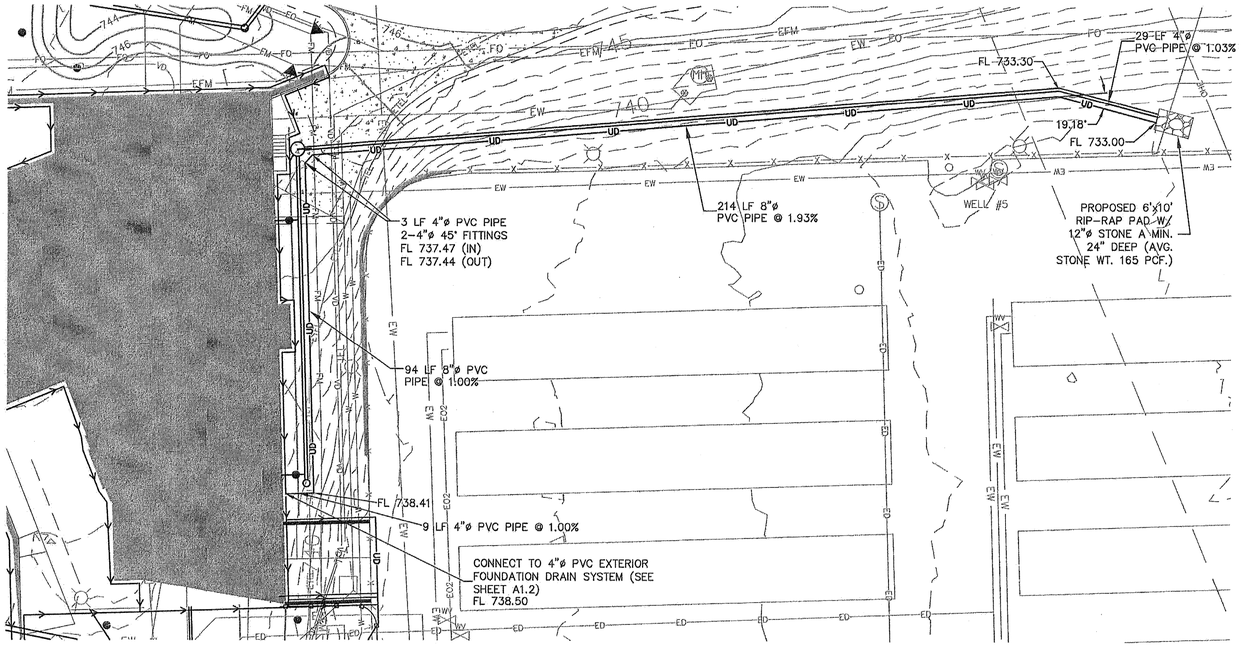
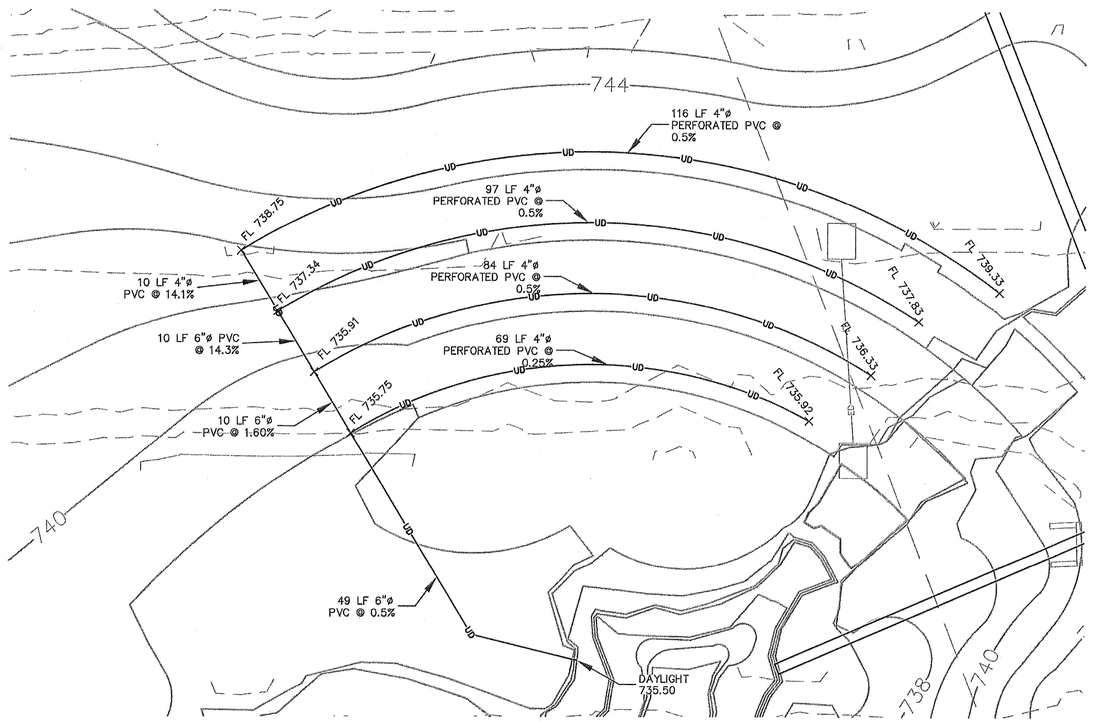


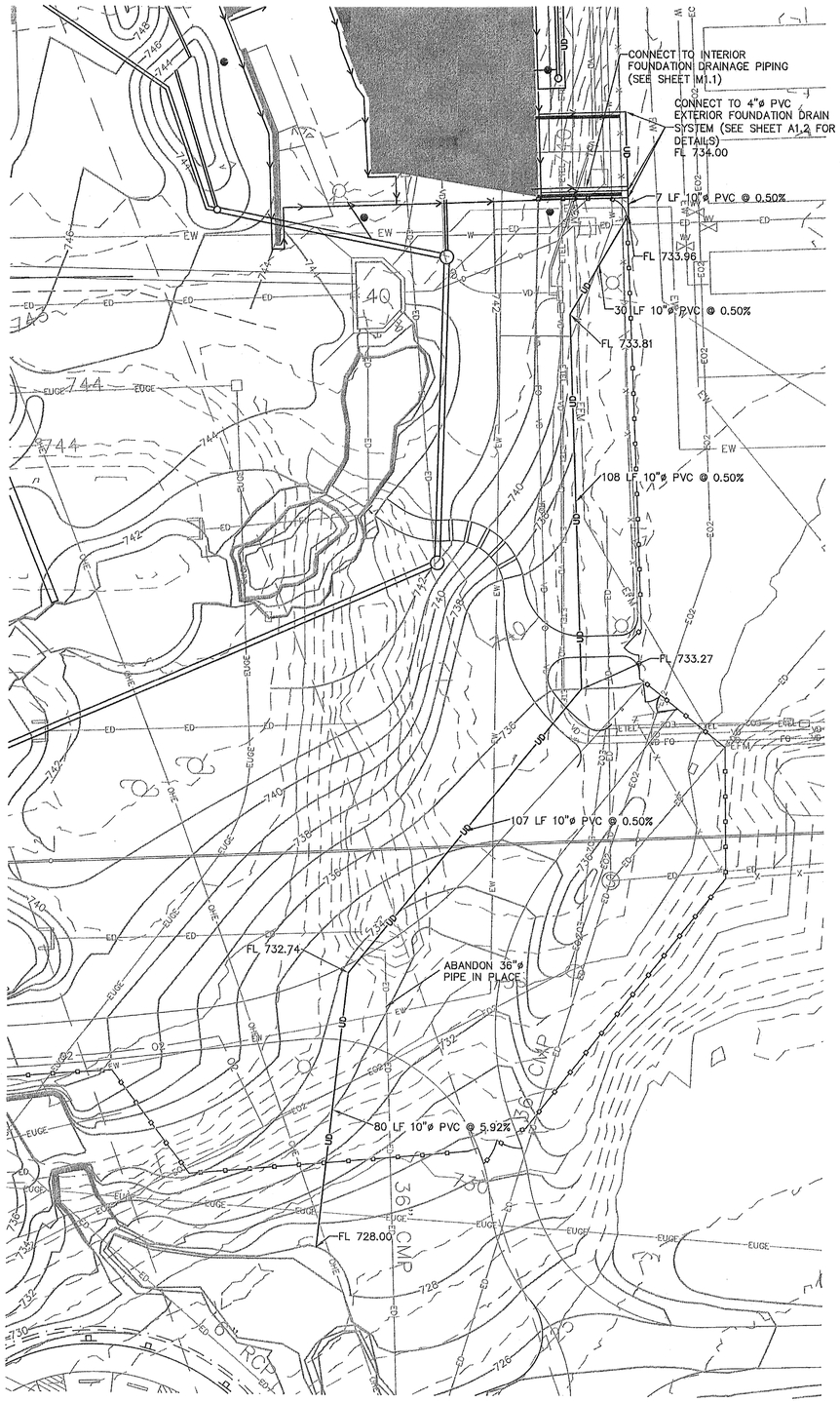
EAST EXTERIOR FOUNDATION UNDERDRAIN OUTFALL

SCALE 1" = 20'



AMPHITHEATER UNDERDRAIN

SCALE 1" = 10'



WEST EXTERIOR FOUNDATION UNDER DRAIN OUTFALL

SCALE 1" = 20'

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E-25734

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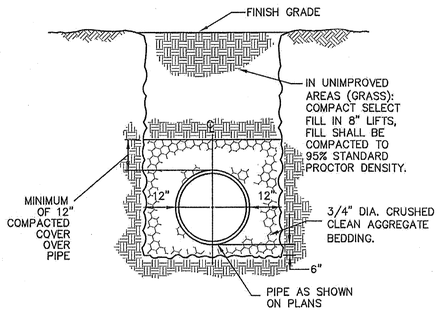
Job:	14023

C5.3

Plotted On: 10/27/16

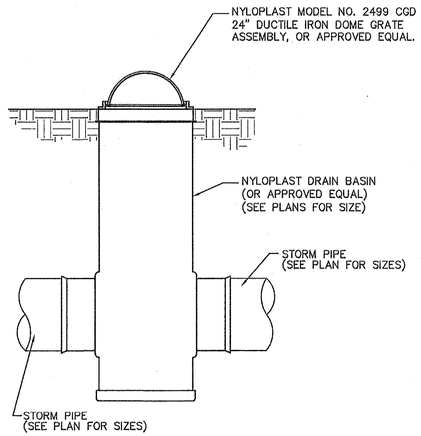
UNDERDRAIN PLAN



STORMWATER PIPE BEDDING DETAIL

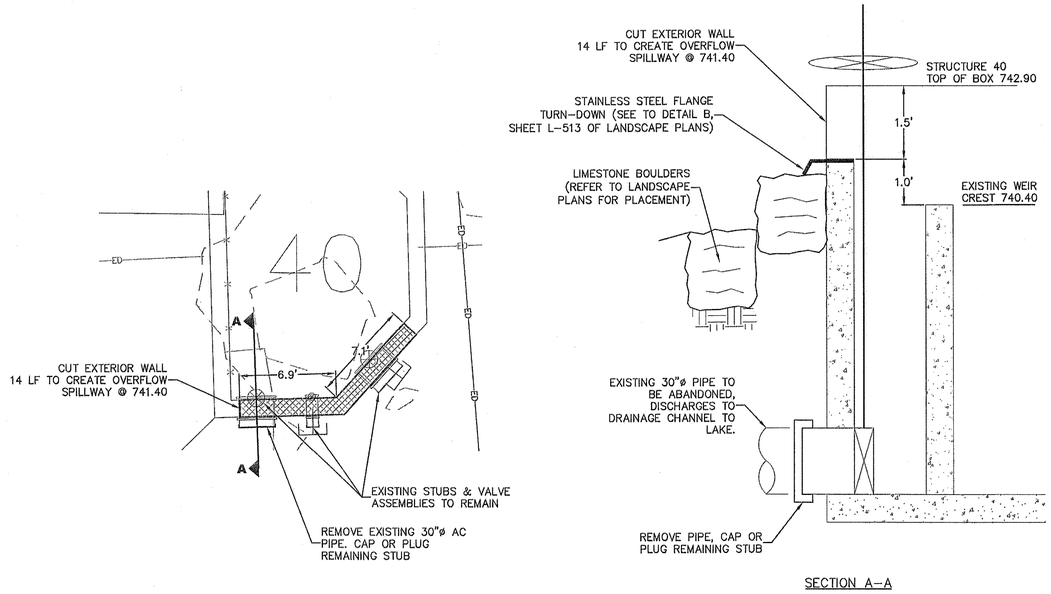
NOT TO SCALE

NOTES:
1. EXTEND GRANULAR BEDDING TO SUBGRADE UNDER IMPROVED SURFACES (I.E. PAVEMENT, SIDEWALKS, BUILDINGS). WHERE PIPE PASSES UNDER RETAINING WALLS, EXTEND BEDDING TO BOTTOM OF WALL FOOTING.
2. ALL CPP STORM PIPE SHALL BE SMOOTH WALL HDPE PIPE EQUIVALENT TO ADS N-12, OR APPROVED EQUAL. (UNLESS OTHERWISE NOTED)
3. ALL CSP STORM PIPE SHALL BE 14 GAUGE PIPE. (UNLESS OTHERWISE NOTED)



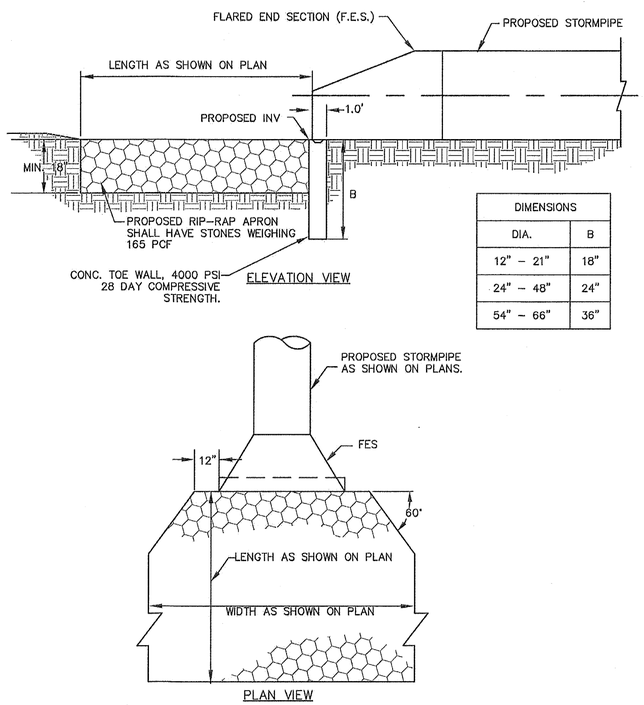
DRAIN BASIN (ELEVATION VIEW)

NOT TO SCALE



STRUCTURE 40 WEIR DETAIL

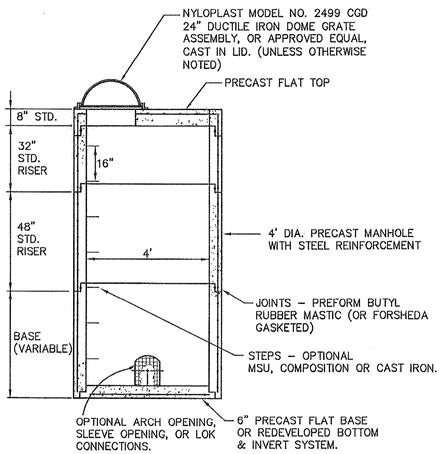
NOT TO SCALE



DIMENSIONS	
DIA.	B
12" – 21"	18"
24" – 48"	24"
54" – 66"	36"

FLARED END SECTION FOR RCP PIPE RIP-RAP APRON DETAIL

NOT TO SCALE



PRECAST 4' DIAMETER STORM MANHOLE DETAIL

NOT TO SCALE

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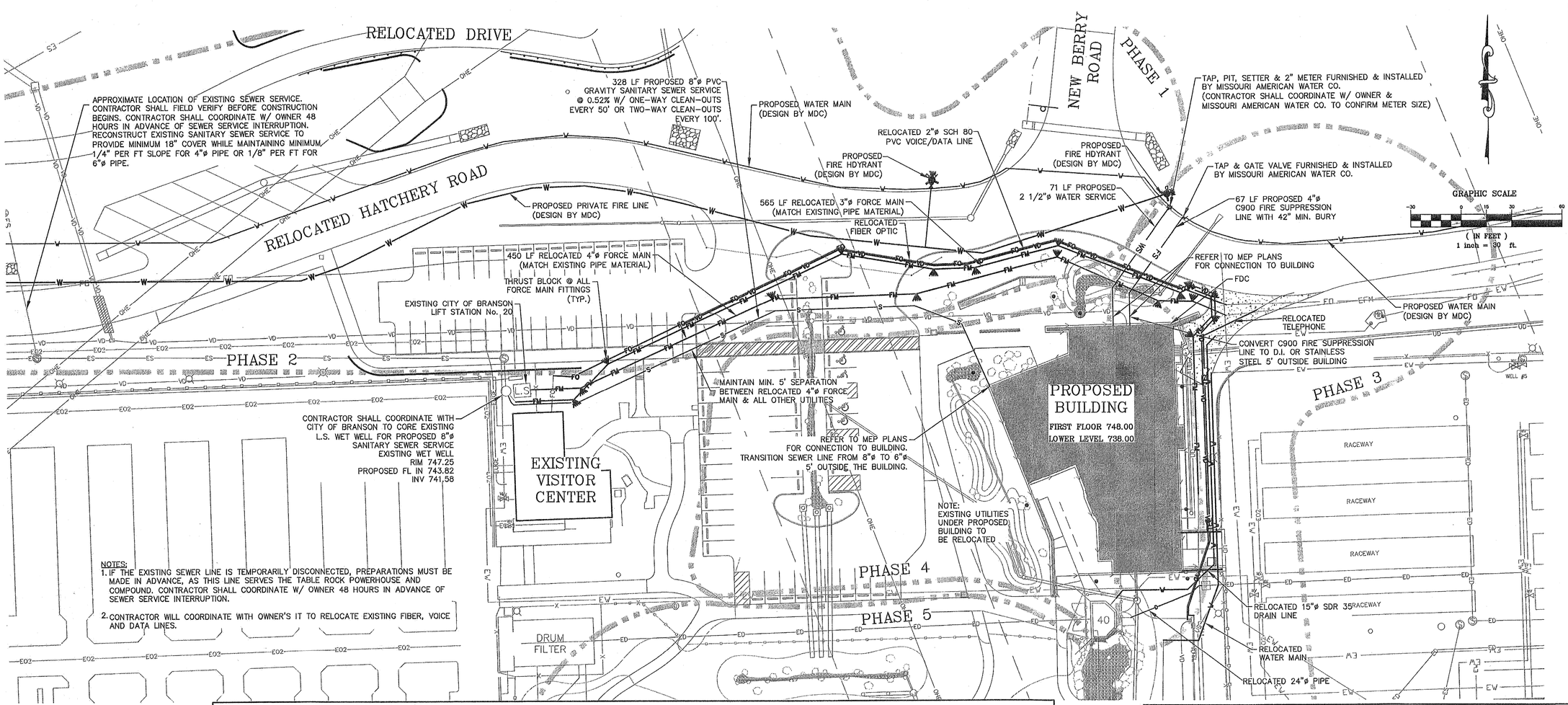
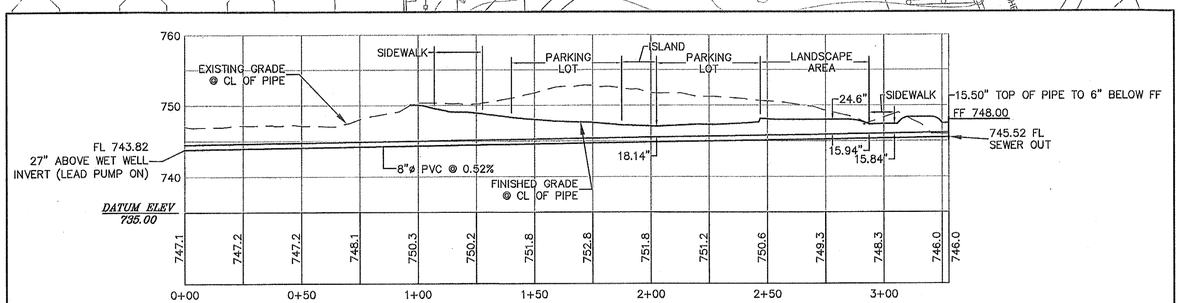
STORMWATER DETAILS 3

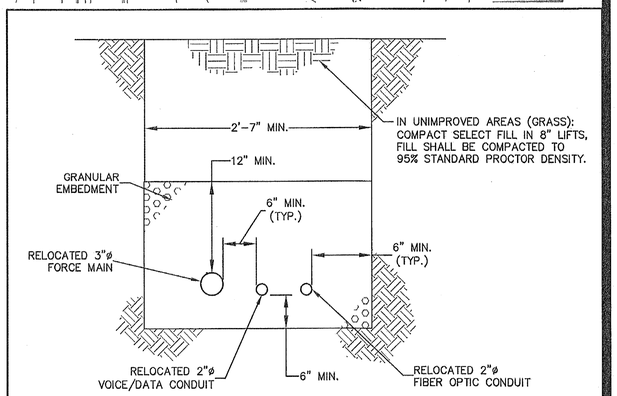
V:\14023 Fish Hatchery\dwg\15425BASE-STORM.dwg, 10/27/2016 3:46:17 PM, 1:1



NOTES:
1. IF THE EXISTING SEWER LINE IS TEMPORARILY DISCONNECTED, PREPARATIONS MUST BE MADE IN ADVANCE, AS THIS LINE SERVES THE TABLE ROCK POWERHOUSE AND COMPOUND. CONTRACTOR SHALL COORDINATE W/ OWNER 48 HOURS IN ADVANCE OF SEWER SERVICE INTERRUPTION.
2. CONTRACTOR WILL COORDINATE WITH OWNER'S IT TO RELOCATE EXISTING FIBER, VOICE AND DATA LINES.



SANITARY SEWER SERVICE PROFILE
SCALE: 1"=30'



NOTE:
EXTEND GRANULAR BEDDING TO SUBGRADE UNDER IMPROVED SURFACES (I.E. PAVEMENT, SIDEWALKS, BUILDINGS). WHERE PIPE PASSES UNDER RETAINING WALLS, EXTEND BEDDING TO BOTTOM OF WALL FOOTING.

UTILITY TRENCH DETAIL
NOT TO SCALE

MISSOURI ONE CALL SYSTEM, INC. 1-800-344-7483 STOP-CALL BEFORE YOU DIG!

LEGEND

VD	EXISTING VOICE/DATA LINE
D	EXISTING DRAIN LINE
LPS	EXISTING LOW PRESSURE SEWER
FO	EXISTING FIBER OPTIC
EFM	EXISTING FORCE MAIN
CBL	EXISTING UNDERGROUND CABLE
ES	EXISTING SEWER
EW	EXISTING WATER
OHE	EXISTING OVERHEAD ELECTRIC
UE	EXISTING UNDERGROUND ELECTRIC
	PROPSOED THRUST BLOCK
	EXISTING GATE VALVE
	EXISTING UTILITY POLE
	EXISTING MANHOLE
	EXISTING FIRE HYDRANT
	EXISTING LIGHT POLE
FO	RELOCATED FIBER OPTIC
FM	RELOCATED FORCE MAIN
VD	RELOCATED VOICE/DATA LINE
W	RELOCATED WATER MAIN
D	RELOCATED DRAIN LINE
WS	PROPOSED WATER SERVICE
S	PROPOSED SEWER SERVICE

ALL EXISTING UTILITIES INDICATED ON THE DRAWINGS ARE ACCORDING TO INFORMATION MADE AVAILABLE TO THE ENGINEER; HOWEVER, ALL UTILITIES ACTUALLY EXISTING MAY NOT BE SHOWN. UTILITIES DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT HIS EXPENSE. CONTACT THE MISSOURI DEPARTMENT OF CONSERVATION ON-SITE REPRESENTATIVE, THE CITY OF BRANSON UTILITY DEPARTMENT AT (417) 243-2731 AND MISSOURI ONE CALL TO REQUEST A LOCATE OF EXISTING UTILITIES PRIOR TO EXCAVATION. SHOULD CONTACT WITH THE MDC ONSITE REPRESENTATIVE BE IN WRITING FOR NOTIFICATION.

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SEAL
STATE OF MISSOURI
WAYNE EBERHOLD
NUMBER E-32741
REGISTERED PROFESSIONAL ENGINEER
WAYNE EBERHOLD, P.E.
E32741

SHEPHERD OF THE HILLS CONSERVATION NATURE CENTER

MISSOURI DEPARTMENT OF CONSERVATION
Hatchery Road
Branson, MO 65616

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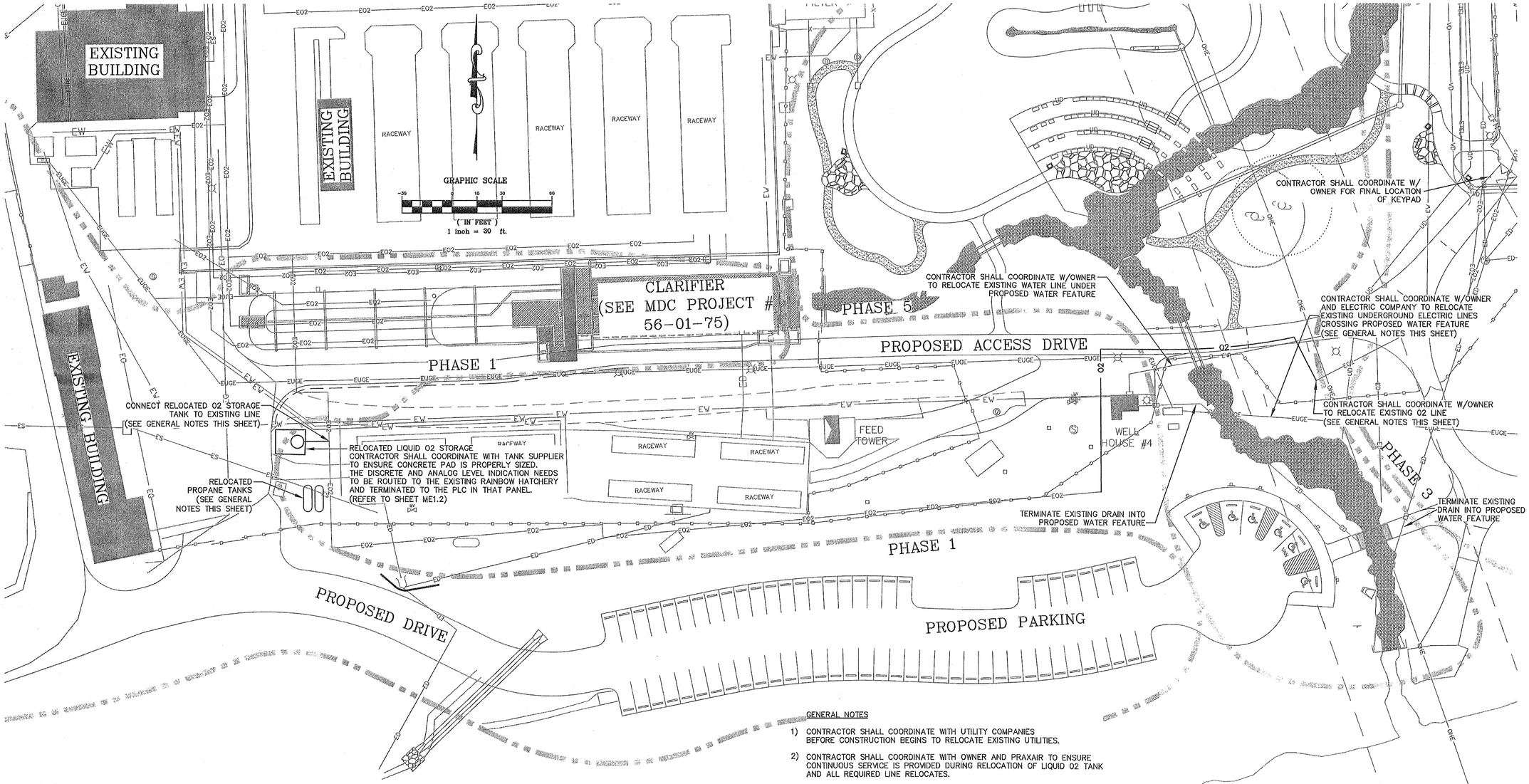
NORTH UTILITY PLAN

N:\15426 Fish Hatchery\dwg\15426-SHEET3.dwg, 12/2/2016 2:42:23 AM, 1:1



ALL EXISTING UTILITIES INDICATED ON THE DRAWINGS ARE ACCORDING TO INFORMATION MADE AVAILABLE TO THE ENGINEER; HOWEVER, ALL UTILITIES ACTUALLY EXISTING MAY NOT BE SHOWN. UTILITIES DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT HIS EXPENSE. CONTACT THE MISSOURI DEPARTMENT OF CONSERVATION ON-SITE REPRESENTATIVE, THE CITY OF BRANSON UTILITY DEPARTMENT AT (417) 243-2731 AND MISSOURI ONE CALL TO REQUEST A LOCATE OF EXISTING UTILITIES PRIOR TO EXCAVATION. SHOULD CONTACT WITH THE MDC ONSITE REPRESENTATIVE BE IN WRITING FOR NOTIFICATION.

GENERAL NOTES

1) CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES BEFORE CONSTRUCTION BEGINS TO RELOCATE EXISTING UTILITIES.

2) CONTRACTOR SHALL COORDINATE WITH OWNER AND PRAXAIR TO ENSURE CONTINUOUS SERVICE IS PROVIDED DURING RELOCATION OF LIQUID O2 TANK AND ALL REQUIRED LINE RELOCATES.

3) CONTRACTOR SHALL COORDINATE WITH OWNER AND PRAXAIR TO ENSURE ALL PIPING REQUIREMENTS ARE MET WHEN CONNECTING RELOCATED TANK TO EXISTING LINE.

4) CONTRACTOR SHALL COORDINATE WITH OWNER AND PRAXAIR TO ENSURE RELOCATED TANK COMPLIES WITH ALL REQUIREMENTS OF NFPA 55.

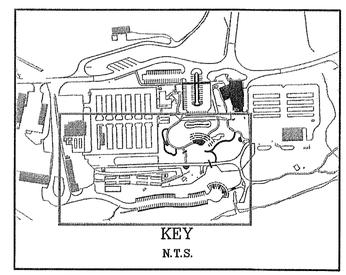
5) CONTRACTOR SHALL COORDINATE WITH OWNER AND ELECTRIC COMPANY TO ENSURE CONTINUOUS SERVICE IS PROVIDED TO DRUM FILTER DURING LINE RELOCATES.

6) CONTRACTOR SHALL COORDINATE WITH OWNER AND PROPANE COMPANY TO RELOCATE PROPANE TANKS.

MISSOURI ONE CALL SYSTEM, INC.
1-800-344-7483
STOP-CALL BEFORE YOU DIG!

LEGEND

VD	EXISTING VOICE/DATA LINE		EXISTING GATE VALVE
D	EXISTING DRAIN LINE		EXISTING UTILITY POLE
LPS	EXISTING LOW PRESSURE SEWER		EXISTING MANHOLE
FO	EXISTING FIBER OPTIC		EXISTING FIRE HYDRANT
FM	EXISTING FORCE MAIN		EXISTING LIGHT POLE
CBL	EXISTING UNDERGROUND CABLE	FO	RELOCATED FIBER OPTIC
ES	EXISTING SEWER	FM	RELOCATED FORCE MAIN
EW	EXISTING WATER	VD	RELOCATED VOICE/DATA LINE
OHE	EXISTING OVERHEAD ELECTRIC	W	RELOCATED WATER MAIN
UE	EXISTING UNDERGROUND ELECTRIC	D	RELOCATED DRAIN LINE



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STATE OF MISSOURI
WAYNE DIEBOLD
NUMBER E-32746
REGISTERED PROFESSIONAL ENGINEER
SEAL
WAYNE DIEBOLD, P.E.
E-32746

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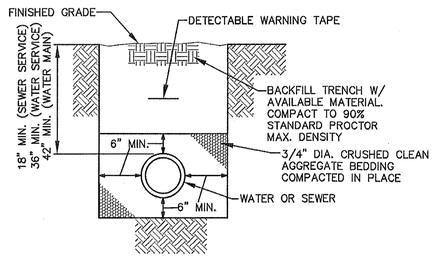
SOUTH UTILITY PLAN

C6.1

Plotted On: 10/27/16

N:\15-425 Fish Hatchery\dwg\15-425-SHEETS.dwg, 10/27/2016 9:22:47 PM, 1:1



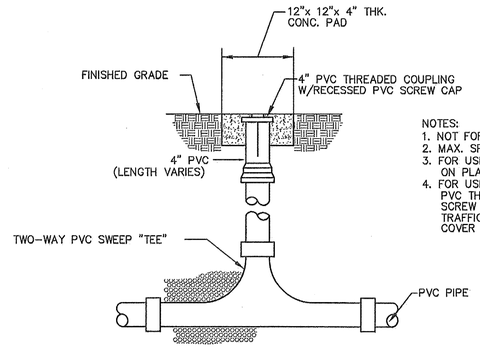
NOTES:

1. EXTEND GRANULAR BEDDING TO SUBGRADE UNDER IMPROVED SURFACES (I.E. PAVEMENT, SIDEWALKS, BUILDINGS). WHERE PIPE PASSES UNDER RETAINING WALLS, EXTEND BEDDING TO BOTTOM OF WALL FOOTING.

2. ALL WATER MAINS TO HAVE A No. 12 SOLID INSULATED COPPER LOCATION WIRE LAID DIRECTLY ON TOP OF PIPE AND CONNECTED TO VALVE BOXES AND FIRE HYDRANTS.

TYPICAL TRENCH DETAIL IN GRASS AREA

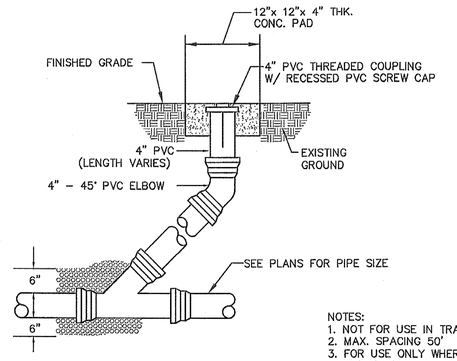
NOT TO SCALE



NOTES:
1. NOT FOR USE IN TRAFFIC AREAS.
2. MAX. SPACING 100'
3. FOR USE ONLY WHERE INDICATED ON PLANS.
4. FOR USE IN TRAFFIC AREAS, PVC THREADED COUPLING AND PVC SCREW CAP SHALL BE REPLACED WITH TRAFFIC DUTY CAST IRON RING AND COVER SET FLUSH WITH CONCRETE PAD.

TWO-WAY SEWER CLEAN-OUT DETAIL

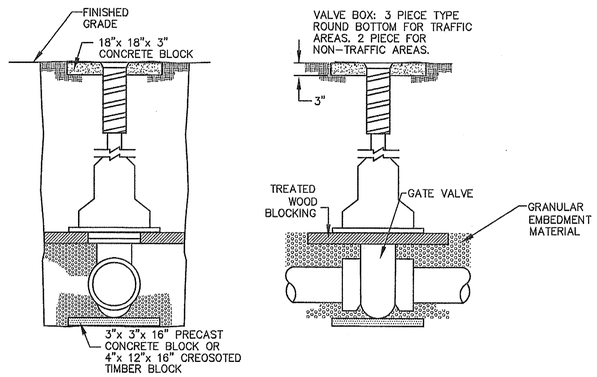
NOT TO SCALE



NOTES:
1. NOT FOR USE IN TRAFFIC AREAS.
2. MAX. SPACING 50'
3. FOR USE ONLY WHERE INDICATED ON PLANS.
4. FOR USE IN TRAFFIC AREAS, PVC THREADED COUPLING AND PVC SCREW CAP SHALL BE REPLACED WITH TRAFFIC DUTY CAST IRON RING AND COVER SET FLUSH WITH CONCRETE PAD.

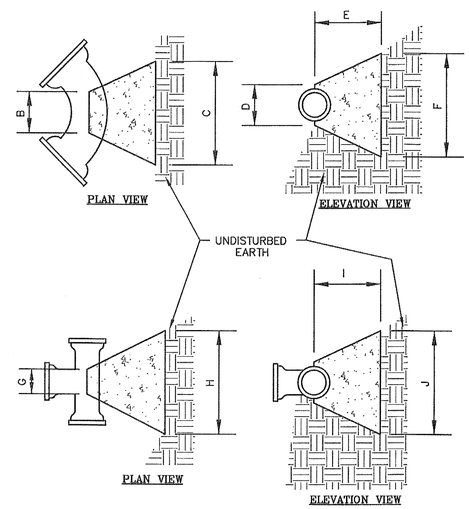
ONE-WAY SEWER CLEAN-OUT DETAIL

NOT TO SCALE



GATE VALVE SETTING DETAIL

NOT TO SCALE

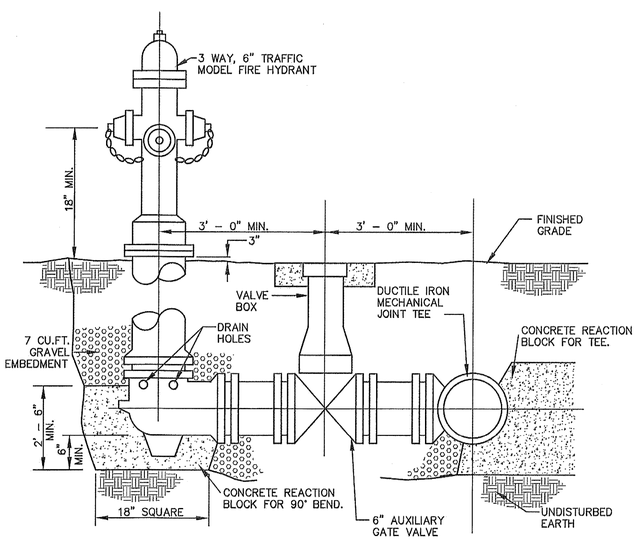


CONCRETE BLOCKING DETAIL

NOT TO SCALE

BENDS	B	C	D	E	F	BENDS	B	C	D	E	F
6" 11 1/4°	12"	15"	12"	24"	12"	6" 45°	12"	30"	12"	24"	14"
6" 22 1/2°	12"	19"	12"	24"	13"	6" 90°	12"	30"	12"	24"	27"
12" 11 1/4°	12"	20"	12"	24"	12"	12" 45°	12"	30"	12"	24"	24"
12" 22 1/2°	12"	22"	12"	24"	17"	12" 90°	12"	312"	12"	24"	36"
12" 11 1/4°	12"	30"	12"	24"	15"	12" 45°	12"	40"	12"	24"	40"
12" 22 1/2°	12"	35"	12"	24"	25"	12" 90°	12"	60"	12"	24"	52"
TEES	G	H	I	J		TEES	G	H	I	J	
6"x 6"x 6"	12"	24"	24"	112"		12"x 12"x 6"	12"	24"	24"	112"	
12"x 12"x 6"	12"	24"	24"	112"		12"x 12"x 12"	12"	24"	24"	24"	
12"x 12"x 12"	12"	24"	24"	24"		12"x 12"x 12"	12"	36"	24"	36"	

* FOR ALL LINES LESS THAN 6" IN DIAMETER, USE THE SAME BLOCKING SIZES AS THOSE LISTED FOR 6" LINES.



NOTES:
1. USE RETAINER GLANDS AND ALL THREAD TO RESTRAIN VALVE TO TEE
2. PIPE BETWEEN GATE VALVE AND TEE MAY BE EXCLUDED IF FLANGED TO FLANGED CONNECTIONS ARE USED AND THE GATE VALVE IS BOLTED TO TEE. RETAINER GLANDS WILL NOT BE REQUIRED IF THIS OPTION IS USED.
3. AVOID PLACING CONCRETE AROUND DRAIN HOLES.
4. FIRE HYDRANTS SHALL BE PAINTED WHITE.

FIRE HYDRANT INSTALLATION DETAIL

NOT TO SCALE

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STATE OF MISSOURI
EDWARD HARGOOD HAYNES
NUMBER E-22744
REGISTERED PROFESSIONAL ENGINEER
MAY 16, 2016
DATE
PROJECT NUMBER
E-22744
EDWARD HARGOOD HAYNES, P.E.
E-22744

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MISSOURI DEPARTMENT OF CONSERVATION
Hatchery Road
Branson, MO 65616

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C6.2

Plotted On: 10/27/16

UTILITY DETAILS

N:\15425 Fish Hatchery\dwg\15425-SHEET3.dwg, 10/27/2016 2:16:00 PM, 1:1

REMOVE EXISTING PROPANE TANK AND REUSE @ NEW WORKSHOP

NOTE 1

REMOVE CONCRETE

REMOVE EXISTING SANITARY SEWER SEPTIC TANK

DISCONNECT EXISTING DOWNSPOUTS (TYP OF 2)

REMOVE EXISTING CONCRETE PAD

DEMOLISH EXISTING BUILDING & REMOVE CONCRETE PAD

REMOVE BUSHES

REMOVE EXISTING PRIVACY FENCE

REMOVE BUSHES

REMOVE EXISTING SANITARY SEWER SEPTIC TANK

REMOVE EXISTING CONCRETE SIDEWALK

REMOVE EXISTING DRAIN LINE TO SEPTIC TANK/MANHOLE

REMOVE EXISTING SEPTIC TANK/MANHOLE

DEMOLISH EXISTING DRIVE

REMOVE EXISTING SEWER LINE WITHIN THE NEW CONSTRUCTION

HATCHERY ROAD

GRAPHIC SCALE

0 10' 20'

1 INCH = 10 FEET

1 FIELD OFFICE DEMOLITION SITE PLAN

SCALE: 1" = 10'

NOTES:

1. THERE IS AN ABANDONED FRENCH DRAIN SYSTEM IN THIS AREA. IT MAY BE ENCOUNTERED DURING THE GRADING OR DRAINAGE EXCAVATION. ANY PIPING OR OTHER DRAIN MATERIAL ENCOUNTERED BY THE CONTRACTOR MUST BE LEGALLY DISPOSED OF.
2. DEMOLISH ALL UTILITIES CONNECTED TO FIELD OFFICE AND DISPOSE OF IN ACCORDANCE WITH STATE AND FEDERAL REGULATIONS.
3. REFER TO VISITOR CENTER PLANS FOR PROPOSED WORK.
4. REFER TO ASBESTOS REPORT PREPARED BY OTHERS FOR ASBESTOS LOCATIONS.

DESIGN AND DEVELOPMENT
MDC
MISSOURI DEPARTMENT OF CONSERVATION
P.O. BOX 180, JEFFERSON CITY, MO 65102
(573) 522-4115 www.mdc.mo.gov

STATE OF MISSOURI
CHITRA B. POUDEL
NUMBER PE-2015007441
PROFESSIONAL ENGINEER
12/07/16

CHITRA B. POUDEL
CIVIL ENGINEER
PE-2015007441

SHEPHERD OF THE HILLS FISH HATCHERY

STORAGE BUILDING IMPROVEMENTS

TANEY COUNTY

MARK	DATE	DESCRIPTION
0	12/6/16	ISSUED

ISSUE

PROJECT NO: 56-01-64

CAD DWG FILE: 56-01-64_C-101.dwg

DRAWN BY: JMT

DESIGNED BY: CBP

CHECKED BY:

SHEET TITLE

FIELD OFFICE DEMOLITION SITE PLAN

C-101

SHEET 3 OF 30

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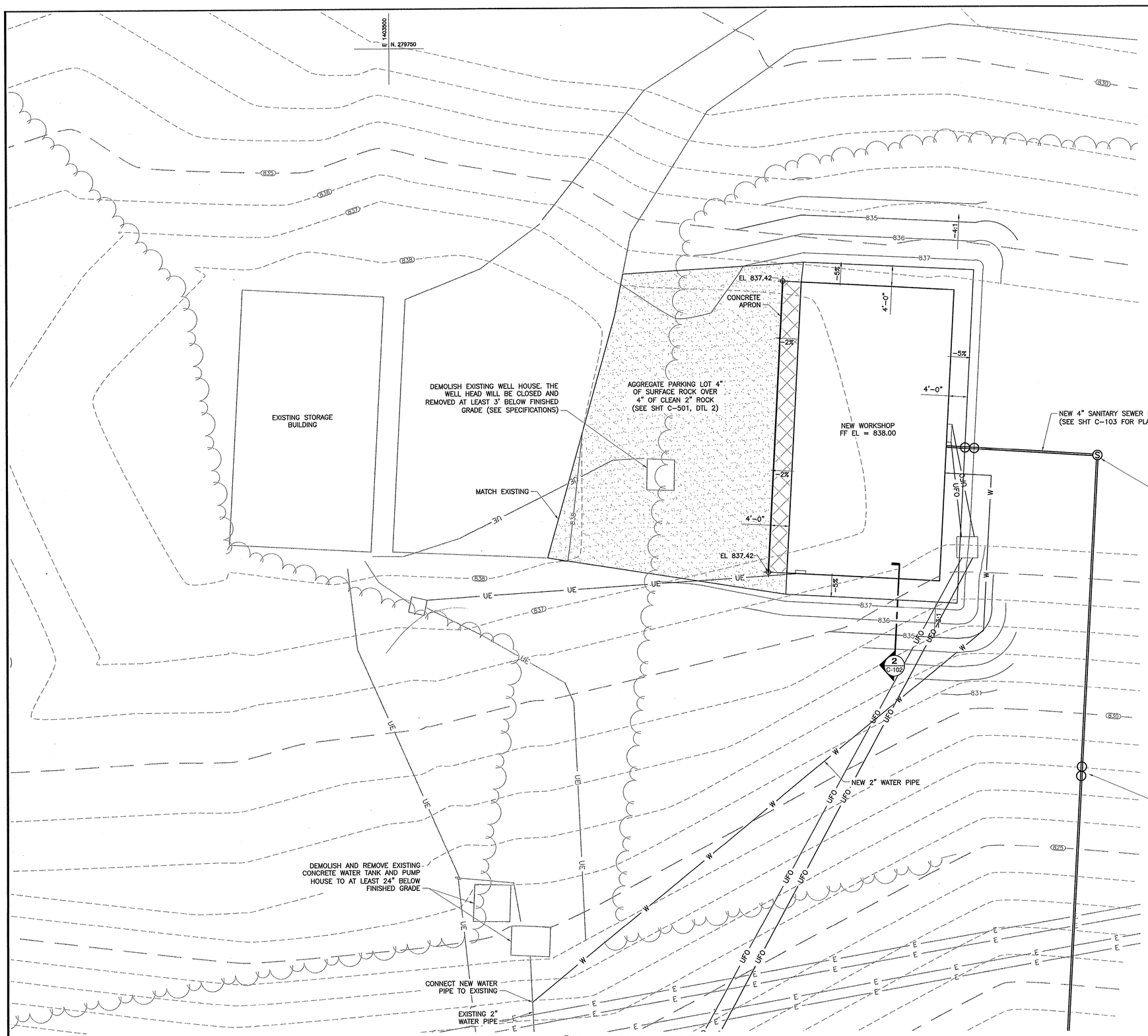
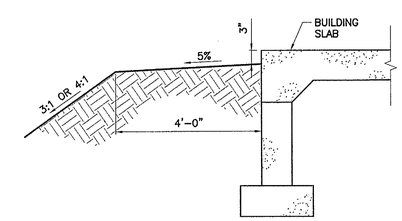


1 **WORKSHOP SITE PLAN**
SCALE: 1" = 10'



2 **WORKSHOP PARTIAL SECTION**
SCALE: NTS

DESIGN AND DEVELOPMENT
MISSOURI DEPARTMENT OF CONSERVATION
P.O. BOX 180, JEFFERSON CITY, MO 65102
(573) 522-4115 www.mdc.mo.gov

STATE OF MISSOURI
CHITRA B. POUDEL
NUMBER PE-2015007441
PROFESSIONAL ENGINEER
12/07/16

CHITRA B. POUDEL
CIVIL ENGINEER
PE-2015007441

SHEPHERD OF THE HILLS FISH HATCHERY

STORAGE BUILDING IMPROVEMENTS

TANEY COUNTY

MARK	DATE	DESCRIPTION
0	12/6/16	ISSUED

ISSUE

PROJECT NO: **56-01-64**
CAD DWG FILE: 56-01-64_C-104.dwg
DRAWN BY: JMT
DESIGNED BY: CBP
CHECKED BY:

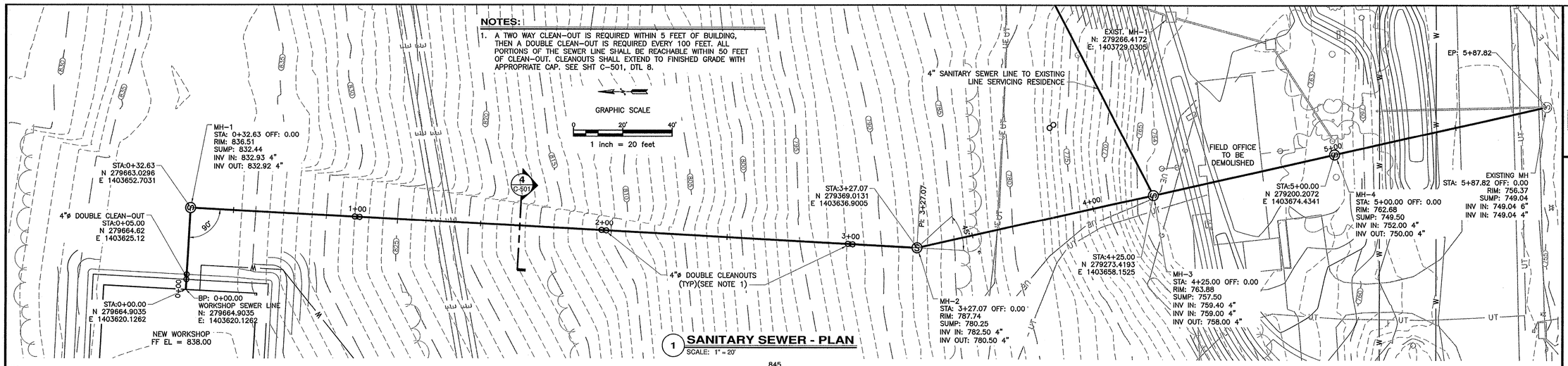
SHEET TITLE
WORKSHOP SITE PLAN

C-102
SHEET 4 OF 30

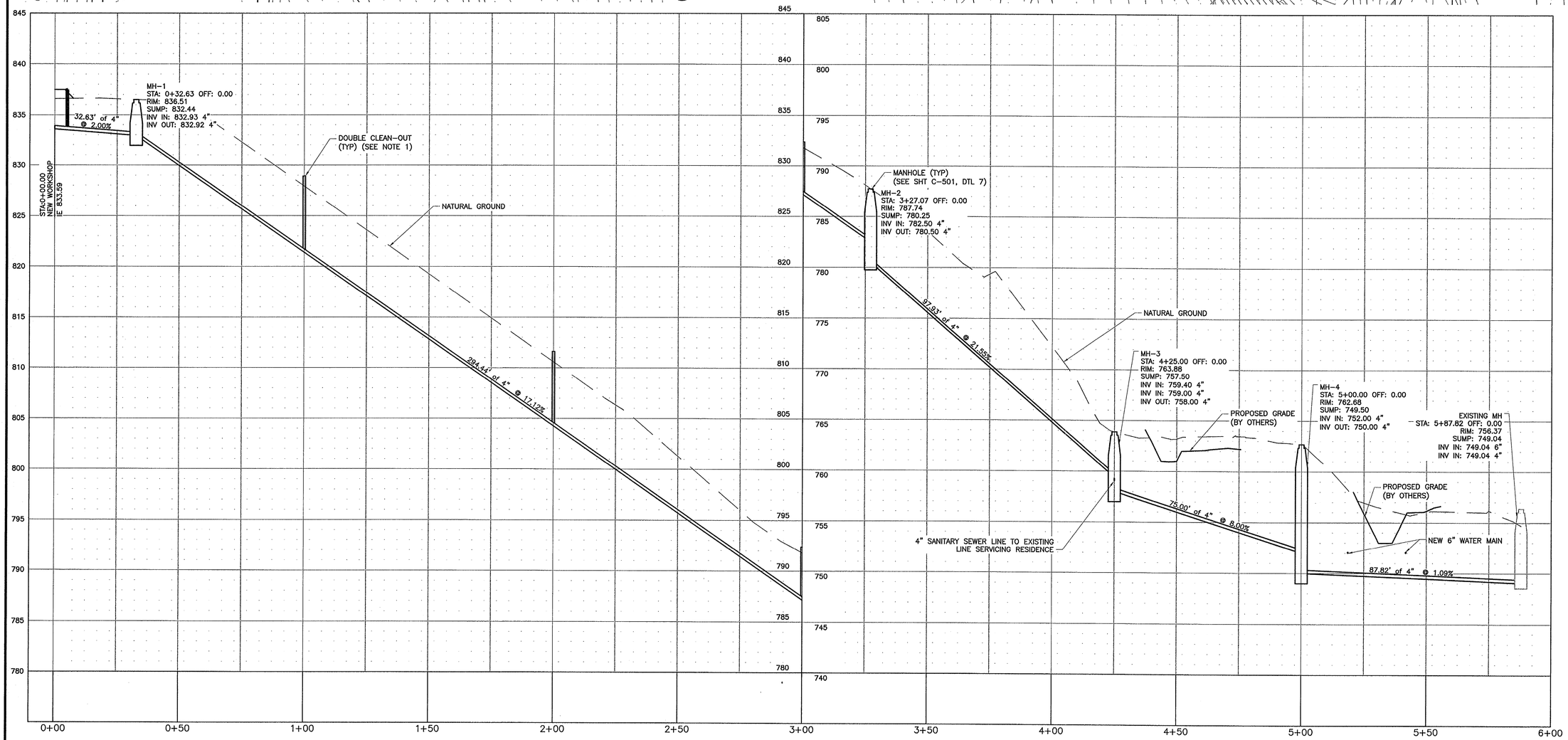
Path and filename: N:\Projects\56-01\56-01-64\Drawings\Civil\56-01-64_C-104.dwg Printed on 12/08/16 9:59 AM by Mike Tuter

NOTES:

1. A TWO WAY CLEAN-OUT IS REQUIRED WITHIN 5 FEET OF BUILDING, THEN A DOUBLE CLEAN-OUT IS REQUIRED EVERY 100 FEET. ALL PORTIONS OF THE SEWER LINE SHALL BE REACHABLE WITHIN 50 FEET OF CLEAN-OUT. CLEANOUTS SHALL EXTEND TO FINISHED GRADE WITH APPROPRIATE CAP. SEE SHT C-501, DTL 8.



1 **SANITARY SEWER - PLAN**
SCALE: 1" = 20'



2 **SANITARY SEWER PROFILE**
SCALE: HOR: 1" = 20', VERT: 1" = 5'

DESIGN AND DEVELOPMENT
MDC
MISSOURI DEPARTMENT OF CONSERVATION
P.O. BOX 180, JEFFERSON CITY, MO 65102
(573) 522-4115 www.mdc.mo.gov

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PE-2015007441

SHEPHERD OF THE HILLS FISH HATCHERY

STORAGE BUILDING IMPROVEMENTS

TANEY COUNTY

MARK	DATE	DESCRIPTION
0	12/6/16	ISSUED

ISSUE

PROJECT NO: **56-01-64**

CAD DWG FILE: 56-01-64_C-105.dwg

DRAWN BY: JMT

DESIGNED BY: CBP

CHECKED BY:

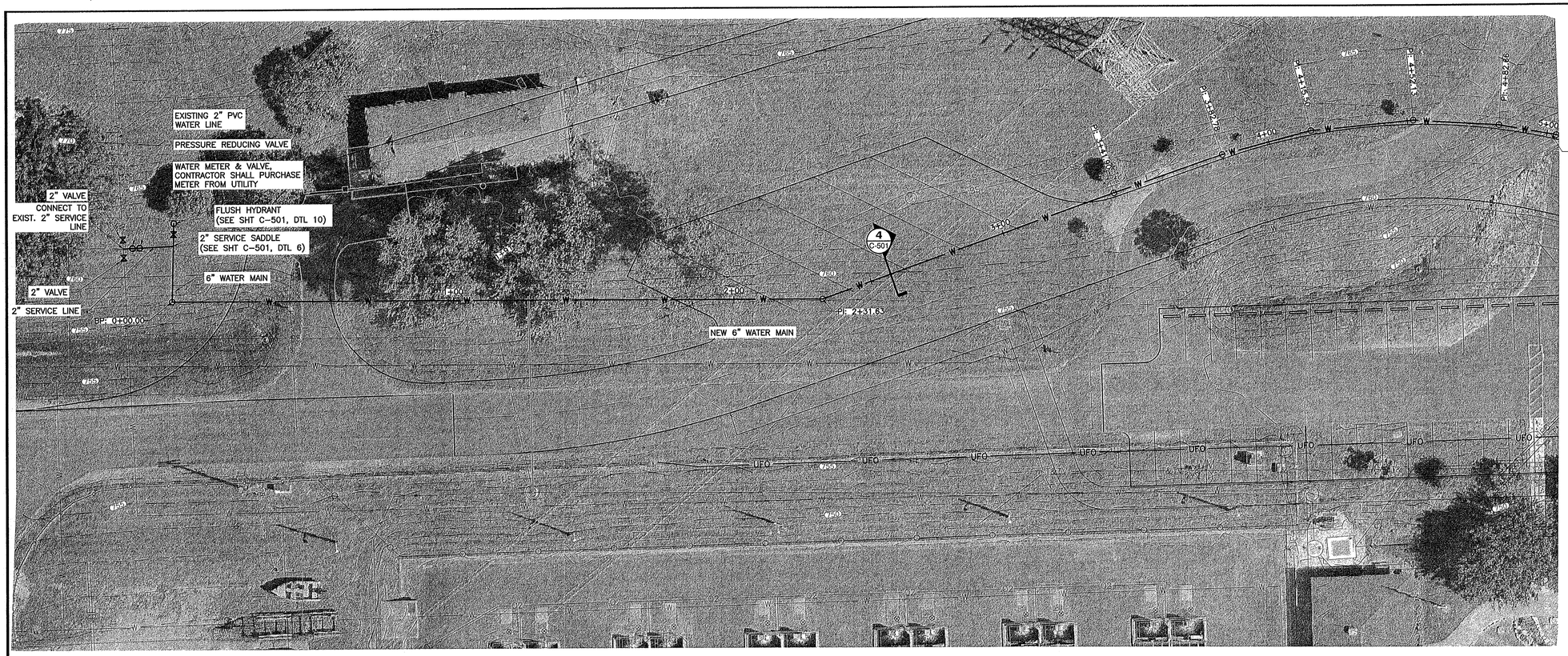
SHEET TITLE

SANITARY SEWER PLAN & PROFILE

C-103

SHEET **5** OF **30**

Path and filename: N:\Projects\56-01\56-01-64\Drawings\Civil\56-01-64_C-105.dwg Printed on 12/06/16 9:59 AM by Mike Tuter



GRAPHIC SCALE

0 20' 40'

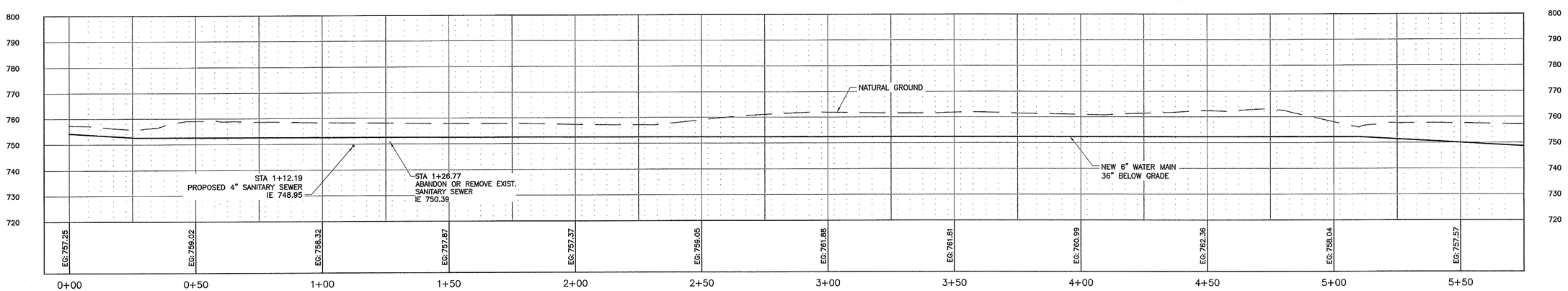
1 INCH = 20 FEET

1 WATERLINE - PLAN

SCALE: 1" = 20'

GENERAL NOTES:

1. EACH VALVE, METER AND PRESSURE RELIEF VALVE SHALL BE IN ITS OWN METER BOX OR VALVE BOX UNLESS APPROVED BY THE PROJECT ENGINEER.
2. ALL MATERIALS INCLUDING PIPE, FITTINGS, METER, VALVE BOXES, AND VALVES SHALL CONFORM TO THE LATEST STANDARDS ISSUED BY THE AWWA AND ANSI/NSF, AND BE ACCEPTABLE TO MISSOURI DNR AND TO AMERICAN WATER UTILITY.
3. ALL PIPE SHALL BE PRESSURE CLASS 200 PVC C900 PRESSURE PIPE WITH PUSH ON GASKETS.
4. ALL PIPE SHALL BE INSTALLED WITH MEGALUGS AT EVERY JOINT.
5. ALL FITTINGS SHALL BE RESTRAINED TYPE DUCTILE IRON.
6. PIPE DEFLECTIONS SHALL BE PER MANUFACTURERS RECOMMENDATIONS.
7. SEE SHEET C-501 DETAIL 4 FOR PIPE TRENCH BEDDING DETAILS.
8. THE PIPE FLOWLINE ELEVATIONS SHOWN ON THE PROFILE ARE USED FOR ESTIMATING ROCK QUANTITY. THE ACTUAL PROFILE WILL BE FIELD DETERMINED BY THE CONTRACTOR AND SHALL MEET THE CONTRACT SPECIFICATIONS AND DNR REQUIREMENTS FOR DOMESTIC WATER, AND GENERALLY FOLLOW THE LAY OF THE LAND.
9. ROCK QUANTITIES FOR WATER LINE TRENCHING WILL BE FIELD MEASURED AND PAID FOR ACCORDING TO THE SPECIFICATIONS. ALL OTHER EXCAVATION ON THE PROJECT IS UNCLASSIFIED.
10. THE MINIMUM COVER REQUIREMENT TO THE TOP OF THE WATER LINE SHALL BE 36" UNLESS SHOWN OTHERWISE OR UNLESS OTHERWISE APPROVED BY PROJECT ENGINEER.



2 WATERLINE - PROFILE

SCALE: 1" = 20'

DESIGN AND DEVELOPMENT
MISSOURI DEPARTMENT OF CONSERVATION
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SHEPHERD OF THE HILLS FISH HATCHERY

STORAGE BUILDING IMPROVEMENTS

TANEY COUNTY

MARK	DATE	DESCRIPTION
0	12/6/16	ISSUED

ISSUE

PROJECT NO: 56-01-64

CAD DWG FILE: 56-01-64_C-106.dwg

DRAWN BY: JMT

DESIGNED BY: CBP

CHECKED BY:

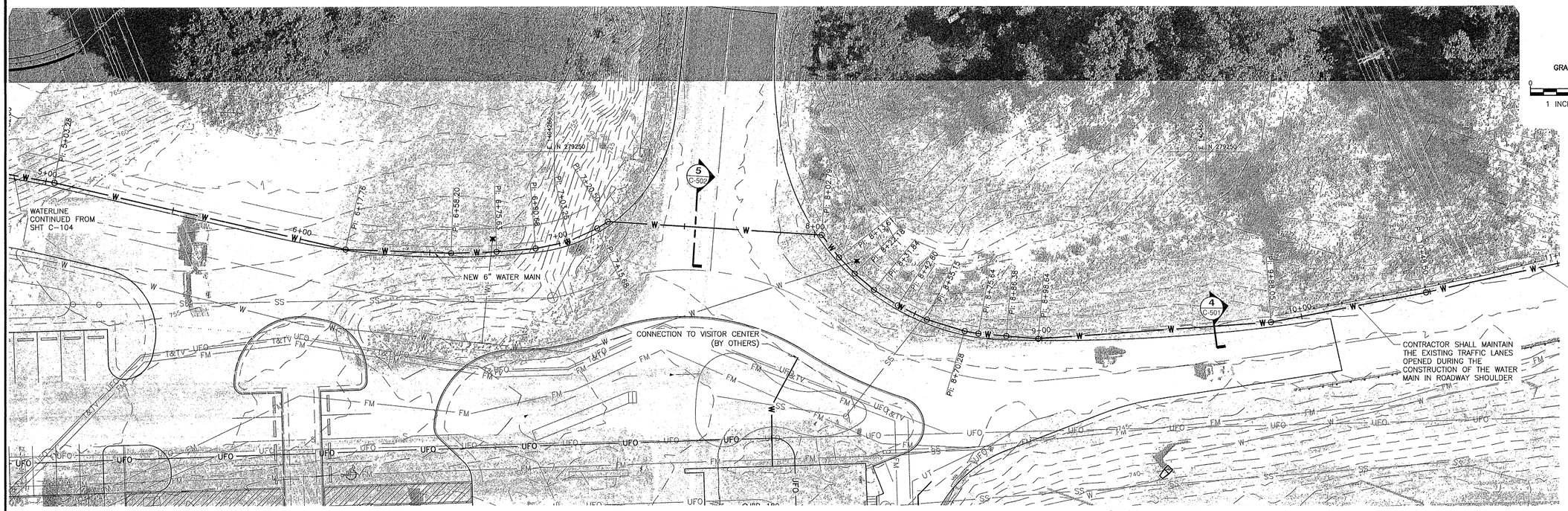
SHEET TITLE

WATERLINE PLAN & PROFILE

C-104

SHEET 6 OF 30

Path and filename: N:\Projects\56-01\56-01-64\Drawings\Civil\56-01-64_C-106.dwg Printed on 12/06/16 11:22 AM by Jack Quade



1 **WATERLINE - PLAN**
SCALE: 1" = 20'

GRAPHIC SCALE
0 20' 40'
1 INCH = 20 FEET

GENERAL NOTES:

1. EACH VALVE, METER AND PRESSURE RELIEF VALVE SHALL BE IN ITS OWN METER BOX OR VALVE BOX UNLESS APPROVED BY THE PROJECT ENGINEER.
2. ALL MATERIALS INCLUDING PIPE, FITTINGS, METER, VALVE BOXES, AND VALVES SHALL CONFORM TO THE LATEST STANDARDS ISSUED BY THE AWWA AND ANSI/NSF, AND BE ACCEPTABLE TO MISSOURI DNR AND TO AMERICAN WATER UTILITY.
3. ALL PIPE SHALL BE PRESSURE CLASS 200 PVC C900 PRESSURE PIPE WITH PUSH ON GASKETS.
4. ALL PIPE SHALL BE INSTALLED WITH MEGALUGS AT EVERY JOINT.
5. ALL FITTINGS SHALL BE RESTRAINED TYPE AND SHALL MEET THE LATEST APPLICABLE ANSI/AWWA STANDARDS.
6. PIPE DEFLECTIONS SHALL BE PER MANUFACTURERS RECOMMENDATIONS.
7. SEE SHEET C-501 DETAIL 4 FOR PIPE TRENCH BEDDING DETAILS.
8. THE PIPE FLOWLINE ELEVATIONS SHOWN ON THE PROFILE ARE USED FOR ESTIMATING ROCK QUANTITY. THE ACTUAL PROFILE WILL BE FIELD DETERMINED BY THE CONTRACTOR AND SHALL MEET THE CONTRACT SPECIFICATIONS AND DNR REQUIREMENTS FOR DOMESTIC WATER, AND GENERALLY FOLLOW THE LAY OF THE LAND.
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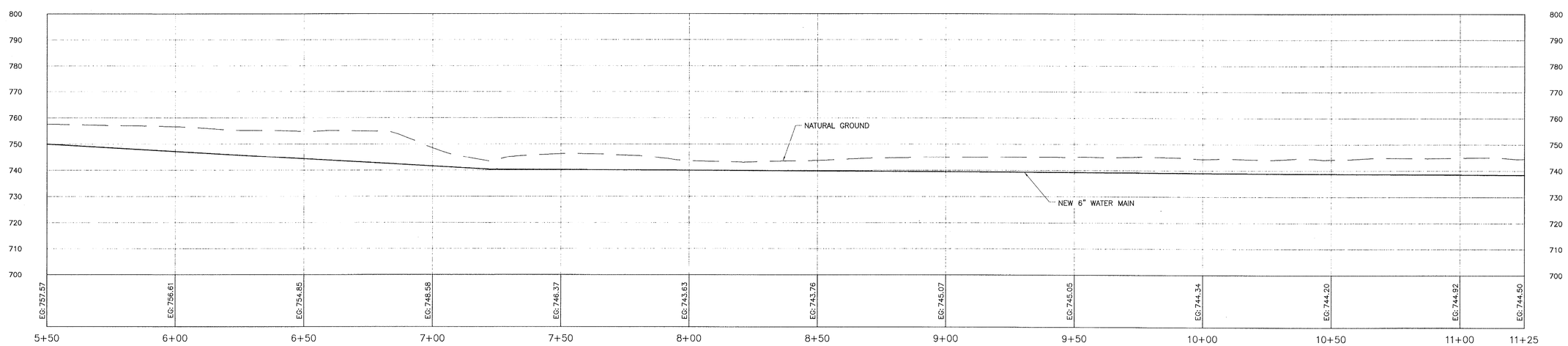
10. THE MINIMUM COVER REQUIREMENT TO THE TOP OF THE WATER LINE SHALL BE 36" UNLESS SHOWN OTHERWISE OR UNLESS OTHERWISE APPROVED BY PROJECT ENGINEER



2 **WATERLINE - PROFILE**
SCALE: 1" = 20'

DESIGN AND DEVELOPMENT
MISSOURI DEPARTMENT OF CONSERVATION
P.O. BOX 180, JEFFERSON CITY, MO 65102
(573) 522-4115 www.mdc.mo.gov

STATE OF MISSOURI
CHITRA B. POUDEL
NUMBER
PE-2015007441
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12/07/16

CHITRA B. POUDEL
CIVIL ENGINEER
PE-2015007441

SHEPHERD OF THE HILLS FISH HATCHERY

STORAGE BUILDING IMPROVEMENTS

TANEY COUNTY

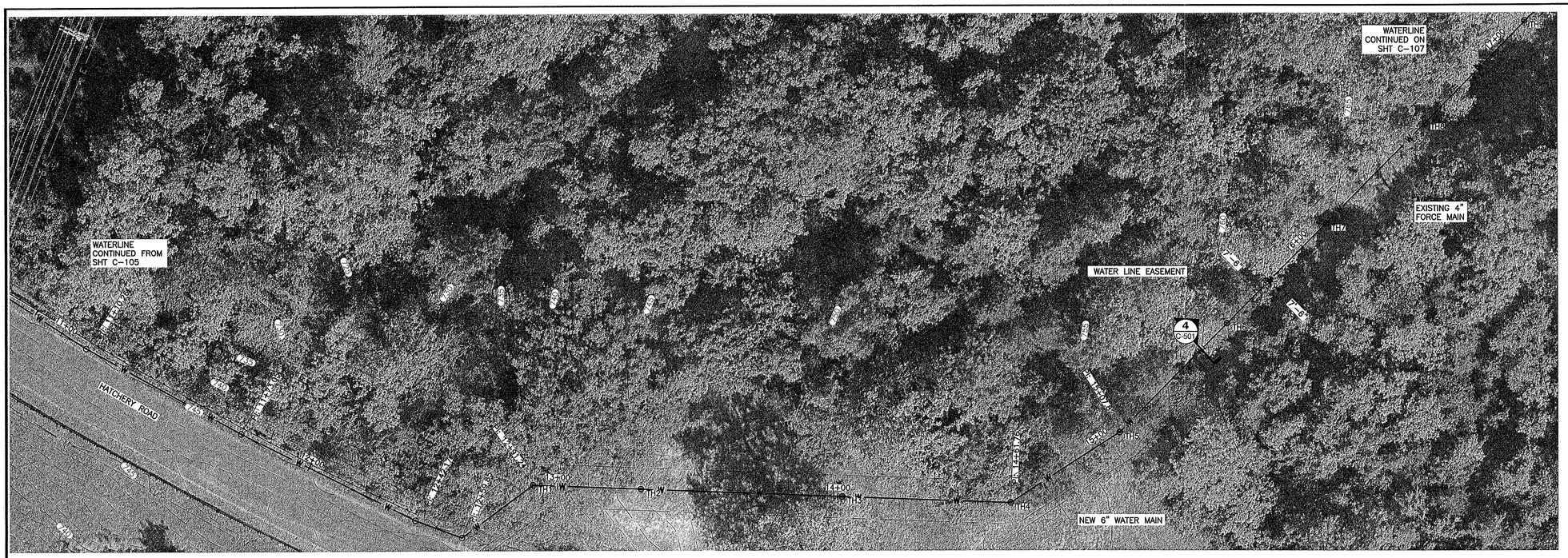
MARK	DATE	DESCRIPTION
0	12/6/16	ISSUED ISSUE

PROJECT NO: **56-01-64**
CAD DWG FILE: 56-01-64_C-107.dwg
DRAWN BY: JMT
DESIGNED BY: CBP
CHECKED BY:
SHEET TITLE

WATERLINE PLAN & PROFILE

C-105
SHEET 7 OF 30

Path and filename: N:\Projects\56-01\56-01-64\Drawings\Civil\56-01-64_C-107.dwg Printed on 12/06/16 11:21 AM by Jack Quade



GRAPHIC SCALE

0 20' 40'

1 INCH = 20 FEET

1 WATERLINE - PLAN

SCALE: 1" = 20'

GENERAL NOTES:

1. EACH VALVE, METER AND PRESSURE RELIEF VALVE SHALL BE IN ITS OWN METER BOX OR VALVE BOX UNLESS APPROVED BY THE PROJECT ENGINEER.
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4. ALL PIPE SHALL BE INSTALLED WITH MEGALUGS AT EVERY JOINT.
5. ALL FITTINGS SHALL BE RESTRAINED TYPE AND SHALL MEET THE LATEST APPLICABLE ANSI/AWWA STANDARDS.
6. PIPE DEFLECTIONS SHALL BE PER MANUFACTURERS RECOMMENDATIONS.
7. SEE SHEET C-501 DETAIL 4 FOR PIPE TRENCH BEDDING DETAILS.
8. THE PIPE FLOWLINE ELEVATIONS SHOWN ON THE PROFILE ARE USED FOR ESTIMATING ROCK QUANTITY. THE ACTUAL PROFILE WILL BE FIELD DETERMINED BY THE CONTRACTOR AND SHALL MEET THE CONTRACT SPECIFICATIONS AND DNR REQUIREMENTS FOR DOMESTIC WATER, AND GENERALLY FOLLOW THE LAY OF THE LAND.
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10. THE MINIMUM COVER REQUIREMENT TO THE TOP OF THE WATER LINE SHALL BE 36" UNLESS SHOWN OTHERWISE OR UNLESS OTHERWISE APPROVED BY PROJECT ENGINEER

SOIL BORING TABLE

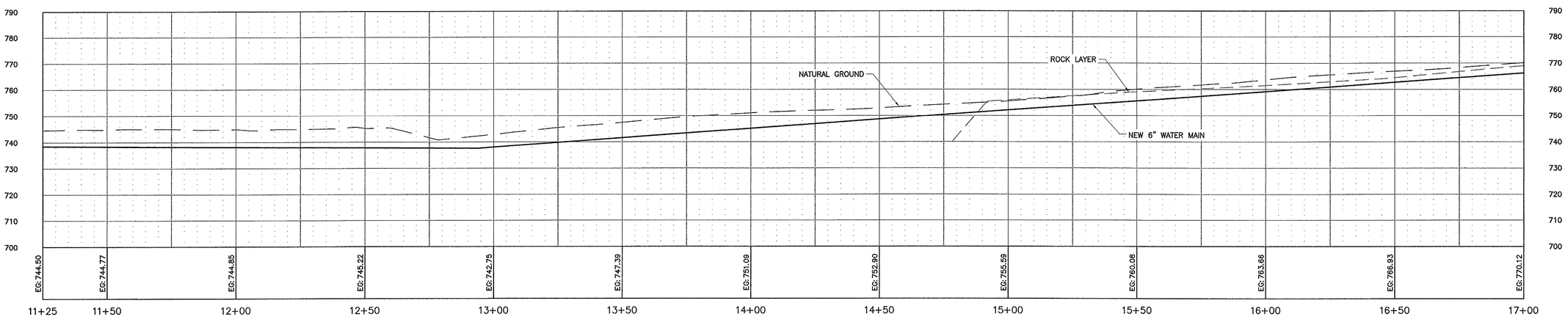
BORING	APPROXIMATE STATIONING	APPROXIMATE DEPTH TO TOP OF DOLOMITE (FT)	COORDINATES
TH1	12+91.24	DEEPER THAN 5.0	N 279288.1610' E 1404791.2970'
TH2	13+29.75	DEEPER THAN 5.0	N 279314.3467' E 1404819.5397'
TH3	14+01.59	DEEPER THAN 5.0	N 279363.1904' E 1404872.2206'
TH4	14+61.76	DEEPER THAN 5.0	N 279404.1010' E 1404916.3450'
TH5	15+07.82	0.7	N 279449.0390' E 1404926.2960'
TH6	15+61.91	2.0	N 279503.1540' E 1404926.3430'
TH7	16+11.75	3.5	N 279552.9990' E 1404926.5990'
TH8	16+61.74	3.4	N 279602.9820' E 1404926.6480'
TH9	17+11.83	2.3	N 279653.0790' E 1404926.5250'

ESTIMATED TRENCH ROCK EXCAVATION

STATION	ROCK AREA (SF)	ROCK VOLUME (CY)
13+79.00	0.00	0.0
15+07.96	9.98	23.8
15+61.96	6.79	16.8
16+11.96	0.69	6.9
16+61.96	0.86	1.4
17+11.96	3.52	4.1
17+61.96	3.69	6.7
18+11.96	0.00	3.4
18+61.96	5.04	4.7
19+28.96	0.00	6.3
21+06.96	0.00	0.0
21+41.96	8.75	5.7
24+94.96	8.75	114.4
TOTAL		194.1

SOIL BORING NOTES:

1. NO ROCK EXCAVATION IS EXPECTED BEFORE STATION 14+48.
2. ROCK DEPTHS AFTER STATION 16+98 ARE ESTIMATED FROM PREVIOUS PROJECT EXCAVATION IN THE AREA.



2 WATERLINE - PROFILE

SCALE: 1" = 20'

DESIGN AND DEVELOPMENT
MISSOURI DEPARTMENT OF CONSERVATION
P.O. BOX 180, JEFFERSON CITY, MO 65102
(573) 522-4115 www.mdc.mo.gov

STATE OF MISSOURI
CHITRA B. POUDEL
NUMBER PE-2015007441
PROFESSIONAL ENGINEER
12/07/16

CHITRA B. POUDEL
CIVIL ENGINEER
PE-2015007441

SHEPHERD OF THE HILLS FISH HATCHERY

STORAGE BUILDING IMPROVEMENTS

TANEY COUNTY

MARK	DATE	DESCRIPTION
0	12/6/16	ISSUED

ISSUE

PROJECT NO: 56-01-64
CAD DWG FILE: 56-01-64_C-108.dwg
DRAWN BY: JMT
DESIGNED BY: CBP
CHECKED BY:

SHEET TITLE

WATERLINE PLAN & PROFILE

C-106

SHEET 8 OF 30

Path and filename: N:\Projects\56-01\56-01-64\Drawings\Civil\56-01-64_C-108.dwg Printed on 12/06/16 11:11 AM by Jack Quade

SOIL BORING TABLE

BORING	APPROXIMATE STATIONING	APPROXIMATE DEPTH TO TOP OF DOLOMITE (FT)	COORDINATES
TH8	16+61.74	3.4	N 279602.9820' E 1404926.6480'
TH9	17+11.83	2.3	N 279653.0790' E 1404926.5250'
TH10	17+61.74	2.6	N 279702.9880' E 1404926.8080'
TH11	18+11.78	DEEPER THAN 5.0	N 279753.0240' E 1404926.8850'
TH12	18+61.68	3.0	N 279802.9270' E 1404927.1570'
TH13	19+11.84	DEEPER THAN 5.0	N 279853.0900' E 1404927.2840'
TH14	19+61.81	DEEPER THAN 5.0	N 279903.0590' E 1404927.3850'
TH15	20+11.81	DEEPER THAN 5.0	N 279951.4150' E 1404915.5960'

ESTIMATED TRENCH ROCK EXCAVATION

STATION	ROCK AREA (SF)	ROCK VOLUME (CY)
13+79.00	0.00	0.0
15+07.96	9.98	23.8
15+61.96	6.79	16.8
16+11.96	0.69	6.9
16+61.96	0.86	1.4
17+11.96	3.52	4.1
17+61.96	3.69	6.7
18+11.96	0.00	3.4
18+61.96	5.04	4.7
19+28.96	0.00	6.3
21+06.96	0.00	0.0
21+41.96	8.75	5.7
24+94.96	8.75	114.4
TOTAL		194.1

SOIL BORING NOTES:

1. NO ROCK EXCAVATION IS EXPECTED BEFORE STATION 14+48.
2. ROCK DEPTHS AFTER SHATION 16+98 ARE ESTIMATED FROM PREVIOUS PROJECT EXCAVATION IN THE AREA.

1 WATERLINE - PLAN

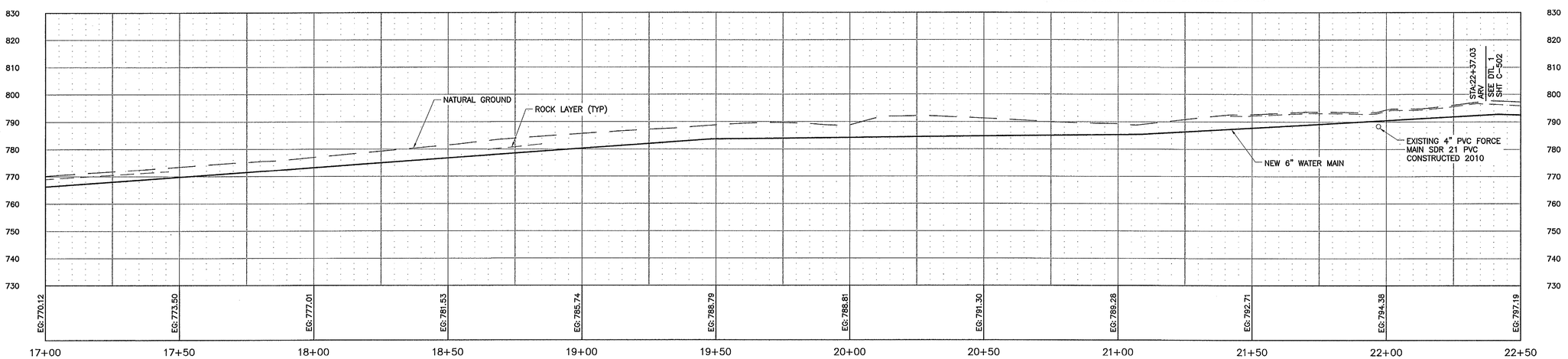
SCALE: 1" = 20'

NOTES:

1. SAWCUT PAVEMENT. DO NOT DAMAGE ROAD.
2. CONTRACTOR SHALL EXPOSE THE EXISTING 4" FORCE MAIN AT THE CROSSING LOCATION TO DETERMINE SEPARATION BETWEEN THE WATER LINE & FORCE MAIN. IF 18" OF SEPARATION IS NOT POSSIBLE THE WATER MAIN SHALL BE ENCASED PER MODNR WATER PUBLICATION 2489 CHAPTER 8. PROVIDE THE MINIMUM COVER OF 30" AT THIS LOCATION TO MAXIMIZE THE SEPARATION BETWEEN WATER MAIN & SEWER FORCE MAIN.

GENERAL NOTES:

1. EACH VALVE, METER AND PRESSURE RELIEF VALVE SHALL BE IN ITS OWN METER BOX OR VALVE BOX UNLESS APPROVED BY THE PROJECT ENGINEER.
2. ALL MATERIALS INCLUDING PIPE, FITTINGS, METER, VALVE BOXES, AND VALVES SHALL CONFORM TO THE LATEST STANDARDS ISSUED BY THE AWWA AND ANSI/NSF, AND BE ACCEPTABLE TO MISSOURI DNR AND TO AMERICAN WATER UTILITY.
3. ALL PIPE SHALL BE PRESSURE CLASS 200 PVC C900 PRESSURE PIPE WITH PUSH ON GASKETS.
4. ALL PIPE SHALL BE INSTALLED WITH MEGALUGS AT EVERY JOINT.
5. ALL FITTINGS SHALL BE RESTRAINED TYPE AND SHALL MEET THE LATEST APPLICABLE ANSI/AWWA STANDARDS.
6. PIPE DEFLECTIONS SHALL BE PER MANUFACTURERS RECOMMENDATIONS.
7. SEE SHEET C-501 DETAIL 4 FOR PIPE TRENCH BEDDING DETAILS.
8. THE PIPE FLOWLINE ELEVATIONS SHOWN ON THE PROFILE ARE USED FOR ESTIMATING ROCK QUANTITY. THE ACTUAL PROFILE WILL BE FIELD DETERMINED BY THE CONTRACTOR AND SHALL MEET THE CONTRACT SPECIFICATIONS AND DNR REQUIREMENTS FOR DOMESTIC WATER, AND GENERALLY FOLLOW THE LAY OF THE LAND.
9. ROCK QUANTITIES FOR WATER LINE TRENCHING WILL BE FIELD MEASURED AND PAID FOR ACCORDING TO THE SPECIFICATIONS. ALL OTHER EXCAVATION ON THE PROJECT IS UNCLASSIFIED.
10. THE MINIMUM COVER REQUIREMENT TO THE TOP OF THE WATER LINE SHALL BE 36" UNLESS SHOWN OTHERWISE OR UNLESS OTHERWISE APPROVED BY PROJECT ENGINEER



2 WATERLINE - PROFILE

SCALE: 1" = 20'

DESIGN AND DEVELOPMENT
MISSOURI DEPARTMENT OF CONSERVATION
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SHEPHERD OF THE HILLS FISH HATCHERY

STORAGE BUILDING IMPROVEMENTS

TANEY COUNTY

MARK	DATE	DESCRIPTION
0	12/6/16	ISSUED

ISSUE

PROJECT NO: 56-01-64

CAD DWG FILE: 56-01-64_C-109.dwg

DRAWN BY: JMT

DESIGNED BY: CBP

CHECKED BY:

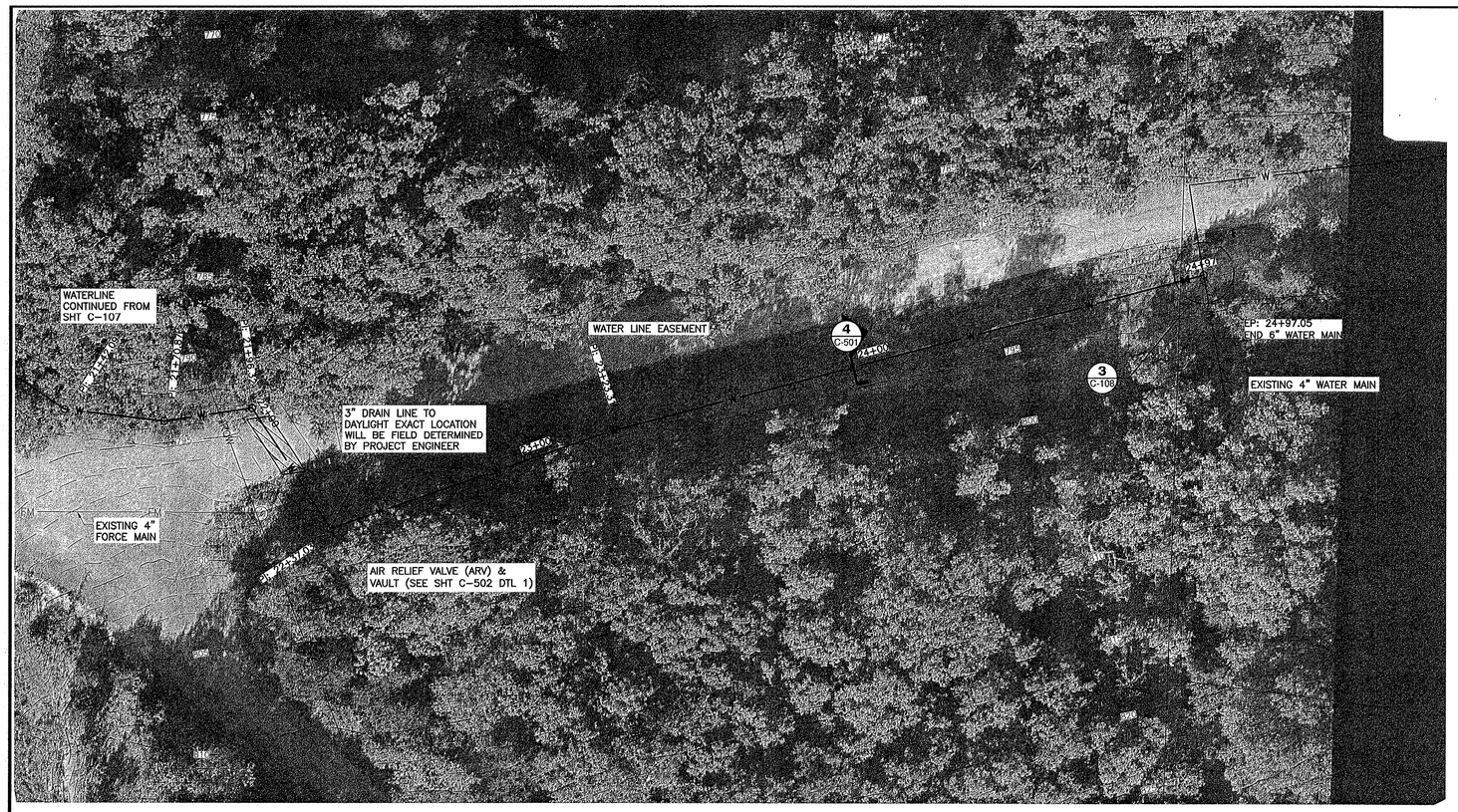
SHEET TITLE

WATERLINE PLAN & PROFILE

C-107

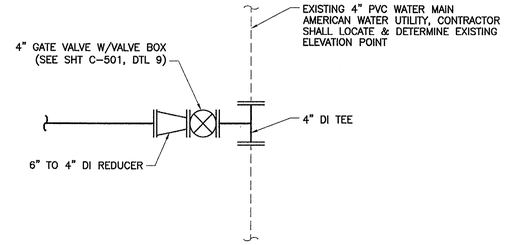
SHEET 9 OF 30

Path and filename: N:\Projects\56-01\56-01-64\Drawings\Civil\56-01-64_C-109.dwg Printed on 12/06/16 11:10 AM by Jack Quade

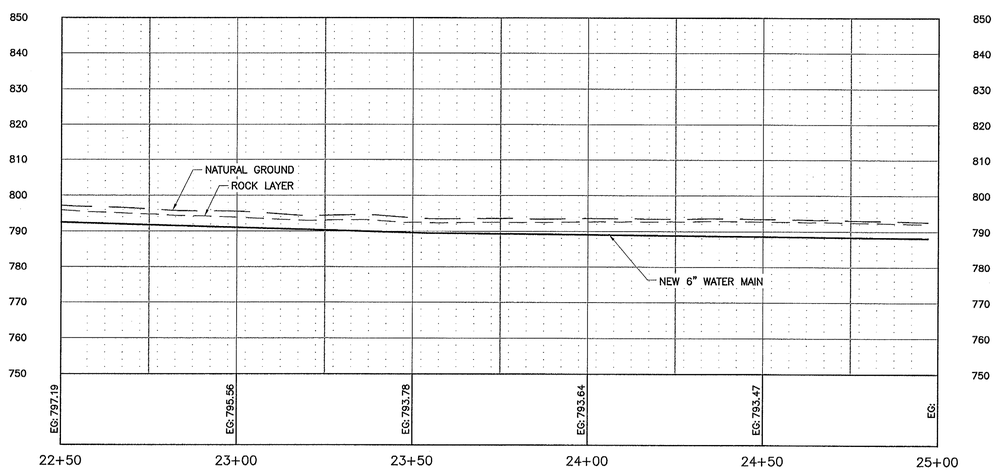


1 **WATERLINE - PLAN**
SCALE: 1" = 20'

GRAPHIC SCALE
0 20' 40'
1 INCH = 20 FEET



3 **CONNECTION TO AMERICAN WATER UTILITY**
SCALE: NTS



2 **WATERLINE - PROFILE**
SCALE: 1" = 20'

GENERAL NOTES:

1. EACH VALVE, METER AND PRESSURE RELIEF VALVE SHALL BE IN ITS OWN METER BOX OR VALVE BOX UNLESS APPROVED BY THE PROJECT ENGINEER.
2. ALL MATERIALS INCLUDING PIPE, FITTINGS, METER, VALVE BOXES, AND VALVES SHALL CONFORM TO THE LATEST STANDARDS ISSUED BY THE AWWA AND ANSI/NSF, AND BE ACCEPTABLE TO MISSOURI DNR AND TO AMERICAN WATER UTILITY.
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ESTIMATED TRENCH ROCK EXCAVATION

STATION	ROCK AREA (SF)	ROCK VOLUME (CY)
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15+61.96	6.79	16.8
16+11.96	0.69	6.9
16+61.96	0.86	1.4
17+11.96	3.52	4.1
17+61.96	3.69	6.7
18+11.96	0.00	3.4
18+61.96	5.04	4.7
19+28.96	0.00	6.3
21+06.96	0.00	0.0
21+41.96	8.75	5.7
24+94.96	8.75	114.4
TOTAL		194.1

SOIL BORING NOTES:

1. NO ROCK EXCAVATION IS EXPECTED BEFORE STATION 14+48.
2. ROCK DEPTHS AFTER STATION 16+98 ARE ESTIMATED FROM PREVIOUS PROJECT EXCAVATION IN THE AREA.

DESIGN AND DEVELOPMENT
MDC
MISSOURI DEPARTMENT OF CONSERVATION
P.O. BOX 180, JEFFERSON CITY, MO 65102
(573) 522-4115 www.mdc.mo.gov

STATE OF MISSOURI
CHITRA B. POUDEL
NUMBER PE-2015007441
PROFESSIONAL ENGINEER
12/07/16

CHITRA B. POUDEL
CIVIL ENGINEER
PE-2015007441

SHEPHERD OF THE HILLS FISH HATCHERY

STORAGE BUILDING IMPROVEMENTS

TANEY COUNTY

MARK	DATE	DESCRIPTION
0	12/6/16	ISSUED

ISSUE

PROJECT NO: **56-01-64**
CAD DWG FILE: 56-01-64_C-110.dwg
DRAWN BY: JMT
DESIGNED BY: CBP
CHECKED BY:
SHEET TITLE

WATERLINE PLAN & PROFILE

C-108
SHEET 10 OF 30

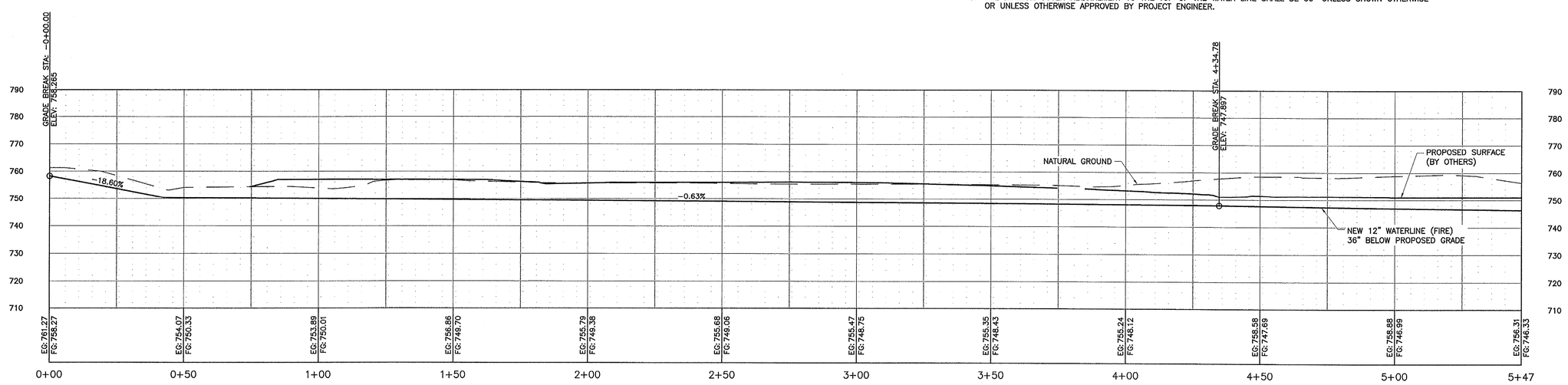
Path and filename: N:\Projects\56-01\56-01-64\Drawings\Civil\56-01-64_C-110.dwg Printed on 12/06/16 11:09 AM by Jack Quade

1 **WATERLINE (FIRE) - PLAN**
SCALE: 1"=20'

GENERAL NOTES:

1. ALL MATERIALS INCLUDING PIPE, FITTINGS, METER, VALVE BOXES, AND VALVES SHALL CONFORM TO THE LATEST STANDARDS ISSUED BY THE AWWA AND ANSI/NSF, AND BE ACCEPTABLE TO MISSOURI DNR AND TO AMERICAN WATER UTILITY.
2. ALL PIPE SHALL BE PRESSURE CLASS 200 PVC C900 PRESSURE PIPE WITH PUSH ON GASKETS.
3. ALL PIPE SHALL BE INSTALLED WITH MEGALUGS AT EVERY JOINT.
4. ALL FITTINGS SHALL BE RESTRAINED TYPE DUCTILE IRON.
5. PIPE DEFLECTIONS SHALL BE PER MANUFACTURERS RECOMMENDATIONS.
6. SEE SHEET C-501 DETAIL 4 FOR PIPE TRENCH BEDDING DETAILS.
7. THE ACTUAL PROFILE WILL BE FIELD DETERMINED BY THE CONTRACTOR AND SHALL MEET THE CONTRACT SPECIFICATIONS AND DNR REQUIREMENTS FOR DOMESTIC WATER, AND GENERALLY FOLLOW THE LAY OF THE LAND.
8. THE MINIMUM COVER REQUIREMENT TO THE TOP OF THE WATER LINE SHALL BE 36" UNLESS SHOWN OTHERWISE OR UNLESS OTHERWISE APPROVED BY PROJECT ENGINEER.

GRAPHIC SCALE
0 20' 40'
1 INCH = 20 FEET



2 **WATERLINE (FIRE) - PROFILE**
SCALE: 1"=20'

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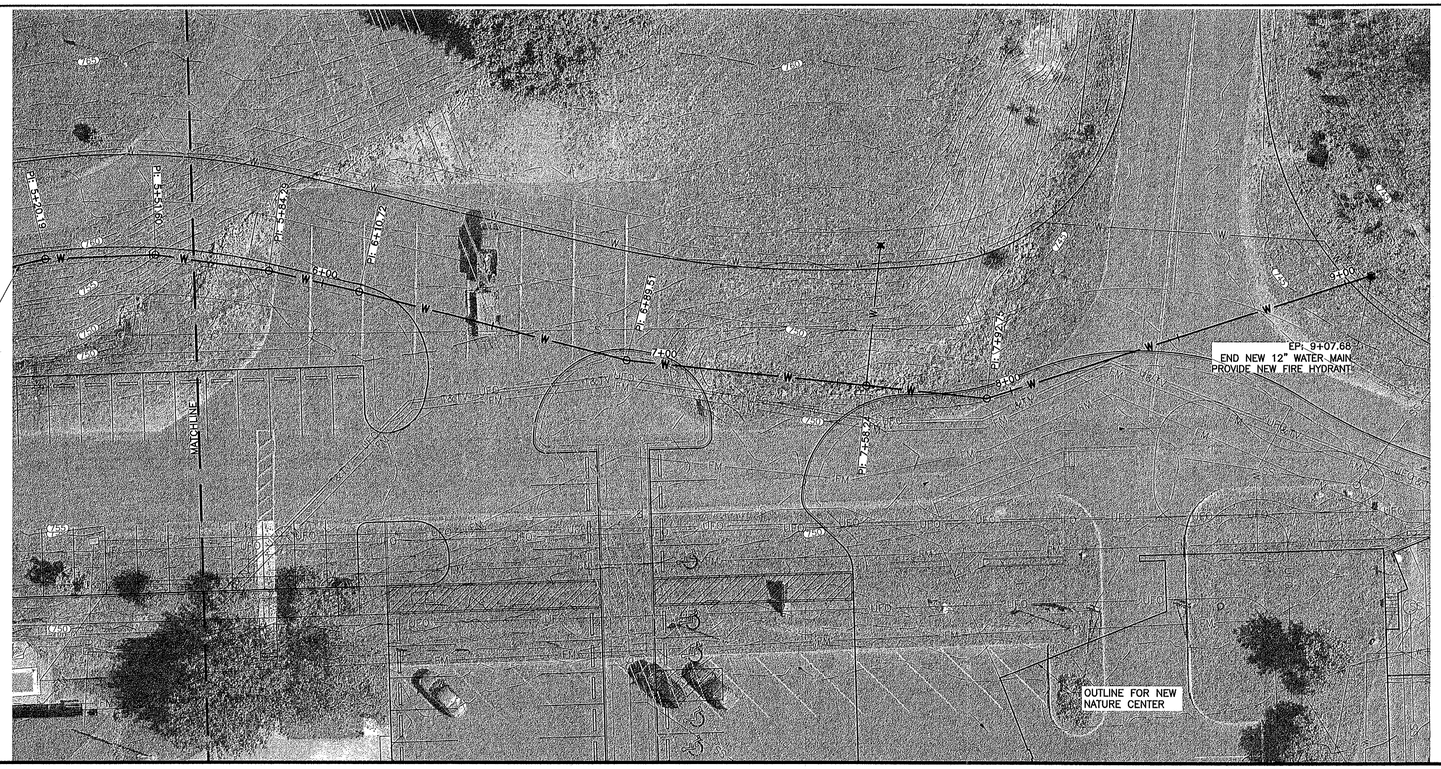
PROJECT NO: **56-01-64**
CAD DWG FILE: 56-01-64_C-107_WH.dwg
DRAWN BY: JCQ
DESIGNED BY: CBP
CHECKED BY:

SHEET TITLE
WATERLINE (FIRE) PLAN & PROFILE

C-109
SHEET 11 OF 30

Path and filename: N:\Projects\56-01\56-01-64\Drawings\Civil\56-01-64_C-107_WH.dwg Printed on 12/08/16 11:08 AM by Jack Quade



1 WATERLINE (FIRE) - PLAN

SCALE: 1"=20'

GENERAL NOTES:

1. ALL MATERIALS INCLUDING PIPE, FITTINGS, METER, VALVE BOXES, AND VALVES SHALL CONFORM TO THE LATEST STANDARDS ISSUED BY THE AWWA AND ANSI/NSF, AND BE ACCEPTABLE TO MISSOURI DNR AND TO AMERICAN WATER UTILITY.
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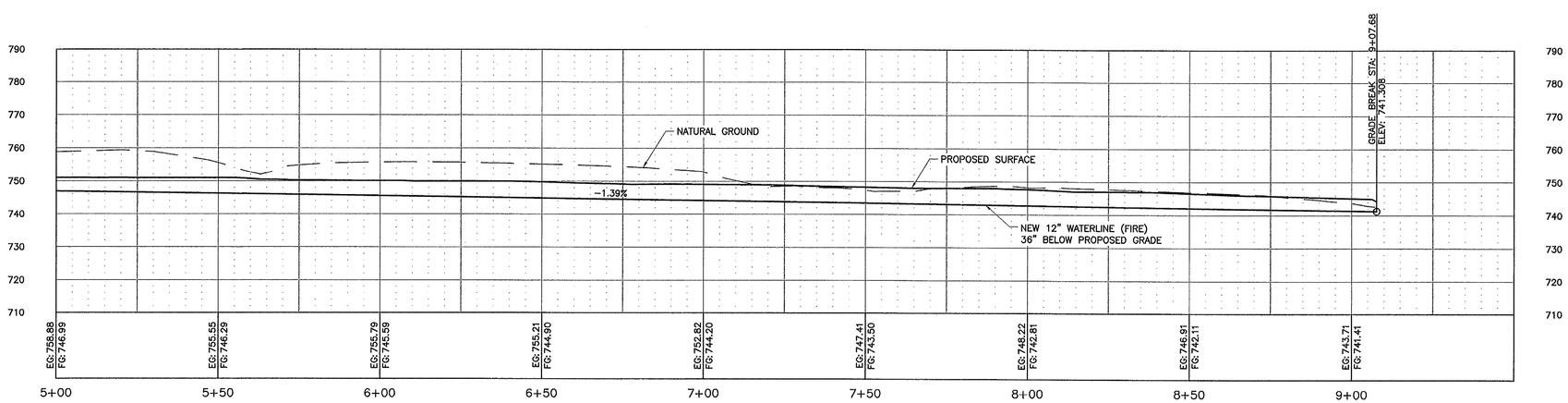
GRAPHIC SCALE

0 20' 40'

1 INCH = 20 FEET



2 WATERLINE (FIRE) - PROFILE

SCALE: 1"=20'

DESIGN AND DEVELOPMENT
MISSOURI DEPARTMENT OF CONSERVATION
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SHEPHERD OF THE HILLS FISH HATCHERY

STORAGE BUILDING IMPROVEMENTS

TANEY COUNTY

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PROJECT NO: 56-01-64

CAD DWG FILE: 56-01-64_C-108_wh.dwg

DRAWN BY: JCQ

DESIGNED BY: CBP

CHECKED BY:

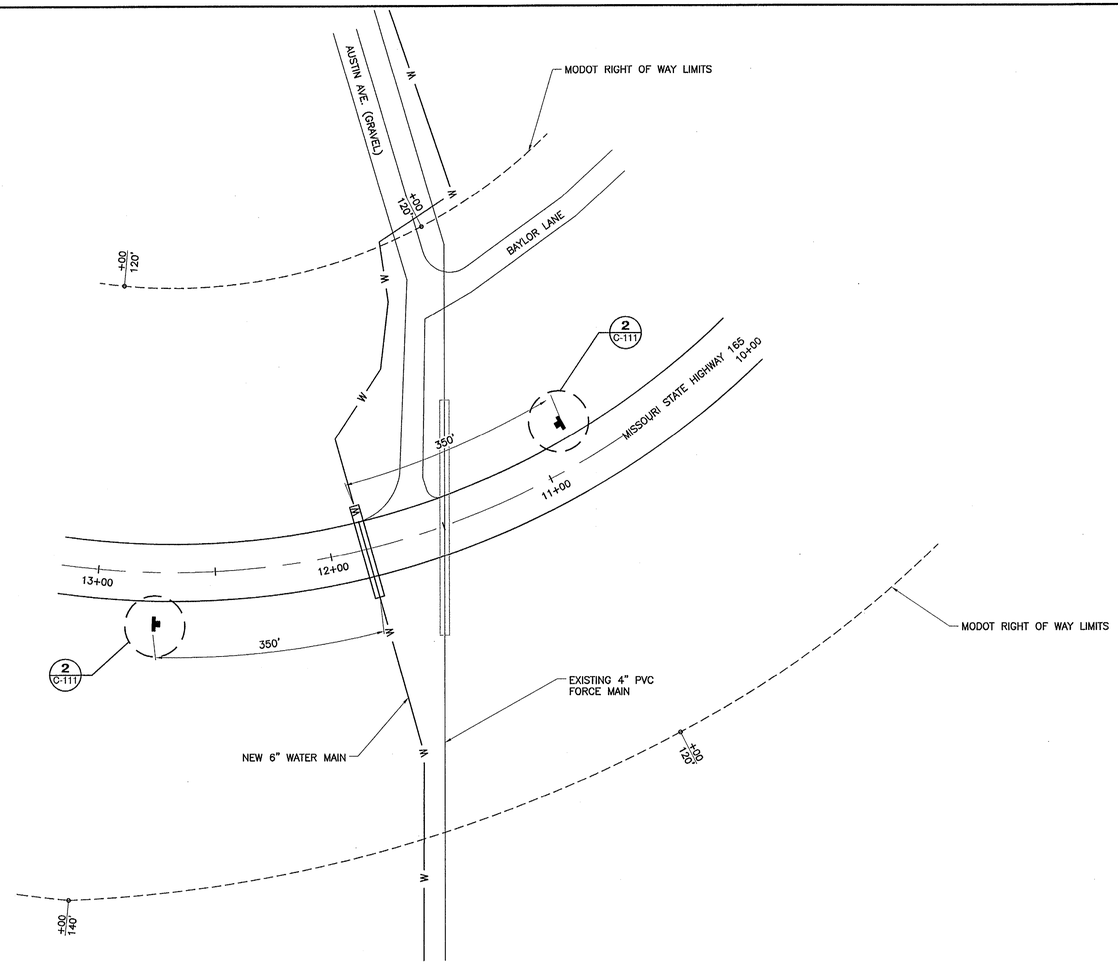
SHEET TITLE

WATERLINE (FIRE) PLAN & PROFILE

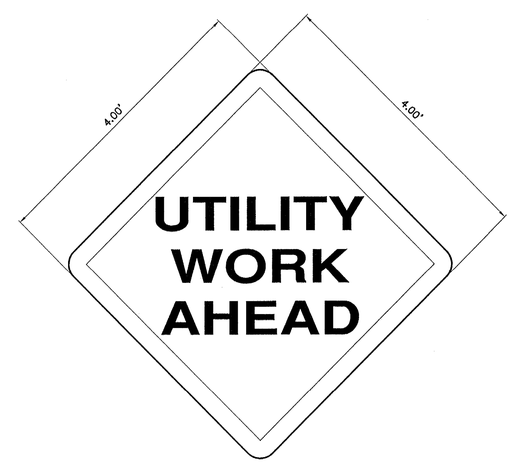
C-110

SHEET 12 OF 30

Path and filename: N:\Projects\56-01\56-01-64\Drawings\Civil\56-01-64_C-108_wh.dwg Printed on 12/06/16 11:07 AM by Jack Quade



1 **TRAFFIC CONTROL PLAN**
SCALE: NTS



2 **SIGNING DETAIL**
SCALE: 1" = 1'-0"

DESIGN AND DEVELOPMENT
MISSOURI DEPARTMENT OF CONSERVATION
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TANEY COUNTY

MARK	DATE	DESCRIPTION
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PROJECT NO: **56-01-64**
CAD DWG FILE: 56-01-64_C-111.dwg
DRAWN BY: JMT
DESIGNED BY: CBP
CHECKED BY:

SHEET TITLE
TRAFFIC CONTROL PLAN

C-111
SHEET 13 OF 30

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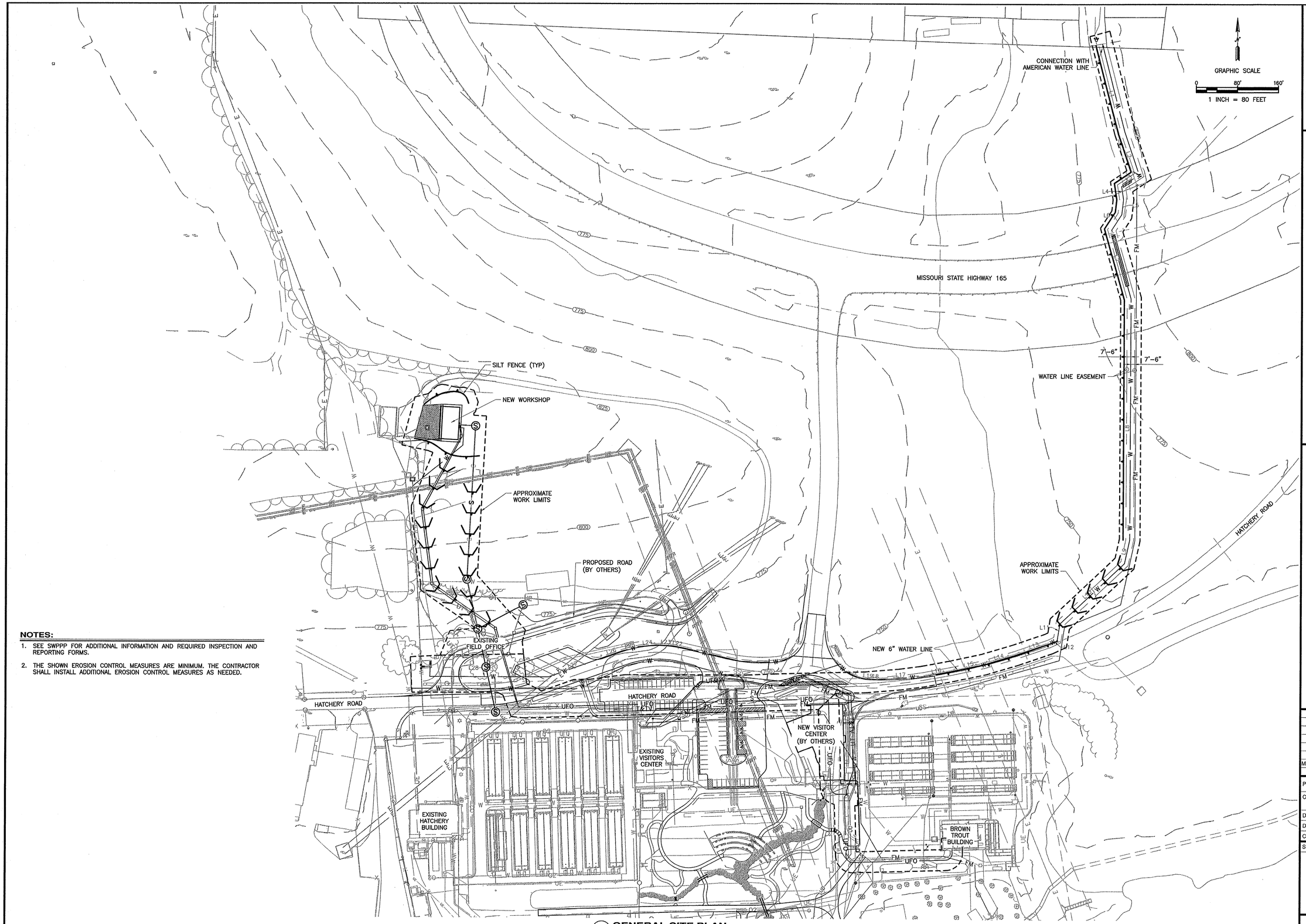

1 **GENERAL SITE PLAN**
SCALE: 1" = 80'

NOTES:

1. SEE SWPPP FOR ADDITIONAL INFORMATION AND REQUIRED INSPECTION AND REPORTING FORMS.
2. THE SHOWN EROSION CONTROL MEASURES ARE MINIMUM. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES AS NEEDED.

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STORAGE BUILDING IMPROVEMENTS

TANEY COUNTY

MARK	DATE	DESCRIPTION
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ISSUE

PROJECT NO: **56-01-64**

CAD DWG FILE: 56-01-64_C-112.dwg

DRAWN BY: JCQ

DESIGNED BY: CBP

CHECKED BY:

SHEET TITLE

EROSION CONTROL PLAN

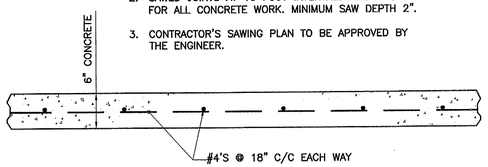
C-112

SHEET 14 OF 30

Path and filename: N:\Projects\56-01\56-01-64\Drawings\Civil\56-01-64_C-112.dwg Printed on 12/08/16 10:00 AM by Mike Tuter

NOTES:

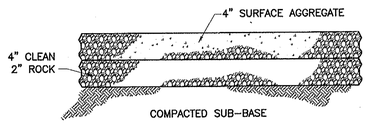
1. CONCRETE PAVEMENT SHALL BE REINFORCED WITH #4 BARS AT 18" C/C EACH WAY.
2. SAWED JOINTS AT 10 FOOT INTERVALS ARE REQUIRED FOR ALL CONCRETE WORK. MINIMUM SAW DEPTH 2".
3. CONTRACTOR'S SAWING PLAN TO BE APPROVED BY THE ENGINEER.



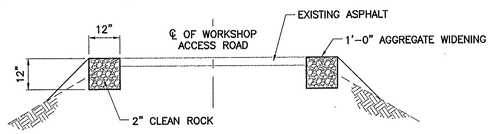
1 CONCRETE PAVEMENT - DETAIL
SCALE: NTS

NOTES:

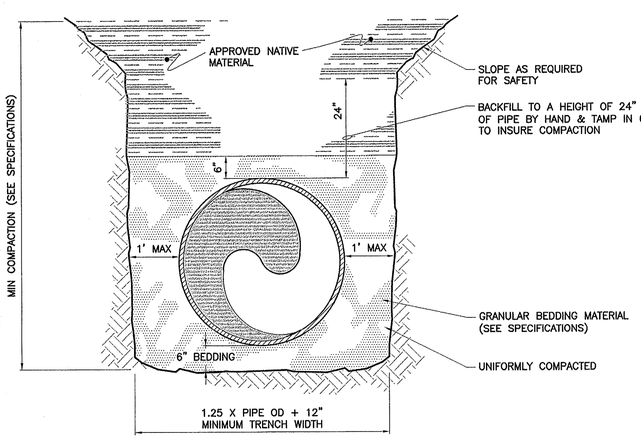
1. AGGREGATE SURFACING SHALL CONFORM TO SECTION 02231 OF THE SPECIFICATIONS.



2 AGGREGATE SURFACING - DETAIL
SCALE: NTS



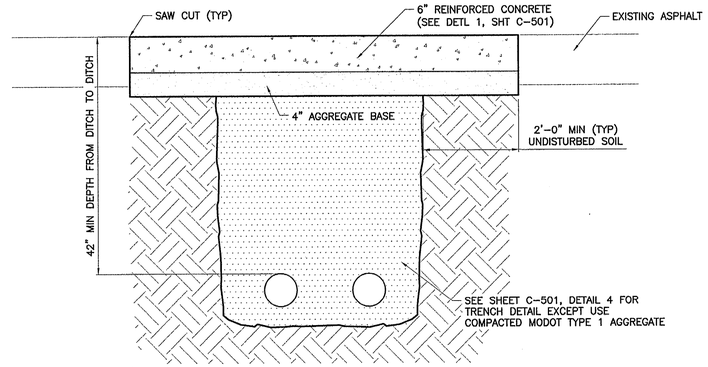
3 WORKSHOP ACCESS ROAD - TYP SECTION
SCALE: NTS



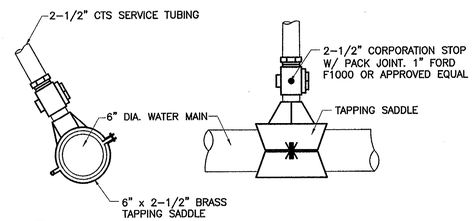
NOTES:

1. TRENCH OVER 5' DEEP SHALL BE EXCAVATED IN A GENERALLY ACCEPTED SAFE MANNER.
2. NO EQUIPMENT COMPACTION OR PASSAGE SHALL BE PERMITTED UNTIL 24" OF BACKFILL IS PLACED OVER TOP OF PIPE.
3. DE-WATERING MAY BE REQUIRED (SEE SPECS) WHENEVER THE GROUND WATER TABLE IS HIGHER THAN THE PIPE GRADE. THE CONTRACTOR SHALL DE-WATER BEFORE EXCAVATION CAN CONTINUE.
4. THE CONTRACTOR SHALL PROTECT THE PIPE FROM VERTICAL (FLOATATION) AS WELL AS LATERAL DISPLACEMENT.
5. STANDARD FOR ALL SIZES AND TYPES OF PIPE.
6. WHEREVER THE NATURAL GRADE IS LESS THAN TWO FEET (2') ABOVE THE PIPE, THESE AREAS SHALL BE FILLED TO A MINIMUM OF TWO FEET (2') ABOVE THE PIPE AND COMPACTED AS REQUIRED BY THE SPECIFICATIONS.
7. NO PAYMENT FOR ROCK EXCAVATION WILL BE MADE FOR MATERIAL REMOVED BEYOND THE MINIMUM REQUIRED LIMITS SHOWN. PAYMENT WILL BE BASED ON FIELD MEASURED VOLUME.

4 TYPICAL PIPE TRENCH BEDDING - DETAIL
SCALE: NTS



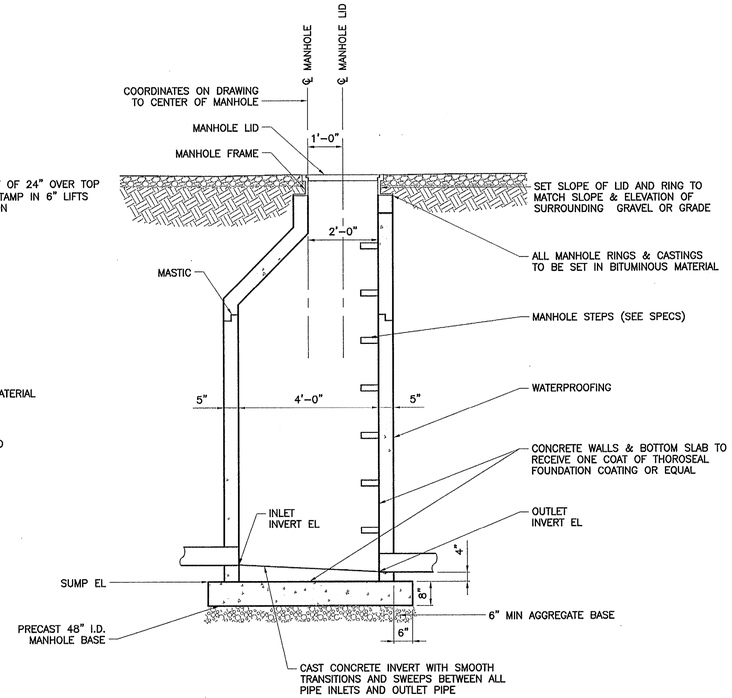
5 FIBER OPTIC CONDUIT ROAD CROSSING
SCALE: NTS



6 WATER SERVICE TAPPING DETAIL
SCALE: NTS

NOTE:

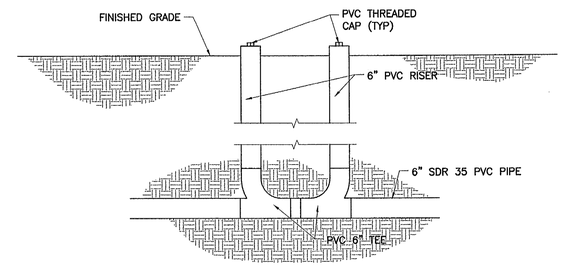
THIS IS A TYPICAL DETAIL ONLY. CONTRACTOR SHALL CONTACT THE APPROPRIATE AUTHORITY FOR SERVICE TAPPING REQUIREMENTS.



7 TYPICAL MANHOLE - DETAIL
SCALE: 1" = 2'

NOTES:

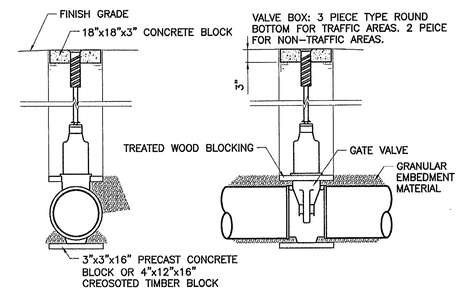
1. THE 4" PVC GRAVITY LINE SHALL BE PLACED AT ⅛" PER FOOT SLOPE (MINIMUM).
2. NO EQUIPMENT COMPACTION OR PASSAGE SHALL BE PERMITTED UNTIL 24" OF BACKFILL IS PLACED OVER TOP OF PIPE.
3. SET CENTER OF LID ON DOWNSTREAM PIPE ALIGNMENT, UNLESS NOTED OTHERWISE.



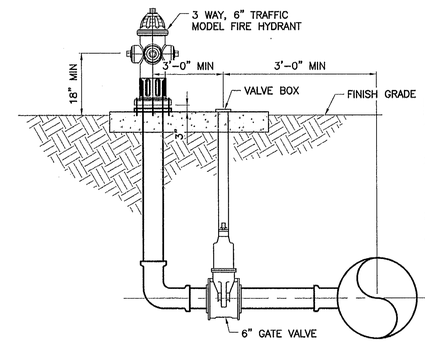
8 TWO-WAY SEWER CLEAN-OUT DETAIL
SCALE: NTS

NOTES:

1. NOT FOR USE IN TRAFFIC AREAS.
2. MAX. SPACING 100'.
3. FOR USE ONLY WHERE INDICATED ON PLANS.
4. FOR USE IN TRAFFIC AREAS, PVC THREADED COUPLING AND PVC SCREW CAP SHALL BE REPLACED WITH TRAFFIC DUTY CAST IRON RING AND COVER SET FLUSH WITH CONCRETE PAD.



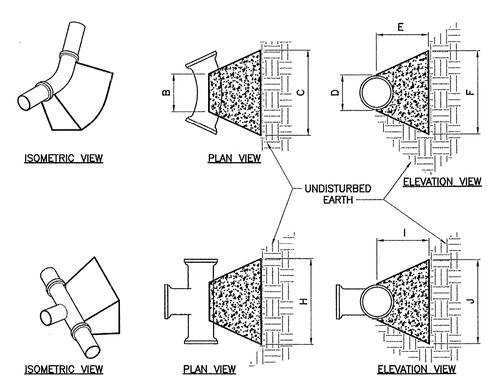
9 GATE VALVE SETTING DETAIL
SCALE: NTS



NOTES:

1. USE RETAINER GLANDS AND ALL THREAD TO RESTRAIN VALVE TO TEE.
2. PIPE BETWEEN GATE VALVE AND TEE MAY BE EXCLUDED IF FLANGED TO FLANGED CONNECTIONS ARE USED AND THE GATE VALVE IS BOLTED TO TEE. RETAINER GLANDS WILL NOT BE REQUIRED IF THIS OPTION IS USED.
3. AVOID PLACING CONCRETE AROUND DRAIN HOLES.
4. FIRE HYDRANTS SHALL BE PAINTED WHITE.

10 FIRE HYDRANT INSTALLATION DETAIL
SCALE: NTS



BENDS	B	C	D	E	F	BENDS	B	C	D	E	F
6" 11-1/4°	12"	15"	12"	24"	12"	6" 45°	12"	30"	12"	24"	14"
6" 22-1/2°	12"	19"	12"	24"	13"	6" 90°	12"	30"	12"	24"	27"
12" 11-1/4°	12"	20"	12"	24"	12"	12" 45°	12"	30"	12"	24"	24"
12" 22-1/2°	12"	22"	12"	24"	17"	12" 90°	12"	312"	12"	24"	36"
12" 11-1/4°	12"	30"	12"	24"	15"	12" 45°	12"	40"	12"	24"	40"
12" 22-1/2°	12"	35"	12"	24"	25"	12" 90°	12"	40"	12"	24"	52"
TEES	G	H	I	J		TEES	G	H	I	J	
6"x6"x6"	12"	24"	24"	112"		12"x12"x6"	12"	24"	24"	112"	
12"x12"x6"	12"	24"	24"	112"		12"x12"x12"	12"	24"	24"	24"	
12"x12"x12"	12"	24"	24"	24"		12"x12"x12"	12"	36"	24"	36"	

* FOR ALL LINES LESS THAN 6" IN DIAMETER, USE THE SAME BLOCKING SIZES AS THOSE LISTED FOR 6" LINES

11 CONCRETE BLOCKING DETAIL
SCALE: NTS

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CHECKED BY:
SHEET TITLE

SITE DETAILS

C-501

SHEET 15 OF 30

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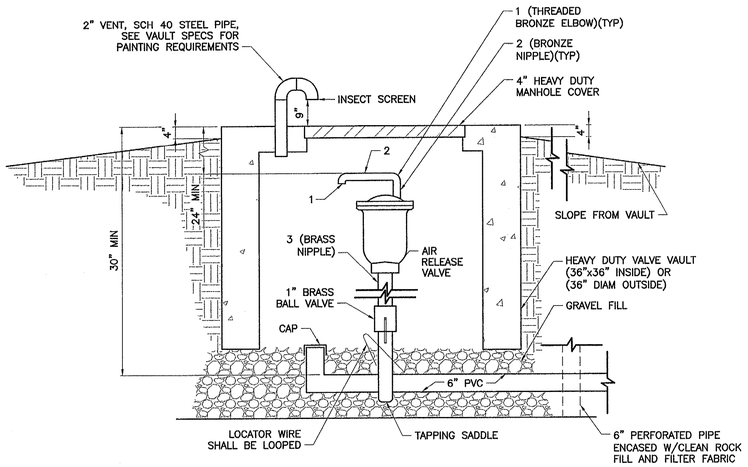
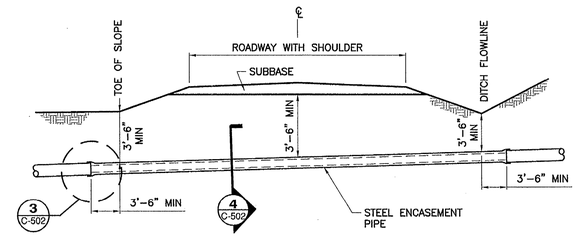


1 AIR VALVE VAULT
SCALE: 1" = 2'

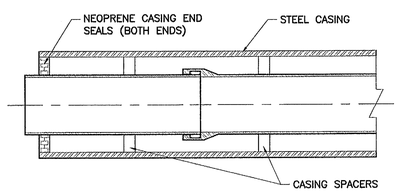
NOTE:
1. INSTALL 3" DRAIN TO DAYLIGHT.



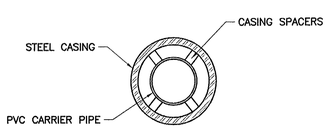
2 ROAD BORING AND ROAD CROSSING (ENCASED)
SCALE: NTS

NOTES:

1. ENCASEMENT PIPE MUST EXTEND BEYOND THE BACK OF THE DITCH FOR A DISTANCE EQUAL TO THE ENCASEMENT DEPTH.
2. ALL ENCASEMENT PIPE SHALL BE SCHEDULE 40 STEEL PIPE AND SHALL HAVE A MINIMUM WALL THICKNESS OF 0.188 INCHES.
3. PROVIDE ½" THICK SLIP-ON SYNTHETIC RUBBER END SEALS AT EACH END OF CASING. ALL ENCASEMENT PIPE JOINTS COMPLETELY WELDED.

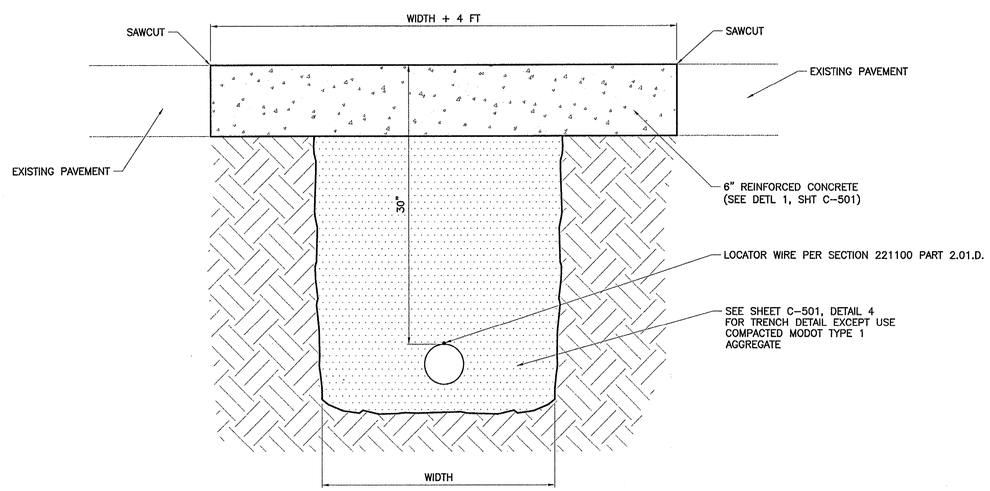


3 ENCASEMENT PIPE ELEVATION
SCALE: NTS

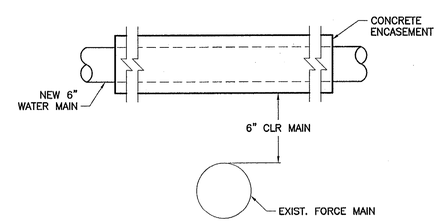


NOTE: A 2 INCH MINIMUM CLEARANCE IS REQUIRED BETWEEN THE FORCE MAIN AND THE ENCASEMENT PIPE.

4 ENCASEMENT PIPE SECTION
SCALE: NTS



5 PAVEMENT TRENCH REPAIR - DETAIL (TYP)
SCALE: NTS



6 SEWER CROSSING DETAIL
SCALE: NTS

DESIGN AND DEVELOPMENT
MISSOURI DEPARTMENT OF CONSERVATION
P.O. BOX 180, JEFFERSON CITY, MO 65102
(573) 522-4115 www.mdc.mo.gov

STATE OF MISSOURI
CHITRA B. POUDEL
NUMBER PE-2015007441
PROFESSIONAL ENGINEER
12/07/16

CHITRA B. POUDEL
CIVIL ENGINEER
PE-2015007441

SHEPHERD OF THE HILLS FISH HATCHERY

STORAGE BUILDING IMPROVEMENTS

TANEY COUNTY

MARK	DATE	DESCRIPTION
01	12/6/16	ISSUED

ISSUE

PROJECT NO: 56-01-64
CAD DWG FILE: 56-01-64_C-502.dwg
DRAWN BY: RDI
DESIGNED BY: CBP
CHECKED BY:
SHEET TITLE

SITE DETAILS

C-502

SHEET 16 OF 30

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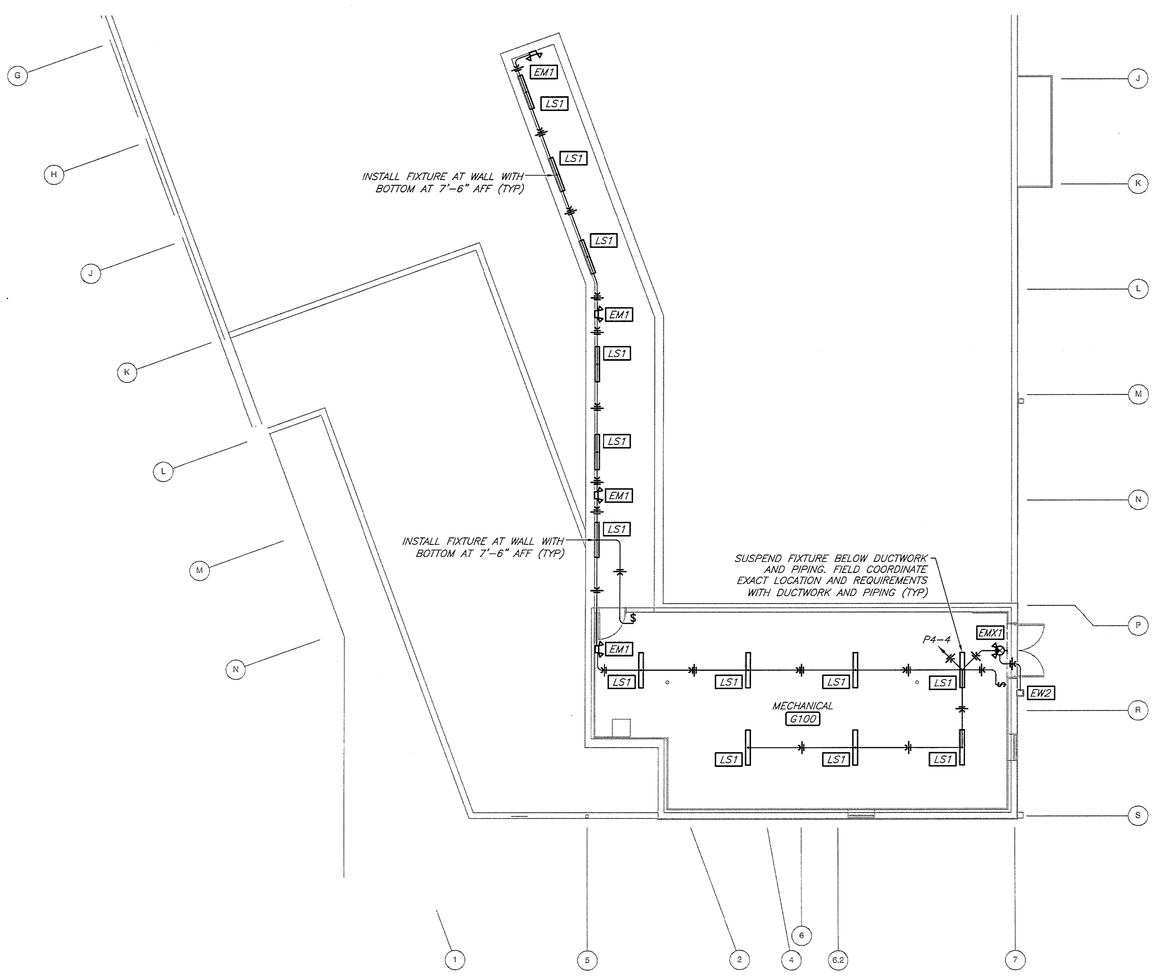

1 BASEMENT LIGHTING PLAN
1/8" = 1'-0"

NORTH

E1.1

Date:	10-27-16
Revised:	-
Scale:	AS NOTED
Drawn:	AKD
Checked:	---
Job:	14023

SHEPHERD OF THE HILLS CONSERVATION NATURE CENTER

MISSOURI DEPARTMENT OF CONSERVATION
Hatchery Road
Branson, MO 65616

BASEMENT LIGHTING PLAN

STATE OF MISSOURI
ALLEN DAVIS
NUMBER
PE-2004017155
PROFESSIONAL ENGINEER
Allen Davis Electronically signed 10-26-2016
ALLEN DAVIS - ENGINEER
PE-2004017155

CJD
Engineering | Energy | Innovation
2101 West Chesterfield Boulevard, Suite E-105A, Springfield, MO 65807
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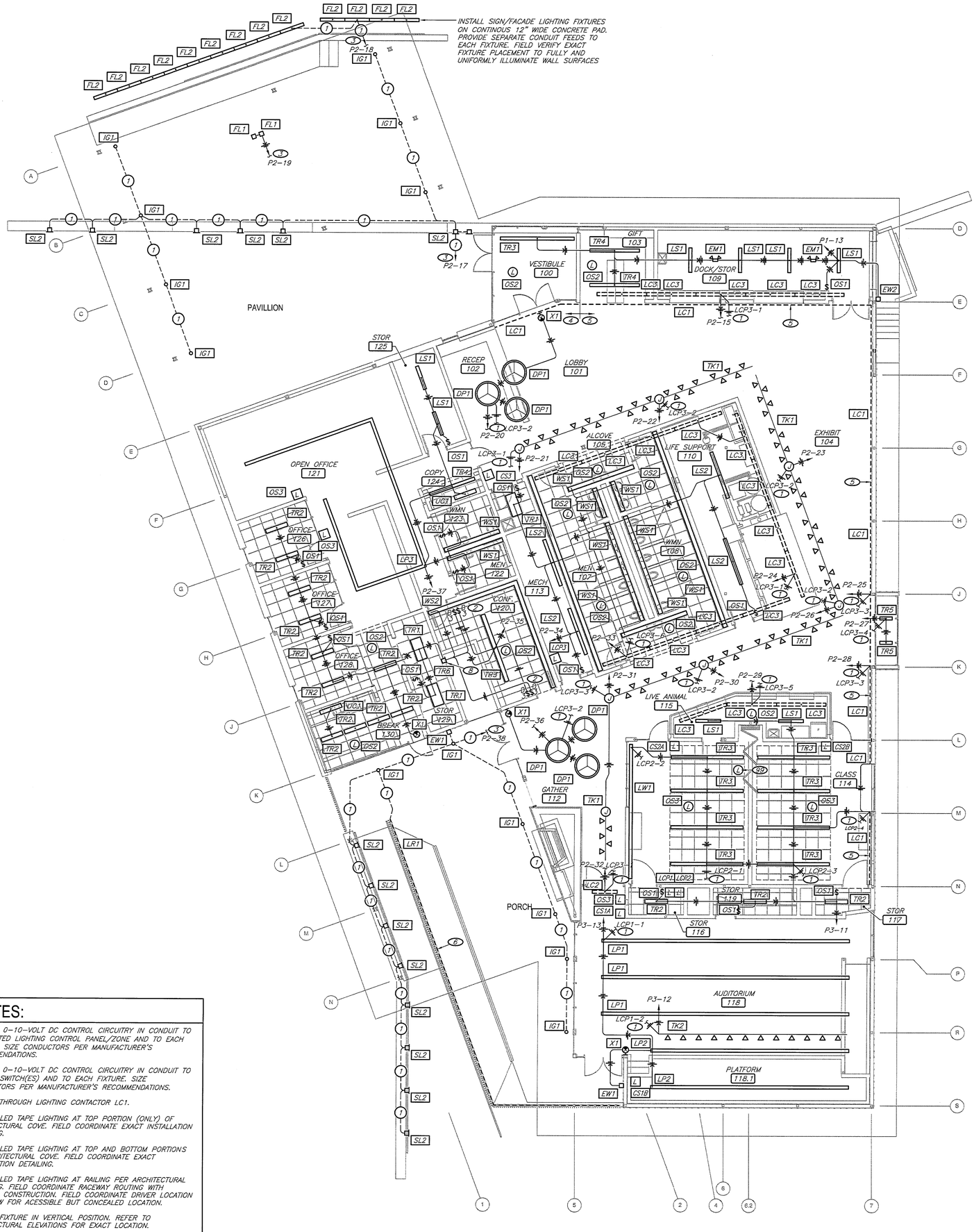

KEYNOTES:

1. PROVIDE 0-10-VOLT DC CONTROL CIRCUITRY IN CONDUIT TO DESIGNATED LIGHTING CONTROL PANEL/ZONE AND TO EACH FIXTURE. SIZE CONDUCTORS PER MANUFACTURER'S RECOMMENDATIONS.
2. PROVIDE 0-10-VOLT DC CONTROL CIRCUITRY IN CONDUIT TO DIMMER SWITCH(ES) AND TO EACH FIXTURE. SIZE CONDUCTORS PER MANUFACTURER'S RECOMMENDATIONS.
3. CIRCUIT THROUGH LIGHTING CONTACTOR LC1.
4. INSTALL LED TAPE LIGHTING AT TOP PORTION (ONLY) OF ARCHITECTURAL COVE. FIELD COORDINATE EXACT INSTALLATION DETAILING.
5. INSTALL LED TAPE LIGHTING AT TOP AND BOTTOM PORTIONS OF ARCHITECTURAL COVE. FIELD COORDINATE EXACT INSTALLATION DETAILING.
6. INSTALL LED TAPE LIGHTING AT RAILING PER ARCHITECTURAL DETAILING. FIELD COORDINATE RACEWAY ROUTING WITH GENERAL CONSTRUCTION. FIELD COORDINATE DRIVER LOCATION TO ALLOW FOR ACESSIBLE BUT CONCEALED LOCATION.
7. INSTALL FIXTURE IN VERTICAL POSITION. REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT LOCATION.
8. VERIFY EXACT INSTALLATION LOCATION AND DETAILING OF LIGHTING CONTROLS PARTITION SENSOR TO MEET INSTALLATION REQUIREMENTS. PROVIDE CONTROL WIRING TO LIGHTING CONTROL PANEL.

CONDUIT & CONDUCTORS:

1. (2) #10 AND (1) #10 GROUND IN 0.5" CONDUIT

1 FIRST FLOOR LIGHTING PLAN
1/8" = 1'-0"

NORTH

E1.2

Job:	14023
Checked:	---
Drawn:	AKD
Scale:	AS NOTED
Revised:	-
Date:	10-27-16

SHEPHERD OF THE HILLS CONSERVATION NATURE CENTER

MISSOURI DEPARTMENT OF CONSERVATION
Hatchery Road
Branson, MO 65616

FIRST FLOOR LIGHTING PLAN

STATE OF MISSOURI
ALLEN DAVIS
NUMBER
PE-2004017155
PROFESSIONAL ENGINEER
Allen Davis 2016.10.27 10:51:22 -05'00'
ALLEN DAVIS - ENGINEER
PE-2004017155

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CONDUITS AND CIRCUITS:

- CONDUIT RUN
- CONDUIT RUN UNDERGROUND
- FLEXIBLE CONDUIT
- CONDUIT OR CIRCUIT CONTINUED ON ANOTHER PLAN OR FURTHER ON IN RUN
- CONDUIT TURNING AWAY FROM VIEWER
- CONDUIT TURNING TOWARD VIEWER (AND PIERCING THE PLANE OF PROJECTION)
- CONDUIT TERMINATED WITH BUSHING
- CONDUIT CAPPED FOR FUTURE USE
- CONDUIT CONTINUATION FROM CAPPED STUB LEFT BY PREVIOUS CONTRACT
- TEE, IN HORIZONTAL CONDUIT RUN, WITH THE BRANCH GOING HORIZONTAL
- TEE, IN VERTICAL CONDUIT RUN, WITH THE BRANCH GOING HORIZONTAL
- TEE, IN HORIZONTAL CONDUIT RUN, WITH THE BRANCH GOING UP (AND PIERCING THE PLANE OF PROJECTION)
- TEE, IN HORIZONTAL CONDUIT RUN, WITH THE BRANCH GOING DOWN
- CONDUIT DROPPING OUT OF BOTTOM OF EQUIPMENT
- SURFACE MOUNTED RACEWAY
- HOME RUN
- HOME RUN UNDERGROUND
- CIRCUITING DESIGNATION DENOTES 3/4" CONDUIT OR LARGER
  SHORT DASH: PHASE CONDUCTOR
  LONG DASH: NEUTRAL CONDUCTOR
  ARC: GROUND CONDUCTOR
- J — JUNCTION BOX
- P — PULL BOX
- UP — UNDERGROUND PRIMARY ELECTRIC LINE
- OP — OVERHEAD PRIMARY ELECTRIC LINE
- UT — UNDERGROUND TELEPHONE CABLE
- UFO — UNDERGROUND FIBER OPTICS

POWER CABLE IDENTIFICATION:

2-#12 AWG, #12 GND, ¾"C
- CONDUIT SIZE
- CONDUIT
- NUMBER OF SINGLE CONDUCTORS
- SIZE CONDUIT
- SIZE OF CONDUCTOR

CONTROL AND INSTRUMENTATION WIRE AND CABLE IDENTIFICATION:

1-#14 AWG, CONTROL, ¾"C, CU-X
- MONITORING SYSTEM I/O
- CONDUIT
- CONDUIT SIZE
- TYPE OF CABLE
- SIZE OF CONDUCTOR
- NUMBER OF SINGLE CONDUCTORS

1-4/C, CONTROL, ¾"C, CU-X
- MONITORING SYSTEM I/O
- CONDUIT
- CONDUIT SIZE
- TYPE OF CABLE
- NUMBER OF CONDUCTORS PER CABLE
- NUMBER OF CABLES

1- 1 PAIR, INSTRUMENT, ¾"C, CU-X
- MONITORING SYSTEM I/O
- CONDUIT
- CONDUIT SIZE
- TYPE OF CABLE
- NUMBER OF PAIRS
- NUMBER OF CABLES

CONDUITS AND CIRCUITS:

- GROUND CABLE BURIED IN EARTH OR EXPOSED WHERE INDICATED
- LIGHTNING PROTECTION CABLE
- AIR TERMINAL
- GROUND ROD
- WELDED CONNECTION
- BOLTED CONNECTION

COMMUNICATIONS

- COMMUNICATIONS OUTLET
- WALL MOUNTED RACEWAY

LIGHTING:

- L1, L2, L3 — FLUORESCENT LUMINARY (LETTER AND NUMBER INDICATE TYPE OF FIXTURE)
- L4, L5, L6 — EMERGENCY FLUORESCENT LUMINARY (LETTER INDICATES TYPE OF FIXTURE, WITH EMERGENCY BALLAST FEATURE)
- L7 — WALL MOUNTED FLUORESCENT LUMINARY
- 22, 24 — CIRCUIT NUMBER
- PENDANT MOUNTED LIGHTING
- L8 — TRACK LIGHTING
- L9 — FLOODLIGHTING
- L10 — FLUORESCENT, LED, H.I.D., OR INCANDESCENT LUMINARY FIXTURE TYPE (LETTER INDICATES TYPE OF FIXTURE)
- L11 — EMERGENCY FLUORESCENT, LED, H.I.D., OR INCANDESCENT LUMINARY FIXTURE TYPE (LETTER INDICATES TYPE OF FIXTURE)
- L12 — WALL MOUNTED FLUORESCENT, LED, OR H.I.D. LUMINARY (LETTER INDICATES TYPE OF FIXTURE)
- L13 — EXIT LUMINARY (ARROWS INDICATE DIRECTION AND SHADED AREAS INDICATE NUMBER AND ORIENTATION OF FACES.) LETTER INDICATES TYPE OF FIXTURE
- L14 — EMERGENCY WALL PACK (LETTER INDICATES TYPE OF FIXTURE)
- L14 — AREA LIGHTING, WALL MOUNTED (LETTER INDICATES TYPE OF FIXTURE)
- PHOTO CELL
- LC1 — LIGHTING CONTROLLER
- PC — PARTITION CONTROLLER
- AV — AUDIO/VISUAL INTERFACE
- ETS — ELECTRONIC TIME SWITCH

ONE-LINE DIAGRAM

- AS — AMMETER SWITCH
- VS — AMMETER SWITCH
- A — AMMETER
- V — VOLTMETER
- POWER CIRCUIT AND EQUIPMENT INSTALLED BY THIS CONTRACT
- EQUIPMENT ENCLOSURE
- CONNECTION
- CABLE STRESS CONE
- THERMAL MAGNETIC BREAKER
- 1200/1600 — CIRCUIT BREAKER (TOP NUMBER IS TRIP SIZE AND THE BOTTOM NUMBER IS FRAME SIZE)
- FUSE
- FUSED DISCONNECT SWITCH
- PLUG-IN OR DRAW OUT CONNECTION
- DISCONNECT SWITCH
- FUSED CONTROL POWER TRANSFORMER
- POWER TRANSFORMER (XFMR)
- (2) — CURRENT TRANSFORMER (2 REQUIRED)
- (2) — POTENTIAL TRANSFORMER (2 REQUIRED)
- GROUND CONNECTION
- SURGE ARRESTER
- TERMINAL
- HP — ELECTRIC MOTOR – HORSEPOWER AS INDICATED
- MOTOR CIRCUIT PROTECTOR, CIRCUIT BREAKER AND SINGLE SPEED NON-REVERSING MAGNETIC STARTER W/ CONTROL POWER TRANSFORMER
- 4 — AUTOTRANSFORMER
- SS — SOLID STATE STARTER
- G — GENERATOR
- GF — GROUND FAULT RELAY
- VFD — VARIABLE FREQUENCY DRIVE

ELECTRICAL EQUIPMENT:

- FLUSH MOUNTED DUPLEX RECEPTACLE, NEMA 5-20R
- GFCI — FLUSH MOUNTED DUPLEX RECEPTACLE, NEMA 5-20R, GROUND FAULT CIRCUIT INTERRUPTER
- WP — FLUSH MOUNTED DUPLEX RECEPTACLE, WEATHERPROOF
- IG — INSOLATED GROUND DUPLEX RECEPTACLE
- WP — FLUSH RECEPTACLE (250V)
- WP — QUADRAPLEX RECEPTACLE NEMA 5-20R
- WP — FLOOR MOUNTED DUPLEX RECEPTACLE
- WELDING RECEPTACLE
- SURFACE MOUNTED DUPLEX RECEPTACLE
- WP — SURFACE MOUNTED DUPLEX RECEPTACLE, WEATHERPROOF
- SURFACE MOUNTED SINGLE RECEPTACLE NEMA (5-20R)
- WP — SURFACE MOUNTED SINGLE RECEPTACLE, WEATHERPROOF
- WALL MOUNTED RACEWAY
- $ — SINGLE POLE SWITCH
- $M — SINGLE POLE SWITCH (MOTOR RATED)
- $2 — DOUBLE POLE SWITCH
- $2M — DOUBLE POLE SWITCH (MOTOR RATED)
- $3 — THREE WAY SWITCH
- $4 — FOUR WAY SWITCH
- DISCONNECT SWITCH
- PANEL
- LC — LOAD CENTER
- CABLE REEL
- ELECTRIC MOTOR
- INFLOOR DUCT
- T2 — TRANSFORMER LOCATION (NUMBER INDICATES NUMBER OF TRANSFORMER)
- P — PULL BOX LOCATION
- ELECTRIC METER
- OS — CEILING MOUNTED OCCUPANCY SENSOR
- OS — WALL MOUNTED OCCUPANCY SENSOR
- OS — CEILING MOUNTED ULTRASONIC OCCUPANCY SENSOR. ARROW INDICATES DIRECTION OF MOUNTING.
- US — WALL MOUNTED ULTRASONIC OCCUPANCY SENSOR. ARROW INDICATES DIRECTION OF MOUNTING.

SCHEMATIC DIAGRAMS

- TERMINAL – FOR INTERNAL WIRING
- TERMINAL – FOR EXTERNAL WIRES TERMINATED INTERNALLY
- CONTACT – NORMALLY OPEN
- CONTACT – NORMALLY CLOSED
- C1 — COIL
- THERMAL OVERLOAD RELAY
- R — INDICATING LIGHT – PILOT TYPE WITH COLOR INDICATED R-RED, A-AMBER, G-GREEN, W-WHITE, BL-BLUE, I-IVORY, Y-YELLOW
- LOCAL WIRING (IN EQUIPMENT ENCLOSURE)
- REMOTE WIRING (OUTSIDE OF EQUIPMENT ENCLOSURE)
- OFF, A, B — HAND-OFF-AUTO SELECTION SWITCH
- SWITCH AS DESIGNATED ON DIAGRAM
- CONTROL POWER TRANSFORMER
- GROUND
- FUSE
- EQUIPMENT ENCLOSURE
- PUSHBUTTON – NORMALLY OPEN MOMENTARY
- PUSHBUTTON – NORMALLY CLOSED MOMENTARY
- OVERLOAD
- FLOW SWITCH (FLS) – CLOSES WITH INCREASING FLOW
- FLOW SWITCH (FLS) – OPENS WITH INCREASING FLOW
- FLOAT OR OTHER LIQUID LEVEL SWITCH (FS) – CLOSES WITH RISING LEVEL
- FLOAT OR OTHER LIQUID LEVEL SWITCH (FS) – OPENS WITH RISING LEVEL
- PRESSURE OR VACUUM SWITCH – CLOSES WITH INCREASING PRESSURE OR DECREASING VACUUM
- PRESSURE OR VACUUM SWITCH – OPENS WITH INCREASING PRESSURE OR DECREASING VACUUM
- MAINTAINED CONTACT
- NORMALLY OPEN TIMED CLOSED CONTACT ACTION RETARDED AFTER COIL IS ENERGIZED.
- NORMALLY CLOSED TIMED OPEN CONTACT ACTION RETARDED AFTER COIL IS ENERGIZED.
- NORMALLY OPEN TIMED CLOSED CONTACT ACTION RETARDED AFTER COIL IS DEENERGIZED.
- NORMALLY CLOSED TIMED CLOSED CONTACT ACTION RETARDED AFTER COIL IS DEENERGIZED.

ABBREVIATIONS

WP	WEATHERPROOF
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
MCB	MAIN CIRCUIT BREAKER
NTS	NOT TO SCALE
TYP	TYPICAL
GND	GROUND
MLO	MAIN LUG ONLY
IG	ISOLATED GROUND

FIRE AND SECURITY ALARM EQUIPMENT

- S — IONIZATION TYPE SMOKE DETECTOR, A-INDICATES ADDRESSABLE TYPE
- H — FIXED TEMPERATURE HEAT DETECTOR
- D — DUCT SMOKE DETECTOR
- F — FIRE ALARM PULL STATION
- H — HORN
- AV 15/75 — AUDIO/VISUAL FIRE ALARM, 15/75 INDICATES CANDELA LEVEL
- V 15/75 — VISUAL FIRE ALARM, 15/75 INDICATES CANDELA LEVEL
- ALARM BELL
- RT — REMOTE TROUBLE UNIT AND SILENCER FOR FIRE ALARM PANEL
- FACP — FIRE ALARM CONTROL PANEL
- FA-ANN — FIRE ALARM ANNUNCIATOR
- WF — WATER FLOW SWITCH
- TS — TAMPER SWITCH
- S — SUPERVISORY SWITCH
- P — LOW AIR PRESSURE SWITCH
- S/FA-ANN — SECURITY/FIRE ALARM ANNUNCIATOR
- SA-ANN — SECURITY ALARM ANNUNCIATOR
- SACP — SECURITY ALARM CONTROL PANEL
- DC — CONCEALED DOOR JAMB MAGNETIC CONTACT
- DC S — SURFACE MOUNTED DOOR JAMB MAGNETIC CONTACT
- ODC — OVERHEAD DOOR CONTACT
- M — MOTION DETECTOR
- TRAN — TRANSMITTER
- REC — RECEIVER

INSTRUMENTATION DESIGNATIONS

TM	BUBBLE INDICATES FIELD MOUNTED INSTRUMENT
TM	TIMER MOTOR
TR	TIMING RELAY
LIT	LEVEL INDICATING TRANSMITTER
LE	LEVEL ELEMENT
TIT	TEMPERATURE INDICATING TRANSMITTER
TE	TEMPERATURE ELEMENT
FIT	FLOW INDICATING TRANSMITTER
FE	FLOW ELEMENT
FLS	FLOW SWITCH
FS	FLOAT SWITCH
PS	PRESSURE SWITCH
LS	LIMIT SWITCH
DOE	DISSOLVED OXYGEN ELEMENT
DOIT	DISSOLVED OXYGEN INDICATING TRANSMITTER
SV	SOLENOID CONTROLLED VALVE
ZE	POSITION ELEMENT

GENERAL NOTES:

1. THE CONDUIT FITTING SYMBOLS REFERENCED ON THIS SHEET ARE USED IN THIS SET OF DRAWINGS ONLY TO INDICATE WHERE CONDUITS JUNCTION, UNLESS SPECIFICALLY INDICATED ON THE DRAWINGS OR IN THE SPECIFICATIONS THE CONTRACTOR IS NOT REQUIRED TO USE THE PARTICULAR FITTINGS INDICATED BY THE SYMBOLS, IF THE MATERIALS USED ARE OTHERWISE IN COMPLIANCE WITH THESE DRAWINGS AND SPECIFICATIONS.
2. THE CURVED LINE ( ) AND HOMERUN INDICATE ELECTRICAL CONTINUITY ONLY, UNLESS OTHERWISE INDICATED BY THE DRAWINGS AND SPECIFICATION, THE CONTRACTOR IS TO SELECT THE ROUTING OF THE CONDUITS FOR THESE CIRCUITS. IN SOME CASES, CIRCUITS MAY HAVE THE CONDUIT ROUTING SHOWN ON THE DRAWINGS. THIS SYMBOL SHOWS UP AS STRAIGHT LINES, CONNECTED BY REGULAR "BENDS" OR BY FITTING SYMBOLS, THUS ( ) AND SHOWS THE RECOMMENDED CONDUIT ROUTE FOR THAT PARTICULAR CIRCUIT.
3. ON THE LAYOUT PLANS, THE LOCATIONS OF SOME EQUIPMENT AND DEVICES AT WHICH CIRCUITS TERMINATE ARE APPROXIMATE. THE CONTRACTOR IS TO INSTALL EACH CIRCUIT TO THE INTENDED EQUIPMENT TERMINATION POINT WITHOUT ADDITIONAL CHARGE TO THE OWNER, ALTHOUGH ITS FINAL LOCATION MAY SHIFT SOMEWHAT FROM THAT WHICH IS SHOWN.
4. THIS IS A STANDARD ELECTRICAL LEGEND AND NOT ALL DEVICES AND DEVICE DESIGNATIONS MAY BE USED ON THIS PROJECT.

DESIGN AND DEVELOPMENT
MISSOURI DEPARTMENT OF CONSERVATION
P.O. BOX 180, JEFFERSON CITY, MO 65102
(573) 522-4115 www.mdc.mo.gov

STATE OF MISSOURI — JEFFREY D. KRUMM — E-27490 — PROFESSIONAL ENGINEER
12/7/16

JEFFREY D. KRUMM
ELECTRICAL ENGINEER
E-27490

SHEPHERD OF THE HILLS FISH HATCHERY

STORAGE BUILDING IMPROVEMENTS

TANEY COUNTY

MARK	DATE	DESCRIPTION
0	12/6/16	ISSUED

ISSUE

PROJECT NO: 56-01-64
CAD DWG FILE: 56-01-64_E-001.dwg
DRAWN BY: JMT
DESIGNED BY: JDK
CHECKED BY:
SHEET TITLE

ELECTRICAL LEGEND

E-001

SHEET 25 OF 30

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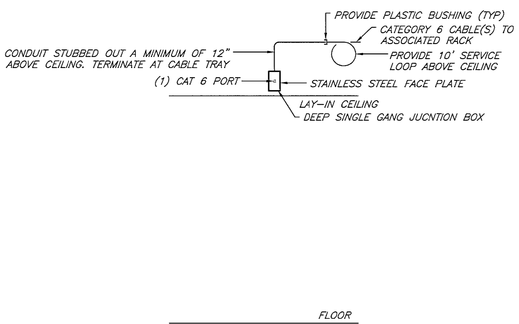

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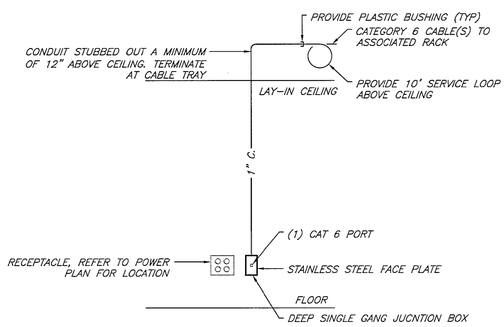

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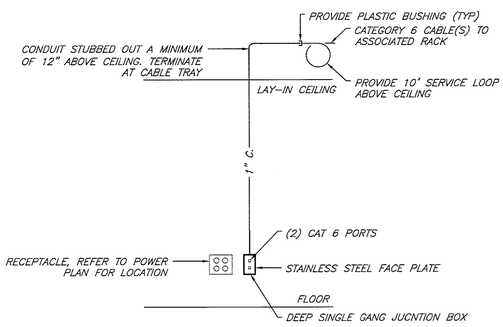

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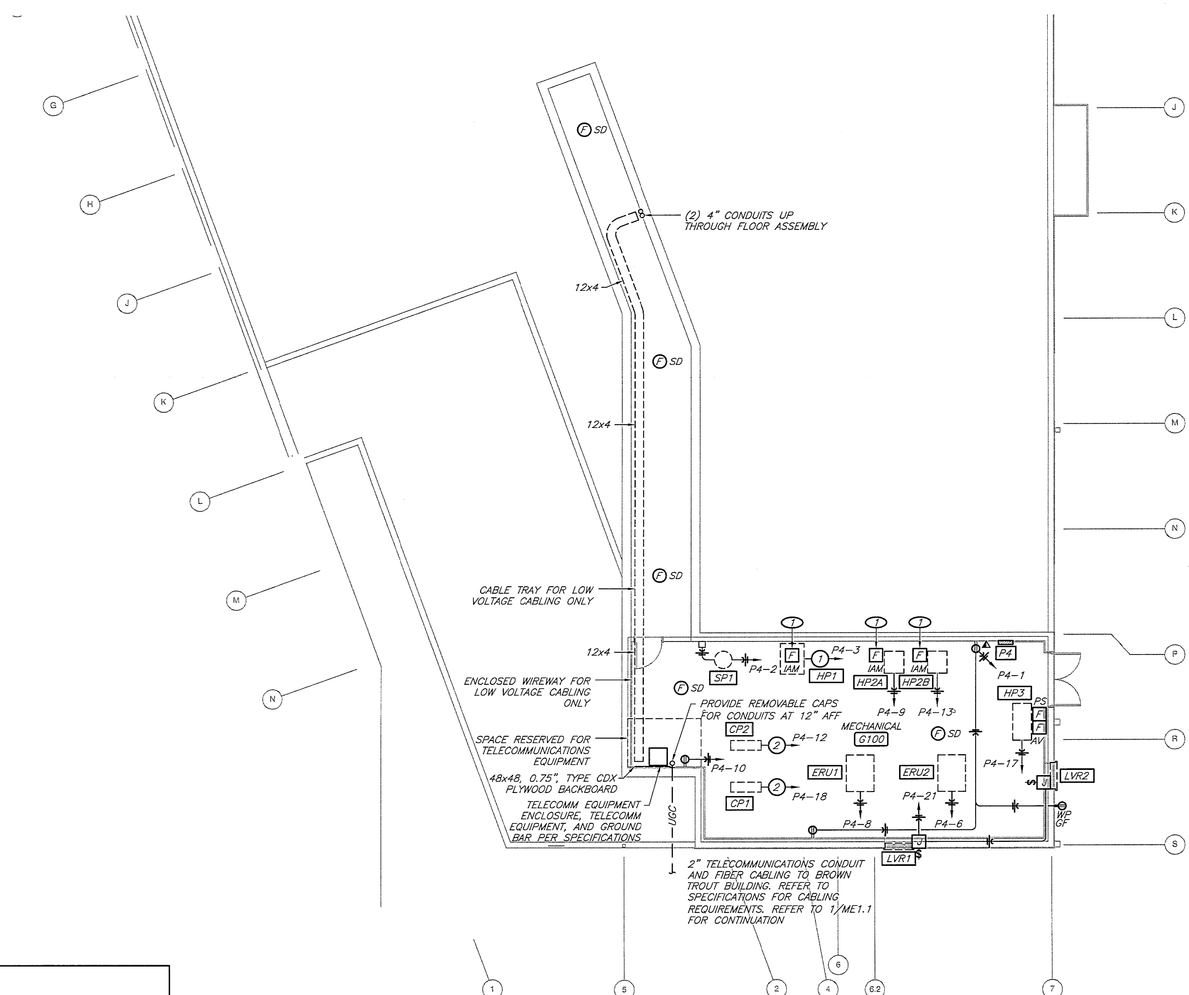
NO SCALE



KEYNOTES:

1. PROVIDE FIRE ALARM RELAY FOR SHUTDOWN OF HVAC EQUIPMENT DURING ANY FIRE EVENT.

CONDUIT & CONDUCTORS:

1. (3) #8 AND (1) #10 GROUND IN 0.75" CONDUIT
2. (3) #6 AND (1) #10 GROUND IN 0.75" CONDUIT

1 BASEMENT POWER AND SPECIAL SYSTEMS PLAN
1/8" = 1'-0"

NORTH

E2.1

Date:	10-27-16
Revised:	-
Scale:	AS NOTED
Drawn:	AKD
Checked:	---
Job:	14023

SHEPHERD OF THE HILLS CONSERVATION NATURE CENTER
MISSOURI DEPARTMENT OF CONSERVATION
Hatchery Road
Branson, MO 65616

BASEMENT POWER AND SPECIAL SYSTEMS PLAN

STATE OF MISSOURI
ALLEN DAVIS
NUMBER
PE-2004017155
PROFESSIONAL ENGINEER
Allen Davis 2016.10.27
ALLEN DAVIS - ENGINEER
PE-2004017155

CJD
Engineering | Energy | Innovation
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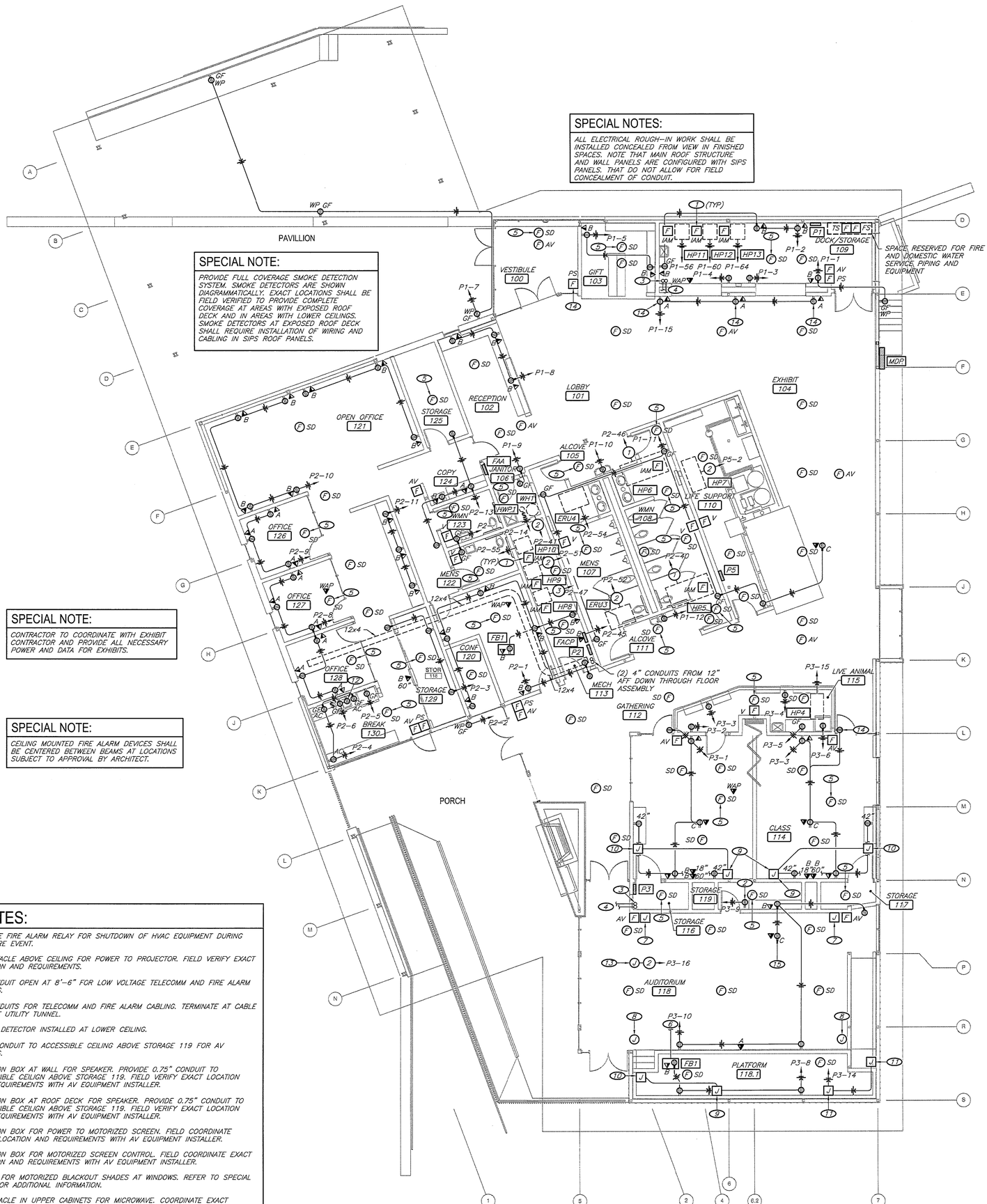

SPECIAL NOTES:

ALL ELECTRICAL ROUGH-IN WORK SHALL BE INSTALLED CONCEALED FROM VIEW IN FINISHED SPACES. NOTE THAT MAIN ROOF STRUCTURE AND WALL PANELS ARE CONFIGURED WITH SIPS PANELS. THAT DO NOT ALLOW FOR FIELD CONCEALMENT OF CONDUIT.

SPECIAL NOTE:

PROVIDE FULL COVERAGE SMOKE DETECTION SYSTEM. SMOKE DETECTORS ARE SHOWN DIAGRAMMATICALLY. EXACT LOCATIONS SHALL BE FIELD VERIFIED TO PROVIDE COMPLETE COVERAGE AT AREAS WITH EXPOSED ROOF DECK AND IN AREAS WITH LOWER CEILINGS. SMOKE DETECTORS AT EXPOSED ROOF DECK SHALL REQUIRE INSTALLATION OF WIRING AND CABLING IN SIPS ROOF PANELS.

SPECIAL NOTE:

CONTRACTOR TO COORDINATE WITH EXHIBIT CONTRACTOR AND PROVIDE ALL NECESSARY POWER AND DATA FOR EXHIBITS.

SPECIAL NOTE:

CEILING MOUNTED FIRE ALARM DEVICES SHALL BE CENTERED BETWEEN BEAMS AT LOCATIONS SUBJECT TO APPROVAL BY ARCHITECT.

KEYNOTES:

1. PROVIDE FIRE ALARM RELAY FOR SHUTDOWN OF HVAC EQUIPMENT DURING ANY FIRE EVENT.
2. RECEPTACLE ABOVE CEILING FOR POWER TO PROJECTOR. FIELD VERIFY EXACT LOCATION AND REQUIREMENTS.
3. 2" CONDUIT OPEN AT 8'-6" FOR LOW VOLTAGE TELECOMM AND FIRE ALARM CABLING.
4. 2" CONDUITS FOR TELECOMM AND FIRE ALARM CABLING. TERMINATE AT CABLE TRAY AT UTILITY TUNNEL.
5. SMOKE DETECTOR INSTALLED AT LOWER CEILING.
6. 1.25" CONDUIT TO ACCESSIBLE CEILING ABOVE STORAGE 119 FOR AV CABLING.
7. JUNCTION BOX AT WALL FOR SPEAKER. PROVIDE 0.75" CONDUIT TO ACCESSIBLE CEILIGN ABOVE STORAGE 119. FIELD VERIFY EXACT LOCATION AND REQUIREMENTS WITH AV EQUIPMENT INSTALLER.
8. JUNCTION BOX AT ROOF DECK FOR SPEAKER. PROVIDE 0.75" CONDUIT TO ACCESSIBLE CEILIGN ABOVE STORAGE 119. FIELD VERIFY EXACT LOCATION AND REQUIREMENTS WITH AV EQUIPMENT INSTALLER.
9. JUNCTION BOX FOR POWER TO MOTORIZED SCREEN. FIELD COORDINATE EXACT LOCATION AND REQUIREMENTS WITH AV EQUIPMENT INSTALLER.
10. JUNCTION BOX FOR MOTORIZED SCREEN CONTROL. FIELD COORDINATE EXACT LOCATION AND REQUIREMENTS WITH AV EQUIPMENT INSTALLER.
11. POWER FOR MOTORIZED BLACKOUT SHADES AT WINDOWS. REFER TO SPECIAL NOTE FOR ADDITIONAL INFORMATION.
12. RECEPTACLE IN UPPER CABINETS FOR MICROWAVE. COORDINATE EXACT LOCATION WITH MILLWORK CONTRACTOR.
13. PROVIDE POWER ABOVE CEILING FOR ROOF DRAINAGE SYSTEM.
14. FIELD COORDINATE EXACT PLACEMENT WITH FINISHES AND EXHIBITS.
15. POWER AND COMMUNICATIONS FOR PROJECTOR. FIELD COORDINATE EXACT LOCATION AND REQUIREMENTS.

CONDUIT & CONDUCTORS:

1. (3) #8 AND (1) #10 GROUND IN 0.75" CONDUIT
2. (2) #10 AND (1) #10 GROUND IN 0.75" CONDUIT
3. (2) #8 AND (1) #10 GROUND IN 0.75" CONDUIT

SPECIAL NOTE:

PROVIDE POWER TO MOTORIZED SHADES AT EXTERIOR WINDOWS AT AUDITORIUM 118. REFER TO ARCHITECTURAL DRAWINGS FOR WINDOW SIZES AND LOCATIONS AND FOR MOTORIZED SHADE SPECIFICATIONS. FIELD COORDINATE EXACT DETAILING AND REQUIREMENTS WITH SHADE INSTALLER. NOTE THAT EXTENSIVE COORDINATION IS REQUIRED.

1 FIRST FLOOR POWER AND SPECIAL SYSTEMS PLAN
1/8" = 1'-0"

NORTH

E2.2

Date:	10-27-16
Revised:	-
Scale:	AS NOTED
Drawn:	AKD
Checked:	---
Job:	14023

SHEPHERD OF THE HILLS CONSERVATION NATURE CENTER
MISSOURI DEPARTMENT OF CONSERVATION
Hatchery Road
Branson, MO 65616

FIRST FLOOR POWER AND SPECIAL SYSTEMS PLAN

STATE OF MISSOURI
ALLEN DAVIS
NUMBER
PE-2004017155
PROFESSIONAL ENGINEER
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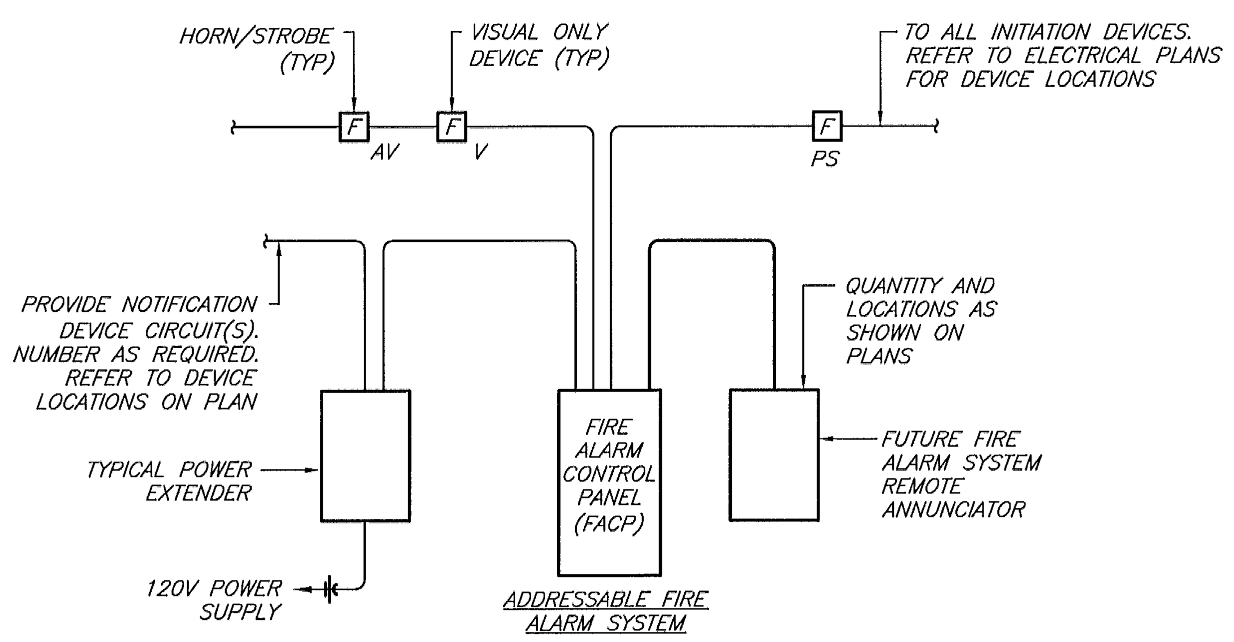
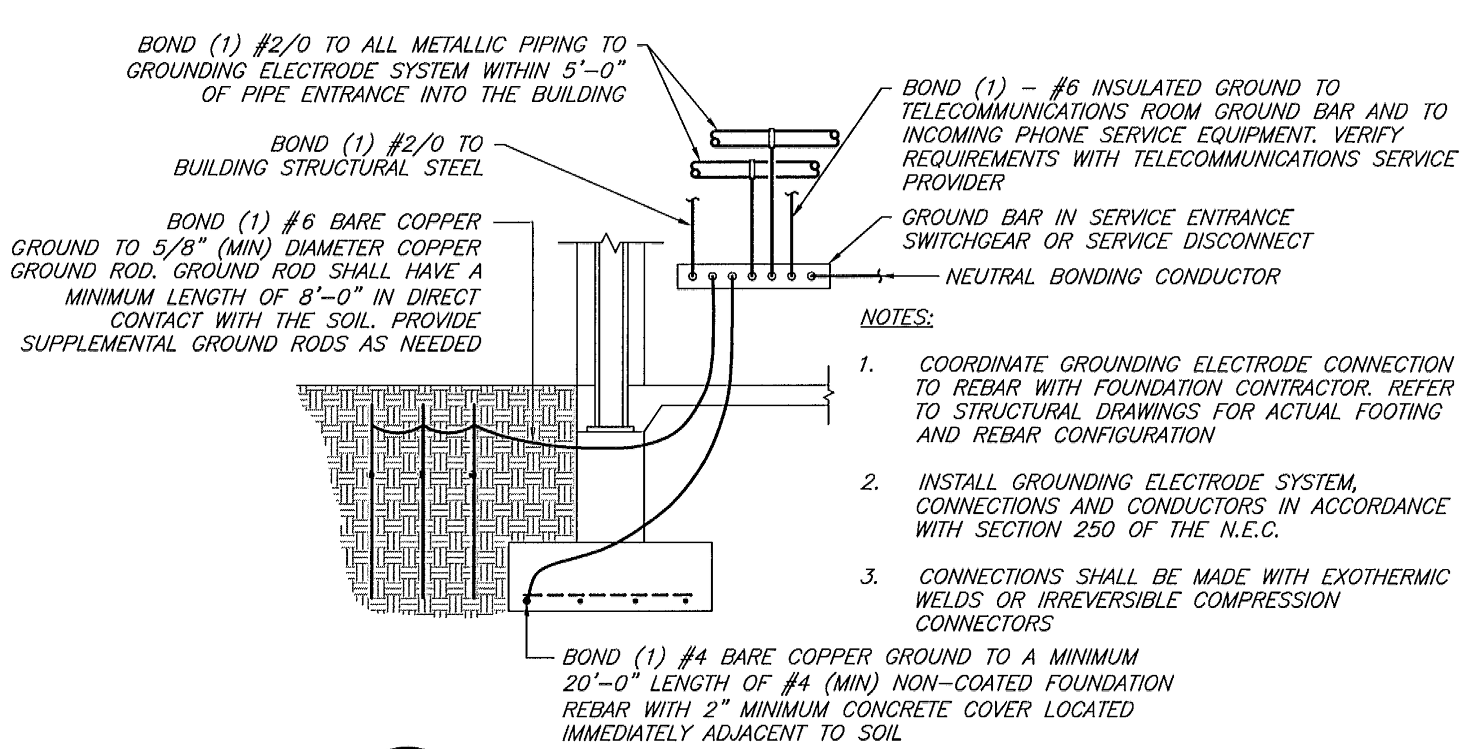


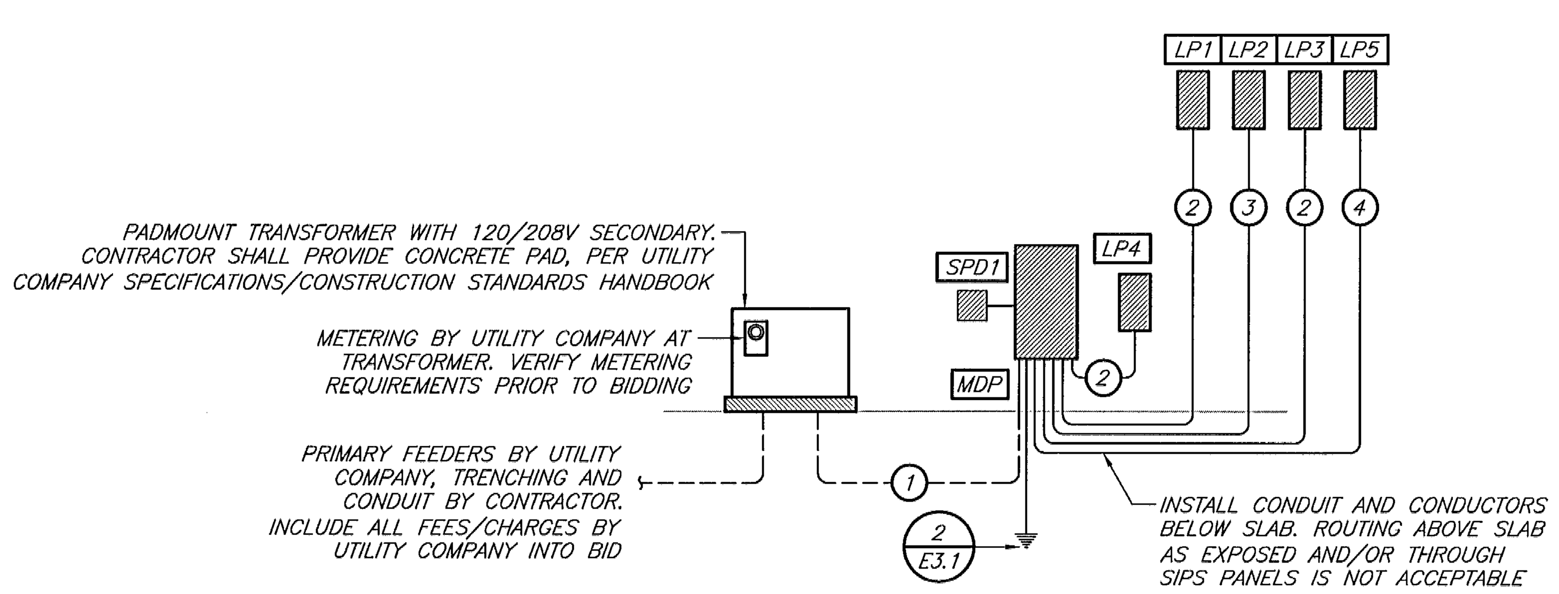
3 **FIRE ALARM SYSTEM DIAGRAM**
NO SCALE



NOTES:

1. COORDINATE GROUNDING ELECTRODE CONNECTION TO REBAR WITH FOUNDATION CONTRACTOR. REFER TO STRUCTURAL DRAWINGS FOR ACTUAL FOOTING AND REBAR CONFIGURATION
2. INSTALL GROUNDING ELECTRODE SYSTEM, CONNECTIONS AND CONDUCTORS IN ACCORDANCE WITH SECTION 250 OF THE N.E.C.
3. CONNECTIONS SHALL BE MADE WITH EXOTHERMIC WELDS OR IRREVERSIBLE COMPRESSION CONNECTORS

2 **GROUNDING ELECTRODE DETAIL**
NO SCALE



1 **ELECTRICAL RISER DIAGRAM**
NO SCALE

ELECTRICAL SYMBOLS:

- EXIT LIGHT; WALL MOUNTED / CEILING MOUNTED
- EMERGENCY LIGHT
- EXIT/EMERGENCY LIGHT
- FLUORESCENT LIGHT FIXTURE
- FLUORESCENT LIGHT FIXTURE WITH DUAL LEVEL SWITCHING
- FLUORESCENT LIGHT FIXTURE WITH EMERGENCY POWER
- NL UNSWITCHED "NIGHT LIGHT" FIXTURE
- RECESSED CAN LIGHT FIXTURE
- WALL-MOUNT LIGHT FIXTURE
- $ 20AMP, SINGLE POLE, 120/277V SWITCH
- $3 20AMP, THREE-WAY, 120/277V SWITCH
- $4 20AMP, FOUR-WAY, 120/277V SWITCH
- $2 20AMP, DOUBLE POLE, 120/277V SWITCH
- $D DIMMER SWITCH
- $ET 120V ELECTRONIC TIMER SWITCH
- $HOA HAND-OFF-AUTO SELECTOR SWITCH
- $K 20AMP, SINGLE POLE, 120/277V, KEY OPERATED SWITCH
- $M 20AMP, MOMENTARY CONTACT, 120/277V SWITCH
- $OS WALL BOX OCCUPANCY SENSOR SWITCH
- $P 20AMP, SINGLE POLE, 120/277V SWITCH WITH PILOT LAMP
- $SC FAN SPEED CONTROL SWITCH
- $SSU BUSSMANN FUSETRON FUSED SWITCH
- OS1 CEILING MOUNTED OCCUPANCY SENSOR FOR LIGHTING CONTROL
- OS1 WALL MOUNTED OCCUPANCY SENSOR FOR LIGHTING CONTROL
- SIMPLEX RECEPTACLE; 2P, 3W, 20A, 125V
- 14-30 SIMPLEX RECEPTACLE; NEMA CONFIGURATION AS INDICATED
- DUPLEX RECEPTACLE; 2P, 3W, 20A, 125V
- 42" DUPLEX RECEPTACLE; MOUNTED @ 42" ABOVE FINISHED FLOOR
- C DUPLEX RECEPTACLE; INSTALLED FLUSH WITH CEILNG
- AC DUPLEX RECEPTACLE; MOUNTED 6" ABOVE COUNTERTOP BACKSPLASH
- GF DUPLEX RECEPTACLE W/ GROUND FAULT INTERRUPTER
- SW DUPLEX RECEPTACLE; SWITCHED
- TR DUPLEX RECEPTACLE; TAMPER RESISTANT
- WP DUPLEX RECEPTACLE; WEATHERPROOF
- DOUBLE DUPLEX RECEPTACLE WITH COMMON FACEPLATE
- RECEPTACLE MOUNTED IN FLUSH FLOOR BOX. REFER TO SPECIFICATIONS
- RECEPTACLE MOUNTED IN FS TYPE BOX ON RIGID CONDUIT
- JUNCTION BOX - CEILING MOUNTED
- JUNCTION BOX - WALL MOUNTED
- LP1 LIGHTING & POWER PANELBOARD
- MDP ELECTRICAL EQUIPMENT. SEE SCHEDULE FOR TAGGED EQUIPMENT
- DS1 DISCONNECT SWITCH
- CONDUIT CONCEALED IN CEILING OR WALL
- CONDUIT CONCEALED IN FLOOR SLAB
- CONDUIT ROUTED EXPOSED AT STRUCTURE
- #12 CONDUCTORS, TICK MARKS INDICATE QUANTITY
- P1-1 HOME RUN WITH PANEL AND CIRCUIT DESIGNATION
- P1-2 PARTIAL HOME RUN WITH PANEL AND CIRCUIT DESIGNATION
- GROUND WIRE
- FEEDER PER SCHEDULE
- ** TELEPHONE OUTLET
- ** TELECOMMUNICATIONS OUTLET
- * CABLE TELEVISION OR MATV OUTLET
- ** TELECOMMUNICATIONS OUTLET INSTALLED IN FLUSH FLOOR BOX

* THESE DEVICE REQUIRE 4" SQUARE JUNCTION BOX WITH 1" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. WHERE APPLICABLE, INSTALL CONDUIT TO NEAR CABLE TRAY. PROVIDE PULL STRING AND INSULATING BUSHING UNLESS INDICATED OTHERWISE IN PLANS OR SPECIFICATIONS

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ELECTRICAL GENERAL NOTES:

1. THESE ELECTRICAL GENERAL NOTES APPLY TO ALL ELECTRICAL SHEETS.
2. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. ALL EXISTING EQUIPMENT, CONDUIT, WIRING, LIGHT FIXTURES, ETC. INDICATED ON THESE PLANS IS BASED ON INFORMATION GATHERED FROM EXISTING PLANS AND DURING FIELD OBSERVATIONS. CONTRACTOR SHALL FIELD VERIFY EXTENT OF EXISTING CONSTRUCTION.
4. PLANS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED. REFER TO ARCHITECTURAL DRAWINGS AND EXISTING CONDITIONS FOR DIMENSIONS. FIELD VERIFY DIMENSIONS.
5. COOPERATE CLOSELY WITH ALL OTHER TRADES TO EXPEDITE CONSTRUCTION AND AVOID INTERFERENCES AND CONFLICTS. COORDINATE LOCATIONS OF CONDUITS, RACEWAYS, SUPPORTS, ETC. WITH ALL TRADES PRIOR TO ROUGH-IN. YIELD RIGHT OF WAY TO SYSTEMS REQUIRED TO BE INSTALLED AT A SLOPE.
6. PROVIDE METAL INSULATION BARRIER AROUND ALL RECESSED LIGHT FIXTURES INSTALLED IN CEILINGS WITH INSULATION THAT COULD BE IN DIRECT CONTACT WITH LIGHT FIXTURE. BARRIER SHALL BE EQUAL TO PRODUCT MANUFACTURED BY E.Z. BARRIER. BARRIER SHALL MAINTAIN 3" CLEARANCE BETWEEN INSULATION AND THE LIGHT FIXTURE.
7. COORDINATE REQUIRED CLEARANCES ABOUT AND ABOVE ELECTRICAL EQUIPMENT WITH PLUMBING, HVAC AND OTHER TRADES TO KEEP DUCTWORK, PIPING, ETC. FROM BEING INSTALLED ABOVE ELECTRICAL EQUIPMENT.
8. COORDINATE LIGHT FIXTURE LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS. COORDINATE LOCATIONS OF WALL MOUNTED LIGHT FIXTURES WITH ARCHITECTURAL INTERIOR ELEVATIONS PRIOR TO ROUGH-IN.
9. COORDINATE WALL MOUNTED SWITCH, RECEPTACLE, TELEPHONE, DATA, AND OTHER ELECTRICAL SYSTEM DEVICE LOCATIONS WITH ARCHITECTURAL INTERIOR AND MILLWORK ELEVATION DRAWINGS PRIOR TO ROUGH-IN. ALL ROUGH-IN LOCATIONS SHALL BE APPROVED BY ARCHITECT.
10. COMMUNICATIONS OUTLETS/DEVICES (DATA AND TELEPHONE), WALL PLATES, AND ASSOCIATED PLENUM RATED WIRING SHALL BE SUPPLIED AND INSTALLED BY CONTRACTOR. BOXES AND CONDUIT SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.
11. ELECTRICAL CONTRACTOR SHALL PROVIDE JUNCTION BOX WITH 0.75" CONDUIT TO ACCESSIBLE CEILING SPACE AT FINISHED AREAS, OR TO STRUCTURE AT UNFINISHED AREAS FOR ALL THERMOSTATS, TEMPERATURE SENSORS, CO2 SENSORS, ETC. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS. CONDUIT STUBS SHALL BE TERMINATED WITH INSULATING BUSHINGS.
13. INSTALL RECEPTACLES ADJACENT TO PHONE, DATA, TV, ETC. OUTLETS WHERE SHOWN IN SAME LOCATION.
14. ALL BRANCH CIRCUITS OR FEEDERS SHALL BE INSTALLED WITH AN EQUIPMENT GROUNDING CONDUCTOR ROUTED WITH THEM.
15. PROVIDE PIPING CURBS AT ALL CONDUIT PENETRATIONS OF ROOF. INSTALL IN ACCORDANCE WITH ROOFING SYSTEM MANUFACTURER'S REQUIREMENTS.
16. ALL LIGHT SWITCHES, FIRE ALARM SYSTEM PULL STATIONS, THERMOSTATS SHALL BE INSTALLED WITHIN 12" OF THE END OF A WALL OR DOOR OPENING. DO NOT INSTALL IN HIGHLY VISIBLE AREAS, I.E. CENTERS OF WALLS. PRIOR TO INSTALLATION AT QUESTIONABLE LOCATIONS, CONTACT THE ARCHITECT TO OBTAIN EXACT INSTALLATION LOCATIONS. ALL ROUGH-IN LOCATIONS SHALL BE APPROVED BY ARCHITECT.
17. COORDINATE WITH TELEPHONE, DATA, CABLE TELEVISION, AND OTHER ASSOCIATED VENDORS TO ESTABLISH EXACT ROUGH-IN LOCATIONS FOR ALL DEVICES.
18. PROVIDE ALL ACCESSORIES, COMPONENTS, ETC. REQUIRED FOR COMPLETE INSTALLATION OF SPECIFIED EQUIPMENT.
19. SEAL ALL PENETRATIONS THROUGH FIRE-RATED ASSEMBLIES AS NECESSARY TO RESTORE FIRE-RESISTANCE RATING OF ASSEMBLY. REFER TO ARCHITECTURAL PLANS AND SPECIFICATIONS FOR RATED ASSEMBLIES, FIRESTOPPING MATERIALS AND REQUIREMENTS.
20. MAINTAIN ALL CLEARANCES REQUIRED FOR EQUIPMENT. COORDINATE WITH ALL CONTRACTORS, SUCH THAT NO ROUTE PIPING, DUCTWORK, ETC. IS INSTALLED ABOVE ELECTRICAL PANELS.
21. DRAWINGS REPRESENT FINAL RESULT. REMOVE, RELOCATE, MODIFY EXISTING EQUIPMENT, FIXTURES, WIRING, CONDUIT, ETC. AS REQUIRED. FIELD VERIFY EXISTING CONDITIONS AND EXACT REQUIREMENTS.
22. THE CONTRACTOR SHALL INCLUDE IN BID THE COSTS TO CUT, PATCH AND REPAIR EXISTING WALLS, FLOORS AND CEILING CONSTRUCTION AS REQUIRED TO INSTALL EQUIPMENT, CONDUIT, ETC.

FIRE ALARM SYMBOLS:

- AV CEILING MOUNTED AUDIO/VISUAL FIRE ALARM ANNUNCIATING DEVICE
- CO WALL/CEILING MOUNTED CARBON MONOXIDE DETECTOR MONITORED BY FIRE ALARM SYSTEM
- HD CEILING MOUNTED HEAT DETECTOR
- SD CEILING MOUNTED SMOKE DETECTOR
- DD DUCT MOUNTED SMOKE DETECTOR WITH SAMPLING TUBE. INSTALL AT RETURN DUCT UNLESS OTHERWISE NOTED
- DD DUCT MOUNTED SMOKE DETECTOR WITH SAMPLING TUBE, FOR CONTROL OF FIRE/SMOKE DAMPER. REFER TO PLAN NOTE FOR DETAILS
- FACP FIRE ALARM SYSTEM CONTROL PANEL
- AV WALL MOUNTED AUDIO/VISUAL FIRE ALARM ANNUNCIATING DEVICE
- DH FIRE ALARM DOOR HOLDER
- FA REMOTE ANNUCIATOR PANEL
- FB FIRE ALARM BELL
- IM FIRE ALARM SYSTEM INDIVIDUAL ADDRESSABLE MODULE
- PS MANUAL PULL STATION
- RT DUCT SMOKE DETECTOR REMOTE TEST SWITCH
- TS TAMPER SWITCH
- V WALL MOUNTED VISUAL FIRE ALARM ANNUNCIATING DEVICE
- ZM FIRE ALARM SYSTEM ZONE ADDRESSABLE MODULE

FIRE ALARM GENERAL NOTES:

1. THESE FIRE ALARM GENERAL NOTES APPLY TO ALL ELECTRICAL SHEETS.
2. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. PROVIDE FIRE ALARM SYSTEM INITIATION DEVICES AND NOTIFICATION APPLIANCES, MONITORING AND CONTROL DEVICES AS INDICATED ON THE DRAWINGS.
4. ALL FIRE ALARM WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF NFPA 72 AND THE NATIONAL ELECTRICAL CODE.
5. FIRE ALARM SYSTEM WIRING SHALL BE PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. SYSTEM CONNECTIONS FOR INITIATING DEVICES SHALL BE CLASS B, STYLE A; NOTIFICATION APPLIANCE CIRCUITS SHALL BE CLASS B STYLE Y. ALL FIRE ALARM SYSTEM WIRING SHALL BE INSTALLED COMPLETELY IN EMT CONDUIT. PAINT FIRE ALARM JUNCTION BOXES AND CONDUIT FITTINGS RED.
6. FIRE ALARM SYSTEM EQUIPMENT SUBMITTALS SHALL INCLUDE PRODUCT DATA SHEETS, EQUIPMENT WIRING DIAGRAMS, SEQUENCE OF OPERATIONS, VOLTAGE DROP AND BATTERY CALCULATIONS.
7. WHERE A POWER EXTENDER IS REQUIRED, PROVIDE POWER EXTENDER, ASSOCIATED 120V POWER SUPPLY AND A SMOKE DETECTOR IN SAME ROOM AS POWER EXTENDER.
8. IF SHOWN ON THE PLANS, CONTRACTOR SHALL PROVIDE ALL MAGNETIC DOOR HOLDERS, AND ALL CONTROL WIRING, TO CLOSE DOORS UPON DETECTION BY ASSOCIATED SMOKE DETECTOR. DOOR HOLDER FINISH SHALL MATCH ALL DOOR HARDWARE FINISH OF DOOR HARDWARE PROVIDED BY OTHERS.
9. COORDINATE WITH FIRE SPRINKLER SYSTEM CONTRACTOR. PROVIDE NUMBER OF FIRE ALARM MONITORING MODULES AS REQUIRED FOR ALL TAMPER SWITCHES AND FLOW SWITCHES.
10. FIRE ALARM SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH NFPA STANDARDS AND MANUFACTURER'S RECOMMENDATIONS BY PERSONS WHO ARE QUALIFIED AND EXPERIENCED IN THE INSTALLATION, INSPECTION AND TESTING OF FIRE ALARM SYSTEMS. INSTALLER SHALL HAVE A MINIMUM OF 3 YEARS OF EXPERIENCE. PERFORM OPERATIONAL SYSTEM TESTS UPON COMPLETION OF INSTALLATION. CORRECT DEFICIENCIES AND RETEST PRIOR TO OWNER OCCUPATION OF BUILDING. PROVIDE A COMPLETED NFPA 72 RECORD OF COMPLETION FORM TO THE OWNER AND AUTHORITY HAVING JURISDICTION.

TELECOMM GENERAL NOTES:

1. THESE ELECTRICAL GENERAL NOTES APPLY TO ALL ELECTRICAL SHEETS.
2. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETE INSTALLATION OF TELECOMM DEVICES AND CABLING, RACKS, EQUIPMENT, ETC. PER SPECIFICATIONS.
4. ALL EQUIPMENT AND MATERIALS SHALL BE PROVIDED PER SPECIFICATIONS. SUBSTITUTIONS WITH PRIOR APPROVAL ONLY FROM OWNER'S REPRESENTATIVE.

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Date:	10-27-16
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ELECTRICAL SCHEDULES AND DETAILS