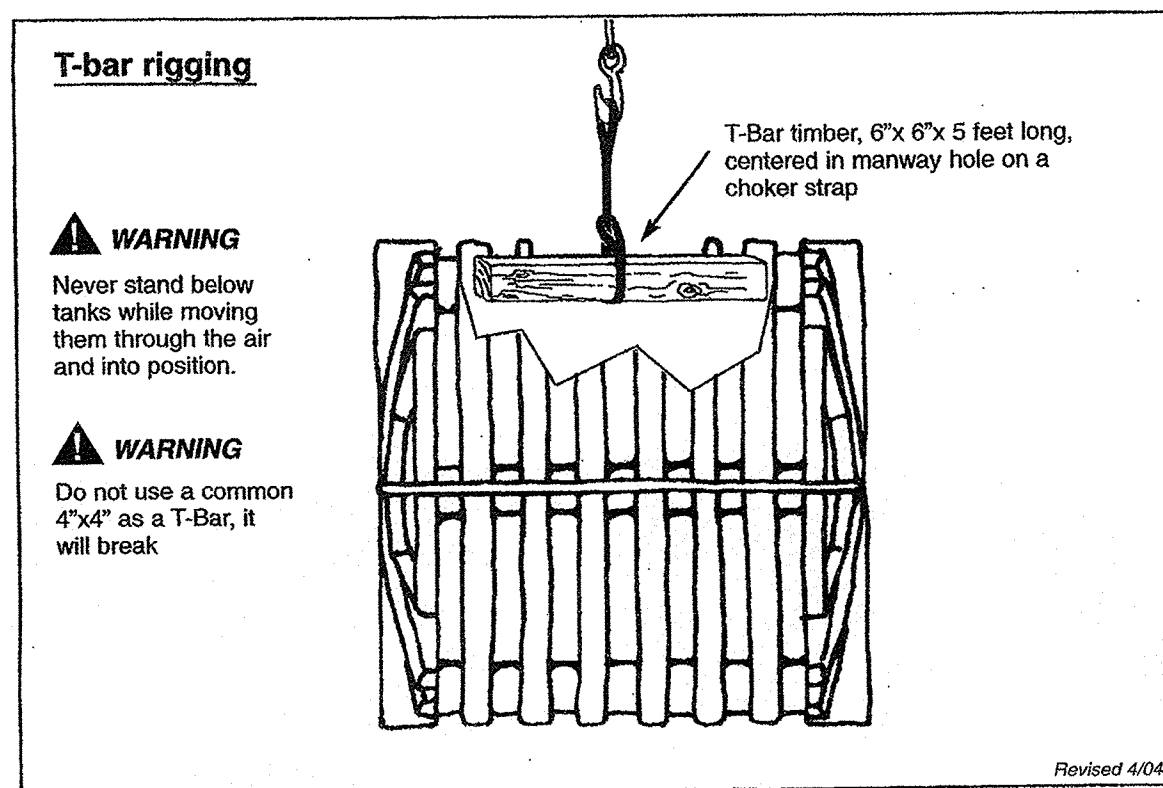
- Always follow the Darco Installation Manual and call if you have questions.
- Excavate to the appropriate hole size & depth and bed properly.
- Position and assemble the modules in the prepared excavation.
- Add 10% water ballast if water is available. **Burial may be done dry (without water).**
- Backfill in 12 inch deep lifts working evenly around the tank.
- Hand probe under and around each module as illustrated.
- Backfill until sand completely covers all modules and rake smooth.
- Apply geotextile fabric or approved underground foam board insulation.
- Cover and mound soil to 36 inch maximum bury depth.
- Fill tank with water immediately after installation to avoid floatation.
- Chain or bolt the manway at all times to discourage children and vandals.
- Disinfect potable water systems as directed by your local Health Department.
- Review the following illustration depicting the probing process.
 - Probe tool is a 3/4 inch metal pipe about 4 feet long with tee handle and flattened tip for easy penetration deep into the sand backfill.
 - No voids or air pockets may exist under the tank for proper support.
 - Probe thoroughly from 4 o'clock around to 8 o'clock along both sides.
 - Probe deeply, but avoid violent tamping which may disturb the tank.

Continued



PLACING OCTANK MODULES INTO THE HOLE

Rig through manway and lift with wooden 6x6 T-bar as illustrated below.



STANDARD STABLE SOIL SITE REQUIREMENTS

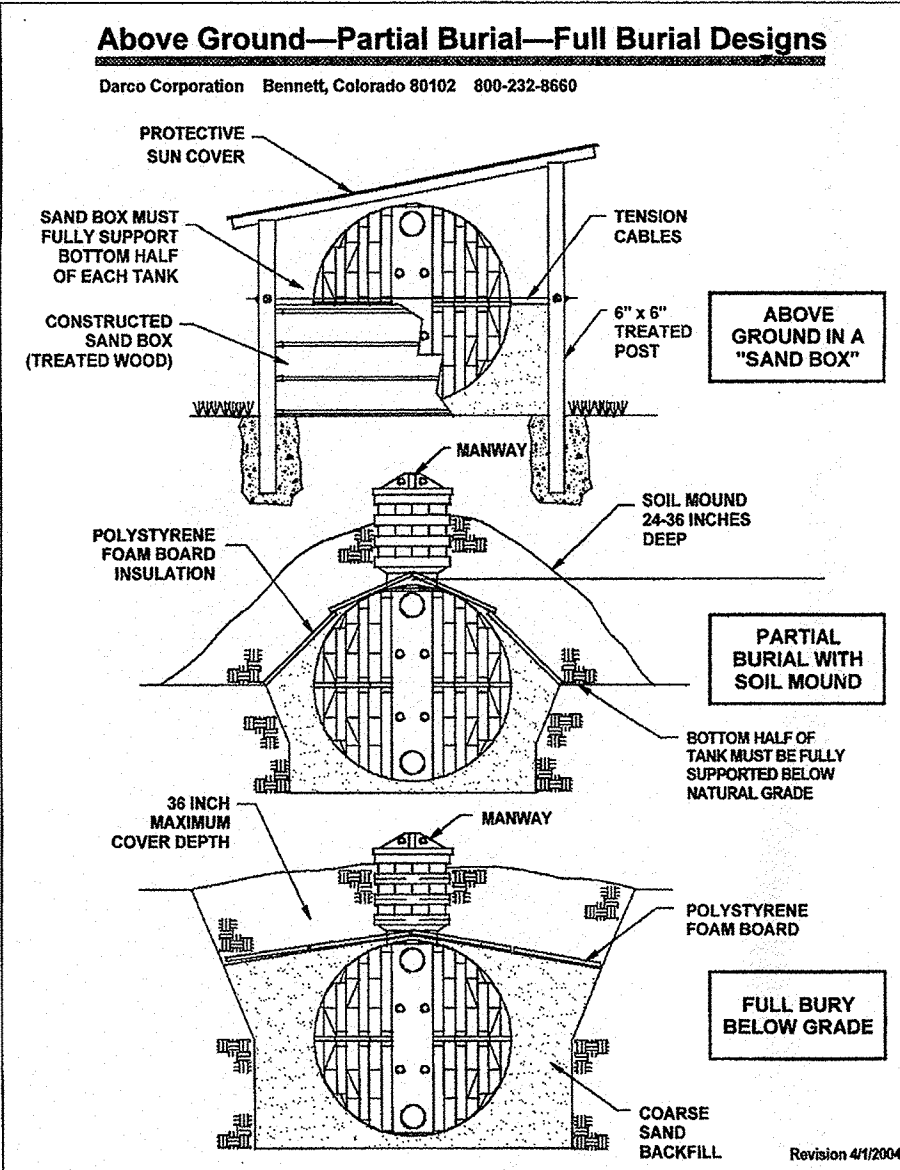
- Soil bearing must be at least 2500 lbs. / sq. ft. (consult geotechnical engineer).
- Soil cohesion or backslope angle must be adequate for side wall stability.
- Follow OSHA 1926.650/P safety guidelines for trenching and tank hole excavation.
- If site is subject to seasonal or unpredictable ground water, do consider:
 - Using deadman anchors to avoid possible floatation.
 - Burying the tank above probable groundwater with mounded soil cover.
 - Installing a tank bed underdrain ground water collection and discharge pipelines.

BEDDING AND BACKFILL MATERIAL REQUIREMENTS

- Backfill medium must totally surround and cover every module completely.
- Use only dry, clean, washed and graded material.
- No individual particles should be over 1/2 inch screen size.
- Material must be free of trash, ice, snow, and powdered soil fines.
- The following are examples of common approved materials:
 - Coarse sand or squeegee
 - Pea gravel or B-B gravel
 - Crushed and screened rock chips
- Do not use generic structural fill, road base, or crusher fines as backfill.

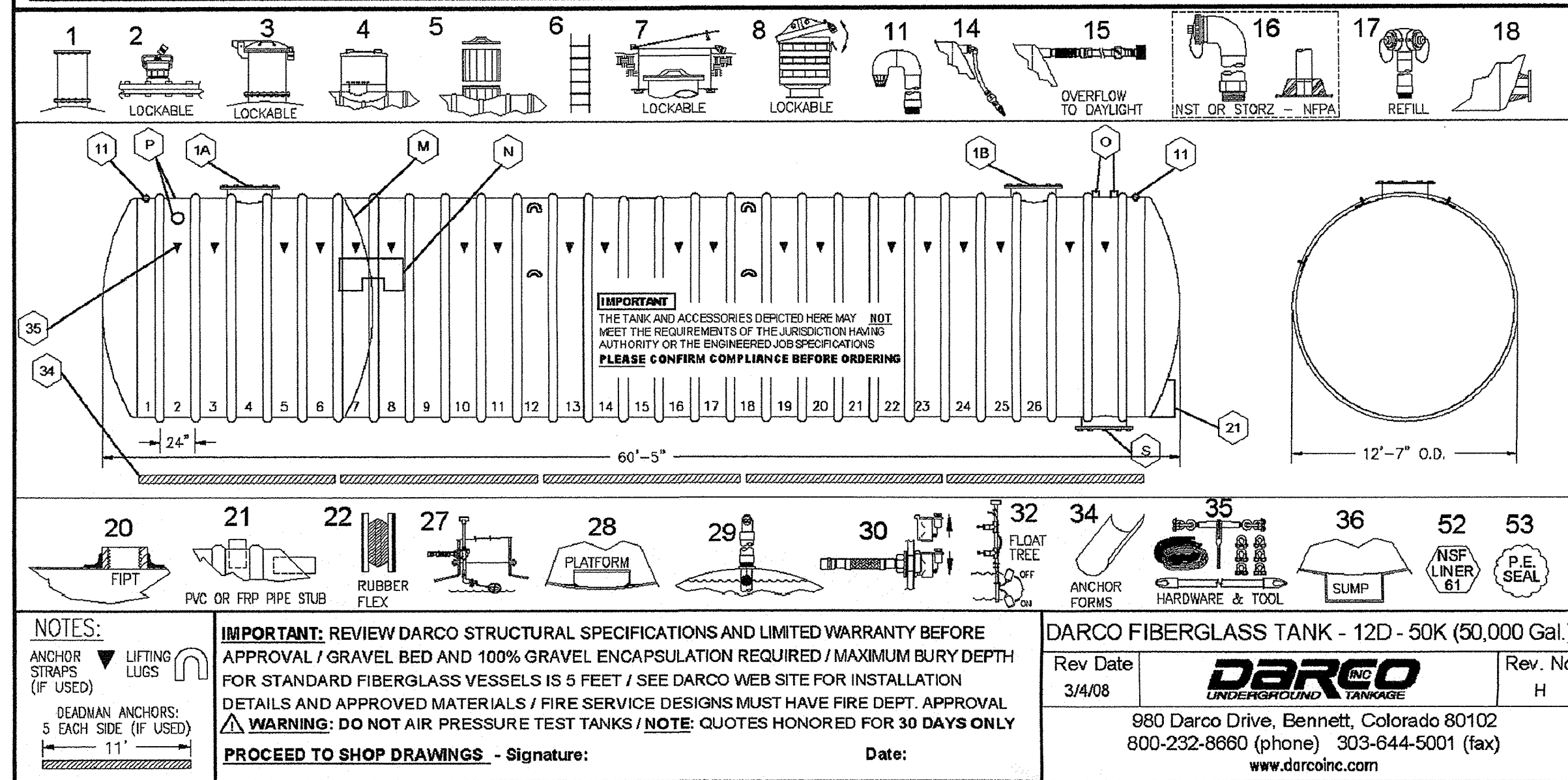
BURY DEPTH OPTIONS

- Above ground in a constructed "sand box" for support.
 - Fabricate cover or roof over sand box to reduce direct sunlight exposure.
- Partial burial to spring line or deeper for proper support of the tank belly.
 - Mound soil cover to depth necessary for frost protection.
- Full bury below grade with maximum cover depth of 36 inches.
 - Insulate with underground rated foam board for frost protection.
 - Add 4 French Drains on 9' centers and connect to 8" PVC pipe stubs. (See note "P" on Darco Tank details.)

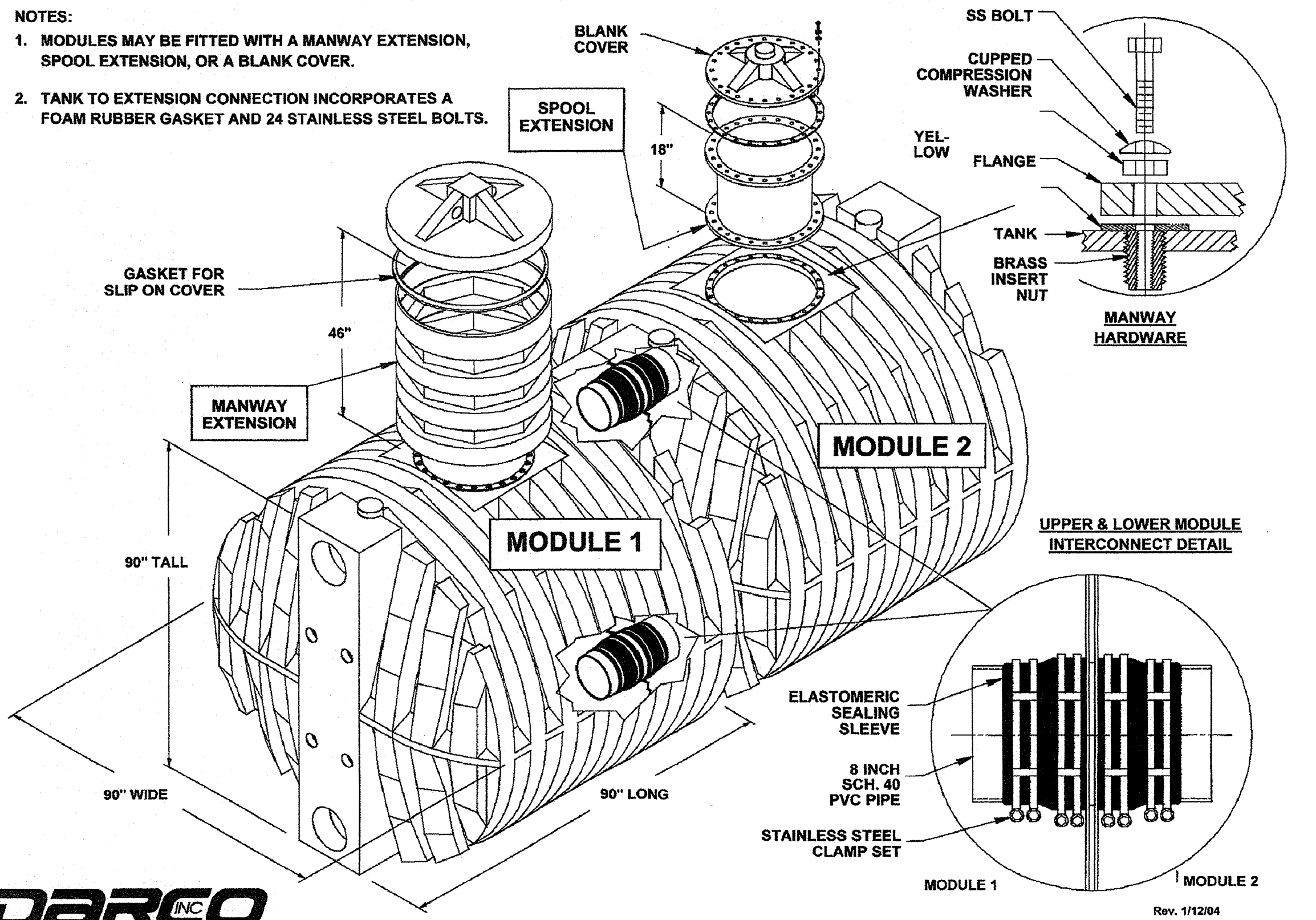


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TO Doug Hughes		FIRM: URS Corporation		PROJECT: Mesa Del Sol-Aperture Park		QUOTE #	B0520R-R1	DATE	11 June 08		
PHONE 505-855-7535		FAX: C 205-8443		EMAIL: doug_hughes@urscorp.com		SITE LOCATION		Albuquerque	NM	COUNTY	
STANDARD D-5		NOM. CAPACITY 50,000		NOM. WEIGHT 13,500#		POTABLE		NON-POTABLE	X USE	Rain Capture/Irrigation	
<u>INCLUDED WITH THIS FIBERGLASS UNDERGROUND TANK QUOTATION</u>											<u>PREPAID PRICE</u>
1A - 30"D X 48"T Manway - open top		0 - 8" PVC Sleeves for Standpipes		\$ 75,492		TAX May Apply		DEPOSIT 33%			
1B - 36"D X 48"T Manway - hinged cover		S - 36"D X 96"T Beveled Sump		FREIGHT DETAILS Estimated to Albuquerque NM		DELIVERY: 10-12 WEEKS FROM ORDER ACCEPTANCE <u>EXCLUDED IN THIS PRICE QUOTATION</u> 1. INSPECTION, ACCEPTANCE, AND OFFLOAD 2. INSTALLATION MATERIALS AND LABOR 3. UNSPECIFIED PIPE, VALVES, AND FITTINGS 4. UNSPECIFIED PUMPS, CONTROLS, AND LEVEL SENSORS 5. DEADMAN ANCHORS, ANCHOR STRAPS, & CABLE KITS 6. State and Local Taxes Not Included					
11 - 6" PVC Vent Head - screened		- Includes 2 - 6" PVC Standpipes for pumps									
21 - 24" PVC Pipe Stub - for future expansion		P - 2 - 8" PVC Pipe Stubs-to perimeter drain									
M - Full Baffle		34 - FRP Anchor Forms-deadmen poured on-site									
N - 2 - 12" PVC Crossovers		35 - FRP Anchor Straps/Cable Kits									
BURY DETAILS: 36" Typical/60" Maximum Cover Depth				WATER SOURCE: Rainwater							
ANTIBUOYANCY Included-Deadmen Poured On-Site				APPROVALS							
COMMENTS: Preliminary Design											
Warranty on this tank may not be available due to unusual design											



MANWAY EXTENSIONS, BLANK COVER, AND INTERCONNECT DETAILS



URS

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505 855 7555 f

MESA DEL SOL
SUSTAINABILITY CISTERN
ALBUQUERQUE, NEW MEXICO

JAMES D. HUGHES
1954
REGISTERED PROFESSIONAL ENGINEER
NEW MEXICO
6-23-08

DATE: JUNE 11, 2008

SHEET TITLE:
DARCO TANK
SPECIFICATIONS
SHEET NUMBER:
SHEET 8 OF 11

24342665 P:\07_Drawings\0706_Working\Sustainability\COND\CMUTCSP_DT102.dwg PLOTTED: 6/23/08 - 2:56pm ed_krouse

INTRODUCTION

IMPORTANT- The following is a list of physical conditions which are **not suitable** for standard FRP tank installations. Additional consideration and special engineering attention must be given to these conditions or your warranty may become **void**. If you have any doubts or questions about a proposed installation site, call Darco for verbal site review assistance at 800-232-8660.

1. Unstable soil, defined as having a load bearing capacity of **less than 2000** pounds / square foot or a cohesion value of **less than 500** pounds / square foot per ASTM D2166 (consult a geotechnical engineering firm).
2. Surface auto or truck traffic **without** an approved concrete slab on grade.
3. Locations suspect of being totally **saturated** during spring runoff periods.
4. Marshy or tidal conditions.
5. Landfill sites of any type.
6. Wet holes (water encountered during excavation).
7. Hydro-compactive or hydro-expansive soils (Bentonite is hydro-expansive).
8. Probable flood plains along the banks of creeks, rivers, or lakes.
9. Storage of hot water above 150 degrees Fahrenheit (such as generated by some solar heat systems, process cooling water, or geothermal springs).
10. Unapproved structural tank modifications.
11. Use above ground without proper support and written design approval.
12. Storage of liquids or materials other than **water**.

WARNING - Darco neither permits nor approves the use of our FRP tank systems to store any liquid other than **water** or water based domestic sewage without prior project review and specific written approval. Under no circumstances are tanks to be used for the storage of **waste oil, motor fuels, fertilizers, process chemicals, industrial spillage, fire sprinkler overflow, or hazardous materials of any type**.

INTRODUCTION

Deadman anchors are solid concrete rectangles of the appropriate size, reinforced with multiple full length #5 rebars as illustrated on the prior page. Each deadman must be secured to **2 or more anchor straps** and must pull downward in an **even and balanced** manner. Long tanks will require multiple deadmen along each side, laid end to end. These concrete anchors are easily poured with reusable wooden forms. Determine the **length** and consider the **lifting weight** of each deadman you pour. Form the deadmen on the ground using 2x12 lumber and steel side support stakes (sort of like making a very thick section of sidewalk). Suspend and locate the rebar with wire in each form as illustrated. Insert several rebar loops sticking out the top for easy handling with chains. Allow these deadmen to cure for several days and then carefully lift them at 2 balanced points to avoid cracking the green concrete. Position each deadmen in the hole **on top of the bedding gravel** and out **beyond the tank major diameter** as illustrated on the following page. Check your tank drawing for the proper designated anchor strap locations. Be sure these fiberglass straps are properly located **as illustrated** for each **specific** Darco tank design. **Lightly tension** 1/2 inch solid core 6 x 19 **galvanized wire rope** straight down from each anchor strap eyelet and around the deadman. **Secure the cable ends with 1 clamp before attaching the Darco tensioning tool. As you move from strap to strap, alternate sides in an effort to keep the tank plumb. Remove all cable slack but don't over do it, there is no need to tension beyond the slack removal point.**

IMPORTANT- It usually takes at least **2 people** to remove all the slack and then tighten the clamps. It is almost impossible to do this properly by yourself. Once the slack has been removed, **triple clamp** every wire rope joint tightly. Then, back go over each assembly again, check for slack and retorquer **all** the cable clamps **one last time** (as tightly as you can) with common hand wrenches.

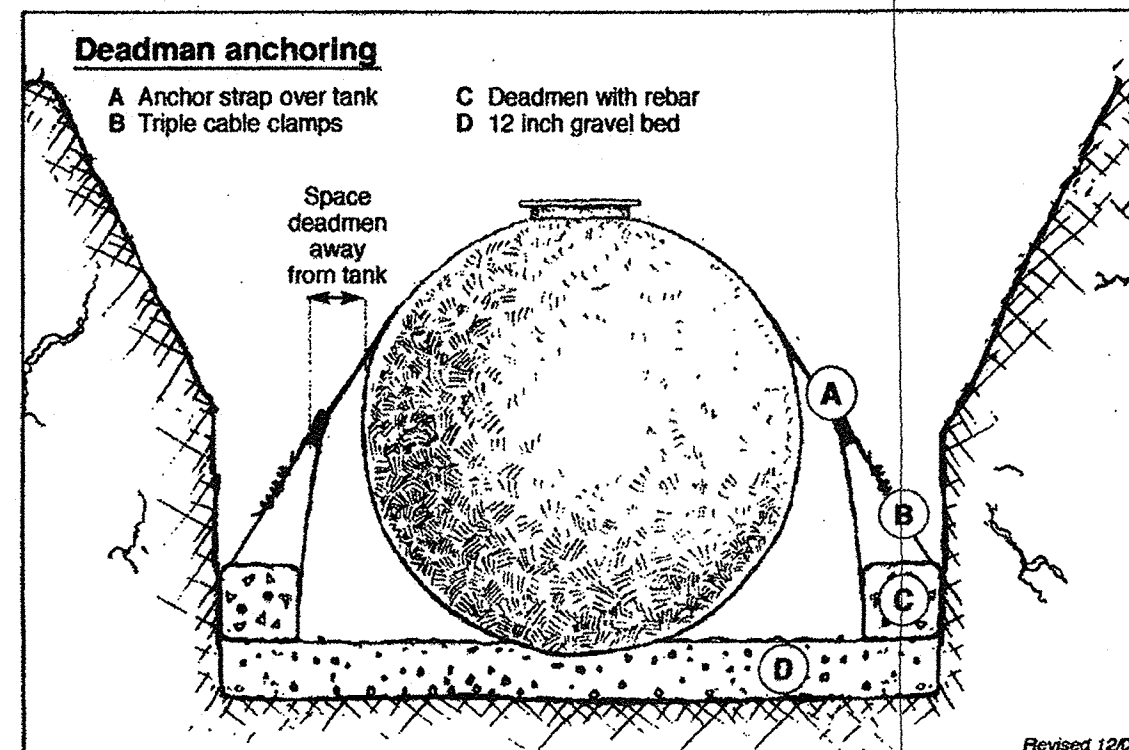
If more severe conditions exist; where soil conditions are marginal, high groundwater is a predictable seasonal event, or where a tank must be located in a riparian area near a stream, lake, or river flood plain - an **under slab** is the preferred method of anchoring. Such slabs are heavily reinforced, 12 inch thick concrete monoliths which extend outward beyond the entire tank perimeter as specified. **Anchor Lugs** are cast into the slab and slide over the internal steel reinforcing bars to create an anchor point for each strap as illustrated. The cable tie-down procedure and soil cover requirements are the same as with the deadman anchor system. Please refer to the appropriate illustrations and charts for the correct component sizes and proper bury depth for either style anchor system.

IMPORTANT- For proper anchoring "**down force**", the effective minimum tank bury depth must be **correct**. This depth must be maintained over the **entire excavation** area. In addition, if a **mounded** soil cover is used, extend this mounded depth outward to the sides 3 additional feet **beyond** the deadmen or slab, as illustrated on the previous page.

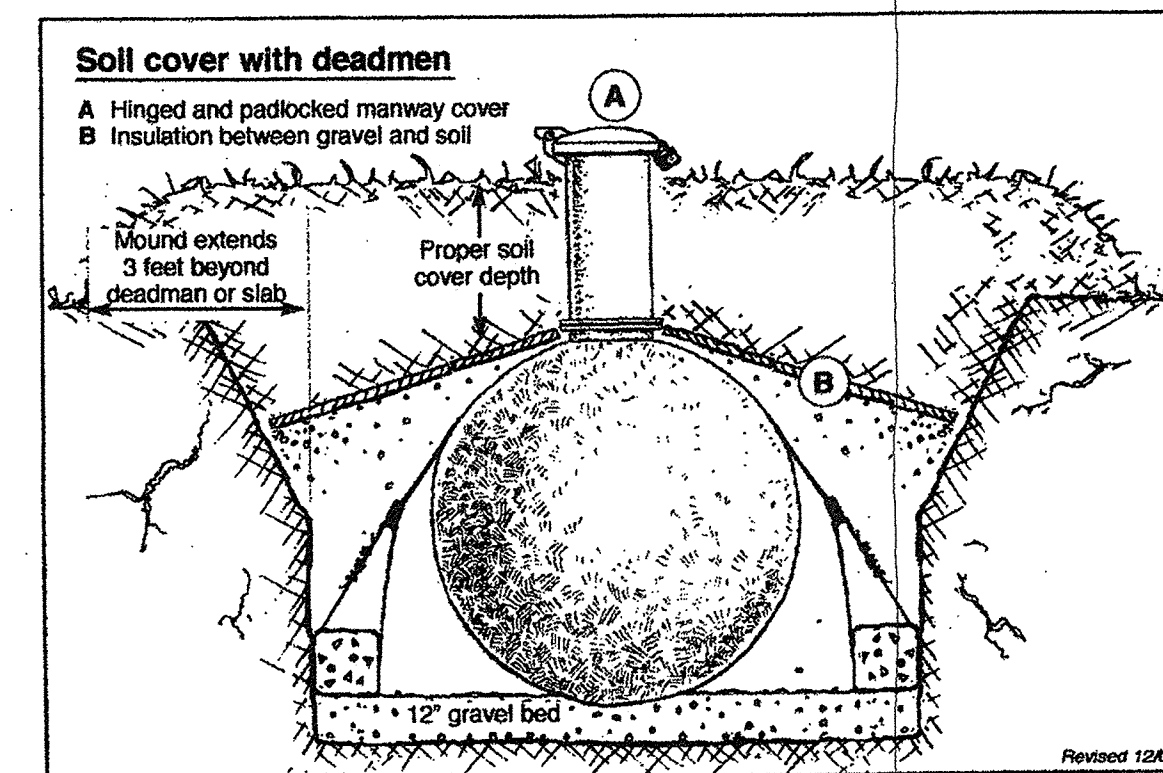
14

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INTRODUCTION



Multiple anchored tanks		
For use with 8 diameter tanks 2 - #5 rebars		
For use with 10 diameter tanks 3 - #5 rebars		
For use with 12 diameter tanks 4 - #5 rebars		
See your tank drawing for individual deadman lengths		
Nominal tank diameter		
8 feet	10 feet	12 feet
36 inches	36 inches	48 inches
12'H X 18"W	12'H X 24"W	12'H X 36"W
concrete	concrete	concrete
deadman size	deadman size	deadman size



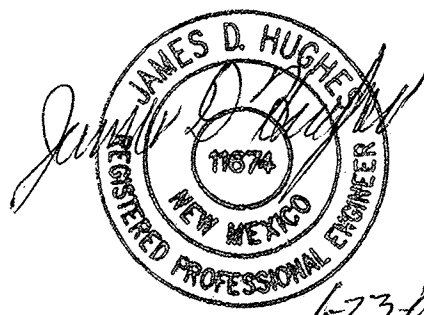
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15

URS

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505 855 7555 f

MESA DEL SOL
SUSTAINABILITY CISTERN
ALBUQUERQUE, NEW MEXICO



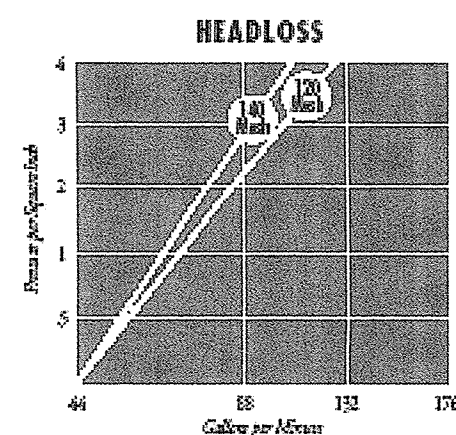
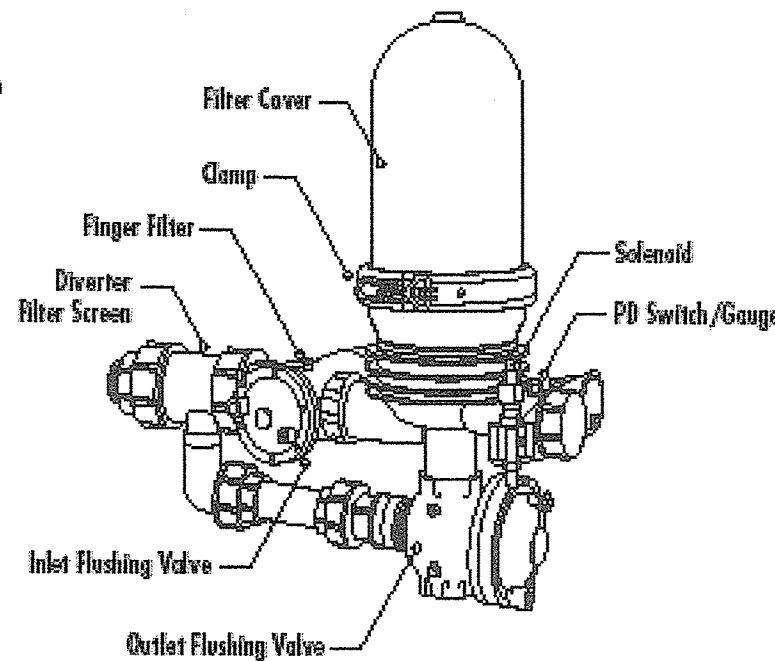
DATE: JUNE 11, 2008

SHEET TITLE:
DEADMEN ANCHOR DETAIL

SHEET NUMBER:
SHEET 9 OF 11

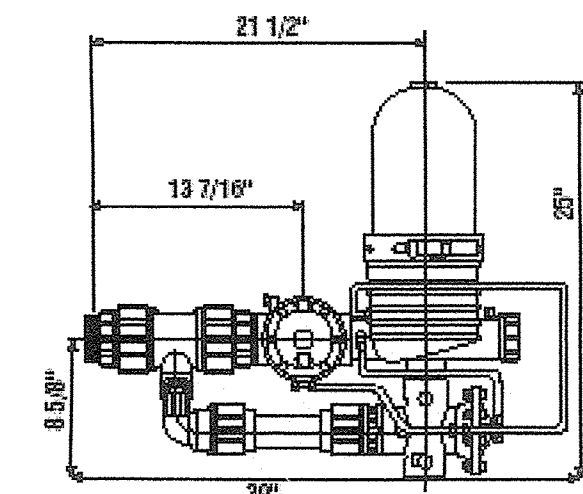
Specifications

- Maximum Operating Pressure: 140 psi
- Minimum Operating Pressure for Backflushing: 40 psi upstream
- Minimum Backflush Flow: 35 GPM
- Maximum Operating Temperature: 158° F
- Inlet Connection: 2" Male Pipe Thread
- Outlet Connection: 2" Female Pipe Thread
- Flush Port Connection: 2" Female Pipe Thread
- Flush Valves: Bronze with Plastic Cover
- Filter Body: Glass Reinforced Polyamide
- Discs: Polypropylene



DISC COLOR

Color	Yellow	Red	Black
Mesh	80	120	140



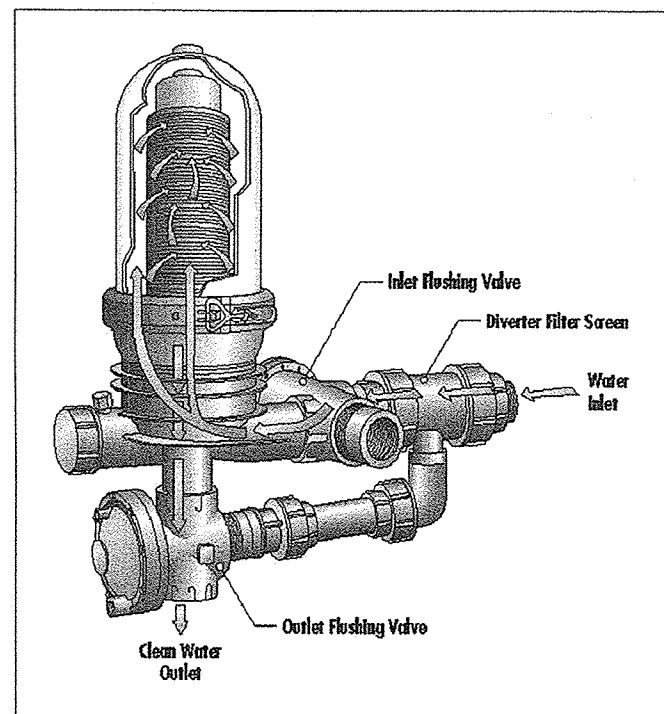
DIMENSIONS

	Inlet / Outlet	Inlet / Outlet Offset	Overall	Weight
	21 1/2"	8 5/8"	30" x 25"	37 lbs.

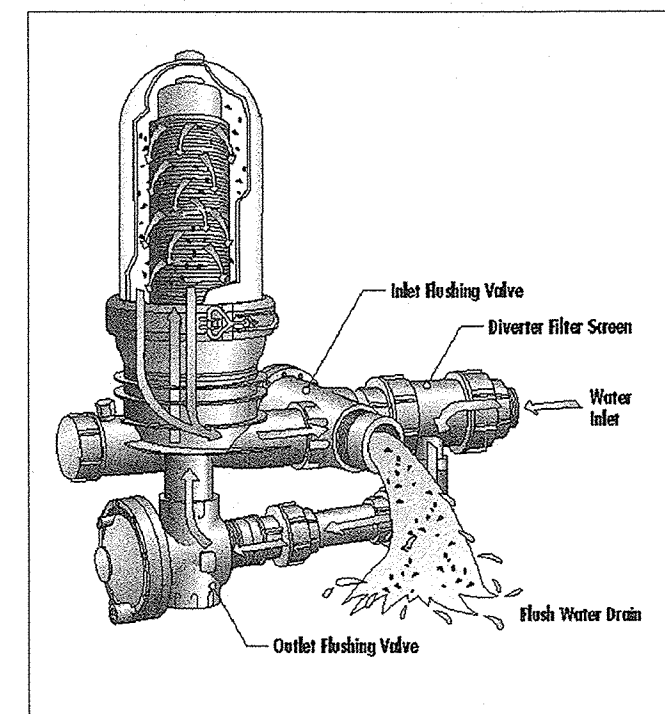
System Operation

The discs are stacked on the spine. The discs are color-coded by micron size and are assembled according to the water filtration requirements. The spine assembly has a spring compression unit and an internal piston which are used to alternately compress and release the discs during filtra-

tion and backflush cycles. During filtration, water flows through the inlet flushing valve via the diverter filter tube and into the filter unit where it is cleaned. The filtered water then flows through the outlet flushing valve, clean for consumer use.



Filtration Mode



Backflushing Mode

Filtration Mode:

During the filtration process the filter discs are tightly compressed together by the spring and the differential pressure, forcing the water to flow through the grooves and traps of the discs.

Backflushing Mode:

Backflush commands, based on pressure differential or time settings, are sent from the controller to three separate components in the filter:

- Inlet Valve - Enters backflush mode (entrance closed, drain opens)
- Outlet Valve - Enters backflush mode (downstream closed, flush water diverter opens)
- Filter - Operational (stack of discs enters open mode)

Water flows via the diverter filter screen, through the diverter into the outlet flushing valve. It enters the main filter (which is open), where jets of water flush the grooves in the discs as the discs spin. The water carries away impurities toward the inlet valve.

At the end of the backflushing process (approximately 20 seconds), the backflush command is withdrawn, the discs are re-energized and the filter returns the filtration mode.

The inlet and outlet valves return to the filtering mode. Water flows once again into the filter, carrying with it the impurities that are collected on the diverter filter screen during backflushing.

Installation

Installation Steps:

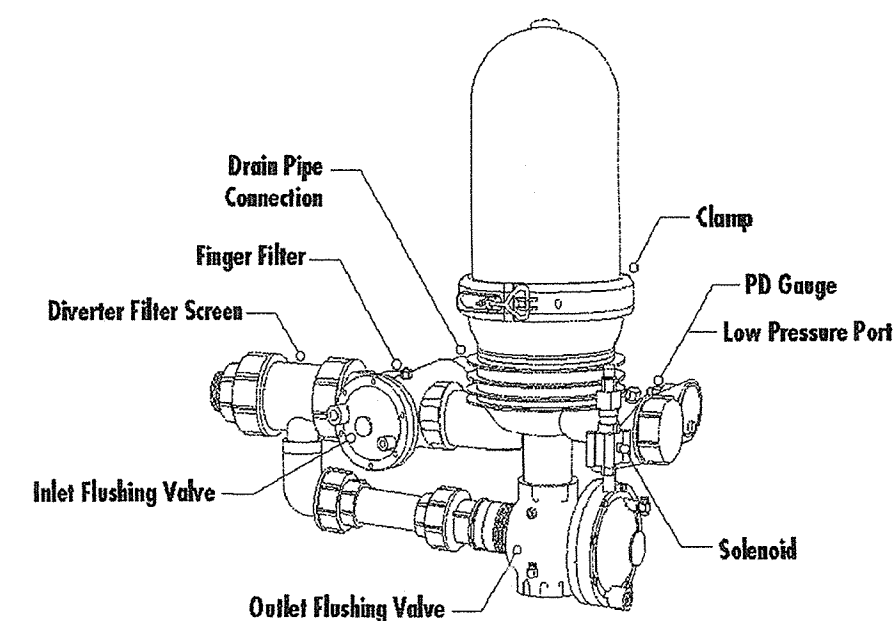
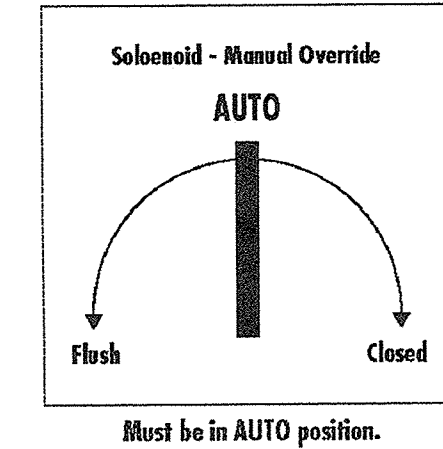
- Install the filter making sure the flow of water follows the directional arrows on the filter.
- Connect a drain line to the flush drain of the backflush valve located in the front of the filter. The drain line should be at least 2" in diameter and not be longer than 30 feet. If a longer drain line is necessary, use a 3" diameter line. The drain water must flow freely with no back-pressure to the filter.
- Unscrew the 2" plastic cap next to the Pressure Differential (PD) gauge. Connect the 9 volt battery to the terminal connection of the controller. After the battery is connected, make sure the small red bulb in the corner of the control card blinks once every 5 seconds. This indicates that both the battery and the control card are good.
- Check the Pressure Differential (PD) gauge and make sure it is set to 7 psi.
- Verify that the manual override switch on the solenoid is in the vertical position - AUTO.

- Turn on the water to the filter. When the line is pressurized, initiate a backflush by turning the manual override on the solenoid to the left 90 degrees - FLUSH. The filter will go into the backflush mode and stay in the backflush mode as long as the manual override is to the left. Return to manual over-ride to the vertical position (AUTO) and the filter will end the backflush cycle and return to filtration mode.

IMPORTANT: There must be at least 35 GPM at 40 psi at the upstream side of the filter during backflush for the filter to flush properly. The Low Flow model requires at least 20 GPM at 40 psi during backflush.

- Check the Pressure Differential (PD) gauge to make sure it is working. For Murphy PD gauges, unscrew the hydraulic tube on the Low Pressure port (the offset port) under the PD gauge. For United PD gauges, unscrew the hydraulic tube on the Low Pressure port of the PD gauge. Water will squirt out of the tube. Direct the water away from you. By disconnecting the Low Pressure tube, the PD gauge will think that the downstream pressure is 0 psi. For Murphy PD gauges, the long needle on the gauge should move to the set (short) needle, and a backflush will be initiated. There is a 25 - 30 second pre-dwell delay from the time the 2 needles make contact until the backflush begins. For United PD gauges a backflush will be initiated after a 25 - 30 second pre-dwell delay.

- The backflush will last for 15 seconds, end, and the filter will return to filtration mode.
- The outlet valve will shut completely during the 15 second backflush. It will reopen when the backflush is complete.



System Maintenance

- Confirm there is 40 psi of pressure upstream of the filter during backflush.
- Check that the Pressure Differential (PD) gauge returns to 0-2 psi after a backflush.

Seasonal Maintenance:

- Close the water inlet after backflushing the system.
- Make certain there is no pressure in the system.
- Remove the cover by opening the clamp.
- Remove the disc set and tie the set on a string.
- If there is an accumulation of algae and organic material in the grooves of the discs, soak the discs in a 10% Chlorine solution for 30 minutes and rinse with fresh water. If well water is being used for filtering and there is an accumulation of iron bacteria, soak the discs in Muriatic acid for 30 minutes and rinse with fresh water.
- Reassemble the discs on the spine, reassemble the filter cover and tighten the clamp.
- Check and clean Finger Filter.

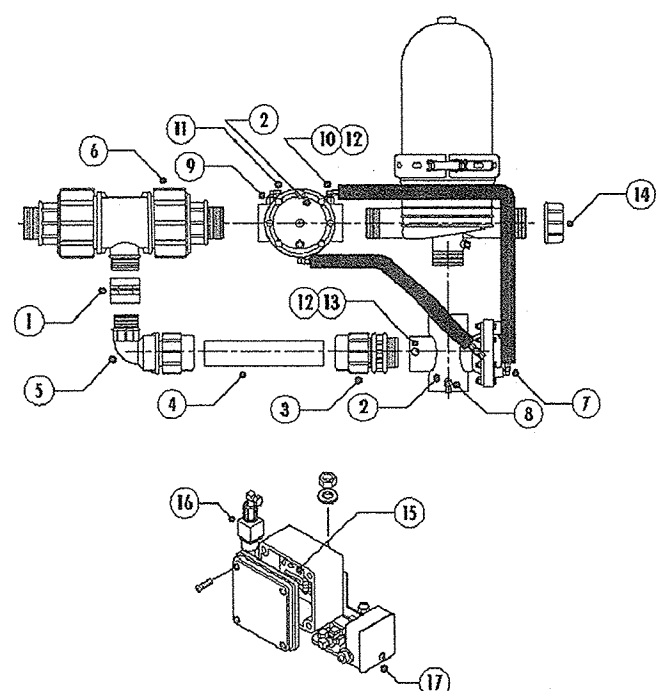
Weekly Check

<input checked="" type="checkbox"/>	Inlet/Outlet Pressure
<input checked="" type="checkbox"/>	Backflush Controller
<input checked="" type="checkbox"/>	Leakage

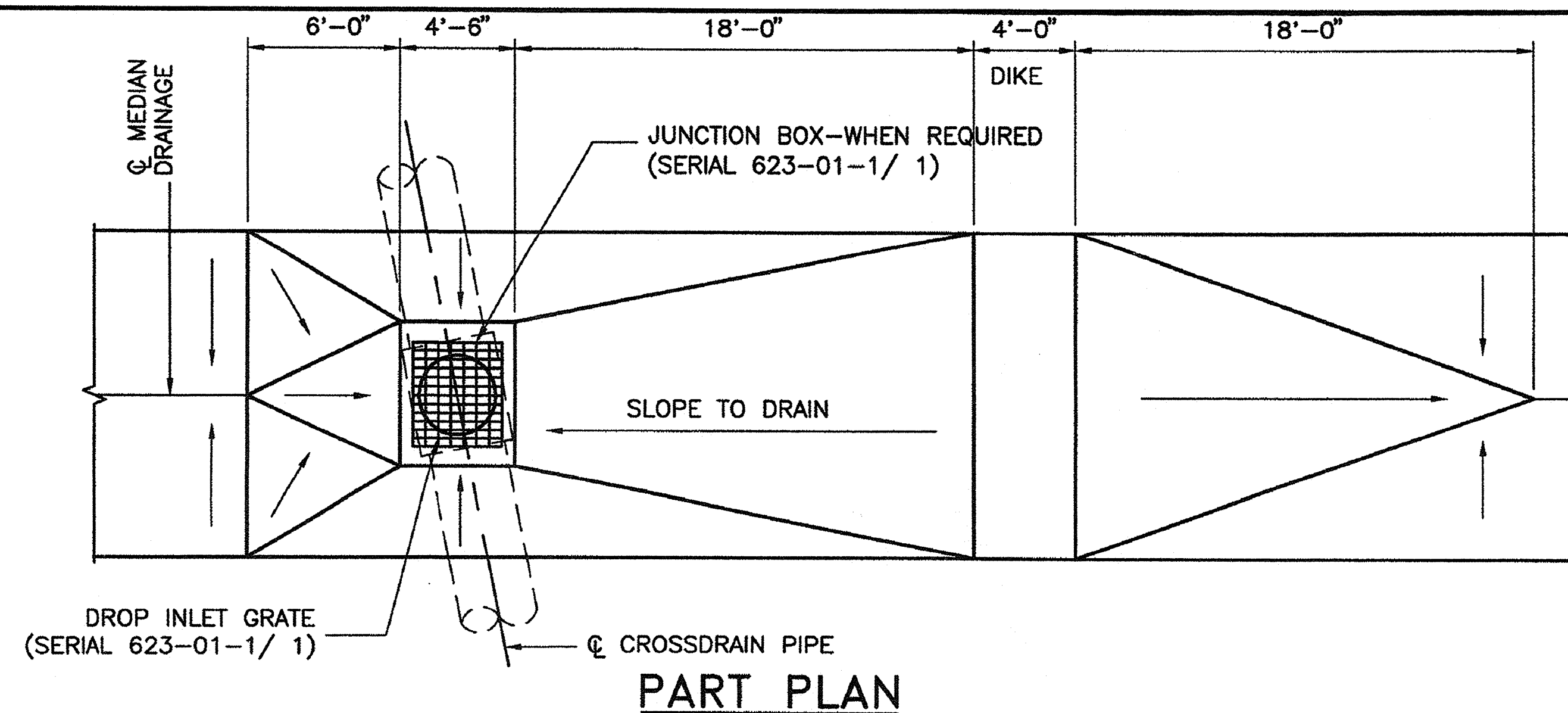
Monthly Check

<input checked="" type="checkbox"/>	Solenoid
<input checked="" type="checkbox"/>	Downstream Pressure and Drain

Replacement Parts



2" Compact Disc-Kleen Filter Parts



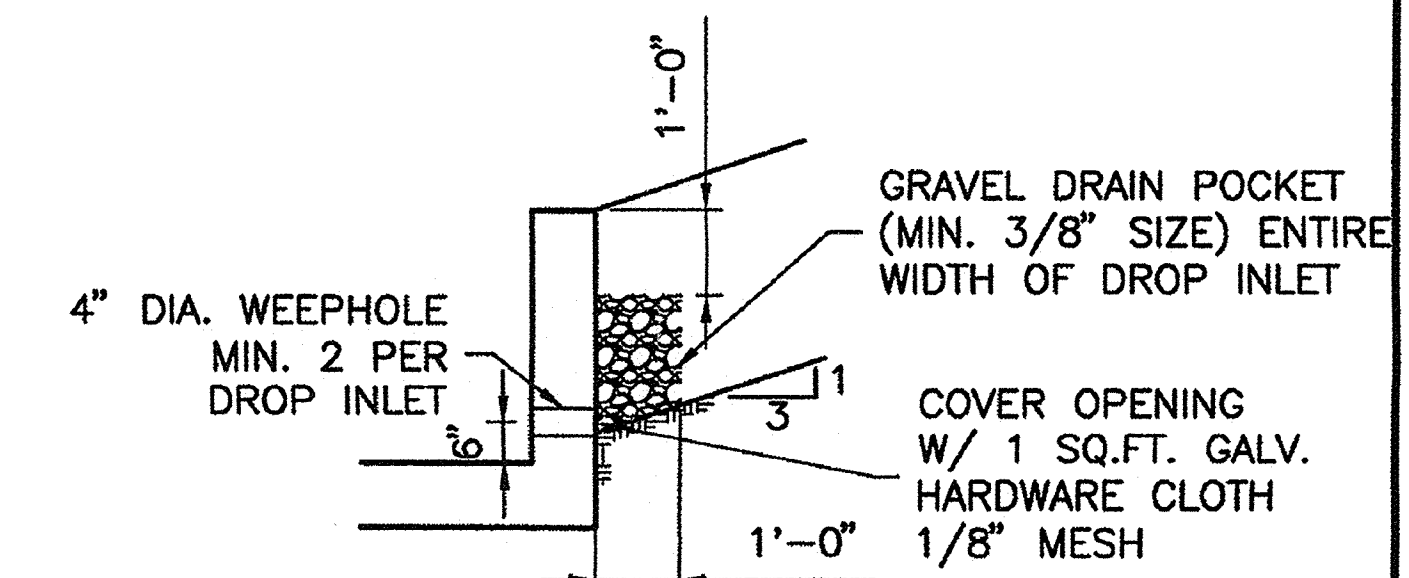
REINFORCING STEEL REQUIRED FOR DROP INLET

#4A	2'-6"	REQ'D. 14
#4B	4'-3"	REQ'D. 10
#4C	5'-3"	REQ'D. 8
#4D	3'-6"	REQ'D. 4

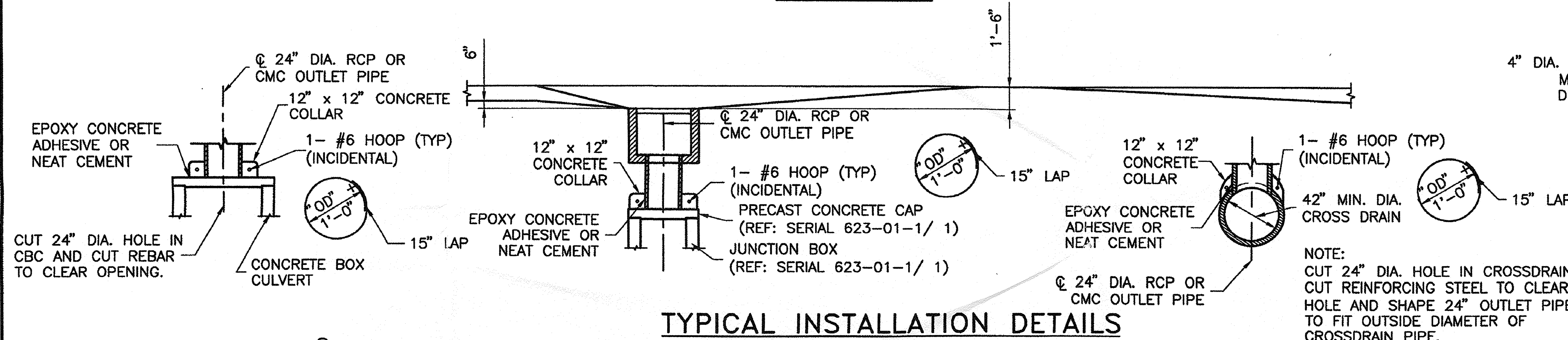
* ESTIMATED QUANTITIES FOR DROP INLET

CLASS "A" CONCRETE:
USING R.C. PIPE 1.46 CU.YDS.
USING C.M. PIPE 1.51 CU.YDS.
REINFORCING STEEL: 89 LBS.
STRUCTURAL STEEL (URBAN): 304 LBS.
STRUCTURAL STEEL (RURAL): 359 LBS.

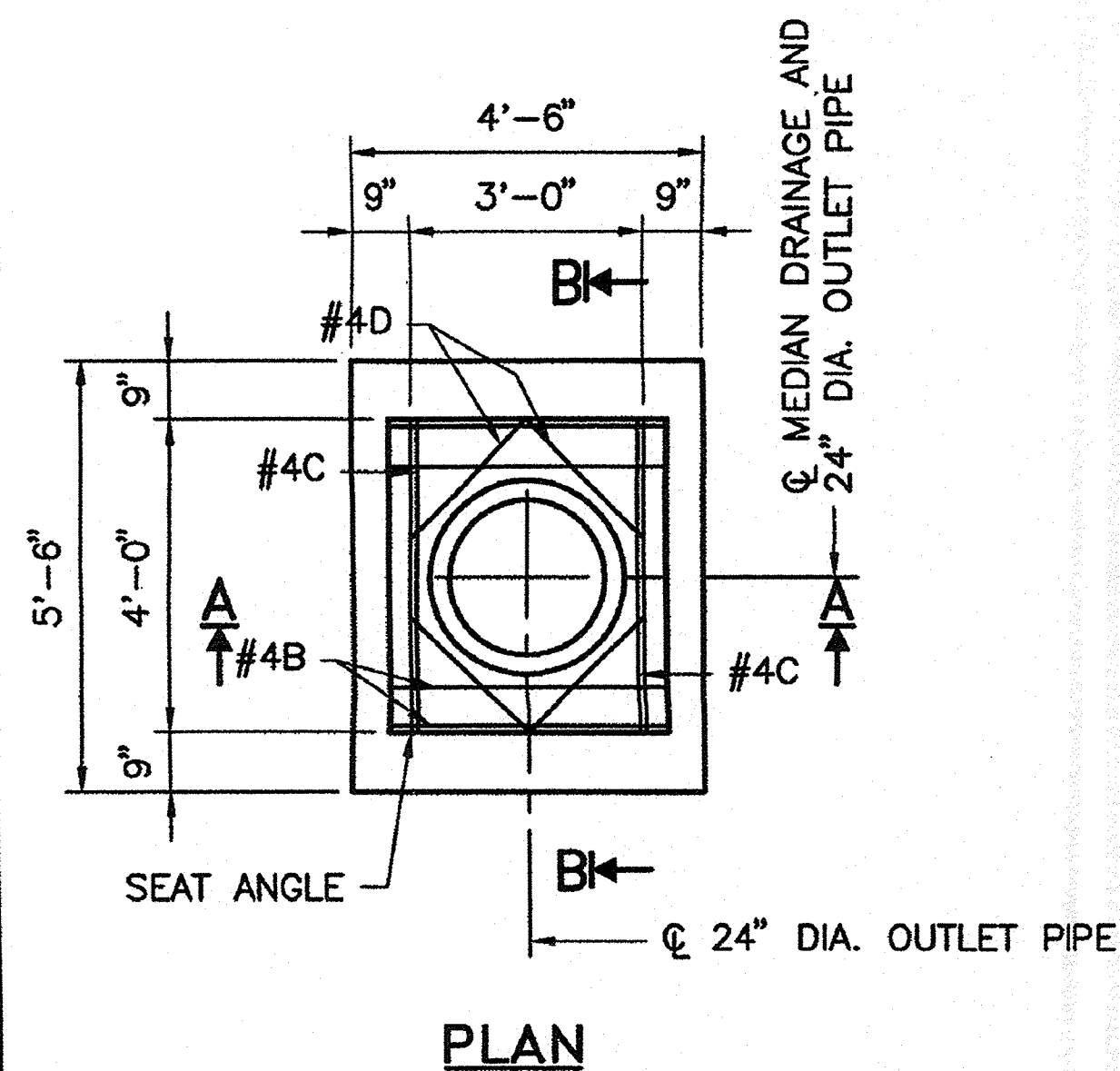
* NOT A BID ITEM, FOR CONTRACTORS
INFORMATION ONLY



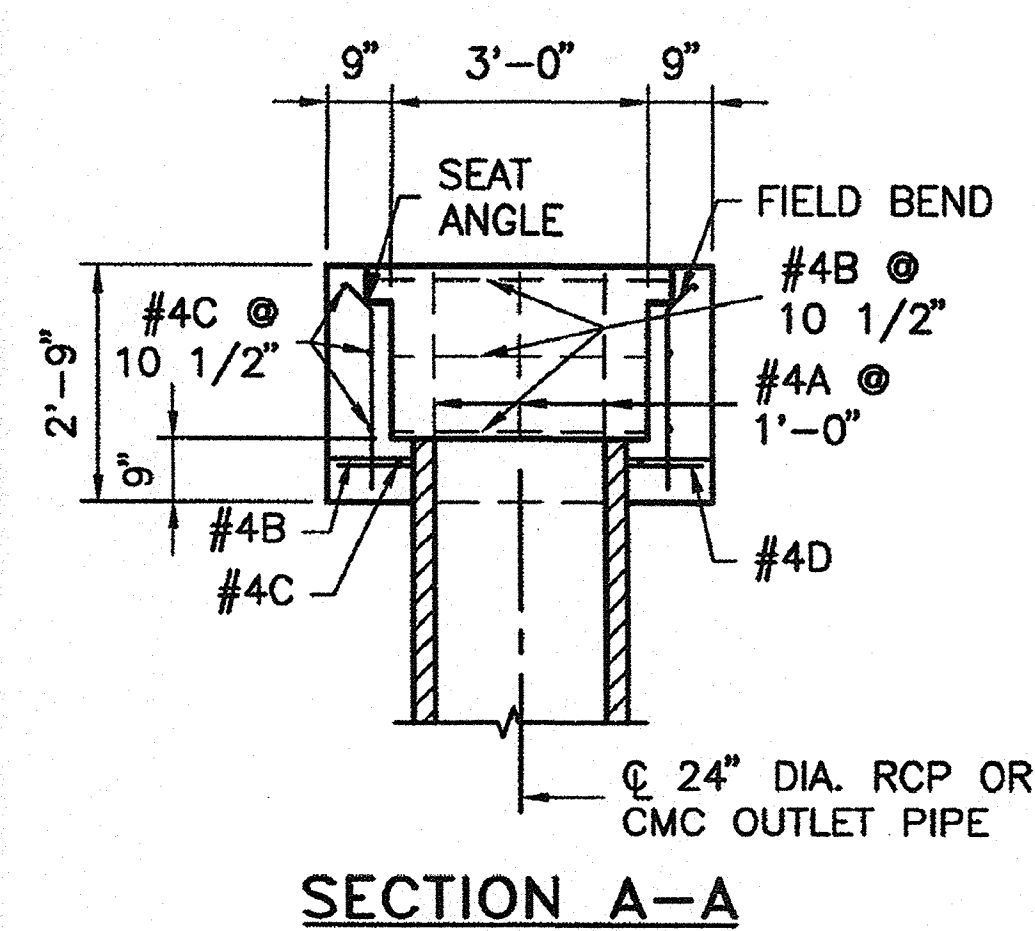
WEEP HOLE DETAIL



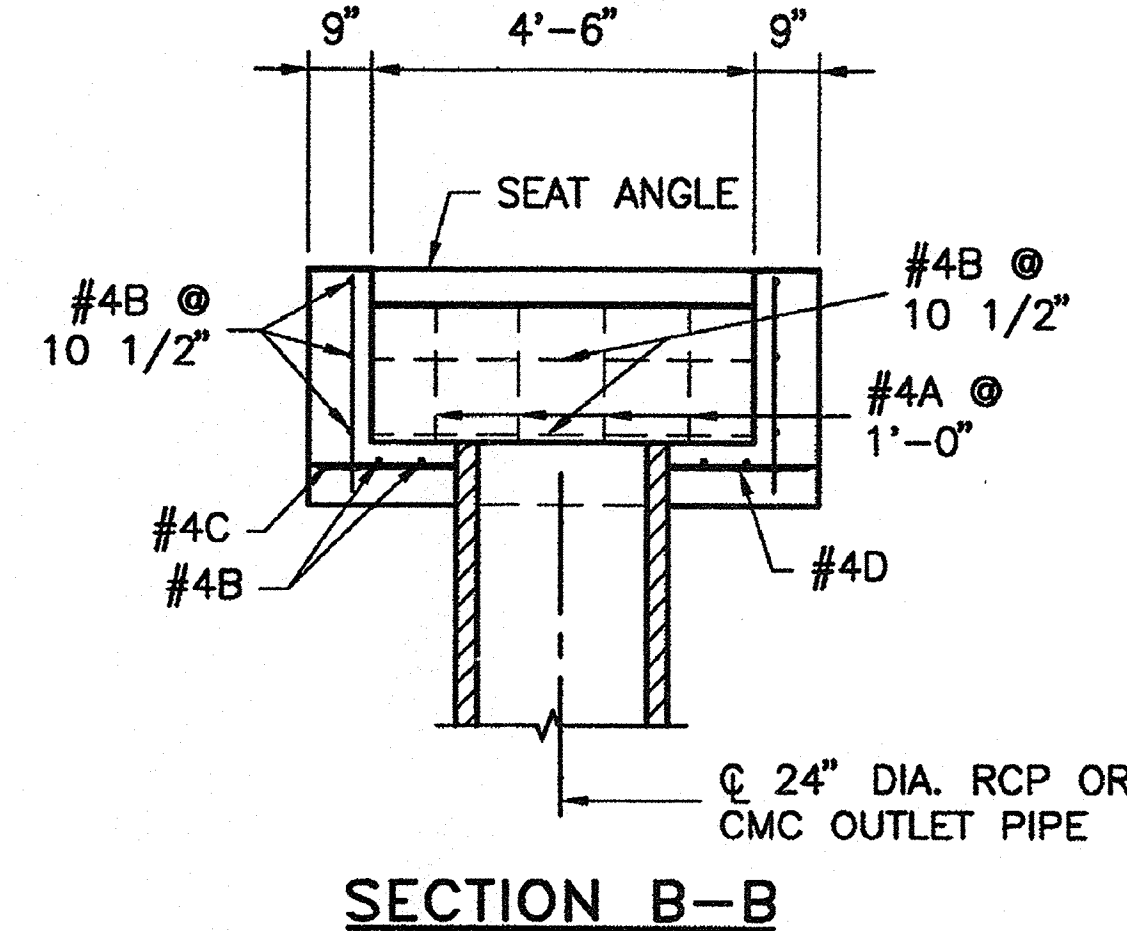
TYPICAL INSTALLATION DETAILS



PLAN



SECTION A-A



SECTION B-B

DROP INLET DETAILS

NOTE: MEDIAN DROP INLETS, COMPLETE
IN PLACE, WILL BE PAID FOR AT
THE UNIT PROCE BID PER EACH.

NOTE: SERIAL 623-01-1/ 1 MUST
ACCOMPANY THIS SHEET

NO.	DATE	REV. BY	DESCRIPTION
REVISIONS (OR CHANGE NOTICES)			
NEW MEXICO DEPARTMENT OF TRANSPORTATION STANDARD DRAWING			
MEDIAN DROP INLET TYPE III DETAILS AND QUANTITIES			
APPROVED	DESIGN ENGINEER	DATE	6-17-05
DESIGNED BY	DRAWN BY	CHECKED BY	
623-03-1/1			

DATE: JUNE 11, 2008

SHEET TITLE:
NMDOT DETAILS

SHEET NUMBER:
SHEET 11 OF 11