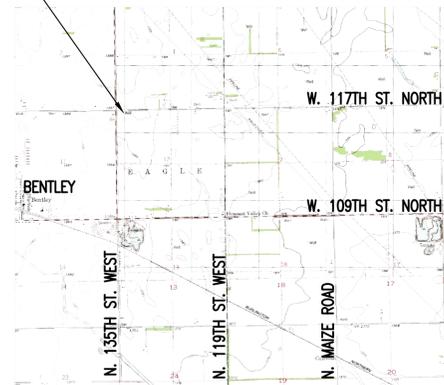


SIX SIMS WELLS AND ONE EQUUS BEDS WELL

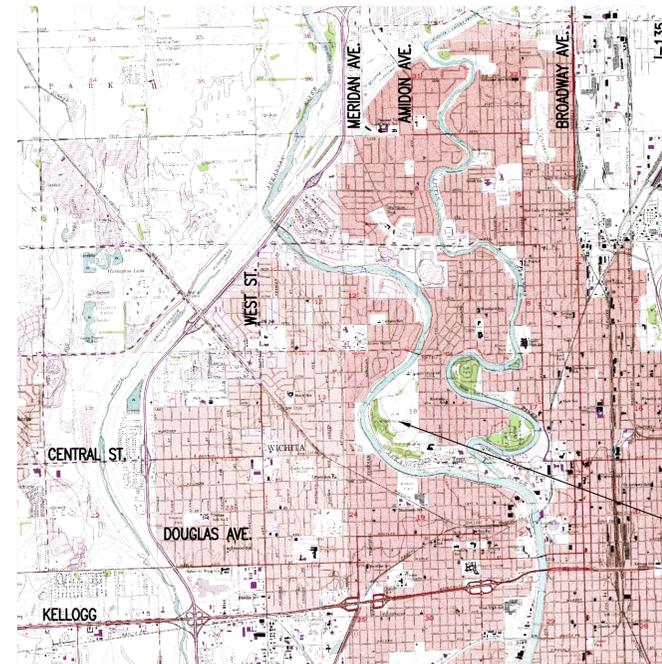
PROJECT NO. 750395 AND 750022
OCA NO. 633821 AND 633822

CITY OF WICHITA, KANSAS
JAMES L. ARMOUR, P.E. - CITY ENGINEER

PROJECT SITE
EQUUS BEDS WELL



LOCATION MAP



LOCATION MAP

NOT TO SCALE

PROJECT SITE
SIMS WELLS

INDEX OF SHEETS

	TITLE SHEET
CIVIL	
PC1	KEY MAP
PC2	WELL S-4
PC3	WELL S-5
PC4	WELL S-7
PC5	WELL S-8
PC6	WELL S-10
PC7	WELL S-11
PC8	WELL M-31
PS1	TYPICAL SIMS WELL DESIGNS
PS2	TYPICAL SIMS WELL DESIGNS
PP1	TYPICAL EXISTING SIMS WELL VAULT DEMOLITION PLAN & SECTION
PP2	TYPICAL EXISTING SIMS WELL VAULT IMPROVEMENT PLAN & SECTION
PP3	EXISTING S-8 WELLHOUSE DEMOLITION PLAN & SECTION
PP4	EXISTING S-8 WELLHOUSE IMPROVEMENT PLAN & SECTION
PP5	TYPICAL SIMS WELL DETAIL
PD1	MISCELLANEOUS WATER DETAILS
PD2	SILT FENCE DITCH CHECK AND BARRIER DETAILS
PD3	STRAW BALE DITCH CHECK AND BARRIER DETAILS
STRUCTURAL	
S1.1	WELL STRUCTURAL PLAN AND DETAIL
MECHANICAL	
M1	MECHANICAL NEW SIMS WELL
ELECTRICAL	
E1.1	ELECTRICAL SCHEDULES
E1.2	ELECTRICAL WIRING DIAGRAMS
E2.1	ELECTRICAL PLAN TYPICAL S-WELL SITE
E3.1	ELECTRICAL PLAN M-31 WELL SITE
E3.2	ELECTRICAL SCHEMATICS AND DETAILS M-31 WELL SITE

CONTRACTOR - WILDCAT CONSTRUCTION CO., INC.

P.E.C. PROJECT NO. 34-11296-2228

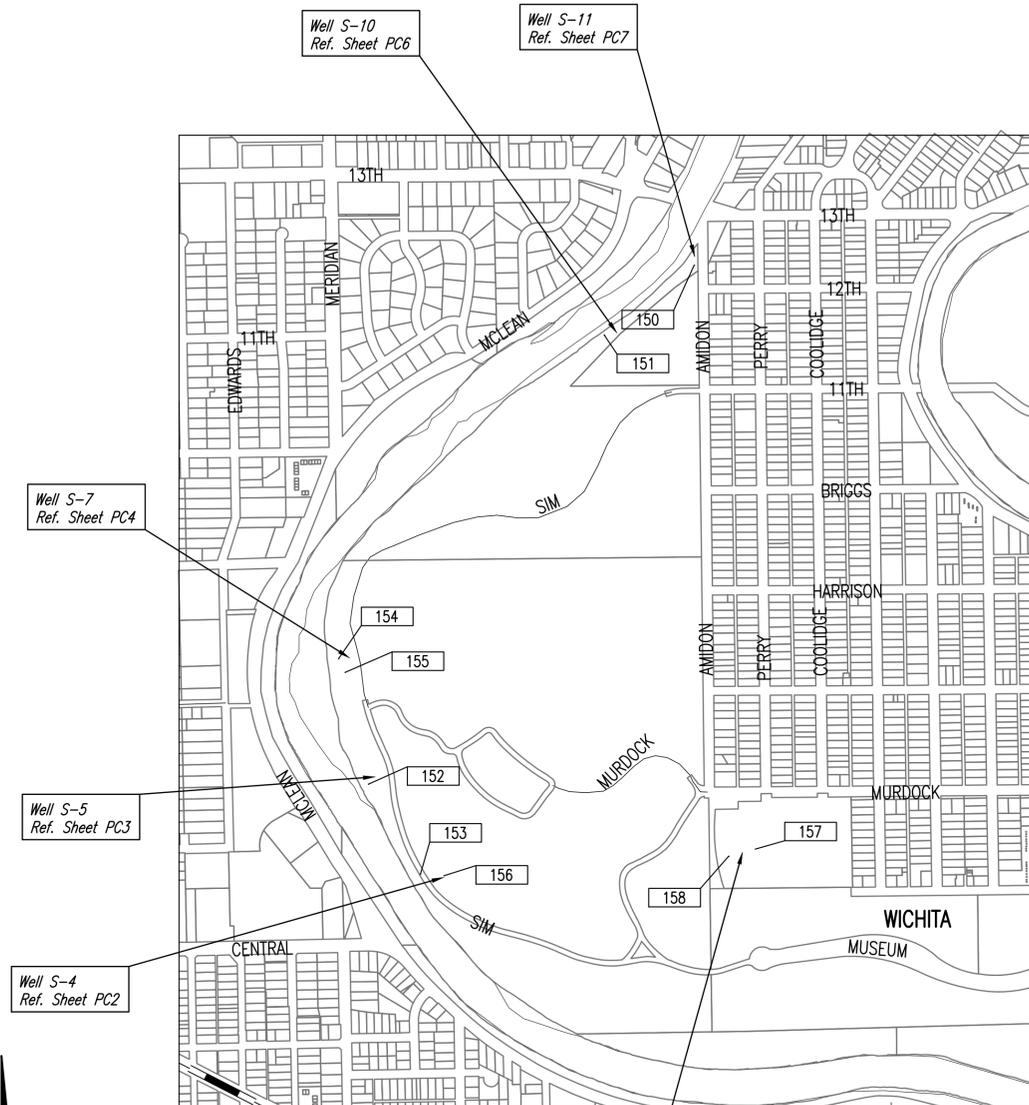
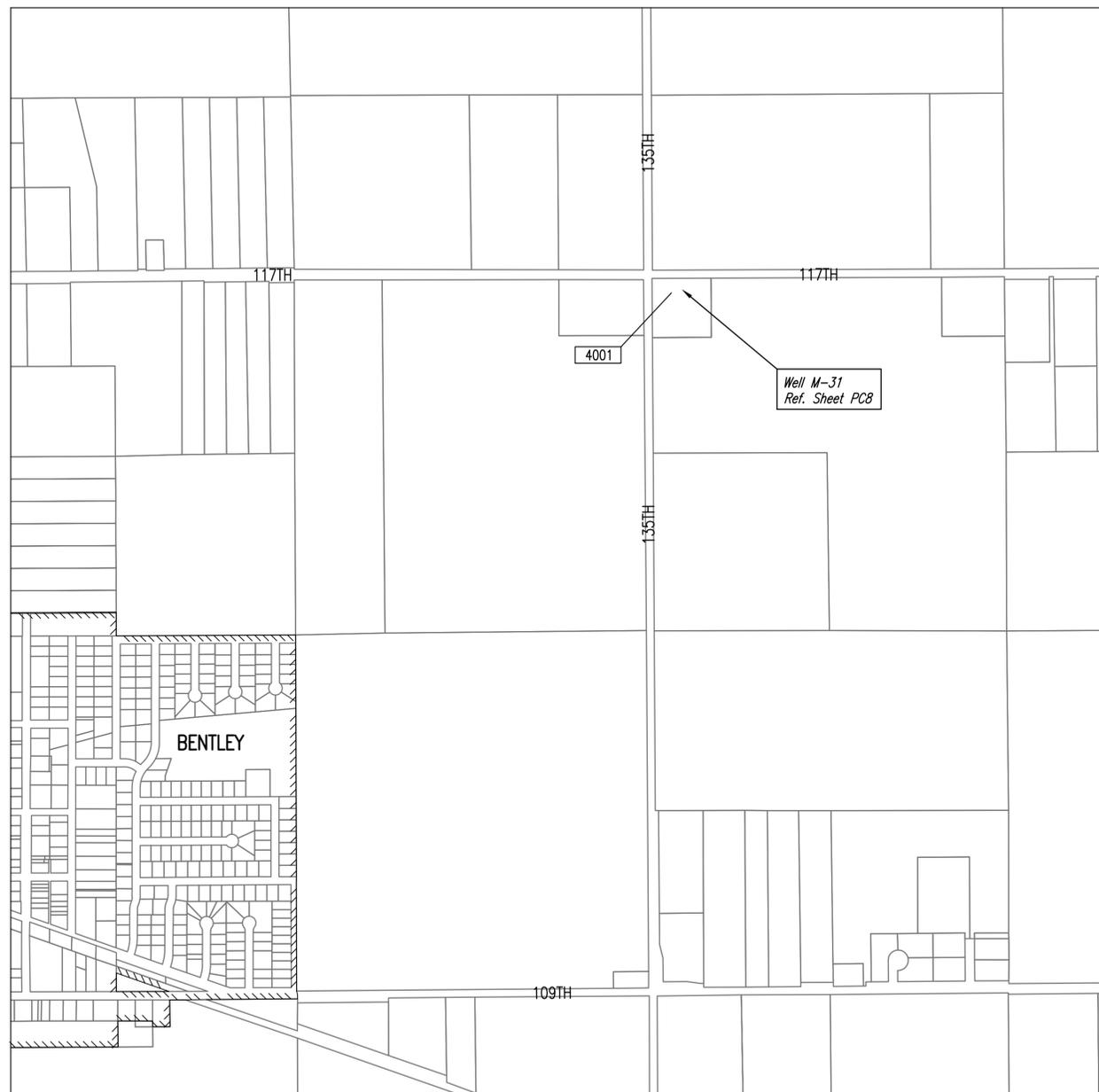
MAY 2012

PLANS PREPARED BY

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
ENGINEERS
WICHITA, KANSAS

RECORD DRAWING

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 P:\Projects\11296-C-PC1-Key Map\Drawings\Civil\11296-C-PC1-Key Map.dwg



NOT TO SCALE

CONTROL POINTS 150

CONTROL PROVIDED BY: RUGGLES & BOHM
 STATE PLANE COORDINATES, NAVD88 DATUM
 WICHITA/SEDGWICK COUNTY GPS CORS NETWORK

STA. #150
 N: 1,693,176.923, E: 1,641,189.026
 Chis. "X" on S. side MH for Water Vault
 60' south of old wells
 Elev. 1308.671

STA. #151
 N: 1,692,719.776, E: 1,640,598.587
 Mag. Nail in Asphalt Bike Path
 80' west of old wells
 Elev. 1306.417

STA. #152
 N: 1,689,778.129, E: 1,639,050.389
 1/2" rebar
 60' WSW of old wells on West side of bike path.
 Elev. 1300.075

STA. #153
 N: 1,689,188.354, E: 1,639,391.697
 1/2" rebar in dirt between road and bike path.
 150' W of old wells
 Elev. 1310.612

STA. #154
 N: 690,600.075, E: 1,638,854.758
 Chis. "+" on NE corner of Electric Vault
 70' W of old wells
 Elev. 1301.356

STA. #155
 N: 1,690,510.078, E: 1,638,897.254
 Mag. Nail
 Elev. 1302.725

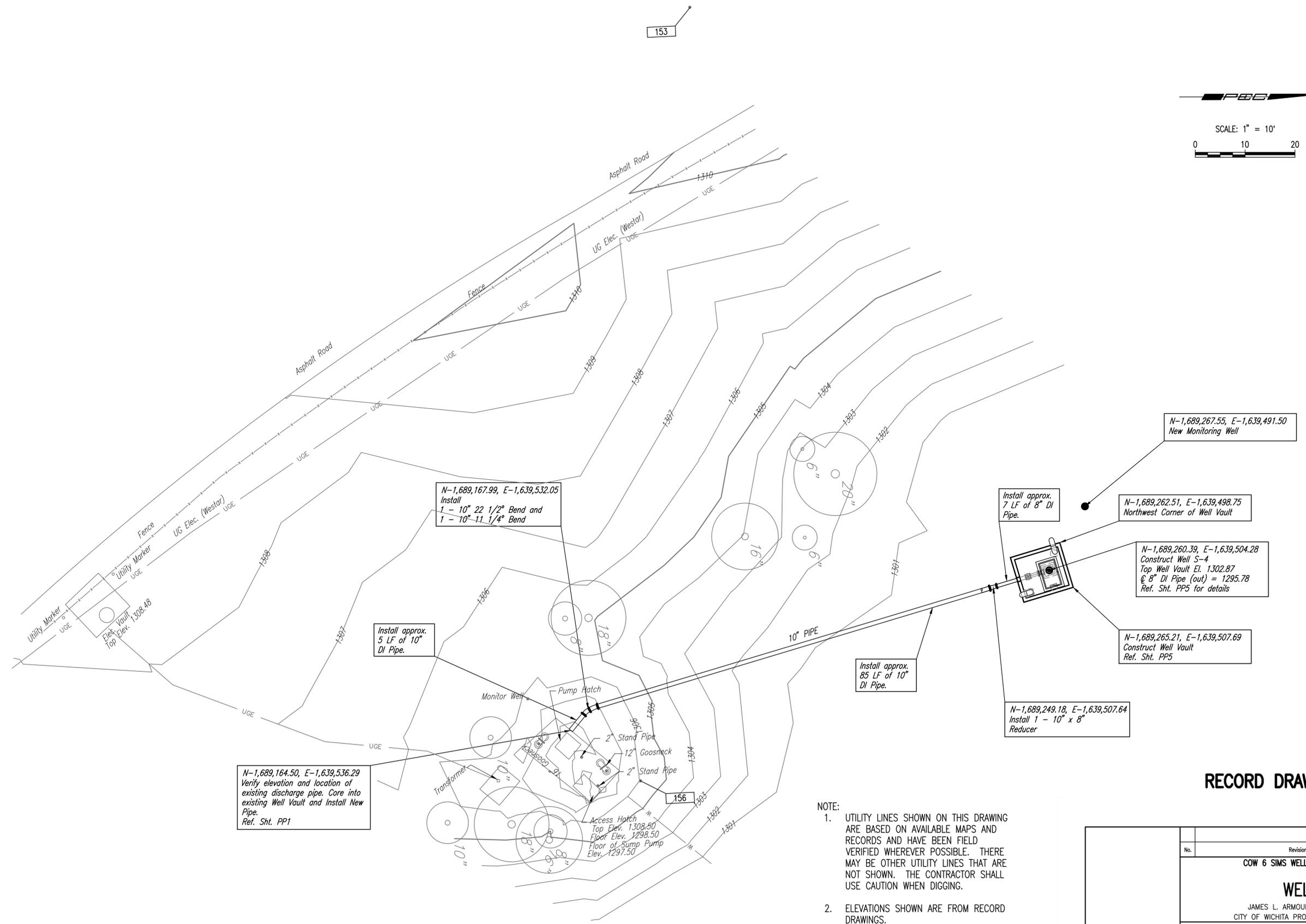
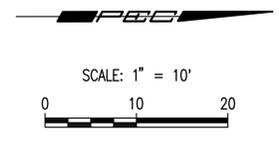
STA. #156
 N: 1,689,178.449, E: 1,639,546.358
 Mag Nail
 Elev. 1305.959

STA. #4001
 N: 1,762,351.499, E: 1,601,103.735
 60d Nail
 Elev. 1386.950

RECORD DRAWING

No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL			
KEY MAP			
JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
PEC PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2891 www.pec1.com			
Designed by	DLM	Job No.	34-11296
Drawn by	CAE	Date	MAY 2012
			Sht. PC1 of 18

153



N-1,689,167.99, E-1,639,532.05
 Install
 1 - 10" 22 1/2" Bend and
 1 - 10" 11 1/4" Bend

Install approx.
 7 LF of 8" DI
 Pipe.

N-1,689,262.51, E-1,639,498.75
 Northwest Corner of Well Vault

N-1,689,260.39, E-1,639,504.28
 Construct Well S-4
 Top Well Vault El. 1302.87
 @ 8" DI Pipe (out) = 1295.78
 Ref. Sht. PP5 for details

N-1,689,265.21, E-1,639,507.69
 Construct Well Vault
 Ref. Sht. PP5

N-1,689,249.18, E-1,639,507.64
 Install 1 - 10" x 8"
 Reducer

Install approx.
 5 LF of 10"
 DI Pipe.

Install approx.
 85 LF of 10"
 DI Pipe.

N-1,689,164.50, E-1,639,536.29
 Verify elevation and location of
 existing discharge pipe. Core into
 existing Well Vault and Install New
 Pipe.
 Ref. Sht. PP1

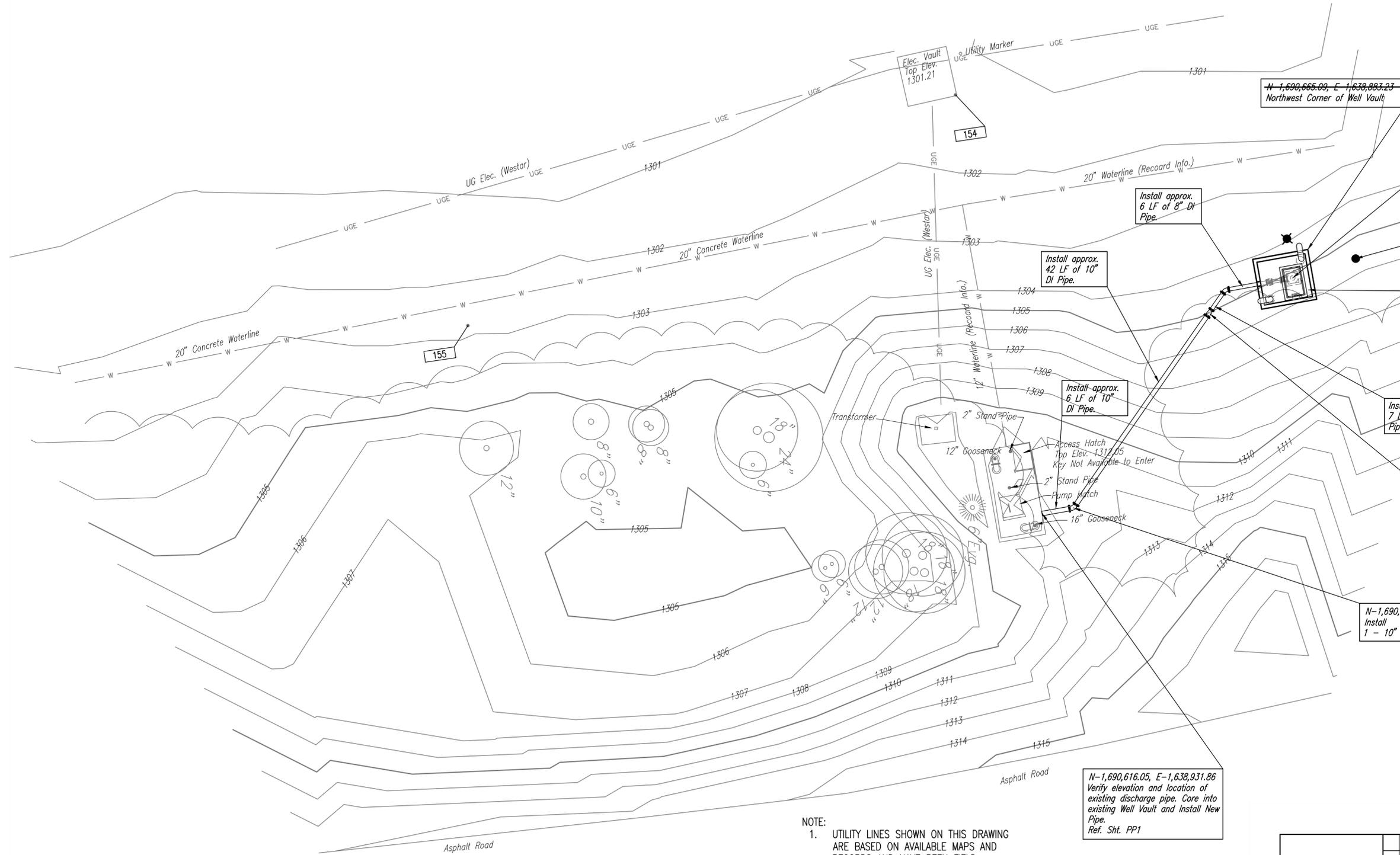
- NOTE:
- UTILITY LINES SHOWN ON THIS DRAWING ARE BASED ON AVAILABLE MAPS AND RECORDS AND HAVE BEEN FIELD VERIFIED WHEREVER POSSIBLE. THERE MAY BE OTHER UTILITY LINES THAT ARE NOT SHOWN. THE CONTRACTOR SHALL USE CAUTION WHEN DIGGING.
 - ELEVATIONS SHOWN ARE FROM RECORD DRAWINGS.

RECORD DRAWING

No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL			
WELL S-4			
JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
		PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2891 www.pec1.com	
Designed by	DLM	Job No.	34-11296
Drawn by	CAE	Date	MAY 2012
			Sht. PC2 of 18

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N-1,690,665.00, E-1,638,983.23
Northwest Corner of Well Vault

N-1,690,662.30, E-1,638,888.47
Construct Well S-7
Top Well Vault El. 1304.87
8" DI Pipe (out) = 1297.78
Ref. Sht. PP5 for details

N-1,690,673.93, E-1,638,884.92
New Monitoring Well

N-1,690,665.26, E-1,638,890.68
Construct Well Vault
Ref. Sht. PP5

Install approx.
6 LF of 8" DI
Pipe.

Install approx.
42 LF of 10"
DI Pipe.

Install approx.
6 LF of 10"
DI Pipe.

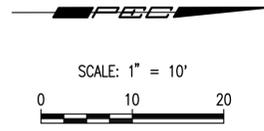
Install approx.
7 LF of 8" DI
Pipe.

N-1,690,647.06, E-1,638,895.11
Install
1 - 10" x 8" Reducer

N-1,690,621.85, E-1,638,930.83
Install
1 - 10" 45° Bend

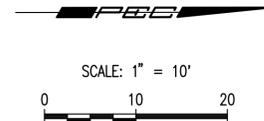
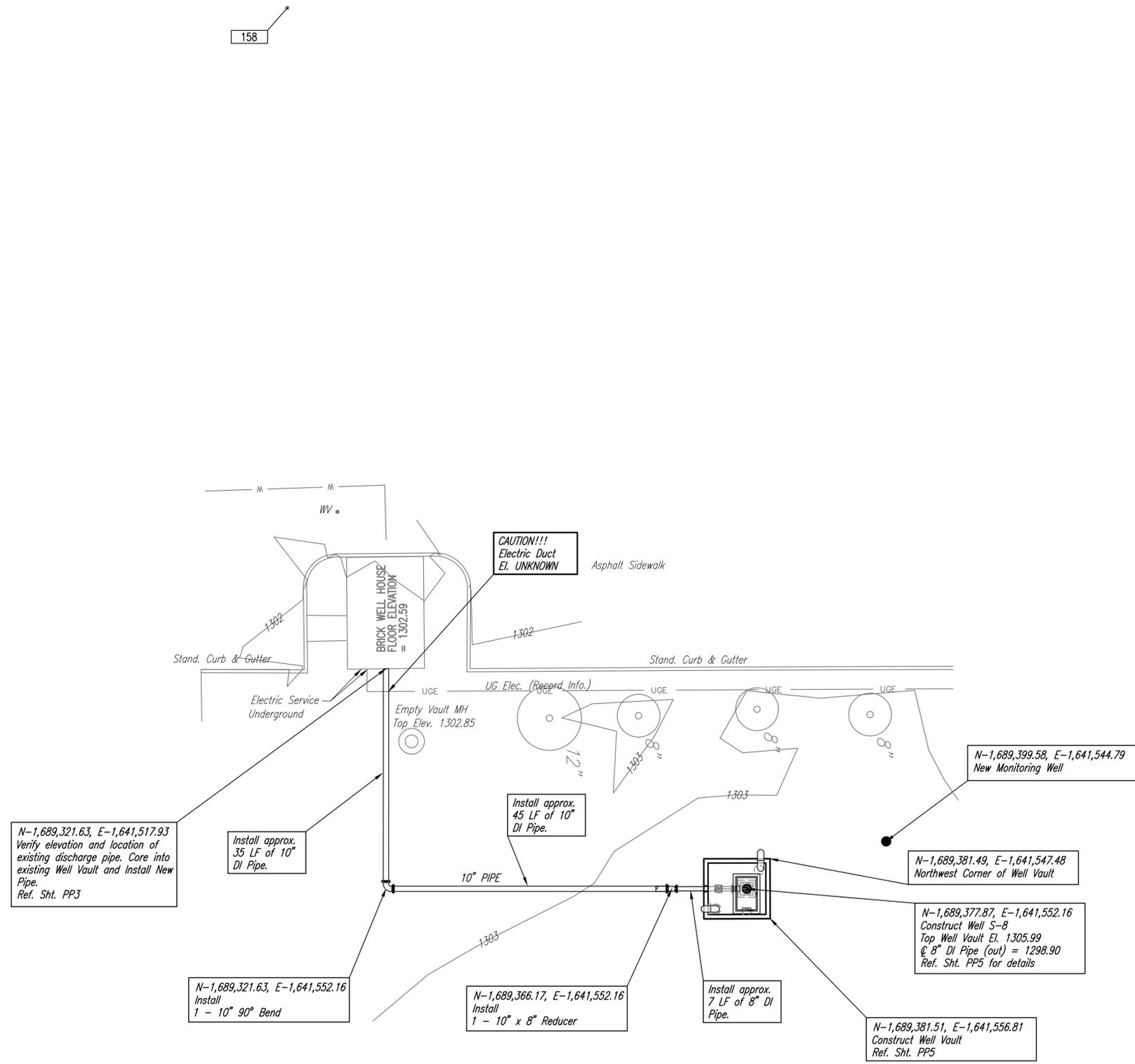
N-1,690,616.05, E-1,638,931.86
Verify elevation and location of
existing discharge pipe. Core into
existing Well Vault and Install New
Pipe.
Ref. Sht. PP1

- NOTE:
- UTILITY LINES SHOWN ON THIS DRAWING ARE BASED ON AVAILABLE MAPS AND RECORDS AND HAVE BEEN FIELD VERIFIED WHEREVER POSSIBLE. THERE MAY BE OTHER UTILITY LINES THAT ARE NOT SHOWN. THE CONTRACTOR SHALL USE CAUTION WHEN DIGGING.
 - ELEVATIONS SHOWN ARE FROM RECORD DRAWINGS.



RECORD DRAWING

No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL			
WELL S-7			
JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
 PEC		PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2891 www.pec1.com	
Designed by	DLM	Job No.	34-11296
Drawn by	CAE	Date	MAY 2012
			Sht. PC4 of 18



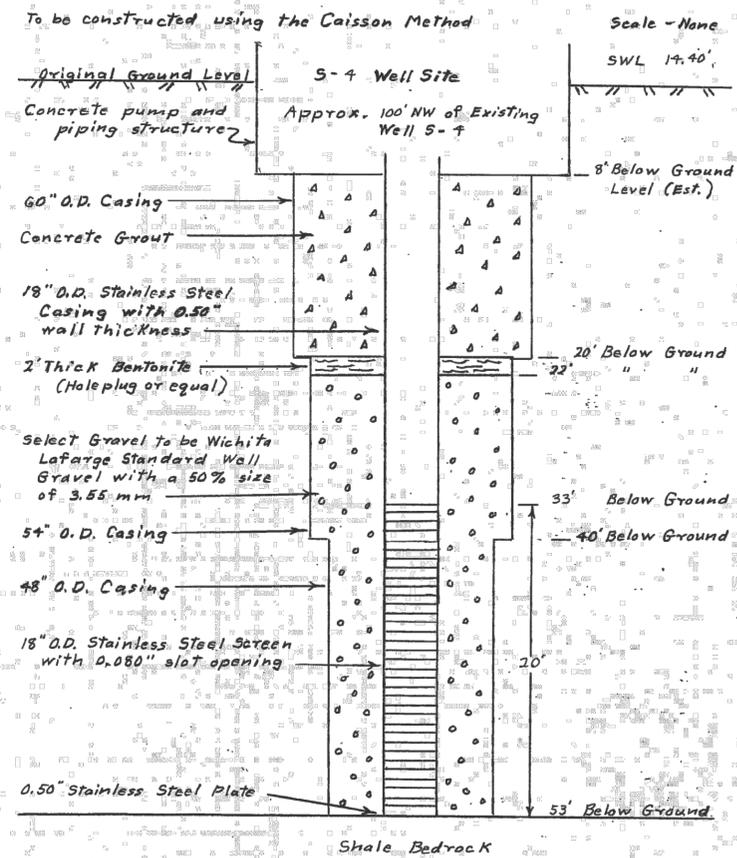
- NOTE:
- UTILITY LINES SHOWN ON THIS DRAWING ARE BASED ON AVAILABLE MAPS AND RECORDS AND HAVE BEEN FIELD VERIFIED WHEREVER POSSIBLE. THERE MAY BE OTHER UTILITY LINES THAT ARE NOT SHOWN. THE CONTRACTOR SHALL USE CAUTION WHEN DIGGING.
 - ELEVATIONS SHOWN ARE FROM RECORD DRAWINGS.

RECORD DRAWING

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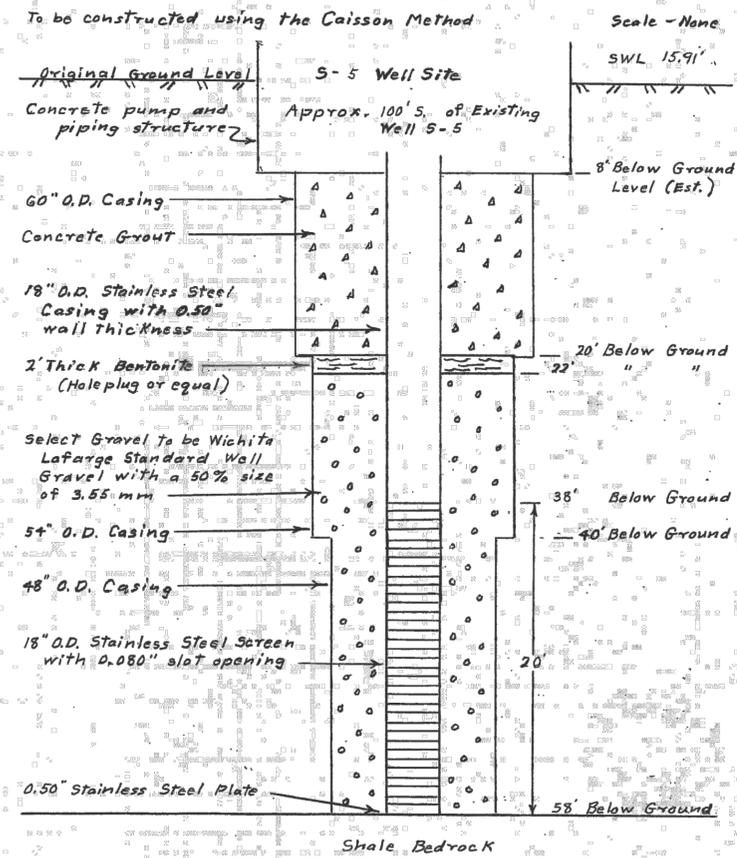
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COW 6 SIMS WELLS & 1 EQUUS BED WELL			
WELL S-8			
JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
		PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2891 www.pec1.com	
Designed by	DLM	Job No.	34-11296
Drawn by	CAE	Date	MAY 2012
			Sht. PC5 of 18

Subject City of Wichita Replacement Wells Date 9 Jan 12



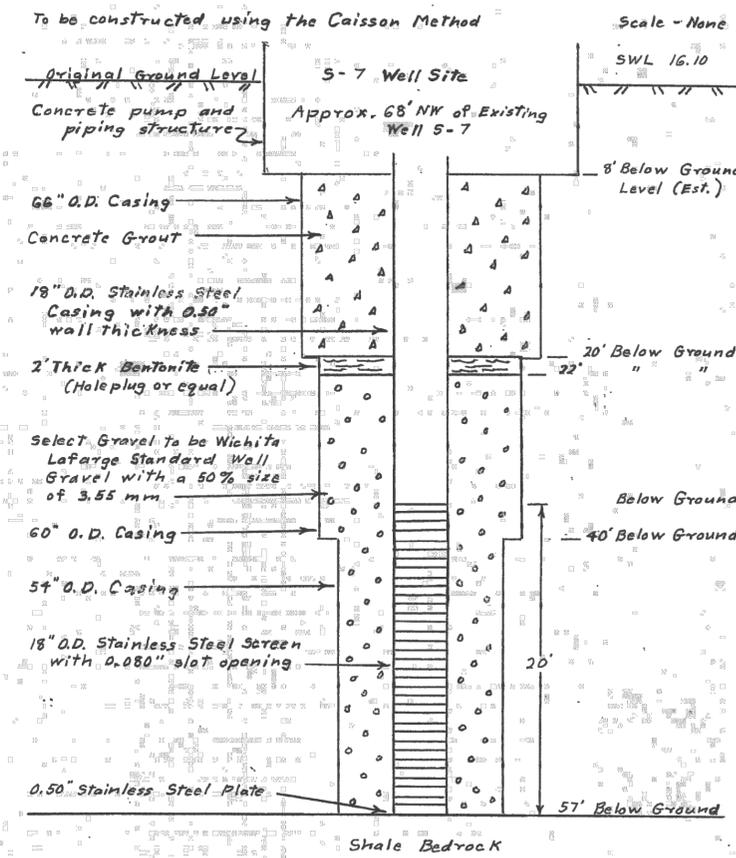
WELL S-4
NOT TO SCALE

Subject City of Wichita Replacement Wells Date Jan 12



WELL S-5
NOT TO SCALE

Subject City of Wichita Replacement Wells Date 28 Feb 12

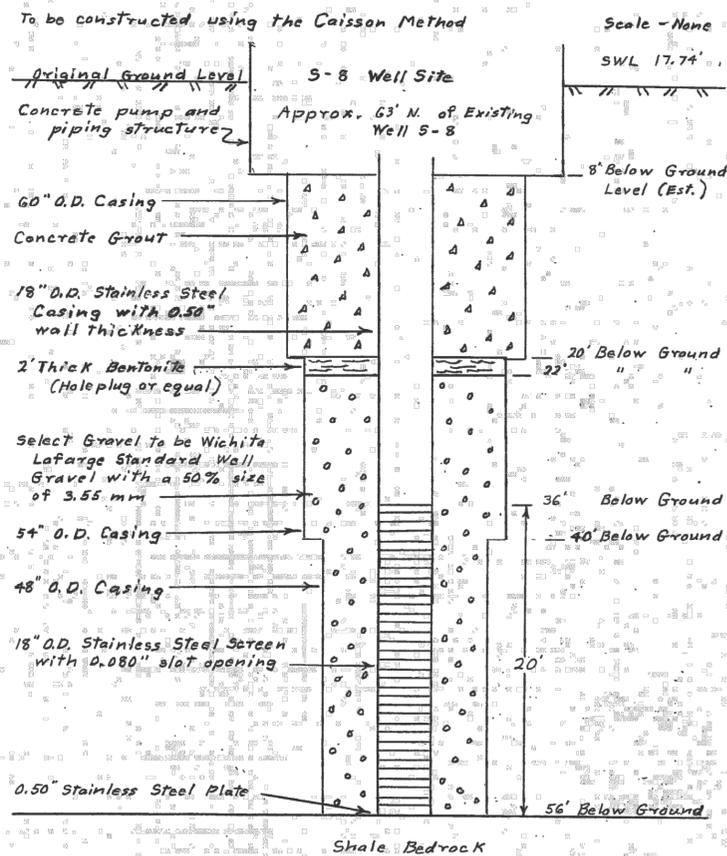


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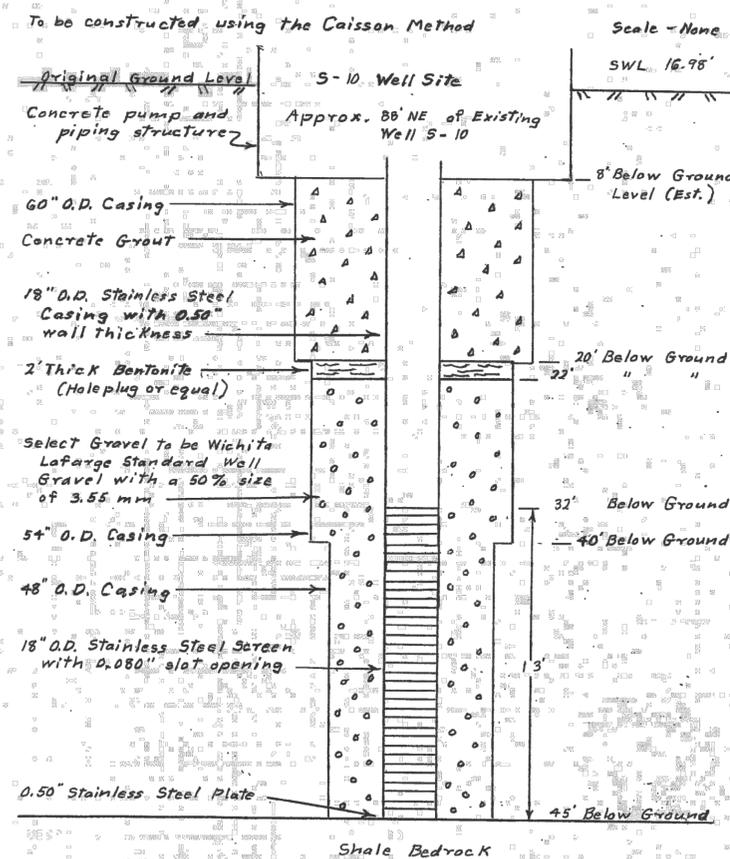
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COW 6 SIMS WELLS & 1 EQUUS BED WELL SIMS WELL DESIGNS JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022 PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2891 www.pec1.com			
Designed by	DLM	Job No.	34-11296
Drawn by	CAE	Date	MAY 2012
			Sht. PS1 of 18

Subject City of Wichita Replacement Wells Date 9 Jan 12



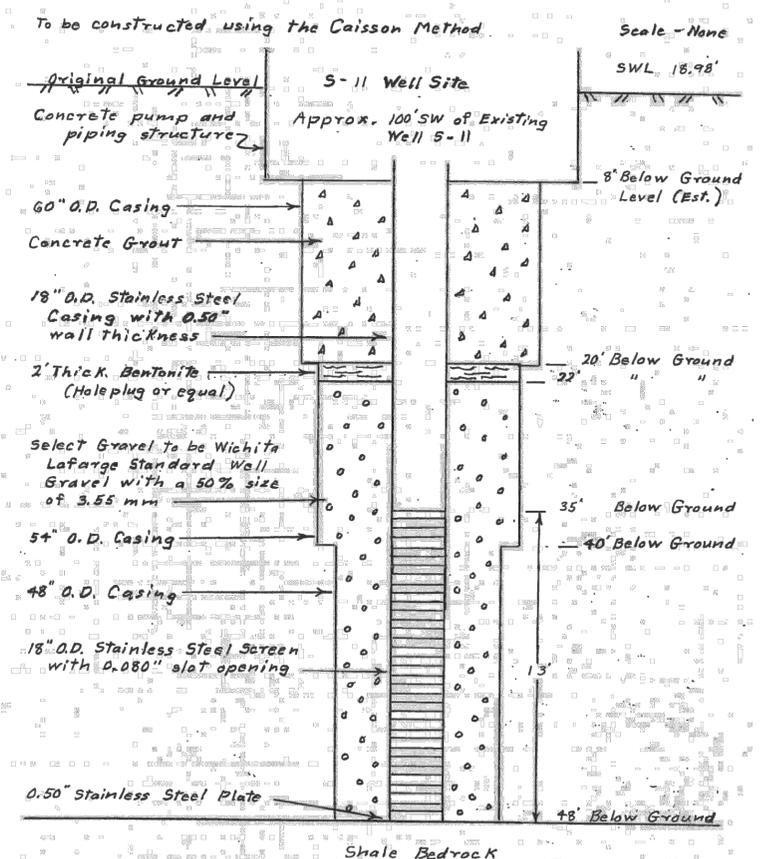
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NOT TO SCALE

Subject City of Wichita Replacement Wells Date 9 Jan 12



WELL S-10
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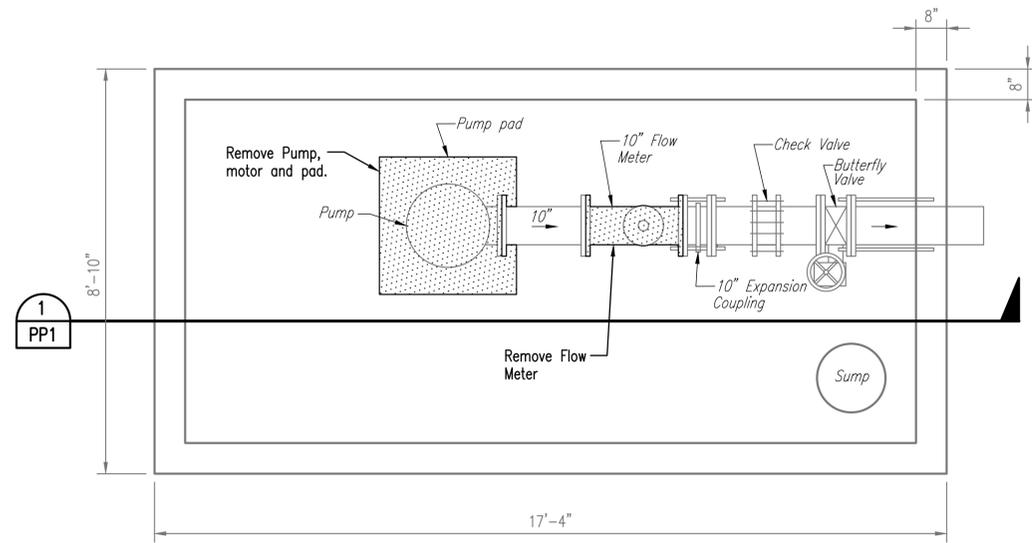
Subject City of Wichita Replacement Wells Date 9 Jan 12



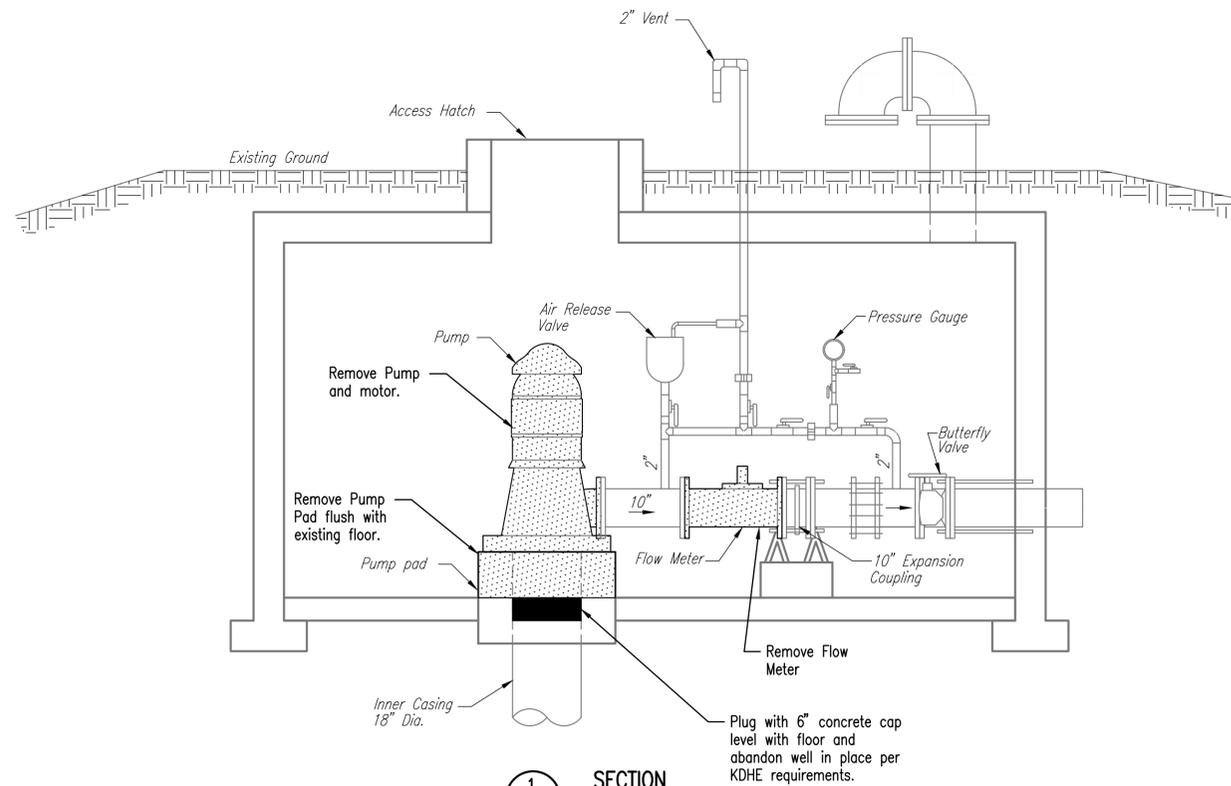
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No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL SIMS WELL DESIGNS JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022 PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2891 www.pec1.com			
Designed by	DLM	Job No.	34-11296
Drawn by	CAE	Date	MAY 2012
			Sht. PS2 of 18



PLAN
SCALE: 1/2"=1'-0"



SECTION
SCALE: 1/2"=1'-0"



- NOTE: CONTRACTOR TO VERIFY EQUIPMENT, PIPE SIZES AND LOCATIONS IN THE FIELD.
- NOTE: DIMENSIONS SHOWN ARE BASED ON AVAILABLE INFORMATION. CONTRACTOR TO VERIFY IN FIELD.

LEGEND

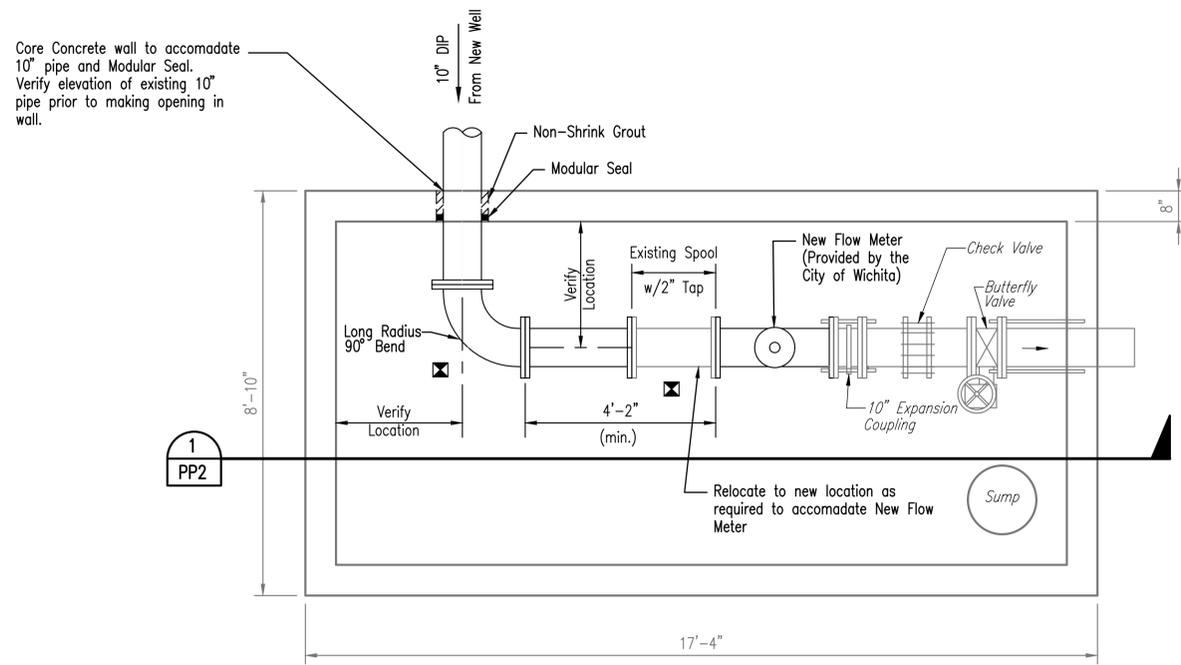
- DENOTES EQUIPMENT, PIPING AND STRUCTURE REMOVAL. COMPONENTS REMOVED SHALL BE DISPOSED OF OFF-SITE BY THE CONTRACTOR UNLESS NOTED OTHERWISE.
- 6" CONCRETE CAP

RECORD DRAWING

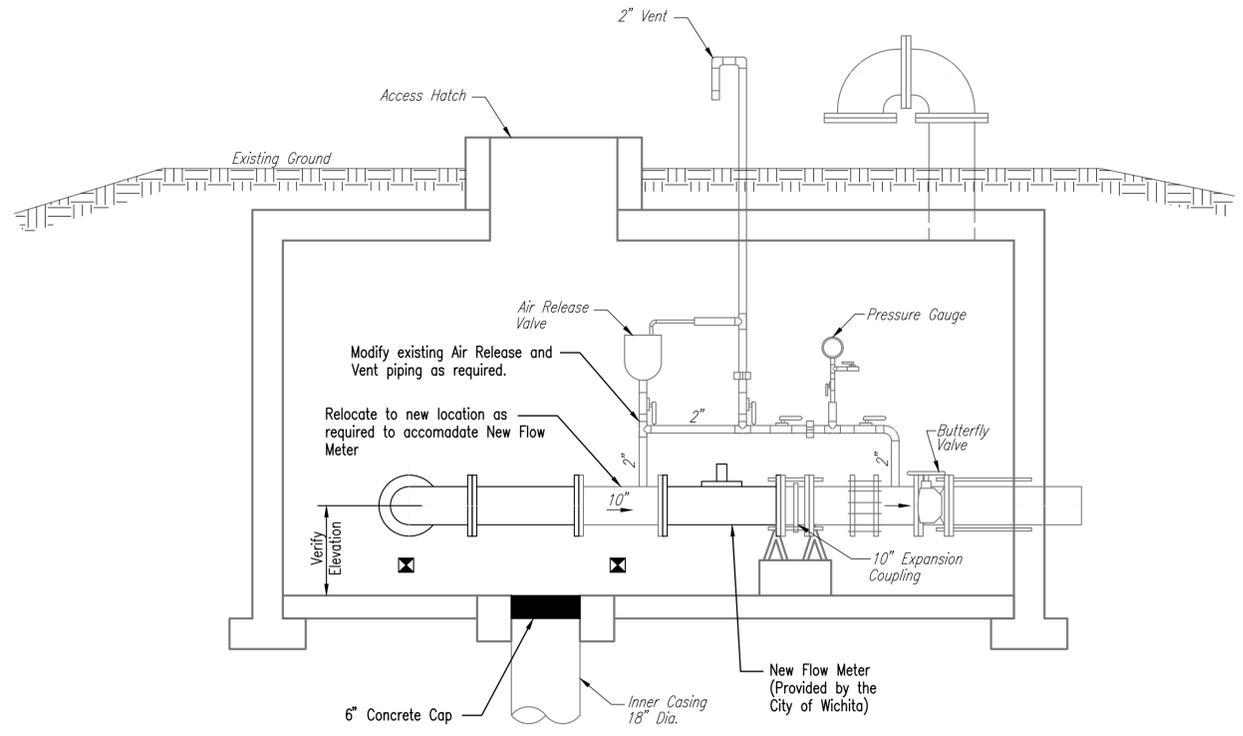
No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL TYPICAL EXISTING SIMS WELL VAULT DEMOLITION PLAN & SECTION JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
PEC PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2691 www.pec1.com			
Designed by	DLM	Job No.	34-11296
Drawn by	CAE	Date	MAY 2012
			Sht. PP1 of 18

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 \Projects\Archive\Civil Drawings\Civil Acad\2011\11296\Record Drawings\11296-C-PP1.TYP. EXISTING SIMS WELL VAULT DEMO PLAN & SECTION

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 \\links2\archive\Civil Drawings\Civil Acad\2011\11296\Record Drawings\11296-C-PP2.TYP - EXISTING SIMS WELL VAULT IMPROV. PLAN & SECTION



PLAN
SCALE: 1/2" = 1'-0"



SECTION
SCALE: 1/2" = 1'-0"



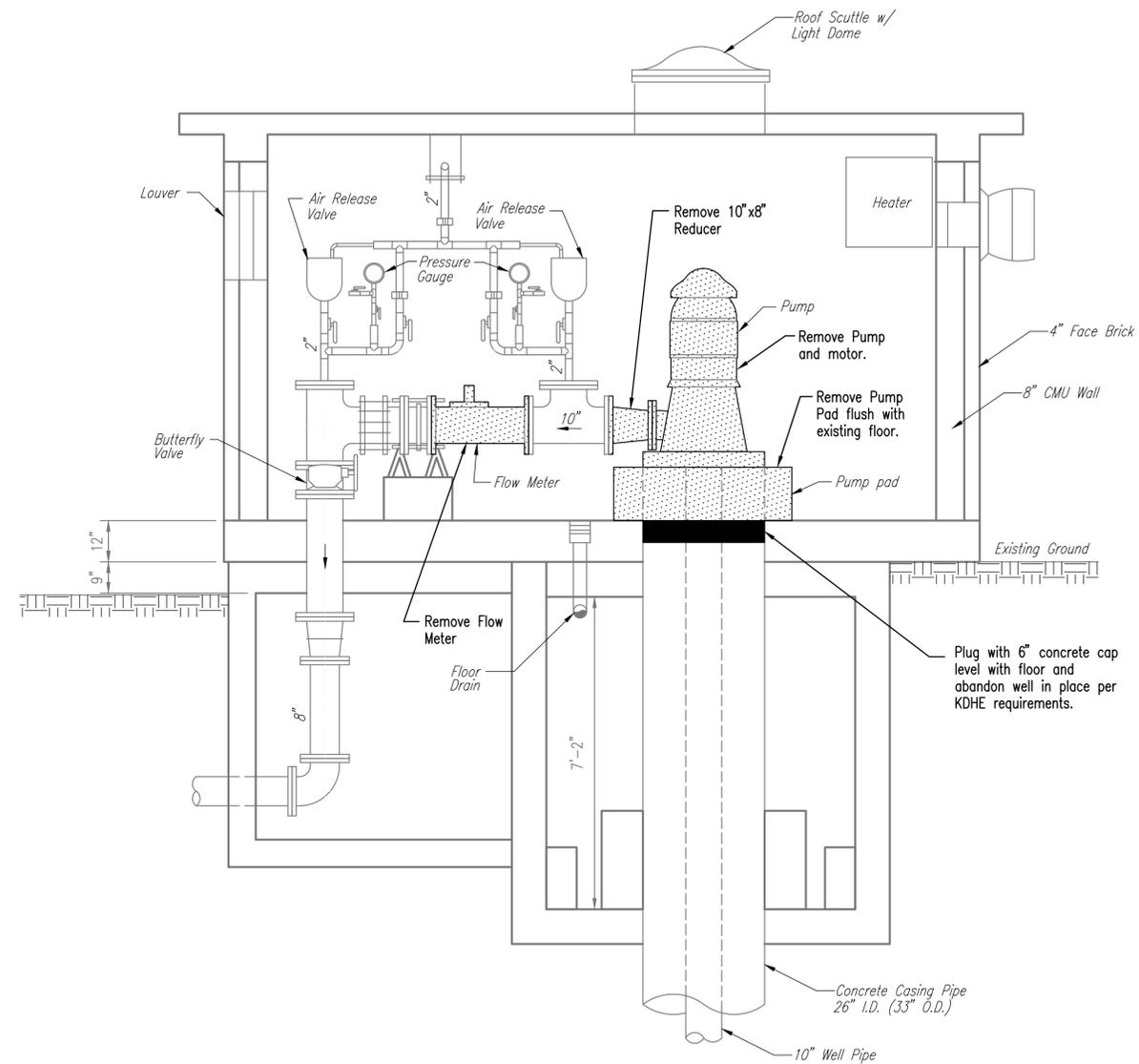
NOTE: CONTRACTOR TO VERIFY EQUIPMENT, PIPE SIZES AND LOCATIONS IN THE FIELD.

NOTE: DIMENSIONS SHOWN ARE BASED ON AVAILABLE INFORMATION. CONTRACTOR TO VERIFY IN FIELD.

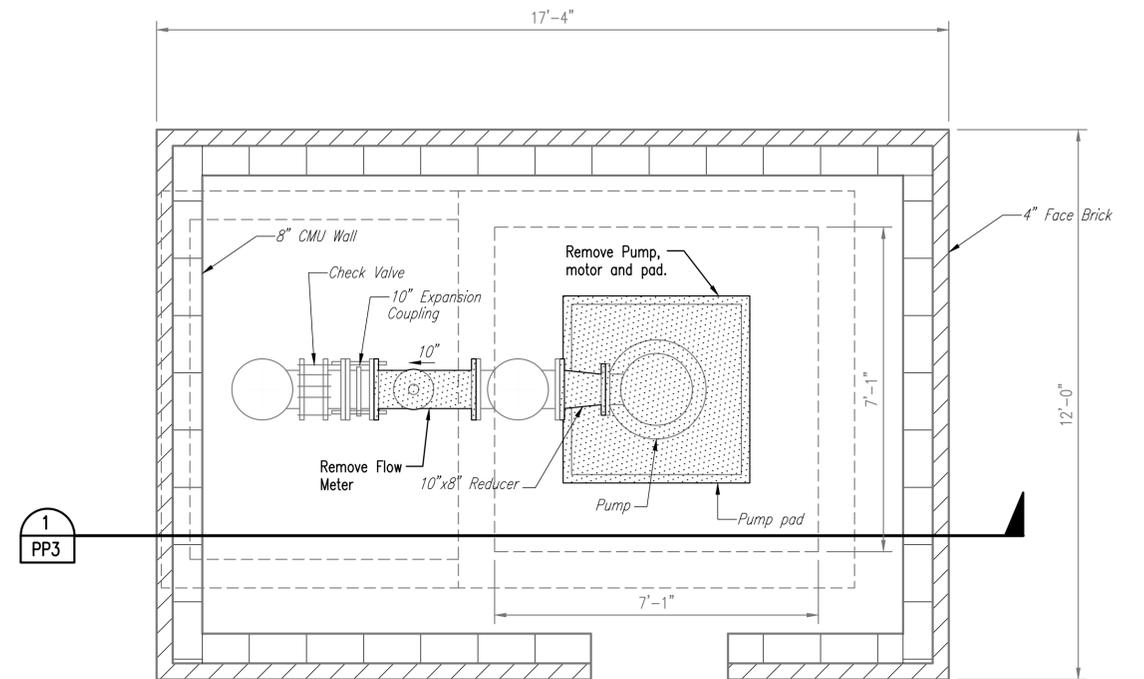
☒ Indicates where piping or equipment needs to be adequately supported. Supports such as Wall Brackets, Clevis Hangers and Steel or Concrete supports shall be positioned to adequately support the pipe. The Contractor shall also install any additional pipe supports deemed necessary. The Contractor shall submit to the Engineer for approval the type of pipe support and proposed location(s) for installation.

RECORD DRAWING

No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL TYPICAL EXISTING SIMS WELL VAULT IMPROVEMENT PLAN & SECTION JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
		PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2891 www.pec1.com	
Designed by	DLM	Job No.	34-11296
Drawn by	CAE	Date	MAY 2012
			Sht. PP2 of 18



1 SECTION
PP3 SCALE: 1/2"=1'-0"
0 1 2



PLAN
SCALE: 1/2"=1'-0"
0 1 2

NOTE: CONTRACTOR TO VERIFY EQUIPMENT, PIPE SIZES AND LOCATIONS IN THE FIELD.

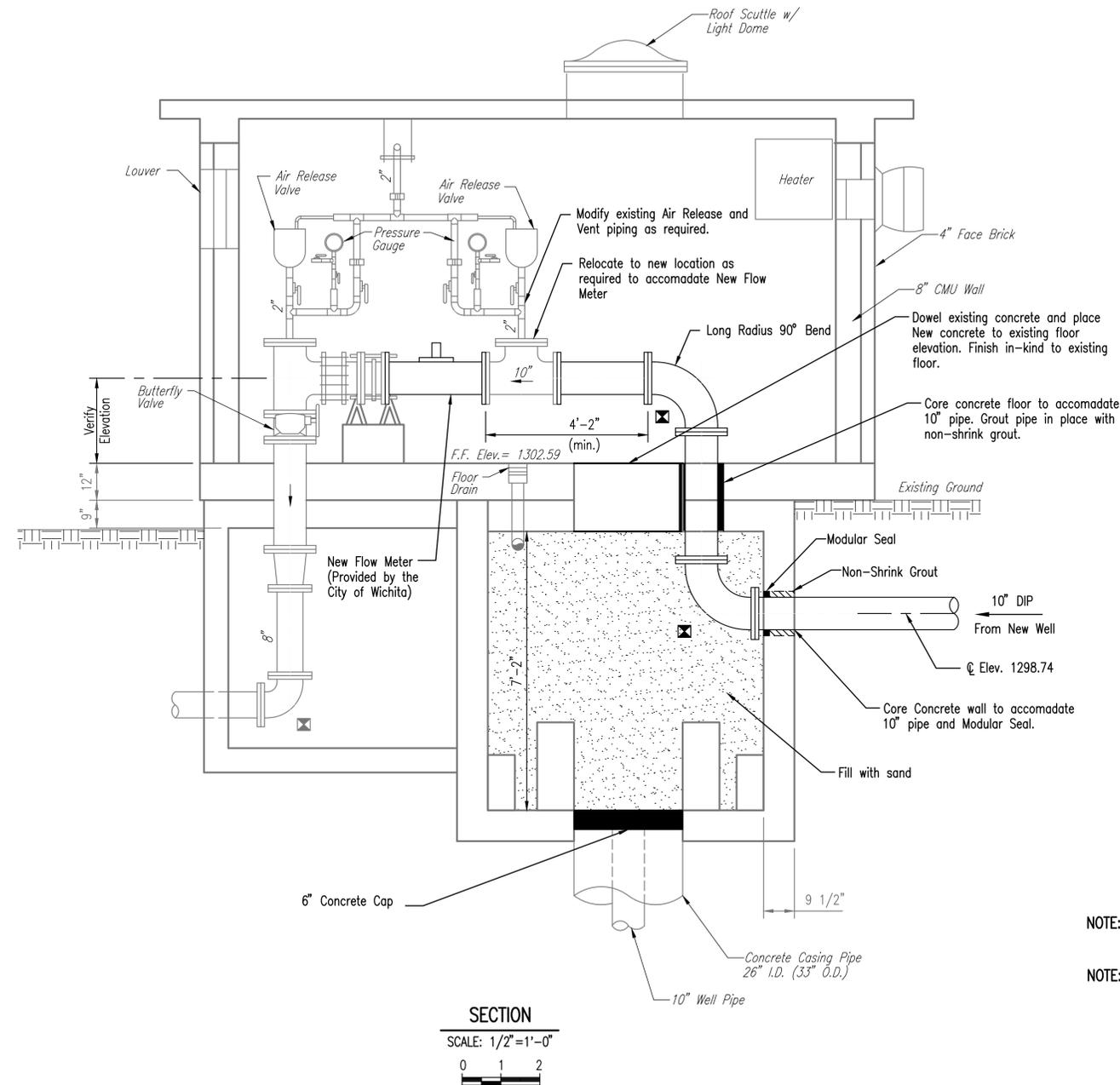
NOTE: DIMENSIONS SHOWN ARE BASED ON AVAILABLE INFORMATION. CONTRACTOR TO VERIFY IN FIELD.

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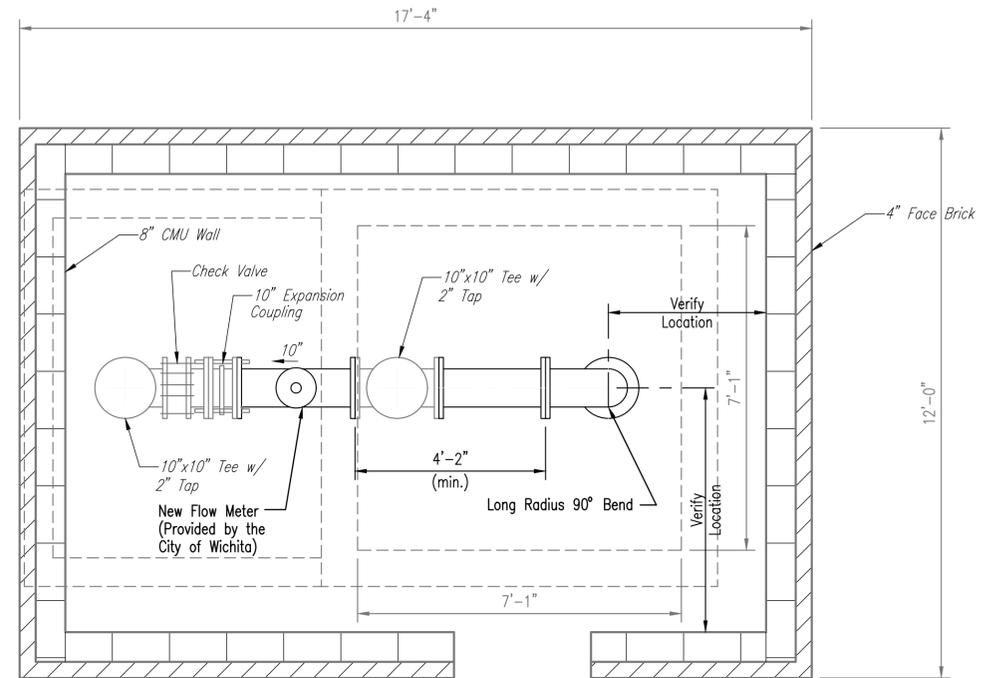
- LEGEND**
- DENOTES EQUIPMENT, PIPING AND STRUCTURE REMOVAL. COMPONENTS REMOVED SHALL BE DISPOSED OF OFF-SITE BY THE CONTRACTOR UNLESS NOTED OTHERWISE.
 - 6" CONCRETE CAP

No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL EXISTING S-8 WELLHOUSE DEMOLITION PLAN & SECTION JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
PEC		PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2691 www.pec1.com	
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Drawn by	CAE	Date	MAY 2012
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SECTION
SCALE: 1/2" = 1'-0"



PLAN
SCALE: 1/2" = 1'-0"

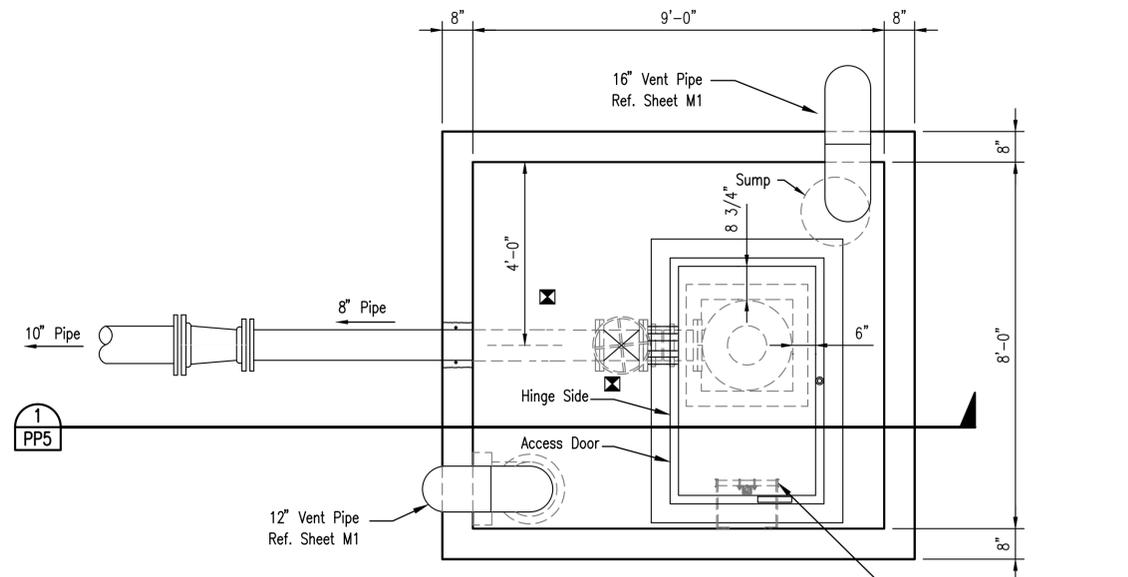
NOTE: CONTRACTOR TO VERIFY EQUIPMENT, PIPE SIZES AND LOCATIONS IN THE FIELD.

NOTE: DIMENSIONS SHOWN ARE BASED ON AVAILABLE INFORMATION. CONTRACTOR TO VERIFY IN FIELD.

⊠ Indicates where piping or equipment needs to be adequately supported. Supports such as Wall Brackets, Clevis Hangers and Steel or Concrete supports shall be positioned to adequately support the pipe. The Contractor shall also install any additional pipe supports deemed necessary. The Contractor shall submit to the Engineer for approval the type of pipe support and proposed location(s) for installation.

RECORD DRAWING

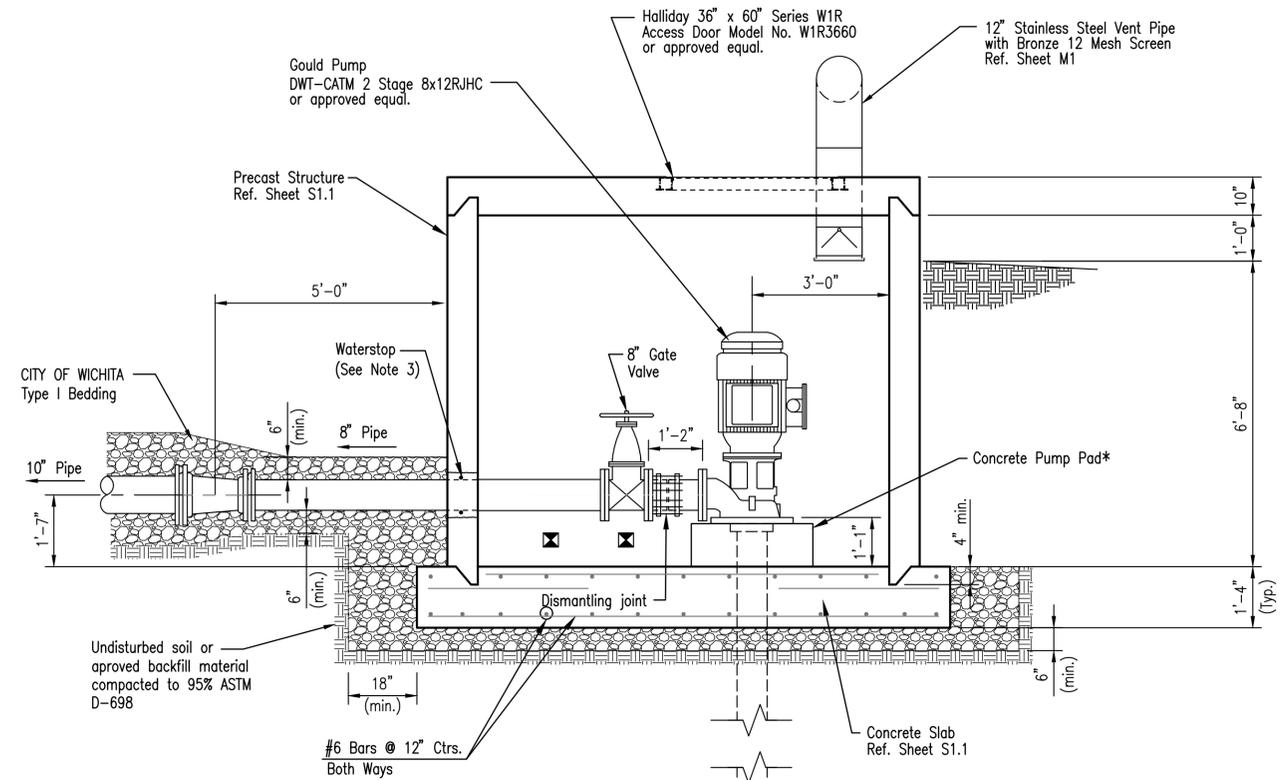
No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL EXISTING S-8 WELLHOUSE IMPROVEMENT PLAN & SECTION JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
		PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2691 www.pec1.com	
Designed by	DLM	Job No.	34-11296
Drawn by	CAE	Date	MAY 2012
			Sht. PP4 of 18



PLAN
SCALE: 1/2"=1'-0"



Halliday Series L1B Ladder with Halliday Series L1E Ladder Extension or approved equal. Install per manufacturers recommendations.



SECTION
SCALE: 1/2"=1'-0"



LEGEND

- = CITY OF WICHITA TYPE I BEDDING
SEE CITY OF WICHITA STANDARD SPECIFICATIONS
- = UNDISTURBED SOIL

* Contractor shall coordinate concrete pad dimensions with equipment manufacturer.

☒ Indicates where piping or equipment needs to be adequately supported. Supports such as Wall Brackets, Clevis Hangers and Steel or Concrete supports shall be positioned to adequately support the pipe. The Contractor shall also install any additional pipe supports deemed necessary. The Contractor shall submit to the Engineer for approval the type of pipe support and proposed location(s) for installation.

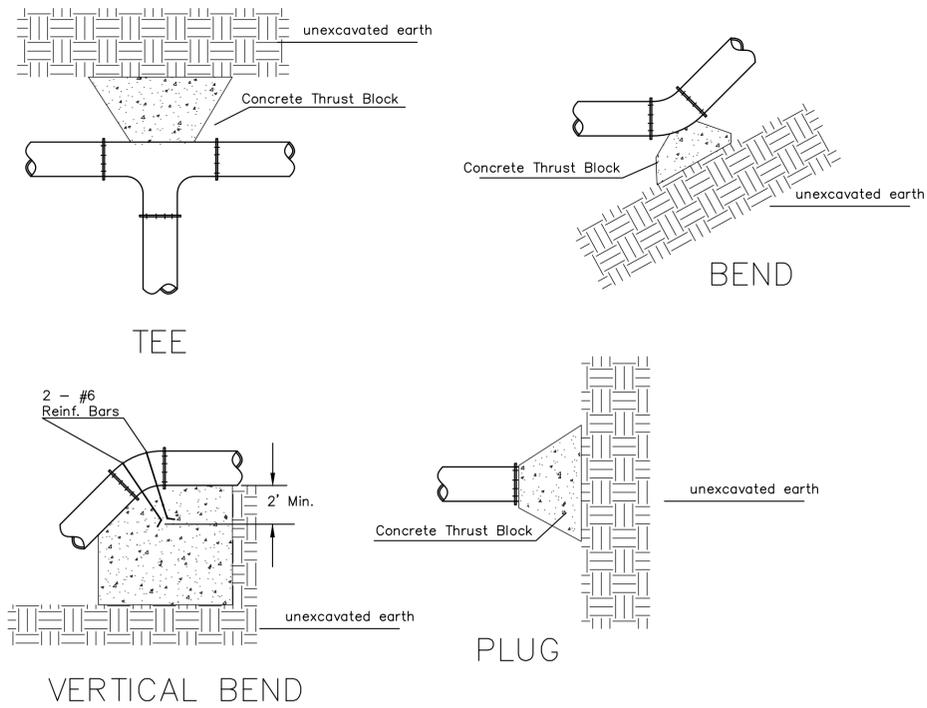
WELL STRUCTURE GENERAL NOTES

1. ALL PRECAST CONCRETE SECTIONS SHALL CONFORM TO THE LATEST REVISIONS OF A.S.T.M. C478 AS MODIFIED BY THE SPECIFICATIONS.
2. NON-SHRINK GROUT SHALL BE NON-METALLIC TYPE.
3. APPROVED FLEXIBLE WATERSTOP SHALL BE INSTALLED TO JOIN THE PIPE TO THE WALL. THE PIPE SHALL BE SUPPORTED WITH CRUSHED ROCK A MINIMUM OF 3 FEET FROM WALL SUCH THAT THE JOINT REMAINS FLEXIBLE.
4. EXTERIOR WALLS SHALL BE COATED PER SECTION 804.4 OF CITY OF WICHITA STANDARD SPECIFICATIONS.
5. JOINT SEALING COMPOUND SHALL BE PER 804.4 OF CITY OF WICHITA STANDARD SPECIFICATIONS.
6. ALL WALL SECTION JOINTS THAT WILL BE IN GROUNDWATER OR GREATER THAN 12' DEEP SHALL BE WRAPPED WITH AN EXTERNAL JOINT SEAL PER SECTION 804.4 OF CITY OF WICHITA STANDARD SPECIFICATIONS OR AS INDICATED BY THE PLANS.
7. PRECAST SECTIONS SHALL BE SET AT LEAST 4 INCHES INTO THE MANHOLE BASE FOR DOG HOUSE MANHOLES.
8. LIFTING HOLES SHALL BE FILLED WITH NON-SHRINK GROUT AND THE INTERIOR SURFACE COATED AS SPECIFIED.
9. MORTAR USED IN MASONRY CONSTRUCTION SHALL CONTAIN 8 SACKS OF CEMENT PER CUBIC YARD. CONCRETE USED IN MANHOLE BASES SHALL CONFORM TO THE REQUIREMENTS OF CONCRETE FOR CONCRETE PAVEMENT CONSTRUCTION AS SPECIFIED IN THE CITY STANDARD PAVING SPECIFICATIONS USING CITY CONCRETE PAVEMENT MIX WITHOUT AIR ENTRAINING ADMIXTURE. COMPLETED WELL STRUCTURE SHALL BE WITHOUT LEAKS AND WATER TIGHT.
10. REINFORCING STEEL SHALL BE INSTALLED IN THE WELL BASES AND SHALL CONSIST OF NO.6 BARS PLACED ON 12" CENTERS IN BOTH DIRECTIONS. THE WELL BASE REINFORCEMENT SHALL BE PLACED AT LEAST 3" ABOVE THE BOTTOM OF THE MANHOLE BASE. ALL COSTS FOR FURNISHING AND INSTALLING REINFORCING STEEL SHALL BE INCCLUDED IN THE UNIT PRICE BID FOR THE WELL STRUCTURE.
11. OPENINGS SHALL BE CORE DRILLED INTO THE MANHOLE WALL WHEN OUTSIDE DROPS ARE CONSTRUCTED ON EXISTING MANHOLES. SUCH OPENINGS DRILLED INTO EXISTING MANHOLES SHALL BE AS SMALL AS PRACTICAL TO FACILITATE INSTALLING AND GROUTING THE NEW PIPE IN PLACE. WATERSTOP GASKETS SHALL BE USED WITH P.V.C. PIPE. THE NEW PIPE SHALL BE GROUTED INTO THE OPENING USING AN APPROVED NONSHRINK GROUT FOR THE FULL WALL THICKNESS. THE EXTERIOR OF THE COMPLETED CONNECTION SHALL BE SEALED WITH AN APPROVED BITUMINOUS COATING SUCH THAT THE CONNECTION WILL BE WATER TIGHT.

RECORD DRAWING

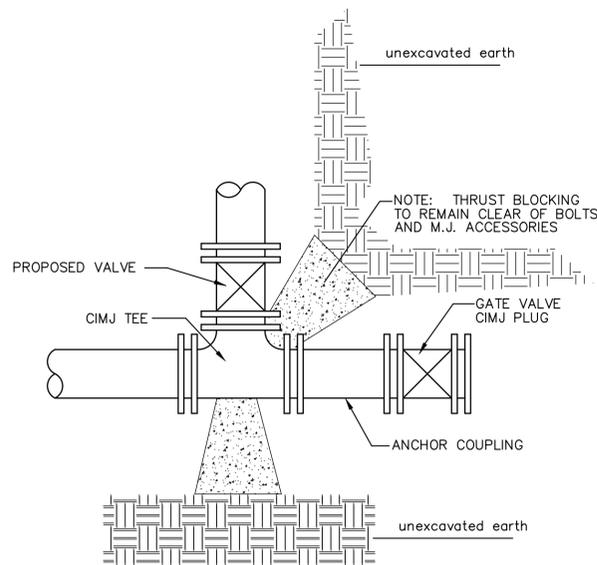
No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL			
TYPICAL NEW SIMS WELL DETAIL			
JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
PEC		PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2691 www.pec1.com	
Designed by	DLM	Job No.	34-11296
Drawn by	CAE	Date	MAY 2012
			Sht. PP5 of 18

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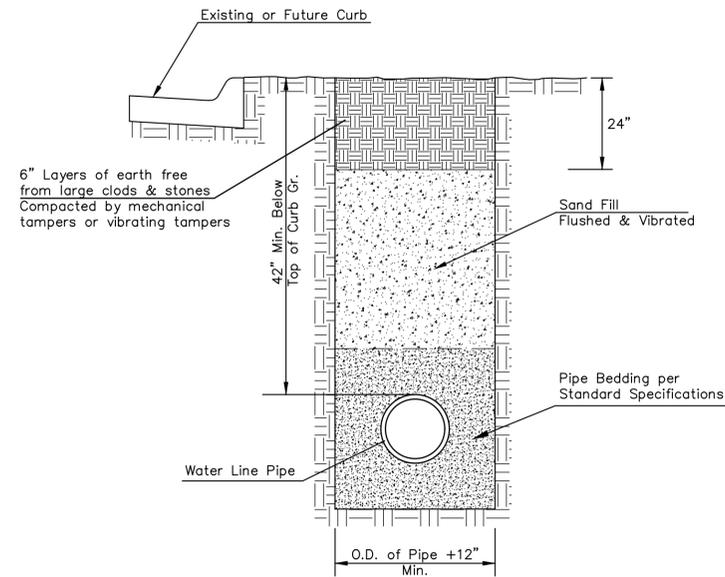


PIPE SIZE	THRUST AT FITTINGS IN TONS-AT 150#/IN ² P					
	PLUG	90°	45°	22 1/2°	11 1/4°	TEE
6"	2.8	3.95	2.15	1.09	.55	2.8
8"	4.9	6.95	3.75	1.90	.96	4.9
12"	11.4	16.1	8.75	4.45	2.25	11.4
16"	20.15	28.5	15.4	7.85	3.95	20.15
20"	31.15	44.0	23.85	12.15	6.10	31.15
24"	44.55	63.0	34.1	17.4	8.75	44.55

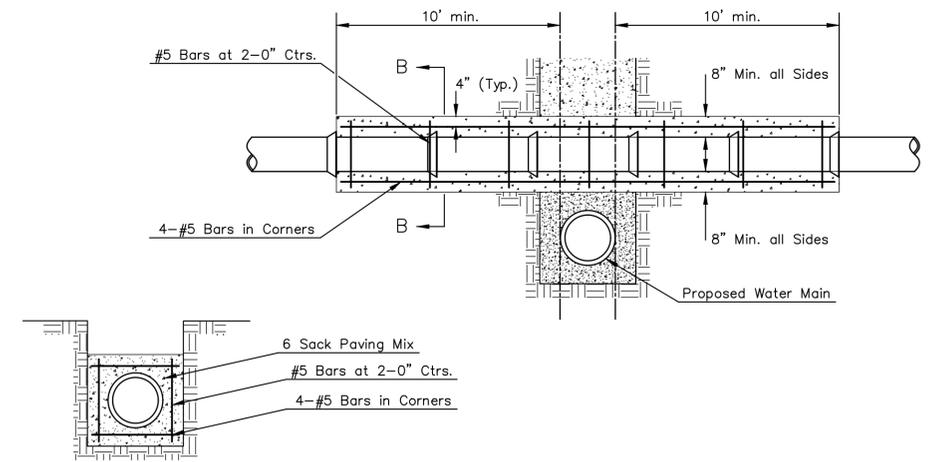
TYPICAL THRUST BLOCKS



KEY BLOCK DETAIL



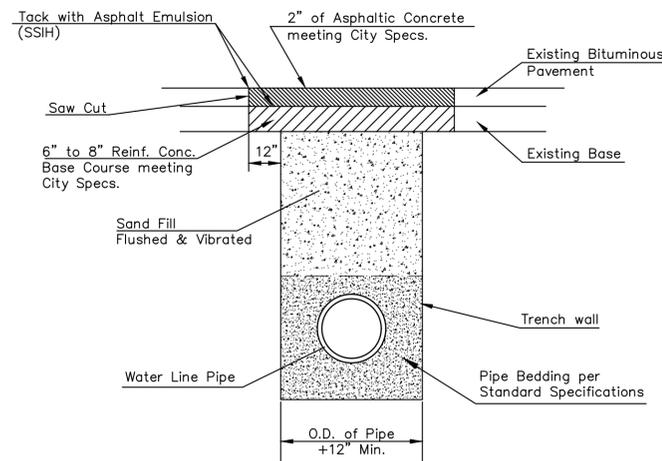
TRENCH COMPACTION IN ROAD RIGHT-OF-WAY



SECTION B-B

Note: Encasement to begin and end at a Bell on Sanitary Sewer Pipe.

REINFORCED CONCRETE ENCASEMENT OF SANITARY SEWER

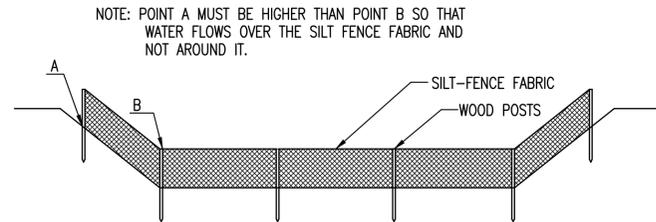


PAVEMENT REPLACEMENT & TRENCH COMPACTION UNDER EXISTING AND PROPOSED CITY ROADS
* UNLESS OTHERWISE NOTED ON PLANS

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 I:\Projects\2012\750022\Drawings\Civil\ACAD\2011\11296\Record Drawings\11296-C-PD1_Miscellaneous Water Details



MISCELLANEOUS WATER DETAILS		
CITY ENGINEER		
JAMES L. ARMOUR, P.E., L.S.		
PROJECT NUMBER	OCA NUMBER	DATE
750395 & 750022	633821 & 633822	01/2012
CITY ENGINEER'S OFFICE		SHEET
CITY HALL - SEVENTH FLOOR 455 NORTH MAIN STREET WICHITA, KANSAS 67202-1620 (316) 268-4501		PD1 of 18



ELEVATION
SILT FENCE DITCH CHECKS
(STREAM PROTECTION)

MATERIAL SPECIFICATION:

SILT FENCE FABRIC SHOULD CONFORM TO THE AASHTO M288 96 SILT FENCE SPECIFICATION. THE POSTS USED TO SUPPORT THE SILT FENCE FABRIC SHOULD BE A HARDWOOD MATERIAL WITH THE FOLLOWING MINIMUM DIMENSIONS: 2" SQUARE (NOMINAL) BY 4' LONG. SILT FENCE FABRIC SHOULD BE ATTACHED TO THE WOODEN POSTS WITH STAPLES, WIRE, ZIP TIES, OR NAILS.

PLACEMENT:

PLACE SILT FENCE IN DITCHES WHERE IT IS UNLIKELY THAT IT WILL BE OVERTOPPED. WATER SHOULD FLOW THROUGH A SILT FENCE DITCH CHECK, NOT OVER IT. SILT FENCE DITCH CHECKS OFTEN FAIL WHEN OVERTOPPED. SILT FENCE DITCH CHECKS SHOULD BE PLACED PERPENDICULAR TO THE FLOWLINE OF THE DITCH. THE SILT FENCE SHOULD EXTEND FAR ENOUGH SO THAT THE GROUND LEVEL AT THE ENDS OF THE FENCE IS HIGHER THAN THE TOP OF THE LOW POINT OF THE FENCE. THIS PREVENTS WATER FROM FLOWING AROUND THE CHECK. SILT FENCE DITCH CHECKS SHOULD NOT BE PLACED IN DITCHES WHERE HIGH FLOWS ARE EXPECTED. ROCK CHECKS SHOULD BE USED INSTEAD. SILT FENCE SHOULD BE PLACED IN DITCHES WITH SLOPES OF 6% OR LESS. FOR SLOPES STEEPER THAN 6%, ROCK CHECKS SHOULD BE USED.

THE FOLLOWING TABLE PROVIDES CHECK SPACING FOR A GIVEN DITCH GRADE:

DITCH CHECK DITCH GRADE (%)	SPACING CHECK SPACING (FEET)
0.5	200
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	30

PROPER INSTALLATION METHOD:

EXCAVATE A TRENCH PERPENDICULAR TO THE DITCH FLOWLINE THAT IS AT LEAST 12" DEEP BY 6" WIDE. EXTEND THE TRENCH IN A STRAIGHT LINE ALONG THE ENTIRE LENGTH OF THE PROPOSED DITCH CHECK. PLACE THE SOIL ON THE UPSTREAM SIDE OF THE TRENCH FOR LATER USE. ROLL OUT A CONTINUOUS LENGTH OF SILT FENCE FABRIC ON THE DOWNSLOPE SIDE OF THE TRENCH. PLACE THE EDGE OF THE FABRIC IN THE TRENCH STARTING AT THE TOP UPSTREAM EDGE OF THE TRENCH. LINE TWO SIDES OF THE TRENCH WITH THE FABRIC AS SHOWN ON DETAIL. BACKFILL OVER THE FABRIC IN THE TRENCH WITH THE EXCAVATED SOIL AND COMPACT. AFTER FILLING THE TRENCH, APPROXIMATELY 24" TO 36" OF SILT FENCE FABRIC SHOULD REMAIN EXPOSED. LAY THE EXPOSED SILT FENCE ON THE UPSLOPE SIDE OF THE TRENCH TO CLEAR AN AREA FOR DRIVING IN THE POSTS. JUST DOWNSLOPE OF THE TRENCH, DRIVE POSTS INTO THE GROUND TO A DEPTH OF AT LEAST 24". PLACE POSTS NO MORE THAN 4' APART. ATTACH THE SILT FENCE TO THE ANCHORED POST WITH STAPLES, WIRE, ZIP TIES, OR NAILS.

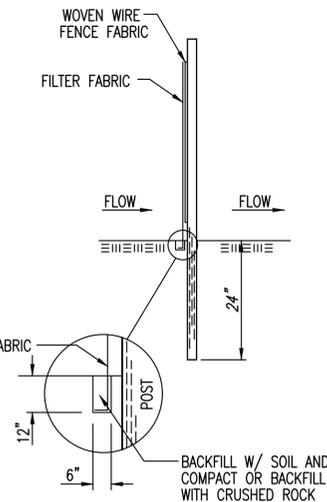
LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

WATER SHOULD FLOW THROUGH A SILT FENCE DITCH CHECK—NOT OVER IT. PLACE SILT FENCE IN DITCHES WHERE IT IS UNLIKELY THAT IT WILL BE OVERTOPPED. SILT FENCE INSTALLATIONS QUICKLY DETERIORATE WHEN WATER OVERTOPS THEM. DO NOT PLACE SILT FENCE POSTS ON THE UPSTREAM SIDE OF THE SILT FENCE FABRIC. IN THIS CONFIGURATION, THE FORCE OF THE WATER IS NOT RESTRICTED BY THE POSTS, BUT ONLY BY THE STAPLES (WIRE, ZIP TIES, NAILS, ETC.). THE SILT FENCE WILL RIP AND FAIL. DO NOT PLACE A SILT FENCE DITCH CHECK DIRECTLY IN FRONT OF A CULVERT OUTLET. IT WILL NOT STAND UP TO THE CONCENTRATED FLOW. DO NOT PLACE SILT FENCE DITCH CHECKS IN DITCHES THAT WILL LIKELY EXPERIENCE HIGH FLOWS. THEY WILL NOT STAND UP TO CONCENTRATED FLOW. FOLLOW PRESCRIBED DITCH CHECK SPACING GUIDELINES. IF SPACING GUIDELINES ARE EXCEEDED, EROSION WILL OCCUR BETWEEN THE DITCH CHECKS. DO NOT ALLOW WATER TO FLOW AROUND THE DITCH CHECK. MAKE SURE THAT THE DITCH CHECK IS LONG ENOUGH SO THAT THE GROUND LEVEL AT THE ENDS OF THE FENCE IS HIGHER THAN THE LOW POINT ON THE TOP OF THE FENCE. DO NOT PLACE SILT FENCE DITCH CHECKS IN CHANNELS WITH SHALLOW SOILS UNDERLAIN BY ROCK. IF THE CHECK IS NOT ANCHORED SUFFICIENTLY, IT WILL WASH OUT.

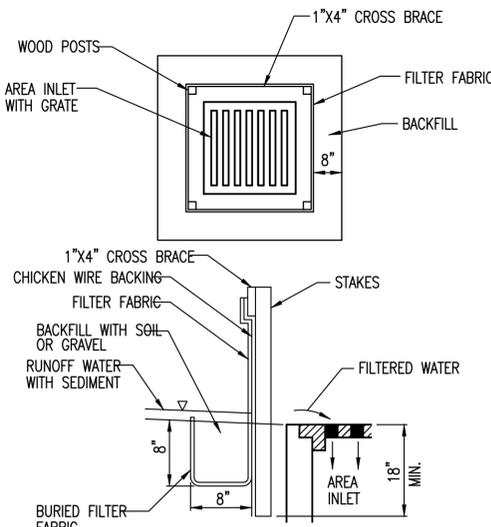
INSPECTION AND MAINTENANCE:

SILT FENCE DITCH CHECKS SHOULD BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 1/2" OR MORE. THE FOLLOWING IS A LIST OF QUESTIONS THAT SHOULD BE ADDRESSED DURING EACH INSPECTION:

- DOES WATER FLOW AROUND THE DITCH CHECK?
- DOES WATER FLOW UNDER THE DITCH CHECK?
- DOES THE SILT FENCE SAG EXCESSIVELY?
- HAS THE SILT FENCE TORN OR BECOME DETACHED FROM THE POSTS?
- DOES SEDIMENT NEED TO BE REMOVED FROM BEHIND THE DITCH CHECK?



ANCHOR TRENCH DETAIL



SILT FENCE BARRIERS FOR AREA INLETS
(INLET PROTECTION)

MATERIAL SPECIFICATION:

SILT FENCE FABRIC SHOULD CONFORM TO THE AASHTO M288 96 SILT FENCE SPECIFICATION. THE WIRE OR POLYMERIC MESH BACKING USED TO HELP SUPPORT THE SILT FENCE FABRIC SHOULD CONFORM TO THE AASHTO M288 96 SILT FENCE SPECIFICATION. THE POSTS USED TO SUPPORT THE SILT FENCE FABRIC SHOULD BE A HARDWOOD MATERIAL WITH THE FOLLOWING MINIMUM DIMENSIONS: 2" SQUARE (NOMINAL) BY 4' LONG. THE MATERIAL USED TO FRAME THE TOPS OF THE POSTS SHOULD BE 1" BY 4" BOARDS. SILT FENCE FABRIC AND SUPPORT BACKING SHOULD BE ATTACHED TO THE WOODEN POSTS AND FRAME WITH STAPLES, WIRE, ZIP TIES, OR NAILS.

PLACEMENT:

PLACE A SILT FENCE DROP INLET BARRIER IN A LOCATION WHERE IT IS UNLIKELY TO BE OVERTOPPED. WATER SHOULD FLOW THROUGH SILT FENCE, NOT OVER IT. SILT FENCE BARRIERS FOR AREA INLETS OFTEN FAIL WHEN REPEATEDLY OVERTOPPED. WHEN USED AS A BARRIER FOR AREA INLETS, SILT FENCE FABRIC AND POSTS MUST BE SUPPORTED AT THE TOP BY A WOODEN FRAME. WHEN A SILT FENCE BARRIER FOR AREA INLETS IS LOCATED NEAR AN INLET THAT HAS STEEP APPROACH SLOPES, THE STORAGE CAPACITY BEHIND THE BARRIER IS DRASTICALLY REDUCED. TIMELY REMOVAL OF SEDIMENT MUST OCCUR FOR A BARRIER TO OPERATE PROPERLY IN THIS LOCATION.

PROPER INSTALLATION METHOD:

EXCAVATE A TRENCH AROUND THE PERIMETER OF THE AREA INLET THAT IS AT LEAST 8" DEEP BY 8" WIDE. DRIVE POSTS TO A DEPTH OF AT LEAST 18" AROUND THE PERIMETER OF THE AREA INLET. THE DISTANCE BETWEEN POSTS SHOULD BE 4' OR LESS. IF THE DISTANCE BETWEEN TWO ADJACENT CORNER POSTS IS MORE THAN 4', ADD ANOTHER POST(S) BETWEEN THEM. CONNECT THE TOPS OF ALL THE POSTS WITH A WOODEN FRAME MADE OF 1" BY 4" BOARDS. USE NAILS OR SCREWS FOR FASTENING. ATTACH THE WIRE OR POLYMERIC-MESH BACKING TO THE OUTSIDE OF THE POST/FRAME STRUCTURE WITH STAPLES, WIRE, ZIP TIES, OR NAILS. ROLL OUT A CONTINUOUS LENGTH OF SILT FENCE FABRIC LONG ENOUGH TO WRAP AROUND THE PERIMETER OF THE AREA INLET. ADD MORE LENGTH FOR OVERLAPPING THE FABRIC JOINT. PLACE THE EDGE OF THE FABRIC IN THE TRENCH, STARTING AT THE OUTSIDE EDGE OF THE TRENCH. LINE ALL THREE SIDES OF THE TRENCH WITH THE FABRIC. BACKFILL OVER THE FABRIC IN THE TRENCH WITH THE EXCAVATED SOIL AND COMPACT. AFTER FILLING THE TRENCH, APPROXIMATELY 24" TO 36" OF SILT FENCE FABRIC SHOULD REMAIN EXPOSED. ATTACH THE SILT FENCE TO THE OUTSIDE OF THE POST/FRAME STRUCTURE WITH STAPLES, WIRE, ZIP TIES, OR NAILS. THE JOINT SHOULD BE OVERLAPPED TO THE NEXT POST.

NOTE: WHEN A SILT FENCE BARRIER FOR AREA INLET IS PLACED IN A SHALLOW MEDIAN DITCH, MAKE SURE THAT THE TOP OF THE BARRIER IS NOT HIGHER THAN THE PAVED ROAD. IN THIS CONFIGURATION, WATER MAY SPREAD ONTO THE ROADWAY CAUSING A HAZARDOUS CONDITION.

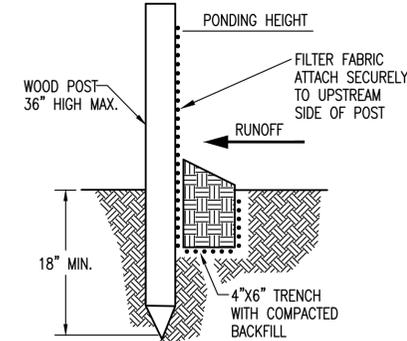
LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

WATER SHOULD FLOW THROUGH A SILT FENCE BARRIER FOR AREA INLET—NOT OVER IT. PLACE A SILT FENCE BARRIER FOR AREA INLET IN A LOCATION WHERE IT IS UNLIKELY TO BE OVERTOPPED. SILT FENCE BARRIER FOR AREA INLETS OFTEN FAIL WHEN REPEATEDLY OVERTOPPED. DO NOT PLACE POSTS ON THE OUTSIDE OF THE SILT FENCE BARRIER FOR AREA INLET. IN THIS CONFIGURATION, THE FORCE OF THE WATER IS NOT RESTRICTED BY THE POSTS, BUT ONLY BY THE STAPLES (WIRE, ZIP TIES, NAILS, ETC.). THE SILT FENCE WILL RIP AND FAIL. DO NOT INSTALL SILT FENCE BARRIER FOR AREA INLETS WITHOUT FRAMING THE TOP OF THE POSTS. THE CORNER POSTS AROUND AREA INLETS ARE STRESSED IN TWO DIRECTIONS WHEREAS A NORMAL SILT FENCE IS ONLY STRESSED IN ONE DIRECTION. THIS ADDED STRESS REQUIRES MORE SUPPORT.

INSPECTION AND MAINTENANCE:

SILT FENCE BARRIER FOR AREA INLETS SHOULD BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 1/2" OR MORE. THE FOLLOWING IS A LIST OF QUESTIONS THAT SHOULD BE ADDRESSED DURING EACH INSPECTION:

- DOES WATER FLOW UNDER THE SILT FENCE?
- DOES THE SILT FENCE SAG EXCESSIVELY?
- HAS THE SILT FENCE TORN OR BECOME DETACHED FROM THE POSTS?
- DOES SEDIMENT NEED TO BE REMOVED FROM BEHIND THE AREA INLET BARRIER?



SILT FENCE BARRIERS

MATERIAL SPECIFICATION:

SILT FENCE FABRIC SHOULD CONFORM TO THE AASHTO M288 96 SILT FENCE SPECIFICATION. THE POSTS USED TO SUPPORT THE SILT FENCE FABRIC SHOULD BE A HARDWOOD MATERIAL WITH THE FOLLOWING MINIMUM DIMENSIONS: 2" SQUARE (NOMINAL) BY 4' LONG. SILT FENCE FABRIC SHOULD BE ATTACHED TO THE WOODEN POSTS WITH STAPLES, WIRE, ZIP TIES, OR NAILS.

PLACEMENT:

A SLOPE BARRIER SHOULD BE USED AT THE TOE OF A SLOPE WHEN A DITCH DOES NOT EXIST. THE SLOPE BARRIER SHOULD BE PLACED ON NEARLY LEVEL GROUND 5' TO 10' AWAY FROM THE TOE OF A SLOPE. THE BARRIER IS PLACED AWAY FROM THE TOE OF THE SLOPE TO PROVIDE ADEQUATE STORAGE FOR SETTLING OUT SEDIMENT. WHEN PRACTICABLE, SILT FENCE SLOPE BARRIERS SHOULD BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW. SILT FENCE SLOPE BARRIERS CAN ALSO BE PLACED ALONG RIGHT-OF-WAY FENCE LINES TO KEEP SEDIMENT FROM CROSSING ONTO ADJACENT PROPERTY. WHEN PLACED IN THIS MANNER, THE SLOPE BARRIER WILL NOT LIKELY FOLLOW CONTOURS.

PROPER INSTALLATION METHOD:

EXCAVATE A TRENCH THE LENGTH OF THE PLANNED SLOPE BARRIER THAT IS 6" DEEP BY 4" WIDE. MAKE SURE THAT THE TRENCH IS EXCAVATED ALONG A SINGLE CONTOUR. WHEN PRACTICABLE, SLOPE BARRIERS SHOULD BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW. PLACE THE SOIL ON THE UPSLOPE SIDE OF THE TRENCH FOR LATER USE. ROLL OUT A CONTINUOUS LENGTH OF SILT FENCE FABRIC ON THE DOWNSLOPE SIDE OF THE TRENCH. PLACE THE EDGE OF THE FABRIC IN THE TRENCH STARTING AT THE TOP UPSLOPE EDGE. LINE ALL THREE SIDES OF THE TRENCH WITH THE FABRIC. BACKFILL OVER THE FABRIC IN THE TRENCH WITH THE EXCAVATED SOIL AND COMPACT. AFTER FILLING THE TRENCH, APPROXIMATELY 24" TO 36" OF SILT-FENCE FABRIC SHOULD REMAIN EXPOSED. LAY THE EXPOSED SILT FENCE UPSLOPE OF THE TRENCH TO CLEAR AN AREA FOR DRIVING IN THE POSTS. JUST DOWNSLOPE OF THE TRENCH, DRIVE POSTS INTO THE GROUND TO A DEPTH OF AT LEAST 18". PLACE POSTS NO MORE THAN 4' APART. ATTACH THE SILT FENCE TO THE ANCHORED POST WITH STAPLES, WIRE, ZIP TIES, OR NAILS.

LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

WHEN PRACTICABLE, DO NOT PLACE SILT FENCE SLOPE BARRIERS ACROSS CONTOURS. SLOPE BARRIERS SHOULD BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW. WHEN THE FLOW CONCENTRATES, IT OVERTOPS THE BARRIER AND THE SILT FENCE SLOPE BARRIER QUICKLY DETERIORATES. DO NOT PLACE SILT-FENCE POSTS ON THE UPSLOPE SIDE OF THE SILT FENCE FABRIC. IN THIS CONFIGURATION, THE FORCE OF THE WATER IS NOT RESTRICTED BY THE POSTS, BUT ONLY BY THE STAPLES (WIRE, ZIP TIES, NAILS, ETC.). THE SILT FENCE WILL RIP AND FAIL. DO NOT PLACE SILT FENCE SLOPE BARRIERS IN AREAS WITH SHALLOW SOILS UNDERLAIN BY ROCK. IF THE BARRIER IS NOT SUFFICIENTLY ANCHORED, IT WILL WASH OUT. SILT FENCE SLOPE BARRIERS MUST BE DUG INTO THE GROUND—SILT FENCE AT GROUND LEVEL DOES NOT WORK BECAUSE WATER WILL FLOW UNDERNEATH.

INSPECTION AND MAINTENANCE:

SILT FENCE SLOPE BARRIERS SHOULD BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 1/2" OR MORE. THE FOLLOWING IS A LIST OF QUESTIONS THAT SHOULD BE ADDRESSED DURING EACH INSPECTION:

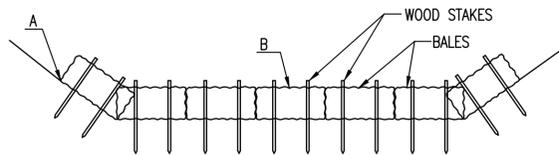
- ARE THERE ANY POINTS ALONG THE SLOPE BARRIER WHERE WATER IS CONCENTRATING?
- DOES WATER FLOW UNDER THE SLOPE BARRIER?
- DO THE SILT FENCES SAG EXCESSIVELY?
- HAS THE SILT FENCE TORN OR BECOME DETACHED FROM THE POSTS?
- DOES SEDIMENT NEED TO BE REMOVED FROM BEHIND THE SLOPE BARRIER?



SILT FENCE DITCH CHECK AND BARRIER DETAILS

CITY ENGINEER JAMES L. ARMOUR, P.E., L.S.		
PROJECT NUMBER 750395 & 750022	OGA NUMBER 633821 & 633822	DATE 11/2010
CITY ENGINEER'S OFFICE CITY HALL - SEVENTH FLOOR 455 NORTH MAIN STREET WICHITA, KANSAS 67202-1620 (316) 268-4501		DESIGN DRAWN SHEET PD2 of 18

NOTE: POINT A MUST BE HIGHER THAN POINT B SO THAT WATER FLOWS OVER THE BALES AND NOT AROUND THEM.



STRAW BALE DITCH CHECKS

MATERIAL SPECIFICATION:

BALE DITCH CHECKS MAY BE CONSTRUCTED OF WHEAT STRAW, OAT STRAW, PRAIRIE HAY, OR BROMEGRASS HAY THAT IS FREE OF WEEDS DECLARED NOXIOUS BY THE KANSAS STATE BOARD OF AGRICULTURE. THE STAKES USED TO ANCHOR THE BALES SHOULD BE A HARDWOOD MATERIAL WITH THE FOLLOWING MINIMUM DIMENSIONS: 2" SQUARE (NOMINAL) BY 4' LONG. OPTIONAL: THE DOWNSTREAM SCOUR APRON SHOULD BE CONSTRUCTED OF A DOUBLE-NETTED STRAW EROSION-CONTROL BLANKET AT LEAST 6' WIDE. OPTIONAL: THE METAL LANDSCAPE STAPLES USED TO ANCHOR THE EROSION-CONTROL BLANKET SHOULD BE AT LEAST 8" LONG.

PLACEMENT:

BALE DITCH CHECKS SHOULD BE PLACED PERPENDICULAR TO THE FLOWLINE OF THE DITCH. THE DITCH CHECK SHOULD EXTEND FAR ENOUGH SO THAT THE GROUND LEVEL AT THE ENDS OF THE CHECK IS HIGHER THAN THE TOP OF THE LOWEST CENTER BALE. THIS PREVENTS WATER FROM FLOWING AROUND THE CHECK. STRAW BALE DITCH CHECKS SHOULD NOT BE PLACED IN DITCHES WHERE HIGH FLOWS ARE EXPECTED. ROCK CHECKS SHOULD BE USED INSTEAD. BALES SHOULD BE PLACED IN DITCHES WITH SLOPES OF 6% OR LESS. FOR SLOPES STEEPER THAN 6%, ROCK CHECKS SHOULD BE USED. THE FOLLOWING TABLE PROVIDES CHECK SPACING FOR A GIVEN DITCH GRADE:

DITCH GRADE (%)	CHECK SPACING (FEET)
0.5	200
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	30

PROPER INSTALLATION METHOD:

EXCAVATE A TRENCH PERPENDICULAR TO THE DITCH FLOWLINE THAT IS 4" DEEP AND A BALE'S WIDTH WIDE. EXTEND THE TRENCH IN A STRAIGHT LINE ALONG THE ENTIRE LENGTH OF THE PROPOSED DITCH CHECK. PLACE THE SOIL ON THE UPSTREAM SIDE OF THE TRENCH-IT WILL BE USED LATER. OPTIONAL: ON THE DOWNSTREAM SIDE OF THE TRENCH, ROLL OUT A LENGTH OF EROSION-CONTROL BLANKET (SCOUR APRON) EQUAL TO THE LENGTH OF THE TRENCH. PLACE THE UPSTREAM EDGE OF THE EROSION-CONTROL BLANKET ALONG THE BOTTOM UPSTREAM EDGE OF THE TRENCH. THE EROSION CONTROL BLANKET SHOULD BE ANCHORED IN THE TRENCH WITH ONE ROW OF 8" LANDSCAPE STAPLES PLACED ON 18" CENTERS. THE REMAINDER OF THE EROSION-CONTROL BLANKET (THE PORTION THAT IS NOT LYING IN THE TRENCH) WILL SERVE AS THE DOWNSTREAM SCOUR APRON. THIS SECTION OF THE BLANKET SHOULD BE ANCHORED TO THE GROUND WITH 8" LANDSCAPE STAPLES PLACED AROUND THE PERIMETER OF THE BLANKET ON 18" CENTERS. THE REMAINDER OF THE BLANKET SHOULD BE ANCHORED USING TWO EVENLY SPACED ROWS OF 8" LANDSCAPE STAPLES ON 18" CENTERS PLACED PERPENDICULAR TO THE FLOWLINE OF THE DITCH. PLACE THE BALES IN THE TRENCH, MAKING SURE THAT THEY ARE BUTTED TIGHTLY. TWO STAKES SHOULD BE DRIVEN THROUGH EACH BALE ALONG THE CENTERLINE OF THE DITCH CHECK, APPROXIMATELY 6" TO 8" IN FROM THE BALE ENDS. STAKES SHOULD BE DRIVEN AT LEAST 12" INTO THE GROUND. ONCE ALL THE BALES HAVE BEEN INSTALLED AND ANCHORED, PLACE THE EXCAVATED SOIL AGAINST THE UPSTREAM SIDE OF THE CHECK AND COMPACT IT. THE COMPACTED SOIL SHOULD BE NO MORE THAN 3" TO 4" DEEP AND EXTEND UPSTREAM NO MORE THAN 24".

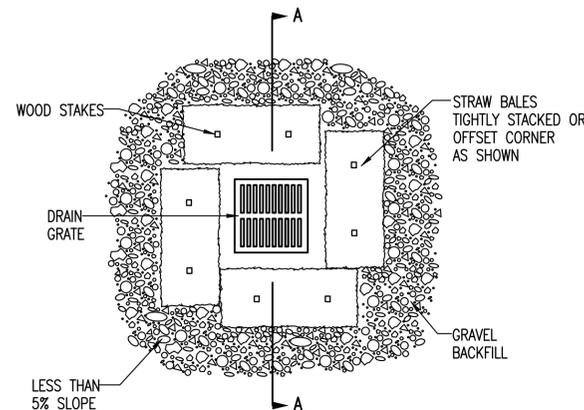
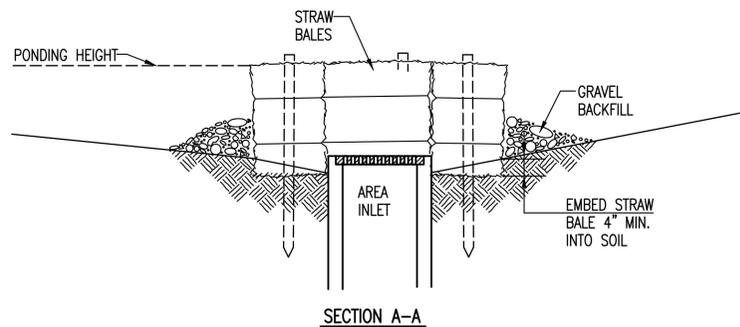
LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

DO NOT PLACE A BALE DITCH CHECK DIRECTLY IN FRONT OF A CULVERT OUTLET. IT WILL NOT STAND UP TO THE CONCENTRATED FLOW. DO NOT PLACE BALE DITCH CHECKS IN DITCHES THAT WILL LIKELY EXPERIENCE HIGH FLOWS. THEY WILL NOT STAND UP TO CONCENTRATED FLOW. FOLLOW PRESCRIBED DITCH-CHECK SPACING GUIDELINES. IF SPACING GUIDELINES ARE EXCEEDED, EROSION WILL OCCUR BETWEEN THE DITCH CHECKS. DO NOT ALLOW WATER TO FLOW AROUND THE DITCH CHECK. MAKE SURE THAT THE DITCH CHECK IS LONG ENOUGH SO THAT THE GROUND LEVEL AT THE ENDS OF THE CHECK IS HIGHER THAN THE TOP OF THE LOWEST CENTER BALE. DO NOT PLACE BALE DITCH CHECKS IN CHANNELS WITH SHALLOW SOILS UNDERLAIN BY ROCK. IF THE CHECK IS NOT ANCHORED SUFFICIENTLY, IT WILL WASH OUT. BALE DITCH CHECKS MUST BE DUG INTO THE GROUND. BALES AT GROUND LEVEL DO NOT WORK BECAUSE THEY ALLOW WATER TO FLOW UNDER THE CHECK.

INSPECTION AND MAINTENANCE:

BALE DITCH CHECKS SHOULD BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 1/2" OR MORE. THE FOLLOWING IS A LIST OF QUESTIONS THAT SHOULD BE ADDRESSED DURING EACH INSPECTION:

- DOES WATER FLOW AROUND THE DITCH CHECK?
- DOES WATER FLOW UNDER THE DITCH CHECK?
- DOES WATER FLOW THROUGH SPACES BETWEEN ABUTTING BALES?
- ARE ANY BALES AND/OR SCOUR APRONS (OPTIONAL) DISLODGED?
- ARE BALES DECOMPOSING DUE TO AGE AND/OR WATER DAMAGE?
- DOES SEDIMENT NEED TO BE REMOVED FROM BEHIND THE DITCH CHECK?



STRAW BALE BARRIERS FOR AREA INLETS (INLET PROTECTION)

MATERIAL SPECIFICATION:

BALE AREA INLET BARRIERS SHOULD BE CONSTRUCTED OF WHEAT STRAW, OAT STRAW, PRAIRIE HAY, OR BROMEGRASS HAY THAT IS FREE OF WEEDS DECLARED NOXIOUS BY THE KANSAS STATE BOARD OF AGRICULTURE. THE STAKES USED TO ANCHOR THE BALES SHOULD BE A HARDWOOD MATERIAL WITH THE FOLLOWING MINIMUM DIMENSIONS: 2" SQUARE (NOMINAL) BY 4' LONG. TWINE SHOULD BE USED TO BIND BALES. THE USE OF WIRE BINDING IS PROHIBITED BECAUSE IT DOES NOT BIODEGRADE READILY.

PLACEMENT:

BALE AREA INLET BARRIERS SHOULD BE PLACED DIRECTLY AROUND THE PERIMETER OF A DROP INLET. WHEN A BALE AREA INLET BARRIER IS LOCATED NEAR AN INLET THAT HAS STEEP APPROACH SLOPES, THE STORAGE CAPACITY BEHIND THE BARRIER IS DRASTICALLY REDUCED. TIMELY REMOVAL OF SEDIMENT MUST OCCUR FOR A BARRIER TO OPERATE PROPERLY IN THIS LOCATION.

PROPER INSTALLATION METHOD:

EXCAVATE A TRENCH AROUND THE PERIMETER OF THE AREA INLET THAT IS AT LEAST 4" DEEP BY A BALE'S WIDTH WIDE. PLACE THE BALES IN THE TRENCH, MAKING SURE THAT THEY ARE BUTTED TIGHTLY. SOME BALES MAY NEED TO BE SHORTENED TO FIT INTO THE TRENCH AROUND THE AREA INLET. TWO STAKES SHOULD BE DRIVEN THROUGH EACH BALE, APPROXIMATELY 6" TO 8" IN FROM THE BALE ENDS. STAKES SHOULD BE DRIVEN AT LEAST 12" INTO THE GROUND. ONCE ALL THE BALES HAVE BEEN INSTALLED AND ANCHORED, PLACE THE EXCAVATED SOIL AGAINST THE RECEIVING SIDE OF THE BARRIER AND COMPACT IT. THE COMPACTED SOIL SHOULD BE NO MORE THAN 3" TO 4" DEEP. NOTE: WHEN A BALE AREA INLET BARRIER IS PLACED IN A SHALLOW MEDIAN DITCH, MAKE SURE THAT THE TOP OF THE BARRIER IS NOT HIGHER THAN THE PAVED ROAD. IN THIS CONFIGURATION, WATER MAY SPREAD ONTO THE ROADWAY CAUSING A HAZARDOUS CONDITION.

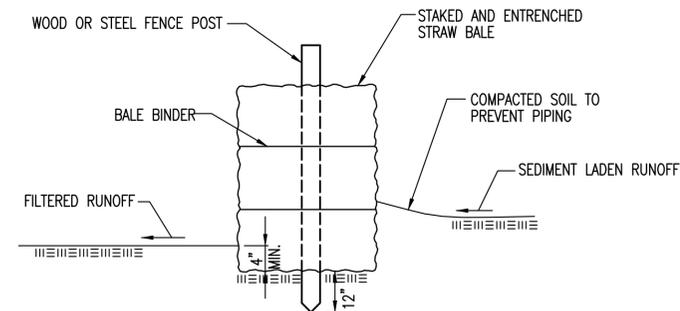
LIST OF COMMON PLACEMENT INSTALLATION MISTAKES TO AVOID:

BALES SHOULD BE PLACED DIRECTLY AGAINST THE PERIMETER OF THE AREA INLET. THIS ALLOWS OVERTOPPING WATER TO FLOW DIRECTLY INTO THE INLET INSTEAD OF ONTO NEARBY SOIL CAUSING SCOUR. BALE AREA INLET BARRIERS MUST BE DUG INTO THE GROUND. BALES AT GROUND LEVEL DO NOT WORK BECAUSE THEY ALLOW WATER TO FLOW UNDER THE BARRIER.

INSPECTION AND MAINTENANCE:

BALE AREA INLET BARRIERS SHOULD BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF A RAINFALL 1/2" OR MORE. THE FOLLOWING IS A LIST OF QUESTIONS THAT SHOULD BE ADDRESSED DURING EACH INSPECTION:

- DOES WATER FLOW UNDER THE AREA INLET BARRIER?
- DOES WATER FLOW THROUGH SPACES BETWEEN ABUTTING BALES?
- ARE ANY BALES DISLODGED?
- ARE BALES DECOMPOSING DUE TO AGE AND/OR WATER DAMAGE?
- DOES SEDIMENT NEED TO BE REMOVED FROM BEHIND THE AREA INLET BARRIER?



STRAW BALE BARRIERS

MATERIAL SPECIFICATION:

BALE SLOPE BARRIERS MAY BE CONSTRUCTED OF WHEAT STRAW, OAT STRAW, PRAIRIE HAY, OR BROMEGRASS HAY THAT IS FREE OF WEEDS DECLARED NOXIOUS BY THE KANSAS STATE BOARD OF AGRICULTURE. THE STAKES USED TO ANCHOR THE BALES SHOULD BE A HARDWOOD MATERIAL WITH THE FOLLOWING MINIMUM DIMENSIONS: 2" SQUARE (NOMINAL) BY 4' LONG. TWINE SHOULD BE USED TO BIND BALES. THE USE OF WIRE BINDING IS PROHIBITED BECAUSE IT DOES NOT BIODEGRADE READILY.

PLACEMENT:

A SLOPE BARRIER SHOULD BE USED AT THE TOE OF A SLOPE WHEN A DITCH DOES NOT EXIST. THE SLOPE BARRIER SHOULD BE PLACED ON NEARLY LEVEL GROUND 5' TO 10' AWAY FROM THE TOE OF A SLOPE. THE BARRIER IS PLACED AWAY FROM THE TOE OF THE SLOPE TO PROVIDE ADEQUATE STORAGE FOR SETTLING OUT SEDIMENT. WHEN PRACTICABLE, BALE SLOPE BARRIERS SHOULD BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW. BALE SLOPE BARRIERS CAN ALSO BE PLACED ALONG RIGHT-OF-WAY FENCE LINES TO KEEP SEDIMENT FROM CROSSING ONTO ADJACENT PROPERTY. WHEN PLACED IN THIS MANNER, THE SLOPE BARRIER WILL NOT LIKELY FOLLOW CONTOURS.

PROPER INSTALLATION METHOD:

EXCAVATE A TRENCH THE LENGTH OF THE PLANNED SLOPE BARRIER THAT IS 4" DEEP AND A BALE'S WIDTH WIDE. MAKE SURE THAT THE TRENCH IS EXCAVATED ALONG A SINGLE CONTOUR. WHEN PRACTICABLE, SLOPE BARRIERS SHOULD BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW. PLACE THE SOIL ON THE UPSLOPE SIDE OF THE TRENCH FOR LATER USE. PLACE THE BALES IN THE TRENCH, MAKING SURE THAT THEY ARE BUTTED TIGHTLY. TWO STAKES SHOULD BE DRIVEN THROUGH EACH BALE ALONG THE CENTERLINE OF THE DITCH CHECK, APPROXIMATELY 6" TO 8" IN FROM THE BALE ENDS. STAKES SHOULD BE DRIVEN AT LEAST 12" INTO THE GROUND. ONCE ALL THE BALES HAVE BEEN INSTALLED AND ANCHORED, PLACE THE EXCAVATED SOIL AGAINST THE UPSLOPE SIDE OF THE CHECK AND COMPACT IT. THE COMPACTED SOIL SHOULD BE NO MORE THAN 3" TO 4" DEEP.

LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

WHEN PRACTICAL, DO NOT PLACE BALE SLOPE BARRIERS ACROSS CONTOURS. SLOPE BARRIERS SHOULD BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW. CONCENTRATED FLOW OVER A SLOPE BARRIER CREATES A SCOUR HOLE ON THE DOWNSLOPE SIDE OF THE BARRIER. THE SCOUR HOLE EVENTUALLY UNDERMINES THE BALES AND THE BARRIER FAILS. DO NOT PLACE BALE SLOPE BARRIERS IN AREAS WITH SHALLOW SOILS UNDERLAIN BY ROCK. IF THE BARRIER IS NOT ANCHORED SUFFICIENTLY, IT WILL WASH OUT. BALE SLOPE BARRIERS MUST BE DUG INTO THE GROUND. BALES AT GROUND LEVEL DO NOT WORK BECAUSE THEY ALLOW WATER TO FLOW UNDER THE BARRIER.

INSPECTION AND MAINTENANCE:

BALE SLOPE BARRIERS SHOULD BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 1/2" OR MORE. THE FOLLOWING IS A LIST OF QUESTIONS THAT SHOULD BE ADDRESSED DURING EACH INSPECTION:

- ARE THERE ANY POINTS ALONG THE SLOPE BARRIER WHERE WATER IS CONCENTRATING?
- DOES WATER FLOW UNDER THE SLOPE BARRIER?
- DOES WATER FLOW THROUGH SPACES BETWEEN ABUTTING BALES?
- ARE ANY BALES DISLODGED?
- ARE BALES DECOMPOSING DUE TO AGE AND/OR WATER DAMAGE?
- DOES SEDIMENT NEED TO BE REMOVED FROM BEHIND THE SLOPE BARRIER?

 <p>CITY OF WICHITA PUBLIC WORKS & UTILITIES ENGINEERING DIVISION</p>			STRAW BALE DITCH CHECK AND BARRIER DETAILS	
			CITY ENGINEER JAMES L. ARMOUR, P.E., L.S.	
PROJECT NUMBER 750395 & 750022	OCA NUMBER 633821 & 633822	DATE 11/2010	DESIGN	DRAWN
CITY ENGINEER'S OFFICE CITY HALL - SEVENTH FLOOR 455 NORTH MAIN STREET WICHITA, KANSAS 67202-1620 (316) 268-4501			SHEET PD3 of 18	

GENERAL STRUCTURAL NOTES

A. DESIGN CRITERIA

- BUILDING CODE: INTERNATIONAL BUILDING CODE (IBC), 2006 EDITION, INCLUDING LOCAL SUPPLEMENTS.
- GRAVITY LOADS:

LOCATION	UNIFORM LIVE LOAD	CONCENTRATED LIVE LOAD	SUPERIMPOSED DEAD LOAD*
ELEV. SLAB	100 PSF	2000 LB	5 PSF

*DEAD LOAD WHICH IS SUPERIMPOSED ONTO ACTUAL STRUCTURAL WEIGHTS.
- FLOOD LOADS
 - THE BASE FLOOD ELEVATION DETERMINED BY THE CIVIL ENGINEER DOES NOT AFFECT THIS STRUCTURE.

B. DELEGATED ENGINEERING OF STRUCTURAL COMPONENTS & SYSTEMS

- ALL STRUCTURAL COMPONENTS & SYSTEMS SPECIFIED TO BE DESIGNED AND SEALED BY A SPECIALTY STRUCTURAL ENGINEER (SSE) SHALL MEET THE GUIDELINES PUBLISHED BY THE COUNCIL OF AMERICAN STRUCTURAL ENGINEERS (CASE) FOR DELEGATED SPECIALTY STRUCTURAL ENGINEERING.
- WHEN COMPONENTS & SYSTEMS SPECIFIED ARE DELEGATED, THE SHOP DRAWINGS SHALL HAVE THE FOLLOWING:
 - PROVIDE A FULL DESIGN ANALYSIS INCLUDING CALCULATIONS WITH A SEALED COVER SHEET IDENTIFYING THE PROJECT NAME AND ADDRESS.
 - THE ENGINEER THAT SEALED THE CALCULATIONS SHALL ALSO SEAL THE FABRICATION, PLACING, AND ERECTION PLANS. EACH PLAN SHALL IDENTIFY THE PROJECT NAME/ADDRESS.
 - THE ENGINEER THAT SEALED THE PLANS SHALL STATE THAT HE HAS COMPLETED A DETAILED REVIEW OF THE CONTRACT DOCUMENTS AND HAS INCORPORATED THE PERFORMANCE CRITERIA INTO THE SUBMITTAL.
- THE CONTRACTOR SHALL REVIEW THE SUBMITTAL FOR QUANTITIES AND DIMENSIONS AND VERIFY THAT THE ABOVE INFORMATION HAS BEEN INCLUDED IN THE SUBMITTAL.

PRECAST CONCRETE

- REF. DELEGATED ENGINEERED STRUCTURAL COMPONENTS & SYSTEM FOR SUBMITTAL REQUIREMENTS.
- REF. DESIGN CRITERIA FOR BUILDING CODE, SERVICE CRITERIA AND LOADS TO BE USED IN DESIGN.
- ADDITIONAL DETAILED CRITERIA
 - PRECAST COMPONENTS & CONNECTIONS SHALL BE DESIGNED IN ACCORDANCE WITH THE PCI DESIGN HANDBOOK. NON-STANDARD MEMBER CROSS-SECTIONS SHALL BE APPROVED BY THE ENGINEER IN ADVANCE OF SHOP DRAWINGS.
 - ALL OPENINGS GREATER THAN 10" ON A SIDE SHALL BE NEATLY FORMED TO DIMENSIONS.
 - BEARING STRIPS FOR SLABS SHALL BE 1/8" X 2" AND LOCATED 1/2" FROM THE FACE OF THE SUPPORT.
 - CONCRETE SHALL MEET THE REQUIREMENTS OF THE MIX DESIGN SECTION UNDER CONCRETE. USE OF SELF-CONSOLIDATION CONCRETE SHALL NOT BE USED WITHOUT WRITTEN APPROVAL PRIOR TO USE.
 - DO NOT REMOVE CONCRETE FROM FORMS UNTIL THE CONCRETE HAS ATTAINED 2500 PSI FOR PRECAST AND 3500 PSI FOR PRESTRESSED CONCRETE.
 - GROUT UNDER PIECES WITH NON-SHRINK NON-METALLIC GROUT THAT HAS THE SAME STRENGTH AS THE PRECAST.

C. SOIL PREPARATION AND FOUNDATIONS

- IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENGAGE A LICENSED GEOTECHNICAL ENGINEER TO PERFORM A SUBSURFACE GEOTECHNICAL INVESTIGATION. THE RESULTS OF THE GEOTECHNICAL INVESTIGATION SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. THE GEOTECHNICAL INVESTIGATION MUST, AT THE MINIMUM, PROVIDE THE FOLLOWING MATERIAL:
 - SUFFICIENT SOIL BORINGS SHALL BE MADE TO VERIFY THAT THE PRESUMPTIVE SOIL BEARING PRESSURE OF 1,500 PSF IN UNDISTURBED SOILS AND ENGINEERED FILLS USED FOR DESIGN IS SAFE.
 - LABORATORY TESTS SHALL BE MADE AS NECESSARY TO VERIFY THAT THE TOTAL SETTLEMENT IS LESS THAN 1" AND THE DIFFERENTIAL SETTLEMENT IS LESS THAN 1/2", NO SHRINK/SWELL POTENTIAL EXISTS, AND THE DEPTH IS ADEQUATE FOR THE SITE.
- SOIL SUPPORTED FOUNDATIONS:
 - DESIGN BEARING PRESSURE (NET) IS 1500 PSF FOR FOUNDATIONS BEARING ON UNDISTURBED SOIL OR APPROVED ENGINEERED FILL MATERIAL. BEARING MATERIALS SHALL BE VERIFIED BY A LICENSED GEOTECHNICAL ENGINEER.
 - ALL FOUNDATIONS ARE DESIGNED WITH EARTH FORMED SIDES; THE TOP 7/8" OF THE FOUNDATION SHALL BE FORMED TO THE DESIGN DIMENSION WHEN VISIBLE AFTER CONSTRUCTION IS COMPLETE. THE CONSTRUCTED FOUNDATION DIMENSION SHALL BE NO LESS THAN THE DESIGN DIMENSION, AND NO MORE THAN 6" GREATER THAN THE DESIGN DIMENSION.

- DO NOT BACKFILL FOUNDATION/BASEMENT WALLS UNTIL THE RESTRAINING SLABS OR ADEQUATE BRACING ARE IN PLACE. ALL BACKFILL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATION.

D. CONCRETE

- ALL STRUCTURAL CONCRETE HAS BEEN DESIGNED IN ACCORDANCE WITH THE ACI 318 AND THE BUILDING CODE, AND IN CONFORMANCE WITH THE CURRENT "ACI MANUAL OF CONCRETE PRACTICE."
- THE CONCRETE REQUIREMENTS ARE:
 - CEMENT SHALL BE TYPE I OR II CONFORMING TO ASTM C150. FLY ASH CONFORMING TO ASTM C618 TYPE C OR F MAY BE USED TO REPLACE A MAXIMUM OF 20% OF THE CEMENT.
 - FINE AND COARSE AGGREGATES FOR NORMAL WEIGHT CONCRETE SHALL CONFORM TO ASTM C33. COARSE AGGREGATES SHALL BE NO LESS THAN 50% OF THE TOTAL AGGREGATE BY WEIGHT, UNLESS APPROVED BY THE ENGINEER PRIOR TO MIX DESIGN SUBMITTAL.
 - MIX REQUIREMENTS ARE:

LOCATION	MIN. F'C	MIN. CEM. W/C	MAX. W/C	COARSE AGGREGATE RATIO	AIR ENT.	SLUMP§ INCHES
FOUNDATIONS	4000	470	0.45	#5 OR #56	5%+/-1%	2-5
PRECAST	5000	611	0.42	#6	5%+/-1%	2-5

§ PRIOR TO THE ADDITION OF HIGH RANGE WATER REDUCERS, IF APPROVED BY ENGINEER, AFTER ADDITION THE SLUMP MAY NOT EXCEED 8".

E. CONCRETE REINFORCING (CAST-IN-PLACE & PRECAST)

- ADMITTURES, HARDENERS, & CURING COMPOUNDS
 - ALL CONCRETE ADMITTURES SHALL, WHEN MIXED INTO CONCRETE, BE NON-CHLORIDE AND NON-CHLORIDE FORMING.
 - CONCRETE CURING COMPOUND AND SEALERS SHALL MEET ASTM C-309 TYPE 1 OR 1D
 - THE CONTRACTOR SHALL VERIFY THAT ALL ADMITTURES, HARDENERS, CURING COMPOUNDS, AND FLOOR COVERING ADHESIVES ARE COMPATIBLE WITH EACH OTHER.
- MISCELLANEOUS CONCRETE DETAILS:
 - ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4" INSIDE FORMS OR TOOLED TO 3/4" RADIUS UNLESS NOTED OTHERWISE.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL FORMING AND SHORING. SHORING FOR ELEVATED SLABS SHALL BE SET SO THAT ANY LOAD DUE TO THE CONCRETE OPERATIONS DOES NOT CAUSE THE FORMS TO SETTLE (SLACK, TAKE-UP, ETC.).
 - NO ALUMINUM SHALL BE EMBEDDED IN CONCRETE. CONDUITS AND PIPING EMBEDDED IN CONCRETE WALLS, SLABS, OR BEAMS SHALL BE SPACED A MINIMUM OF FOUR DIAMETERS AND THE OUTSIDE DIAMETER SHALL BE LESS THAN 30% OF THE MEMBER THICKNESS AND PLACED BETWEEN LAYERS OF REINFORCING.
 - NO CONDUIT MAY BE EMBEDDED IN TOPPING SLABS ON PRECAST CONCRETE UNLESS SPECIFICALLY DETAILED OR NOTED OTHERWISE ON STRUCTURAL PLANS.

2. DETAILS:

- WELDING OF REINFORCING BARS IS PROHIBITED UNLESS NOTED OTHERWISE. WHEN WELDING IS APPROVED, WELDING SHALL BE IN ACCORDANCE WITH AWS D1.4 "WELDING REINFORCING STEEL, ETC."

3. EMBEDMENTS

- ALL EMBEDDED PLATES AND ANCHOR RODS SHALL BY HOT DIP GALVANIZED. COATINGS IN THE WELD AREA SHALL BE REPAIRED.

4. PLACEMENT

- ALL REINFORCING (BARS, ANCHOR RODS, EMBEDMENTS, WWF, ETC.) SHALL BE SUPPORTED ON CHAIRS/BOLSTERS TO THE DESIGN DIMENSIONS. SPACING SHALL BE SUFFICIENTLY CLOSE TO PREVENT DISPLACEMENT OR PERMANENT DEFORMATION DUE TO CONCRETE PLACEMENT, FOOT TRAFFIC, OR VIBRATION. "PUDDLING IN" OR "PULLING UP" REINFORCING IS NOT AN ACCEPTABLE METHOD FOR PLACING REINFORCING. CHAIRS/BOLSTERS SHALL HAVE PLASTIC COATED FEET OR BE MADE OF STAINLESS STEEL. CHAIRS/BOLSTERS IN CONTACT WITH EARTH SHALL HAVE BOTTOM PLATES AND BE COATED TO PREVENT CORROSION. ANCHOR RODS SHALL BE HELD IN PLACE WITH TEMPLATES SUFFICIENTLY STRONG TO PREVENT DISPLACEMENT OR TILTING.

B. MAINTAIN ACI CLEAR COVER ON REINFORCING AS LISTED BELOW UNLESS NOTED OTHERWISE.

- CAST AGAINST EARTH (BOTTOM OR SIDES): 3"
FORMED - EXPOSED TO SOIL, WEATHER OR LIQUIDS: 2"

C. PROVIDE CORNER BARS OF THE SAME SIZE AND SPACING AS ADJACENT REINFORCING. REFERENCE DETAILS. CONTINUOUS WALL FOOTING REINFORCING NEED ONLY TO OVERLAP.

D. OPENINGS IN WALLS OR STRUCTURAL SLABS SHALL BE REINFORCED WITH (2)-#5 MIN. ON ALL SIDES. EXTEND REINFORCING BEYOND OPENING 24" MIN.

E. ALL REINFORCING BARS ARE TO BE MADE CONTINUOUS OR LAPPED 40 BAR DIAMETERS.

F. WWF SHALL BE MADE CONTINUOUS BY LAPPING ONE FULL SQUARE PLUS 2".

F. CONTRACT/CONSTRUCTION DOCUMENTS

- THE CONTRACT DOCUMENTS SHALL INCLUDE ALL PLANS, SPECIFICATIONS, ADDENDAS, AND SUPPLEMENTAL INSTRUCTIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN A FULL SET OF THE MOST RECENT REVISIONS OF EACH DOCUMENT.
- THE CONTRACTOR SHALL REVIEW THE DOCUMENTS PRIOR FABRICATION AND/OR INSTALLATION OF ANY MATERIALS FOR CONFLICTS. IF CONFLICTS OCCUR THE CONTRACTOR SHALL USE THE MOST STRINGENT REQUIREMENT. ALTERNATELY, THE CONTRACTOR MAY REQUEST A CLARIFICATION THROUGH A REQUEST FOR INFORMATION (RFI).
- THE DOCUMENTS MAY NOT BE REPRODUCED IN WHOLE OR IN PART FOR USE ON PROJECTS OTHER THAN IDENTIFIED IN THE TITLE BLOCK. SHOULD THE CONTRACTOR USE THE DOCUMENTS AS A PORTION OF A SHOP DRAWING SUBMITTAL, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CONSEQUENCES RESULTING FROM ERRORS IN THE REPRODUCED DOCUMENTS.
- DETAILS LABELED TYPICAL ARE INTENDED TO REPRESENT A CONDITION THAT OCCURS AT SEVERAL LOCATIONS IN THE PLANS WHETHER OR NOT THE DETAIL IS REFERENCED.
- DO NOT SCALE THE PLANS AND DETAILS FOR THE PURPOSE OF ESTABLISHING DIMENSIONS.

G. STRUCTURAL ENGINEER'S RESPONSIBILITY

- THE CONSTRUCTION DOCUMENTS REPRESENT A STABLE STRUCTURE IN THE COMPLETED FORM. THE STRUCTURAL ENGINEER IS NOT RESPONSIBLE FOR STABILITY OF PARTIALLY COMPLETED STRUCTURES.

H. CONTRACTOR'S RESPONSIBILITY

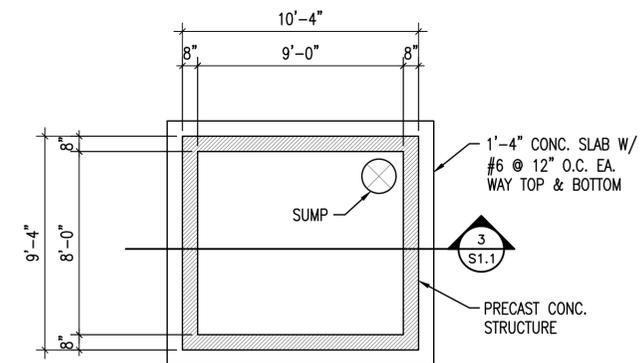
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ALL SUB-CONTRACTOR SUBMITTALS AND NOTING ALL CONFLICTS WITH THE CONSTRUCTION DOCUMENTS PRIOR TO SUBMITTING TO THE STRUCTURAL ENGINEER FOR REVIEW.
- THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR SITE SAFETY.

I. CONSTRUCTION MEANS AND METHODS ISSUES

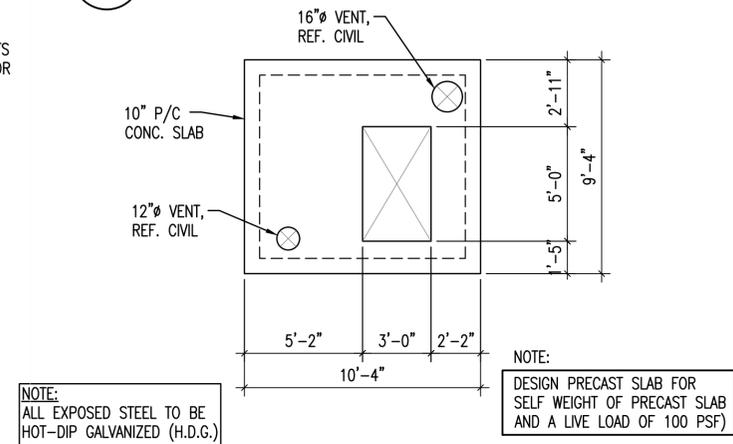
- SLABS ON GRADE AND ELEVATED SLABS ARE NOT DESIGNED TO SUPPORT CRANES, FORKLIFTS, TRUCKS, MANLIFTS, OR OTHER CONSTRUCTION RELATED EQUIPMENT UNLESS NOTED AS SUCH. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE IF CONSTRUCTION EQUIPMENT CAN BE SAFELY OPERATED ON THESE SLABS AND TO REPAIR ANY DAMAGE THE EQUIPMENT MAY CAUSE.
- THE CONTRACTOR SHALL PROVIDE ANY TEMPORARY BRACING AND/OR SHORES TO SAFELY CONSTRUCT THE BUILDING AND PREVENT DAMAGE DURING CONSTRUCTION.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS OF EXISTING CONSTRUCTION THAT MAY AFFECT THE PROJECT AND REPORT DISCREPANCIES TO THE ENGINEER. EXISTING BUILDING ELEMENTS THAT ARE TO BE ABANDONED THAT INTERFERE WITH NEW CONSTRUCTION SHALL BE REMOVED.
- WHEN A PIECE OF EQUIPMENT IS PROVIDED THAT IS DIFFERENT THAN THE EQUIPMENT THAT THE STRUCTURE WAS DESIGNED FOR EITHER BY SIZE, WEIGHT OR CONFIGURATION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE REMEDY OF THE SITUATION.

J. STRUCTURAL TESTS, INSPECTIONS, AND QUALITY ASSURANCE

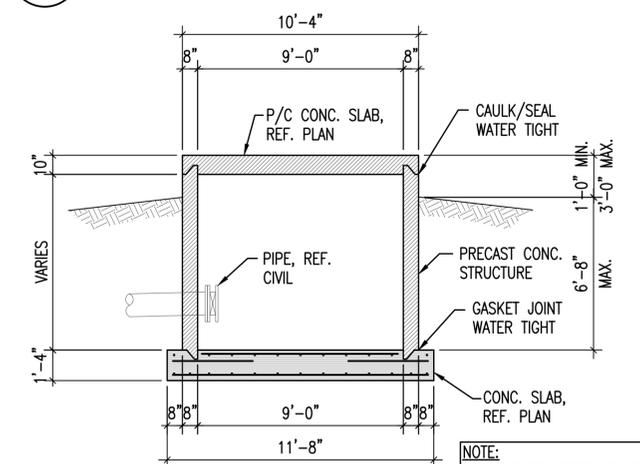
- ALL STRUCTURAL TESTS AND INSPECTIONS SHALL BE PERFORMED PER CHAPTER 17 OF THE BUILDING CODE WITH LOCAL SUPPLEMENTS, UNLESS MORE STRINGENT REQUIREMENTS ARE SPECIFIED.



1 WELL FOUNDATION PLAN
S1.1 1/4"=1'-0"



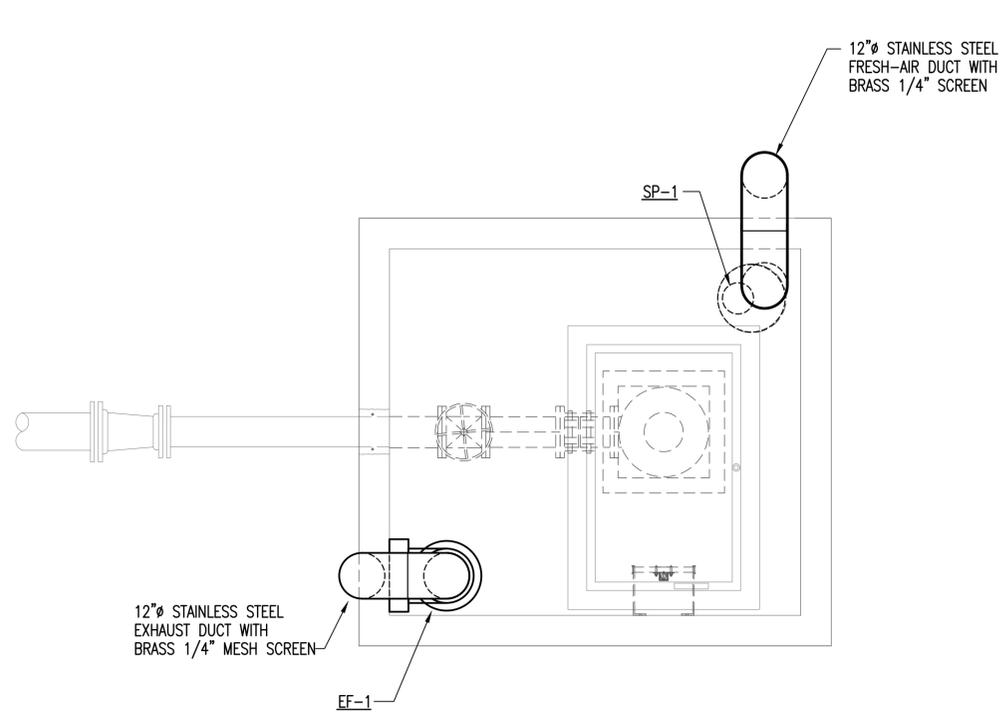
2 WELL COVER PLAN
S1.1 1/4"=1'-0"



3 WELL SECTION
S1.1 1/4"=1'-0"

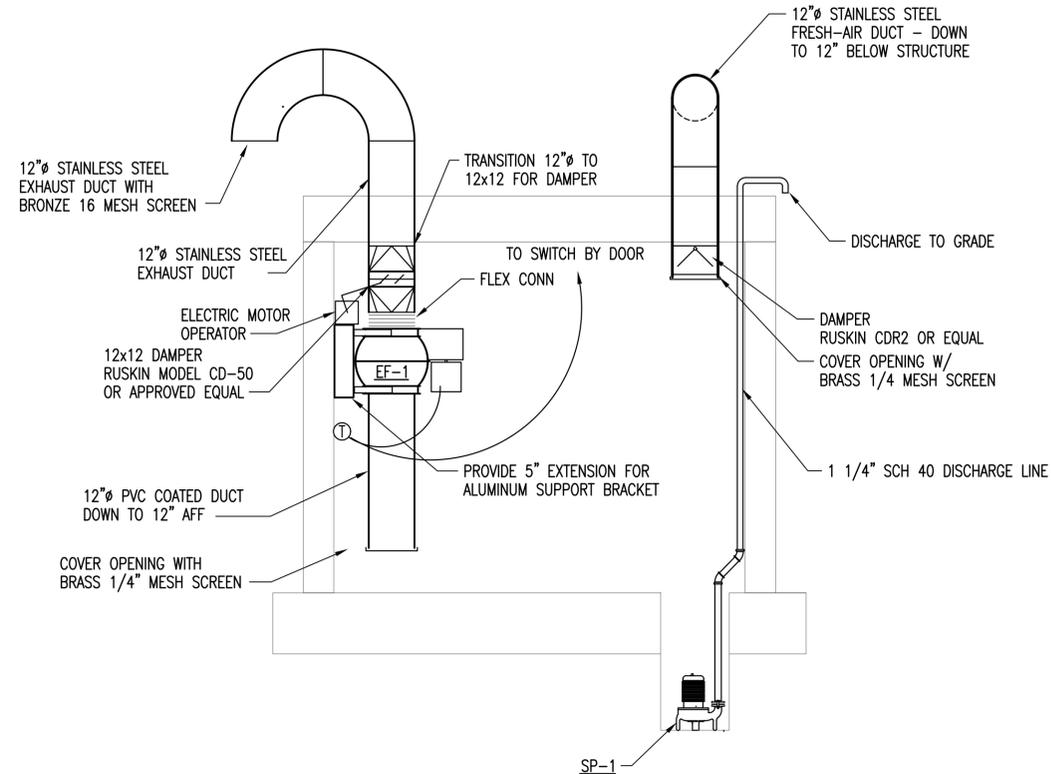
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No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL			
WELL STRUCTURAL PLAN & DETAILS			
JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
		PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2891 www.pec1.com	
Designed by	MWK	Job No.	34-11296
Drawn by	MWK	Date	MAY 2012
			Sht. S1.1 of 1



MECHANICAL FLOOR PLAN

SCALE: 1/4" = 1'-0"



ELEVATION

SCALE: 1/4" = 1'-0"

SUMP PUMP SCHEDULE

MARK	LOCATION	BASIN		PUMP					REMARKS	ELEC REF
		SIZE	INLET	G.P.M.	H.P.	R.P.M.	HEAD	ELEC		
SP-1	PROCESS	18"Ø x36"D	TOP	30	1/3	1750	20'	120 V	①	

① WEIL 1409 1 1/4" SUMP PUMP WITH MIRCO SWITCH.

EXHAUST FAN SCHEDULE

MARK	LOC AT ROOM	TYPE	MIN. CAP CFM	MAX. TIP SP	DRIVE	MOTOR (BY M.C.)					REMARKS	CONTROLS	ELECT REF
						HP	RPM	SPEED	ELECT.	STARTER			
EF-1	WELL	IL	1200	1.0	B	.75	1750	1	120V	--	①	T'STAT	

① BASED ON COOK MODEL 12CVB

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 Plot: Scale: 1:24 11-01-2023 10:11:19 AM by: SEB
 \\vetz2\archive\FACILITIES\DRAWINGS\04\2011\11296\11296 M1 PLAN

No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL			
MECHANICAL NEW SIMS WELL			
JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
 PEC		PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2691 www.pec1.com	
Designed by	JBG	Job No.	34-11296
Drawn by	SEB	Date	MAY 2012
			Sht. M1 of

① ④ ⑤

LIGHTING FIXTURE SCHEDULE

(P.E.C.)

FIXT. LTR.	MANUFACTURER CATALOG NUMBER	MANUFACTURER CATALOG NUMBER	MANUFACTURER CATALOG NUMBER	MANUFACTURER CATALOG NUMBER	DESCRIPTION	LAMP TYPE	LENS\LOUVER\FINISH	W	L	D
CG	WILLIAMS 92-4-232-A	COLUMBIA LU4-232-EB8-PAF	LITHONIA DM-232-PAF	METALUX VT2-232DR-DL	4' DAMP LABEL (2)	F32/835	WHITE	1.6771	4.333	

- GENERAL CONTRACTOR SHALL PROVIDE FIREPROOFING AROUND RECESSED FIXTURES INSTALLED IN FIRE RATED CEILING PER U.L. REQUIREMENTS. ELECTRICAL CONTRACTOR WILL COORDINATE.
- LIGHT FIXTURES SHALL BE PROVIDED WITH ELECTRONIC BALLASTS. COMPACT FLUORESCENT ELECTRONIC BALLASTS SHALL HAVE END-OF-LIFE PROTECTION CIRCUIT TO PREVENT WELDING OF LAMPS IN SOCKETS OR LAMP BREAKAGE. SEE THE SPECIFICATIONS. ALL FLUORESCENT LAMPS SHALL BE LOW MERCURY AND SHALL MEET ALL E.P.A. GUIDELINES FOR PASSING "TCLP" TESTS. ALL INDOOR FLUORESCENT BALLASTS SHALL HAVE A DISCONNECTING MEANS MEETING THE REQUIREMENTS OF NEC SECTION 410.130(G), EXCEPT FOR THOSE INSTALLED IN CORD-AND-PLUG CONNECTED FIXTURES. ELECTRONIC BALLASTS FOR EXTERIOR LOCATED LIGHT FIXTURES SHALL HAVE A MINIMUM STARTING TEMPERATURE OF -20 DEGREES FAHRENHEIT.
- NOT USED.
- MANUFACTURERS LISTED IN THIS SCHEDULE OR APPROVED BY WRITTEN ADDENDUM WILL BE THE ONLY APPROVED MANUFACTURERS TO BID THE LIGHTING FIXTURES FOR THIS PROJECT. CONTRACTORS AND SUPPLIERS USING PRICING FROM MANUFACTURERS NOT LISTED ON SCHEDULE OR BY ADDENDUM DO SO AT THEIR OWN RISK.
- LIGHT FIXTURE SELECTIONS ARE BASED ON THE MANUFACTURER IN THE LEFT MOST COLUMN AS LISTED IN THE SCHEDULE. FIXTURES APPROVED AS EQUALS IN THIS SCHEDULE OR BY ADDENDUM SHALL BE EQUAL TO THE UNIT SPECIFIED IN THE LEFT MOST COLUMN, IE: SPRING LOADED LATCHES, POST PAINTED FINISH, AND PHOTOMETRICS.

GENERAL NOTES

- ALL ELECTRICAL WORK SHALL COMPLY WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC) & THE AMERICANS WITH DISABILITIES ACT (ADA).
- REFER TO RELATED ARCHITECTURAL, MECHANICAL, AND STRUCTURAL DRAWINGS FOR RELATED INFORMATION.
- REFER TO THE SPECIFICATIONS FOR DATA NOT ON THE DRAWINGS.
- E.C. SHALL REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS FOR THE REQUIREMENTS ASSOCIATED WITH WIRING AND CONNECTION OF INTERLOCKING AND CONTROLS OF MECHANICAL UNITS AND THERMOSTAT LOCATIONS.
- COORDINATE OUTLET BOX LOCATIONS WITH MASONRY TO MINIMIZE CUTTING OF BRICK OR BLOCK.
- ALL MOUNTING HEIGHTS TO CENTERLINE OF ITEM U.O.N. VERIFY ALL OUTLET LOCATIONS ON THE JOB PRIOR TO ROUGH-IN.
- CONDUIT RUN W/CONDUCTORS AS INDICATED & GROUND WIRE SIZED PER N.E.C. 250.122. CONDUIT SIZE AS REQUIRED.
- WHEN INCREASED CONDUCTOR SIZES ARE SHOWN ON THE PLANS, THE LARGER CONDUCTOR SIZE SHALL BE USED THROUGHOUT THE LENGTH OF THE CIRCUIT, INCLUDING NEUTRAL AND GROUND.
- BRANCH CIRCUITS ARE INDICATED AS ONE CIRCUIT HOME RUNS WITH INDIVIDUAL NEUTRALS. A MAXIMUM OF THREE CIRCUITS MAY BE GROUPED IN A SINGLE CONDUIT. WHERE MULTIPLE CIRCUITS ARE LOCATED IN THE SAME RACEWAY, JUNCTION BOX OR ENCLOSURE, NEUTRALS SHALL BE MARKED OR LABELED TO INDICATE WHICH CIRCUIT THEY ARE ASSOCIATED WITH. SEE SPECIFICATION SECTION 16120 FOR ADDITIONAL INFORMATION.

SYMBOL LIST

SYMBOL	DESCRIPTION	MOUNTING
	LIGHT FIXTURE & FIXTURE LETTER	CEILING
	STRIP LIGHT FIXTURE & FIXTURE LETTER	CEILING
	LIGHT FIXTURE & FIXTURE LETTER	CEILING
	LIGHT FIXTURE & FIXTURE LETTER	WALL
	EXIT LIGHT (SHADING DENOTES EXIT FACE SIDE)	CEIL./WALL
	LIGHT FIXTURE & FIXTURE LETTER	WALL
	FIXTURE W/SHADED LAMP(S) ON EMERG. POWER	CEILING
	SWITCHES (1-POLE, 2-POLE, 3-WAY, 4-WAY)	46" AFF
	WEATHERPROOF	
	NEMA - 3R ENCLOSURE	
	NEMA - 4XSS ENCLOSURE	
	FEEDER DESIGNATION	
	GROUND FAULT DUPLEX RECEPTACLE	17" AFF
	SPECIAL DEVICE (AS NOTED)	
	JUNCTION BOX	
	FUSTAT BUSS #SSY	
	MISC. EQUIPMENT CONNECTION	
	MOTOR	
	DISCONNECT SWITCH	
	STARTER	
	BRANCH CIRCUIT PANEL & PANEL DESIG.	72" TO TOP
	ELECTRICAL DISTRIBUTION EQUIPMENT	
	N.E.C REQUIRED WORKING CLEARANCE	
	MECHANICAL/PROCESS EQUIPMENT-SEE EQUIP. CONN. SCHED.	
	CONDUIT RUN 2#12 & 1#12 GRD.-1/2" C. GEN NOTE 8	CEIL./WALL
	CONDUIT RUN 2#12 & 1#12 GRD.-3/4" C. GEN NOTE 8	EARTH/FLOOR
	CONDUIT RUN 2 CIRCUITS, 3#12 & 1#12 GRD.-3/4" C.	EARTH/FLOOR
	CONDUIT RUN PARTIAL CIRCUIT	
	CONDUIT SEAL-OFF	
	SEE GENERAL NOTE 7 & 8	
	CONDUIT RUN TWO (2) CIRCUITS PHASE CONDUCTORS (#12 UON)	CEIL./WALL
	NEUTRAL CONDUCTOR (#12 UON)	
	SWITCH LEGS (#12 UON)	
	GROUND CONDUCTOR (#12 UON)	

CONTROL CABLES CONDUIT SCHEDULE

# OF CABLES	ESTIMATED CONDUIT SIZE
2	1/2"
4	3/4"
8	1"
12	1 1/4"
16	1 1/2"
20	2"
32	2 1/2"
44	3"
52	3 1/2"

NOTE:
ABOVE CONDUIT SIZES DEPEND ON ACTUAL CABLES INSTALLED. VERIFY CABLE SIZES & ADJUST CONDUIT AS REQUIRED. RUN ALL CONTROL CABLES IN SEPARATE CONDUIT FROM POWER CIRCUITS. ALSO RUN SHIELDED & LAN CABLES IN SEPARATE CONDUIT FROM OTHER CONTROLS. CONTRACTOR CAN SIZE CONDUIT FOR ACTUAL CABLE SIZE, PER N.E.C. FILL TABLE WITH 25% SPARE CAPACITY. SUBMIT CALCULATIONS.

CONTROLS SYMBOL LIST

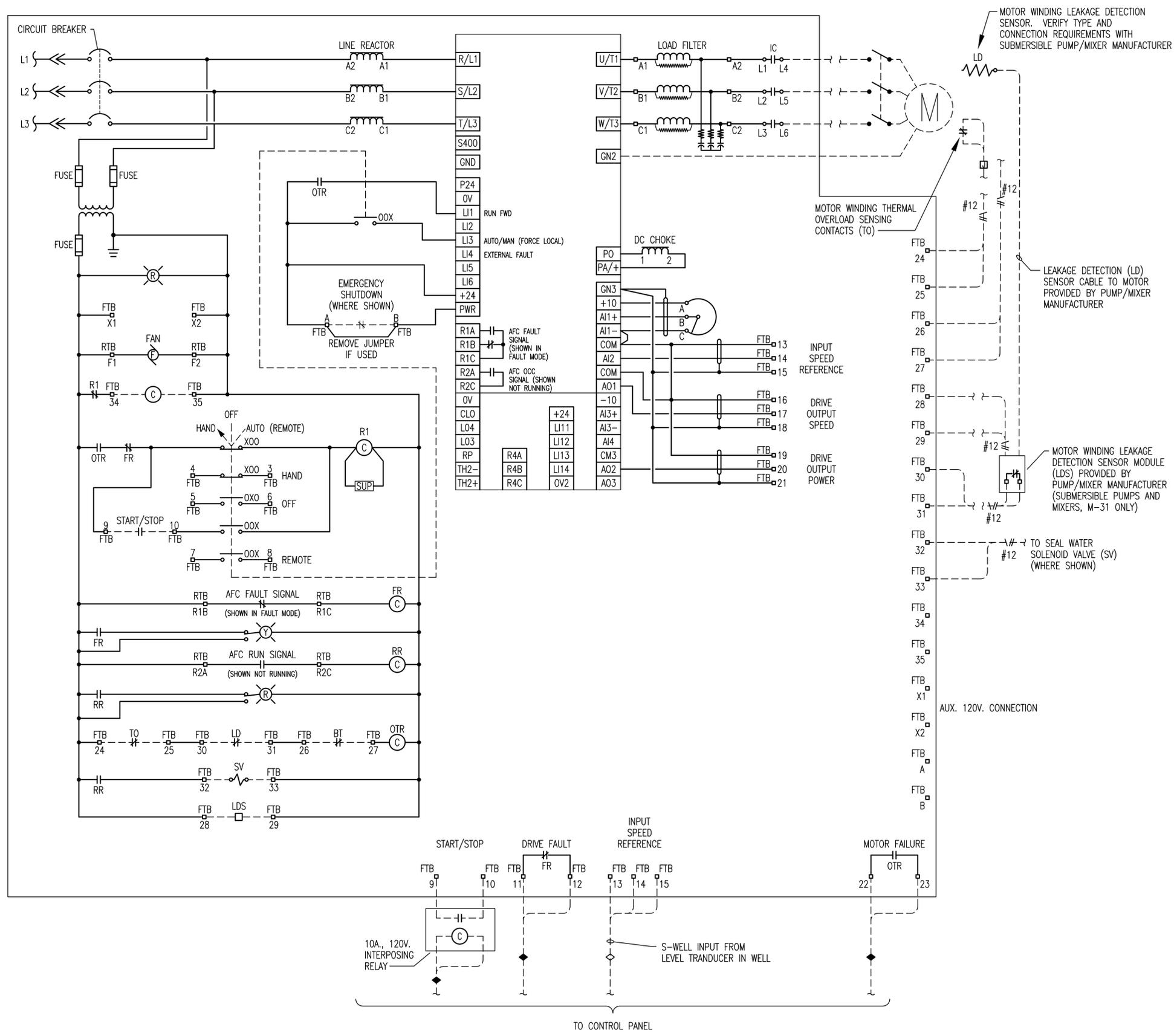
SYMBOL	DESCRIPTION
	CONTROL CABLES IN CONDUIT TO CONTROL PANEL
	DISCRETE CONTROL CABLE (# OF PAIRS) IN CONDUIT
	ANALOG CONTROL CABLE (# OF SHIELDED PAIRS) IN CONDUIT
	SERIAL LINK RS-232 IN CONDUIT
	CONTROL TERMINAL BLOCK
	HAND-OFF-AUTO SWITCH
	HAND-OFF-REMOTE SWITCH
	120V. HORN AT 8'-0" AFF.
	120V. FLASHING BEACON LIGHT AT 8'-0" AFF.
	FLOW METER-MAGNETIC. SEE NOTE 1.
	FLOAT SWITCH. SEE NOTE 1.
	LIMIT SWITCH. SEE NOTE 1.
	LEVEL TRANSDUCER. SEE NOTE 1
	MAN DOWN CONTACT 3'-0" AFF.
	PRESSURE SWITCH. SEE NOTE 1.
	PRESSURE TRANSDUCER. SEE NOTE 1
	MOTOR WINDING THERMAL OVERLOAD CONTACT

NOTES:
1. PROVIDE CONTROL J-BOX. CONNECT ALL DEVICES AT THIS LOCATION WITH 1/2" LIQUID-TIGHT FLEX MIN. PROVIDE ADDITIONAL J-BOXES AS REQUIRED. SEE CONTROL PLANS FOR CONTROL CIRCUIT & QUANTITY OF DEVICE CONNECTIONS AT EACH CONTROL J-BOX. CONTROL CABLES SHALL BE LONG ENOUGH AT THESE J-BOXES TO REACH EACH CONTROL DEVICE WITHOUT SPLICING.

No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL ELECTRICAL SCHEDULES JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
		PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2891 www.pec1.com	
Designed by	RDB	Job No.	34-11296
Drawn by	WAN	Date	MAY 2012
			Sht. E.1.1 of 5

NOTES:

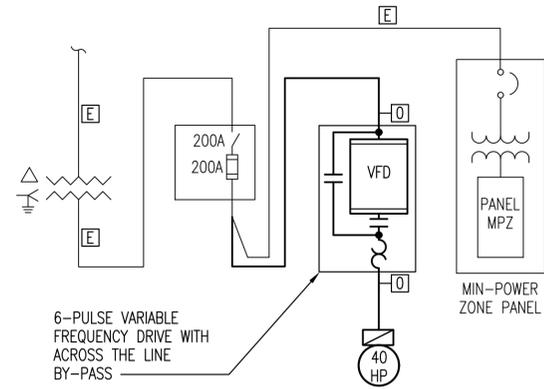
1. WHEN VFD IS LOCATED IN A MOTOR CONTROL CENTER, ALLOW AN ADDITIONAL 3" OF HEIGHT PER VFD FOR THE RELAYS.
2. SYSTEMS INTEGRATOR SHALL PROVIDE INPUT AND OUTPUT ISOLATION MODULES AS REQUIRED FOR ANALOG I/O.
3. ALL VARIABLE FREQUENCY DRIVES SHOWN IN PROCESS EQUIPMENT CONNECTION SCHEDULES SHALL BE PROVIDED WITH THE RELAYS AND EQUIPMENT AS SHOWN IN THIS DIAGRAM.
4. M-31: THE OWNER WILL PRESET THE SPEED FOR THIS LOCATION BASED ON FLOW METER OUTPUT AND THIS WILL ONLY BE DONE MANUALLY. THERE IS NO REQUIREMENT FOR REMOTE CONNECTION OF THE DRIVE TO THE SCADA SYSTEM TO CHANGE THE SPEED.
5. S-WELLS: THE VFD FOR EACH OF THE S-WELL LOCATIONS WILL BE CONNECTED TO THE LEVEL TRANSDUCER IN THE WELL AND THE SPEED OF THE VFD WILL BE BASED ON THE WELL WATER LEVEL. IF THE LEVEL IN THE WELL BEGINS TO DROP, THE PUMP SPEED WILL BE REDUCED TO STABILIZE AS NECESSARY DOWN TO THE MINIMUM PUMP SPEED. IF THE WATER LEVEL CONTINUES TO DROP THE PUMP WILL SHUT DOWN AT A MINIMUM WATER LEVEL IN THE WELL. IF WATER LEVEL DROPS TO A LEVEL REQUIRING PUMP SHUT OFF, THE SCADA SYSTEM WILL RECEIVE A LOCATION FAIL ALARM.



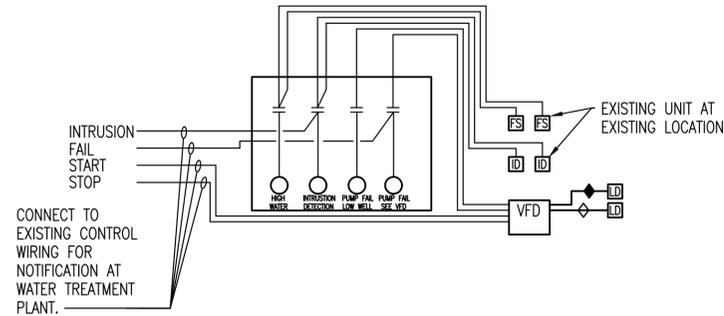
1 VARIABLE FREQUENCY DRIVE WIRING DIAGRAM
 NO SCALE
 VFD FOR EACH S-WELL APPLICATION SHALL BE PROVIDED WITH BY-PASS ACROSS THE LINE STARTER

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No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL ELECTRICAL WIRING DIAGRAMS JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
		PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2691 www.pec1.com	
Designed by	RDB	Job No.	34-11296
Drawn by	WAN	Date	MAY 2012
			Sht. 1.2 of 5



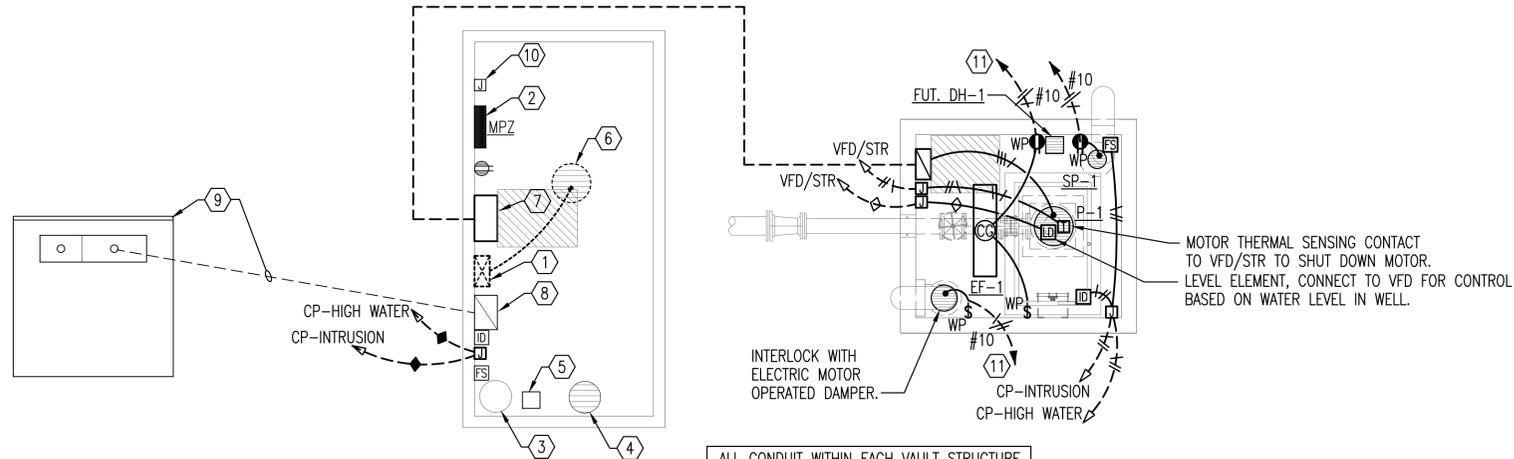
B TYPICAL S-WELL ONE-LINE DIAGRAM



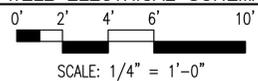
C TYPICAL S-WELL CONTROLS SCHEMATIC

PLAN NOTES:

- BRANCH CIRCUITS ARE INDICATED AS ONE CIRCUIT HOME RUNS WITH INDIVIDUAL NEUTRALS. A MAXIMUM OF THREE CIRCUITS MAY BE GROUPED IN A SINGLE CONDUIT. WHERE MULTIPLE CIRCUITS ARE LOCATED IN THE SAME RACEWAY, JUNCTION BOX OR ENCLOSURE, NEUTRALS SHALL BE MARKED OR LABELED TO INDICATE WHICH CIRCUIT THEY ARE ASSOCIATED WITH. SEE SPECIFICATION SECTION 16120 FOR ADDITIONAL INFORMATION.
- A GROUND CONDUCTOR SIZED PER N.E.C. ARTICLE 250 IS REQUIRED IN ALL CONDUITS.
- FOR CONNECTION REQUIREMENTS TO MECHANICAL UNITS, SEE MECHANICAL EQUIPMENT CONNECTION SCHEDULE.
- ALL PENETRATIONS IN THE RATED WALLS AND CEILINGS SHALL BE SEALED WITH A MATERIAL CAPABLE OF PREVENTING THE PASSAGE OF FLAMES AND HOT GASSES. THE SEALANT SHALL HAVE A T-RATING OF ONE HOUR.
- ALL PIPING, CONDUIT, AND OUTLET BOXES (ELECTRIC, TELEPHONE, COMPUTER, ETC.) IN THE RATED WALLS OR CEILING SHALL BE CONSTRUCTED OF NON-COMBUSTIBLE MATERIAL.
- OUTLET BOXES (ELECTRIC, TELEPHONE, COMPUTER, ETC.) SHALL BE LIMITED TO TWO OUTLET BOXES PER STUD SPACE. OUTLET BOXES ON OPPOSITE SIDES OF THE RATED WALLS SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF 24 INCHES.
- CONDUIT ROUTING SHOWN IS SCHEMATIC ONLY. CONTRACTOR SHALL FIELD VERIFY EXACT ROUTING AND CLEARANCES WITH THE STRUCTURAL PLANS PRIOR TO INSTALLATION.
- CONTROL JUNCTION BOXES SHALL BE SIZED PER THE N.E.C. AS A MINIMUM.
- RUN ALL CONTROL CABLES IN SEPARATE CONDUITS FROM POWER CIRCUITS. RUN SHIELDED CABLES (ANALOG) AND LAN CABLES IN SEPARATE CONDUIT FROM OTHER CONTROL CABLES (DISCRETE).
- SEE CONTROL CABLES CONDUIT SCHEDULE FOR CONTROL CABLE CONDUIT SIZING REQUIREMENTS.
- FURNISH AND INSTALL ALL CONDUIT AND WIRING AS REQUIRED FOR COMPLETE FUNCTIONALITY OF EQUIPMENT AS SPECIFIED AND AS IDENTIFIED BY THE MANUFACTURER. COORDINATE FIELD WIRING REQUIREMENTS WITH EQUIPMENT MANUFACTURER.
- REFER TO CIVIL DRAWINGS AND SECTIONS FOR EXACT EQUIPMENT LOCATIONS.
- LOCATE CONTROLS CONDUIT AND JUNCTION BOXES SO AS NOT TO INTERFERE WITH EQUIPMENT OPERATION, MAINTENANCE, OR REPLACEMENT.
- A CONDUIT FOR ANALOG CABLE SHALL TERMINATE IN EQUIPMENT ENCLOSURE AS CLOSE AS POSSIBLE TO THE TERMINALS. CABLES SHALL NOT PASS NEAR TO CABLES OR EQUIPMENT OPERATING ABOVE 24".
- INTERNAL AND EXTERNAL I/O SHALL BE LANDED ON TERMINAL STRIPS.
- I/O IDENTIFIED ON CONTROL DIAGRAM SHEETS ARE FOR INPUTS & OUTPUTS EXTERNAL TO THE EQUIPMENT CONTROL PANEL. I/O NECESSARY FOR THE COMPLETE FUNCTIONALITY OF THE EQUIPMENT (INTERNAL I/O) SHALL BE PROVIDED BY THE EQUIPMENT MANUFACTURER. THE CONTRACTOR SHALL FURNISH & INSTALL CONDUIT AND WIRE REQUIRED FOR COMPLETE FUNCTIONALITY OF EQUIPMENT AS SPECIFIED AND AS IDENTIFIED BY THE MANUFACTURER. THE CONTRACTOR SHALL COORDINATE WITH EQUIPMENT MANUFACTURER TO DETERMINE FIELD WIRING REQUIREMENTS.



A TYPICAL S-WELL ELECTRICAL SCHEMATIC PLAN



THE ABOVE PLAN IS TYPICAL OF 5 LOCATIONS. REFER TO CIVIL SITE PLAN SHEETS FOR LOCATION OF EXISTING WELL SITE AND NEW WELL SITE.
 REFER TO PC2 FOR WELL S-4.
 REFER TO PC3 FOR WELL S-5
 REFER TO PC4 FOR WELL S-7
 REFER TO PC5 FOR WELL S-8
 REFER TO PC6 FOR WELL S-10
 REFER TO PC7 FOR WELL S-11

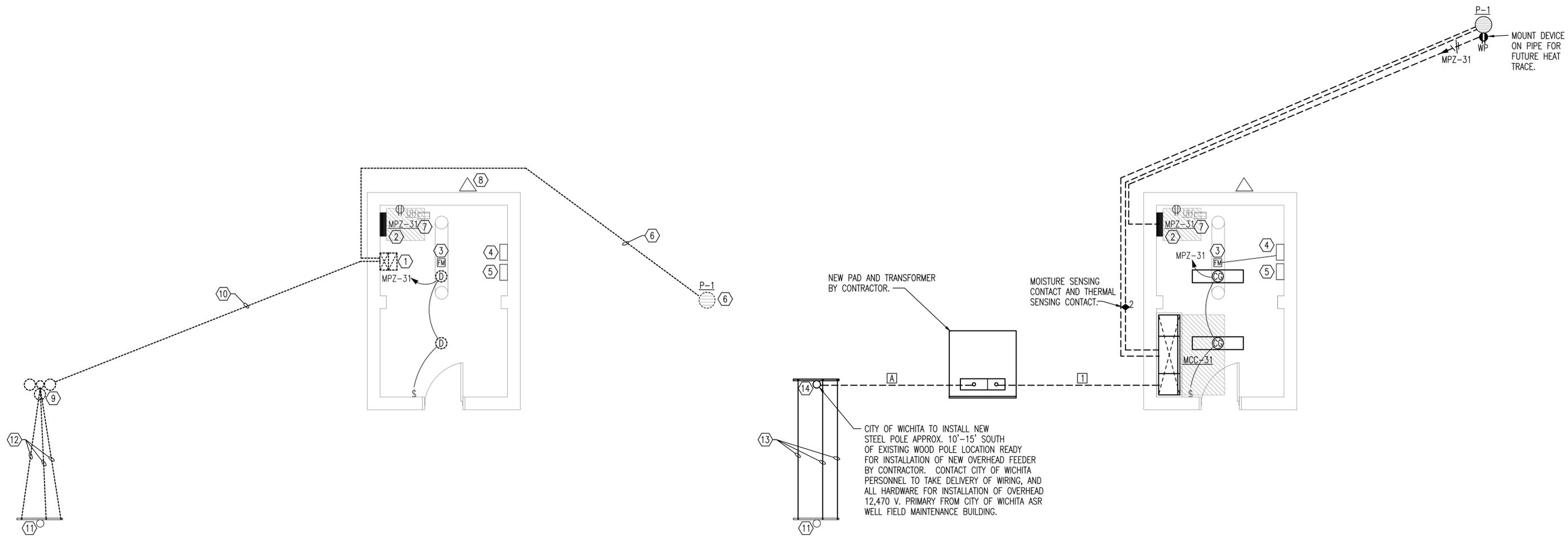
KEY NOTES:

- EXISTING STARTER TO BE REMOVED.
- EXISTING MINI-POWER ZONE FOR 120V. LOADS.
- EXISTING SUMP PUMP TO REMAIN.
- EXISTING EXHAUST FAN TO REMAIN.
- EXISTING DEHUMIDIFIER TO REMAIN.
- EXISTING PUMP TO BE REMOVED. REMOVE FEEDER AND CONTROLS WIRING.
- NEW VARIABLE FREQUENCY DRIVE W/ BYPASS TO OPERATE NEW PUMP IN REMOTE VAULT.
- EXISTING SERVICE DISCONNECT SWITCH TO REMAIN.
- EXISTING UTILITY TRANSFORMER AND SECONDARY FEEDER TO REMAIN.
- EXISTING CONTROL JUNCTION BOX WITH CONTROL WIRING FROM WATER TREATMENT PLANT.
- ROUTE TO EXISTING PANEL MPZ IN THE EXISTING VAULT. PROVIDE 120V. BREAKER AS REQUIRED.

EQUIPMENT CONNECTION SCHEDULE															
PROCESS EQUIPMENT CONNECTIONS															
UNIT DESIG.	UNIT VOLTAGE	LOAD			PANEL DEVICE			DEVICE AT UNIT			REMARKS OR SEE THE INDICATED NOTES BELOW				
		H.P.	FLA	KVA	CIRCUIT NUMBER	BKR./SW./FUSE	STARTER SIZE	BKR./SW./FUSE	STARTER SIZE	OTHER					
P	M-31 PUMP														
1	480/3	40	52.0	43.21	EX. DISC.	200	200	3	200	---	3	VFD 4XSS	1	3 #5/0 AWG THWN; #6 AWG GRD; 2" C.	6 PULSE VFD W/ BY-PASS

① ALL CONNECTIONS AND ELECTRICAL EQUIPMENT LISTED IN SCHEDULE SHALL BE PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. FIELD VERIFY CONNECTION REQUIREMENTS AND EQUIPMENT PROVIDED BY OTHERS PRIOR TO ROUGH-IN.
 ② REFER TO CIVIL DRAWINGS AND SPECIFICATIONS FOR THE REQUIREMENTS ASSOCIATED WITH WIRING AND CONNECTIONS OF INTERLOCKING, INSTRUMENT LOCATIONS, REMOTE CONTROL PANELS AND DEVICES, AND OTHER CONTROLS OF PROCESS EQUIPMENT.

No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL ELECTRICAL PLAN TYPICAL S-WELL SITE JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
		PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2691 www.pec1.com	
Designed by	RDB	Job No.	34-11296
Drawn by	WAN	Date	MAY 2012
			Sht. E2.1 of 5



A M-31 EXISTING ELECTRICAL SCHEMATIC PLAN
 SCALE: 1/4" = 1'-0"

B M-31 NEW ELECTRICAL SCHEMATIC PLAN
 SCALE: 1/4" = 1'-0"

KEY NOTES:

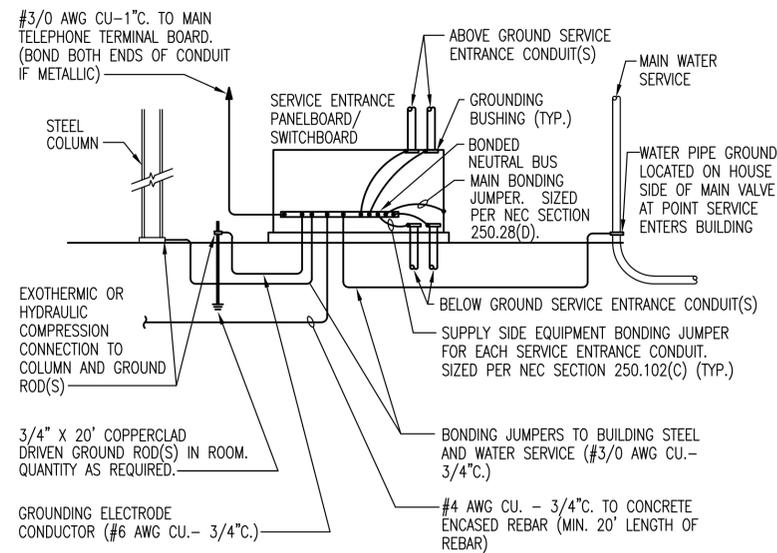
- ① EXISTING COMBINATION STARTER/DISCONNECT TO BE REMOVED.
- ② EXISTING 10KVA MINI-POWER ZONE FOR 120V. LOADS TO REMAIN.
- ③ EXISTING FLOW METER TO REMAIN.
- ④ EXISTING MIDROMETER EA402 FLOW METER READ-OUT TO REMAIN.
- ⑤ EXISTING CONTROLS TO BE REVISED FOR COMMUNICATION WITH NEW ASR SYSTEM.
- ⑥ EXISTING PUMP TO BE REMOVED. REMOVE FEEDER AND CONTROLS WIRING.
- ⑦ EXISTING UNIT HEATER TO REMAIN.
- ⑧ EXISTING ANTENNA TOWER TO REMAIN.
- ⑨ EXISTING CITY OWNED TRANSFORMERS AND WOOD POLE TO BE REMOVED BY CONTRACTOR. CONTRACTOR TO LEAVE POLE AND TRANSFORMER ON THE GROUND AT THIS LOCATION TO BE DISPOSED OF BY CITY PERSONNEL.
- ⑩ EXISTING OVERHEAD 480V. FEEDER TO BE REMOVED BY CONTRACTOR.
- ⑪ EXISTING ASR OVERHEAD ELECTRICAL DISTRIBUTION LINES TO REMAIN.
- ⑫ CONTRACTOR TO REMOVE EXISTING OVERHEAD 12,470V. 3-PHASE FEEDER BETWEEN EXISTING ASR STEEL POLE SYSTEM AND EXISTING WOOD POLE TO BE REMOVED.
- ⑬ CONTRACTOR TO INSTALL NEW 12,470V 3-PHASE FEEDER FROM EXISTING ASR SYSTEM TO NEW STEEL POLE. CITY OF WICHITA TO INSTALL NEW STEEL POLE. CITY TO PROVIDE POLE, WIRING, AND ALL HARDWARE TO CONTRACTOR FOR INSTALLATION. CONTRACTOR TO PROVIDE NEW RISER AT NEW POLE FOR PRIMARY TO TRANSFORMER.
- ⑭ CITY OF WICHITA TO INSTALL NEW RISER POLE, CROSS ARM, INSULATORS, AND FUSED SWITCH READY FOR CONTRACTOR TO INSTALL 12,470 V. WIRING FOR SERVICE TO M-31 WELL SITE.

PLAN NOTES:

- 1. BRANCH CIRCUITS ARE INDICATED AS ONE CIRCUIT HOME RUNS WITH INDIVIDUAL NEUTRALS. A MAXIMUM OF THREE CIRCUITS MAY BE GROUPED IN A SINGLE CONDUIT. WHERE MULTIPLE CIRCUITS ARE LOCATED IN THE SAME RACEWAY, JUNCTION BOX OR ENCLOSURE, NEUTRALS SHALL BE MARKED OR LABELED TO INDICATE WHICH CIRCUIT THEY ARE ASSOCIATED WITH. SEE SPECIFICATION SECTION 16120 FOR ADDITIONAL INFORMATION.
- 2. A GROUND CONDUCTOR SIZED PER N.E.C. ARTICLE 250 IS REQUIRED IN ALL CONDUITS.
- 3. FOR CONNECTION REQUIREMENTS TO MECHANICAL UNITS, SEE MECHANICAL EQUIPMENT CONNECTION SCHEDULE.
- 4. ALL PENETRATIONS IN THE RATED WALLS AND CEILINGS SHALL BE SEALED WITH A MATERIAL CAPABLE OF PREVENTING THE PASSAGE OF FLAMES AND HOT GASSES. THE SEALANT SHALL HAVE A T-RATING OF ONE HOUR.
- 5. ALL PIPING, CONDUIT, AND OUTLET BOXES (ELECTRIC, TELEPHONE, COMPUTER, ETC.) IN THE RATED WALLS OR CEILING SHALL BE CONSTRUCTED OF NON-COMBUSTIBLE MATERIAL.
- 6. OUTLET BOXES (ELECTRIC, TELEPHONE, COMPUTER, ETC.) SHALL BE LIMITED TO TWO OUTLET BOXES PER STUD SPACE. OUTLET BOXES ON OPPOSITE SIDES OF THE RATED WALLS SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF 24 INCHES.
- 7. CONDUIT ROUTING SHOWN IS SCHEMATIC ONLY. CONTRACTOR SHALL FIELD VERIFY EXACT ROUTING AND CLEARANCES WITH THE STRUCTURAL PLANS PRIOR TO INSTALLATION.
- 8. CONTROL JUNCTION BOXES SHALL BE SIZED PER THE N.E.C. AS A MINIMUM.
- 9. RUN ALL CONTROL CABLES IN SEPARATE CONDUITS FROM POWER CIRCUITS. RUN SHIELDED CABLES (ANALOG) AND LAN CABLES IN SEPARATE CONDUIT FROM OTHER CONTROL CABLES (DISCRETE).
- 10. SEE CONTROL CABLES CONDUIT SCHEDULE FOR CONTROL CABLE CONDUIT SIZING REQUIREMENTS.
- 11. FURNISH AND INSTALL ALL CONDUIT AND WIRING AS REQUIRED FOR COMPLETE FUNCTIONALITY OF EQUIPMENT AS SPECIFIED AND AS IDENTIFIED BY THE MANUFACTURER. COORDINATE FIELD WIRING REQUIREMENTS WITH EQUIPMENT MANUFACTURER.
- 12. REFER TO CIVIL DRAWINGS AND SECTIONS FOR EXACT EQUIPMENT LOCATIONS.
- 13. LOCATE CONTROLS CONDUIT AND JUNCTION BOXES SO AS NOT TO INTERFERE WITH EQUIPMENT OPERATION, MAINTENANCE, OR REPLACEMENT.
- 14. A CONDUIT FOR ANALOG CABLE SHALL TERMINATE IN EQUIPMENT ENCLOSURE AS CLOSE AS POSSIBLE TO THE TERMINALS. CABLES SHALL NOT PASS NEAR TO CABLES OR EQUIPMENT OPERATING ABOVE 24V.
- 15. INTERNAL AND EXTERNAL I/O SHALL BE LANDED ON TERMINAL STRIPS.
- 16. I/O IDENTIFIED ON CONTROL DIAGRAM SHEETS ARE FOR INPUTS & OUTPUTS EXTERNAL TO THE EQUIPMENT CONTROL PANEL. I/O NECESSARY FOR THE COMPLETE FUNCTIONALITY OF THE EQUIPMENT (INTERNAL I/O) SHALL BE PROVIDED BY THE EQUIPMENT MANUFACTURER. THE CONTRACTOR SHALL FURNISH & INSTALL CONDUIT AND WIRE REQUIRED FOR COMPLETE FUNCTIONALITY OF EQUIPMENT AS SPECIFIED AND AS IDENTIFIED BY THE MANUFACTURER. THE CONTRACTOR SHALL COORDINATE WITH EQUIPMENT MANUFACTURER TO DETERMINE FIELD WIRING REQUIREMENTS.

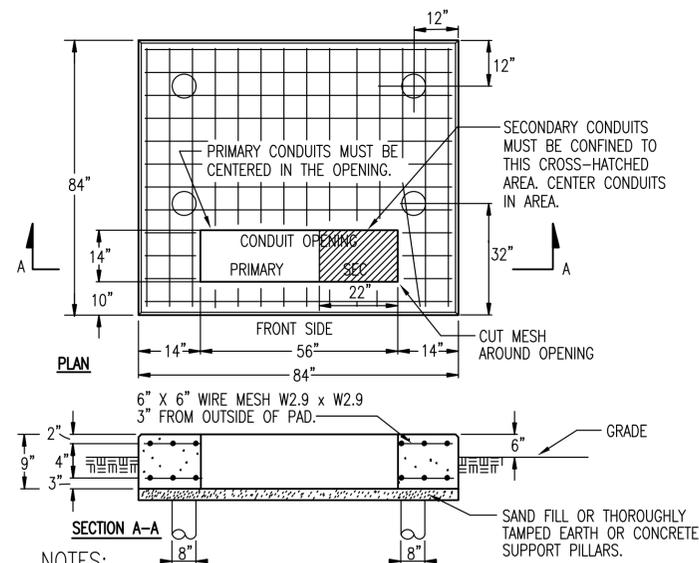
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No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL ELECTRICAL PLAN M-31 WELL SITE JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
		PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2891 www.pec1.com	
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			Sht. E3.1 of 5



NOTE: PROVIDE OTHER GROUNDING CONNECTIONS AS SPECIFIED IN NEC SECTION 250.50.

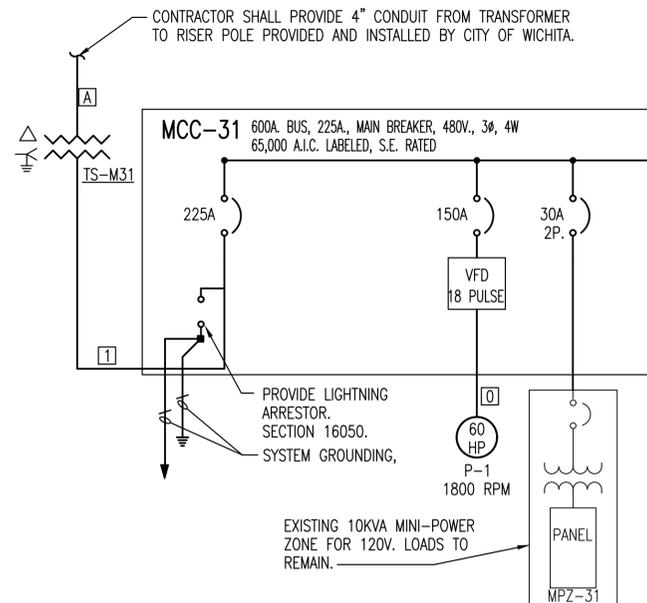
1 SYSTEM GROUNDING DETAIL - PANEL
NO SCALE



NOTES:

1. VERIFY PAD LOCATION, DIMENSIONS & ALL REQUIREMENTS WITH LOCAL UTILITY CO.
2. THE TOP OF THE TRANSFORMER PAD SHALL RECEIVE A SMOOTH TROWEL FINISH. THE CORNERS AND EDGES SHALL BE ROUNDED OR BEVELLED.
3. THE CONCRETE SHALL BE A MINIMUM OF 3,000 LB. MIX.
4. CONTRACTOR SHALL EXTEND FORMS DOWN TO AT LEAST 3\"/>
- 5. TOP OF CONDUITS SHALL BE FLUSH WITH TOP OF PAD.
- 6. THE CONDUIT OPENING SHALL BE FREE AND CLEAR OF CONCRETE.
- 7. PILLARS ARE FORMED BY AUGERING AN 8\"/>

2 TRANSFORMER PAD DETAIL
NO SCALE 75-500KVA



A M-31 1-LINE DIAGRAM
SYSTEM VOLTAGE: 277/480V, 3Ø, 4-WIRE

EQUIPMENT CONNECTION SCHEDULE													
PROCESS EQUIPMENT CONNECTIONS													
UNIT DESIG.	UNIT VOLTAGE	LOAD			PANEL DEVICE		DEVICE AT UNIT			S E T S	FEEDER DESCRIPTION OR SEE THE FEEDER SCHEDULE	REMARKS OR SEE THE INDICATED NOTES BELOW	
		H.P.	FLA	KVA	CIRCUIT NUMBER	BKR./SW./FUSE	BKR./SW./FUSE	P/NEMA I START. AMP/HP	P/NEMA I START. AMP/HP				OTHER
P	M-31 PUMP	480/3	60	77.0	63.99	MCC-31-1	150		3	VFD			1 3 #1/0 AWG THWN; #6 AWG GRD; 2\"/>

1 ALL CONNECTIONS AND ELECTRICAL EQUIPMENT LISTED IN SCHEDULE SHALL BE PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. FIELD VERIFY CONNECTION REQUIREMENTS AND EQUIPMENT PROVIDED BY OTHERS PRIOR TO ROUGH-IN.

2 REFER TO CIVIL DRAWINGS AND SPECIFICATIONS FOR THE REQUIREMENTS ASSOCIATED WITH WIRING AND CONNECTIONS OF INTERLOCKING, INSTRUMENT LOCATIONS, REMOTE CONTROL PANELS AND DEVICES, AND OTHER CONTROLS OF PROCESS EQUIPMENT.

TRANSFORMER SCHEDULE									
TRANSF. DESIG.	KVA RATING	PRIMARY VOLTAGE		SECONDARY VOLTAGE		OIL FILLED	PRIMARY FEEDER (SEE FEEDER SCHEDULE)	SECONDARY FEEDER (SEE FEEDER SCHEDULE)	GROUND WIRE TO NEAREST GROUNDING SOURCE PER N.E.C. ARTICLE 250-30(c)(3)
		480 3Ø, 3W.	12470 3Ø, 3W.	120/208 3Ø, 4W.	277/480 3Ø, 4W.				
TS-M31	150						A	T	

FEEDER SCHEDULE						
DESIG.	CONDUCTORS		GROUND SIZE PER SET	ISOLATED GROUND SIZE	CONDUIT SIZE PER SET	
	SETS	NO. SIZE				
0	SEE EQUIPMENT CONNECTION SCHEDULE					
T	1	4 #4/0 CU	--	----	4"	
A	1	3 #2 15KV 133% INSUL, TS	#3	----	4"	

No.	Revision	By	Date
COW 6 SIMS WELLS & 1 EQUUS BED WELL ELECTRICAL SCHEMATICS AND DETAILS M-31 WELL SITE JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PROJECT NO. 750395 & 750022			
		PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2891 www.pec1.com	
Designed by	RDB	Job No.	34-11296
Drawn by	WAN	Date	MAY 2012
			Sht. E3.2 of 5