

New Outdoor Firing Range Missouri State Highway Patrol Jefferson City, Missouri

The
Schematic Connection, Inc.
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MO CORP. ENGINEERING LICENSE NO. 2003019000

**Midwest
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Missouri State Certificate of Authority #2010032467

GREDELL Engineering Resources, Inc.

ENVIRONMENTAL ENGINEERING LAND - AIR - WATER

1505 East High Street
Jefferson City, Missouri

Telephone: (573) 659-9078
Facsimile: (573) 659-9079

MO CORP. ENGINEERING LICENSE NO. E-2001001669-D



**ALLSTATE
CONSULTANTS**
3312 LEMONE INDUSTRIAL BLVD.
COLUMBIA, MO. 65201
(573) 875-8799
allstateconsultants.net
MISSOURI STATE CERTIFICATE
OF AUTHORITY #2007004004

**The
Architects
Alliance inc.**
Jefferson City, Missouri
Missouri Certificate of Authority
000143 Exp. 12/31/2018
631 West Main Street, Jefferson City, MO 65101
573.636.5000

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OWNER: STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR
DEPARTMENT OF PUBLIC SAFETY
MISSOURI STATE
HIGHWAY PATROL

PROJECT
MANAGEMENT: OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT,
DESIGN AND CONSTRUCTION

DESIGNERS: GREDELL Engineering Resources, Inc.
The Architect's Alliance, Inc.
Allstate Consultants LLC
Midwest Engineering and Design, L.L.C.
The Schematic Connection, Inc.

PROJECT NUMBER: R1806-01

SITE NUMBER: 6026
ASSET NUMBER: 8136026001



SHEET NUMBER:

G-001

1 OF 49 SHEETS
8/30/2019



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OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND CONSTRUCTION

MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
SITE # 6026
ASSET # 8136026001

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: 8/30/2019

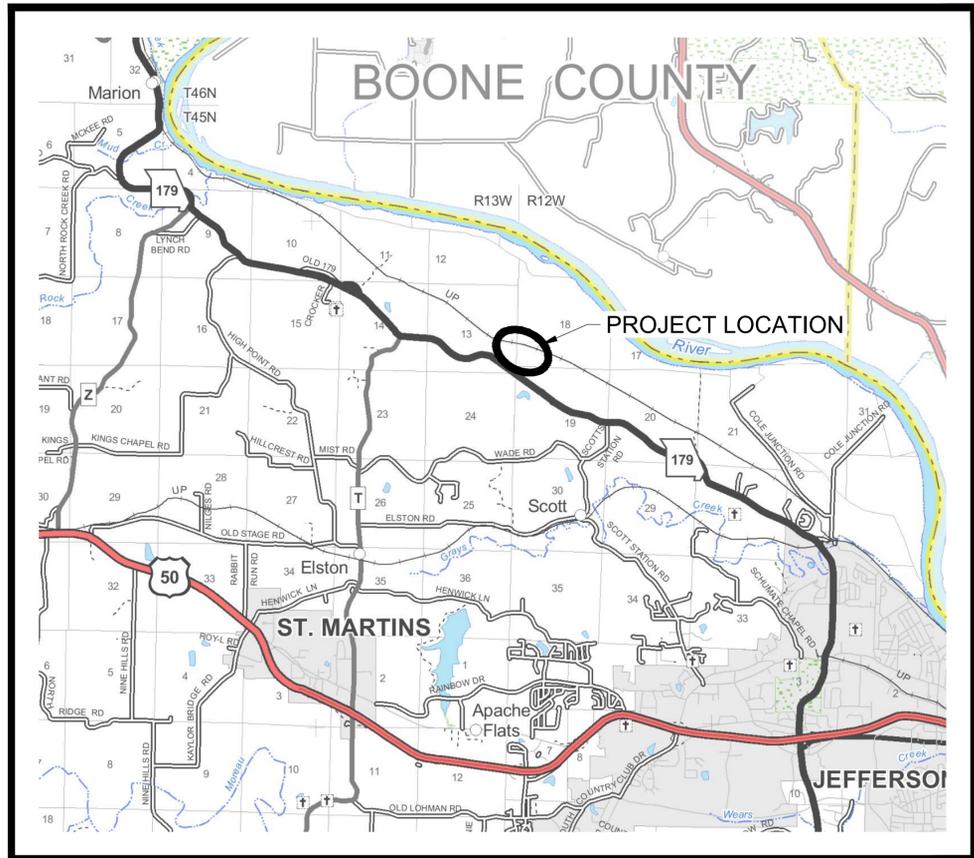
CAD DWG FILE: G-002
DRAWN BY: CP
CHECKED BY: BD
DESIGNED BY: BR

SHEET TITLE:
**SITE LOCATION
& GENERAL
INFORMATION**

SHEET NUMBER:

G-002

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8/30/2019



SITE VICINITY MAP
N.T.S.



PROJECT LOCATION MAP
N.T.S.



SITE LOCATION MAP
N.T.S.

- NOTES:
1. SITE VICINITY MAP FROM MODOT GENERAL HIGHWAY MAP FOR COLE COUNTY.
2. SITE LOCATION MAP FROM GOOGLE EARTH.

NOTES TO THE CONTRACTOR:

UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS AND THEREFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS AT PRESENT NOT KNOWN. VERIFICATION OF THE LOCATIONS OF UNDERGROUND UTILITIES, SHOWN OR NOT SHOWN, WILL BE THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR.

THE CONTRACTOR SHALL MAKE SUITABLE AND TIMELY REQUESTS TO ALL UTILITY OWNERS, PIPELINE OWNERS, OR OTHER PARTIES AFFECTED TO MAKE ALL NECESSARY ADJUSTMENTS OF PUBLIC OR PRIVATE UTILITIES, PIPE LINES, OR OTHER APPURTENANCES WITHIN, OR ADJACENT TO THE LIMITS OF CONSTRUCTION, AS SOON AS PRACTICAL OR POSSIBLE.

MISSOURI ONE CALL SYSTEM (DIG-RITE) 1-800-344-7483



J. Brian Rockwell, MO. PLS #2524
CENTRAL MISSOURI PROFESSIONAL SERVICES
MISSOURI STATE CERTIFICATE
OF AUTHORITY #000355

TOPOGRAPHIC SURVEY
PART OF SE 1/4, SE 1/4 SEC. 13, T45N, R13W
& PART OF SW 1/4, SEC. 18 &
NW 1/4, SEC. 19, T45N, R12W
COLE COUNTY, MISSOURI

SURVEYOR'S CERTIFICATE
This is to certify that at the request of GREDELL Engineering Resources, Inc., a Topographic Survey was made under my personal direction and the results are represented on this plat. This survey was made in accordance with the Missouri Standards for a Rural Property Boundary Survey.

In Witness whereof, I have hereunto set my seal and signature this 4th day of June, 2019.

Field Work Completed: 4/23/2019.

LEGEND

CENTERLINE	
EXISTING RIGHT-OF-WAY	
SECTION LINE	
UNDERGROUND TELEPHONE LINE	
EXISTING FENCE	
TOP OF SLOPE	
TOE OF SLOPE	

CMP-CORRUGATED METAL PIPE, F-FLOW LINE OF PIPE, B-BOOK, P-PAGE

SIGN

TREE

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OFFICE OF ADMINISTRATION
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MANAGEMENT,
DESIGN AND CONSTRUCTION

MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
SITE # 6026
ASSET # 8136026001

REVISION: _____
DATE: _____
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DATE: _____
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DATE: _____
ISSUE DATE: 8/30/2019

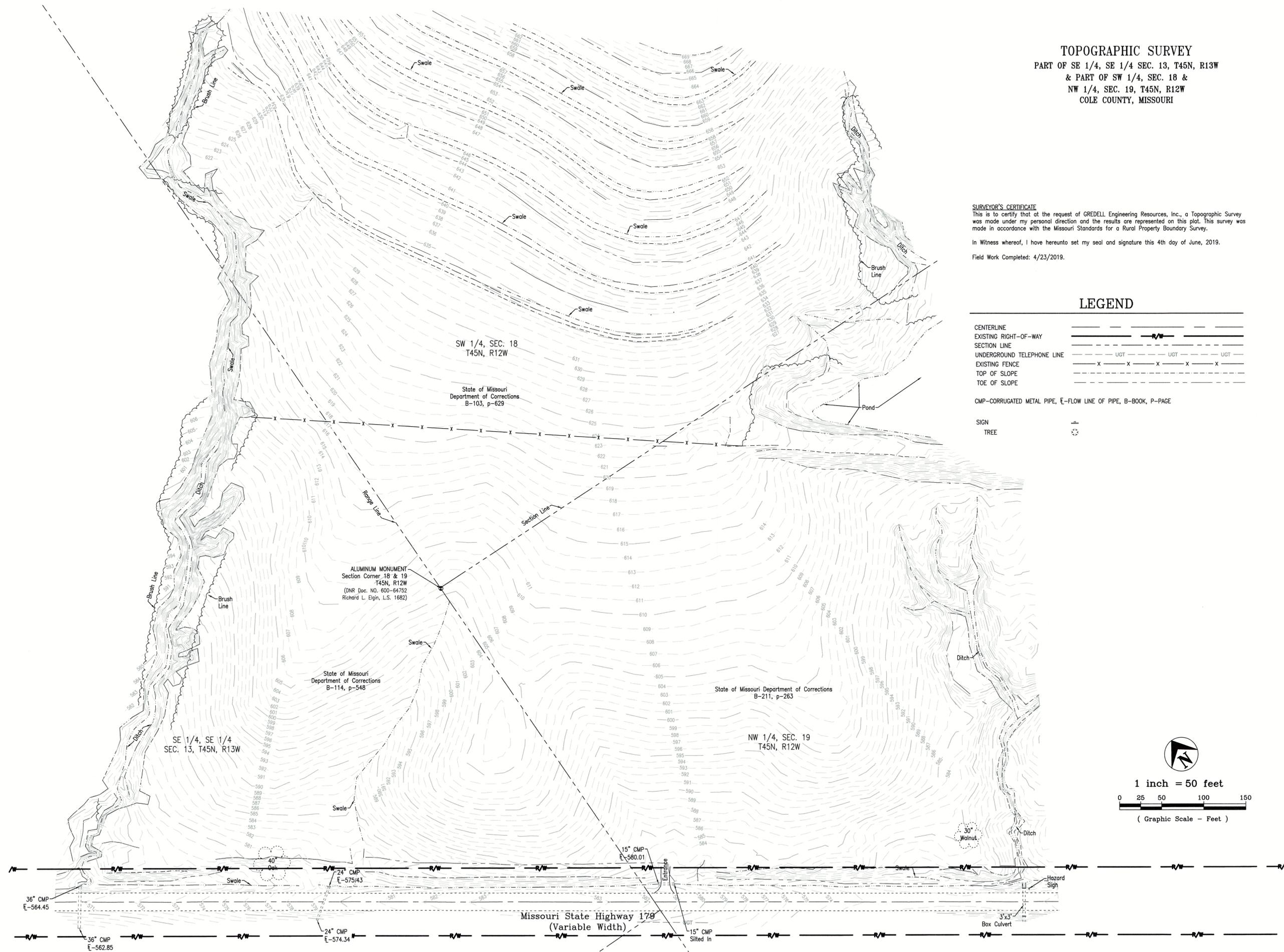
CAD DWG FILE: C-101
DRAWN BY: JM
CHECKED BY: KB, JBR
DESIGNED BY: _____

SHEET TITLE:
**EXISTING
CONDITIONS/
SITE SURVEY**

SHEET NUMBER:

C-101

3 OF 49 SHEETS
8/30/2019



P:\2019\03_131\General_Surveying\Survey\131\Map\131.dwg, 8/30/2019 10:44:34 AM, 10/22/2019 10:44:34 AM, 10/22/2019 10:44:34 AM



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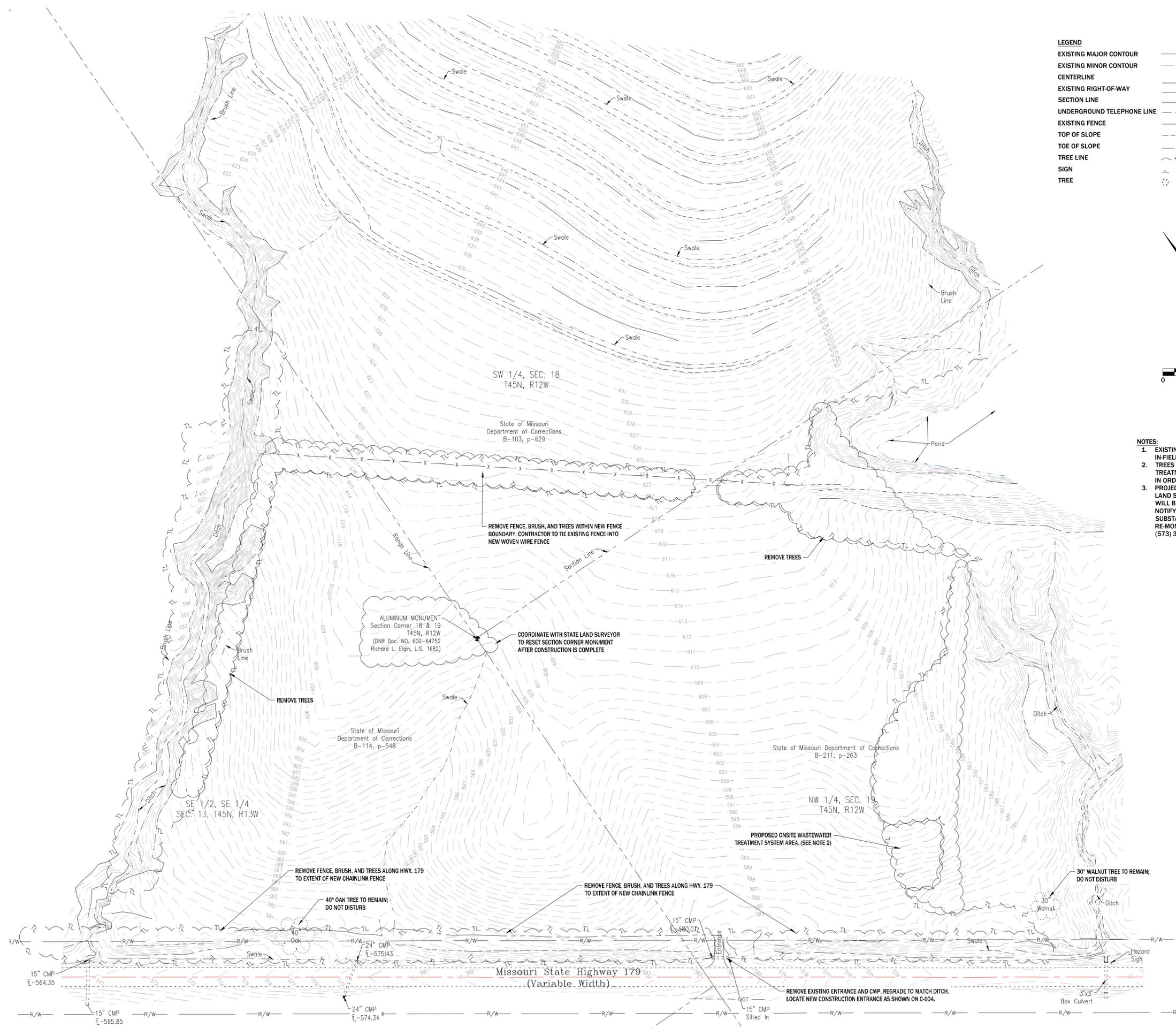
CAD DWG FILE: C-102
DRAWN BY: CP
CHECKED BY: BD
DESIGNED BY: BR

SHEET TITLE:
**SITE CLEARING
AND DEMO**

SHEET NUMBER:

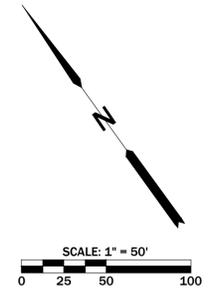
C-102

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8/30/2019



LEGEND

EXISTING MAJOR CONTOUR	----- 620 -----
EXISTING MINOR CONTOUR	----- 618 -----
CENTERLINE	----- R/W -----
EXISTING RIGHT-OF-WAY	----- R/W -----
SECTION LINE	----- UGT ----- UGT ----- UGT -----
UNDERGROUND TELEPHONE LINE	----- X ----- X ----- X ----- X -----
EXISTING FENCE	----- X ----- X ----- X ----- X -----
TOP OF SLOPE	----- TL ----- TL ----- TL ----- TL -----
TOE OF SLOPE	----- TL ----- TL ----- TL ----- TL -----
TREE LINE	----- TL ----- TL ----- TL ----- TL -----
SIGN	----- S ----- S ----- S ----- S -----
TREE	----- T ----- T ----- T ----- T -----



- NOTES:**
- EXISTING SURFACE FEATURES AND TOPOGRAPHY BASED ON A MARCH 2019 IN-FIELD SURVEY BY CENTRAL MISSOURI PROFESSIONAL SERVICES.
 - TREES REMOVED WITHIN BOUNDARY OF PROPOSED ONSITE WASTEWATER TREATMENT SYSTEM SHALL BE REMOVED WITH ROOT BALLS LEFT IN PLACE IN ORDER TO MINIMIZE SOIL DISTURBANCE.
 - PROJECT SURVEYOR HAS FILED A CORNER FORM WITH THE MISSOURI'S LAND SURVEY PROGRAM. THE MONUMENT AS SECTION CORNER 18 & 19 WILL BE OBLITERATED DURING CONSTRUCTION. THE CONTRACTOR IS TO NOTIFY MISSOURI'S LAND SURVEY PROGRAM WHEN CONSTRUCTION IS SUBSTANTIALLY COMPLETE SO THAT THE STATE LAND SURVEYOR CAN RE-MONUMENT THE SECTION CORNER. MISSOURI LAND SURVEY PROGRAM: (573) 368-2300.

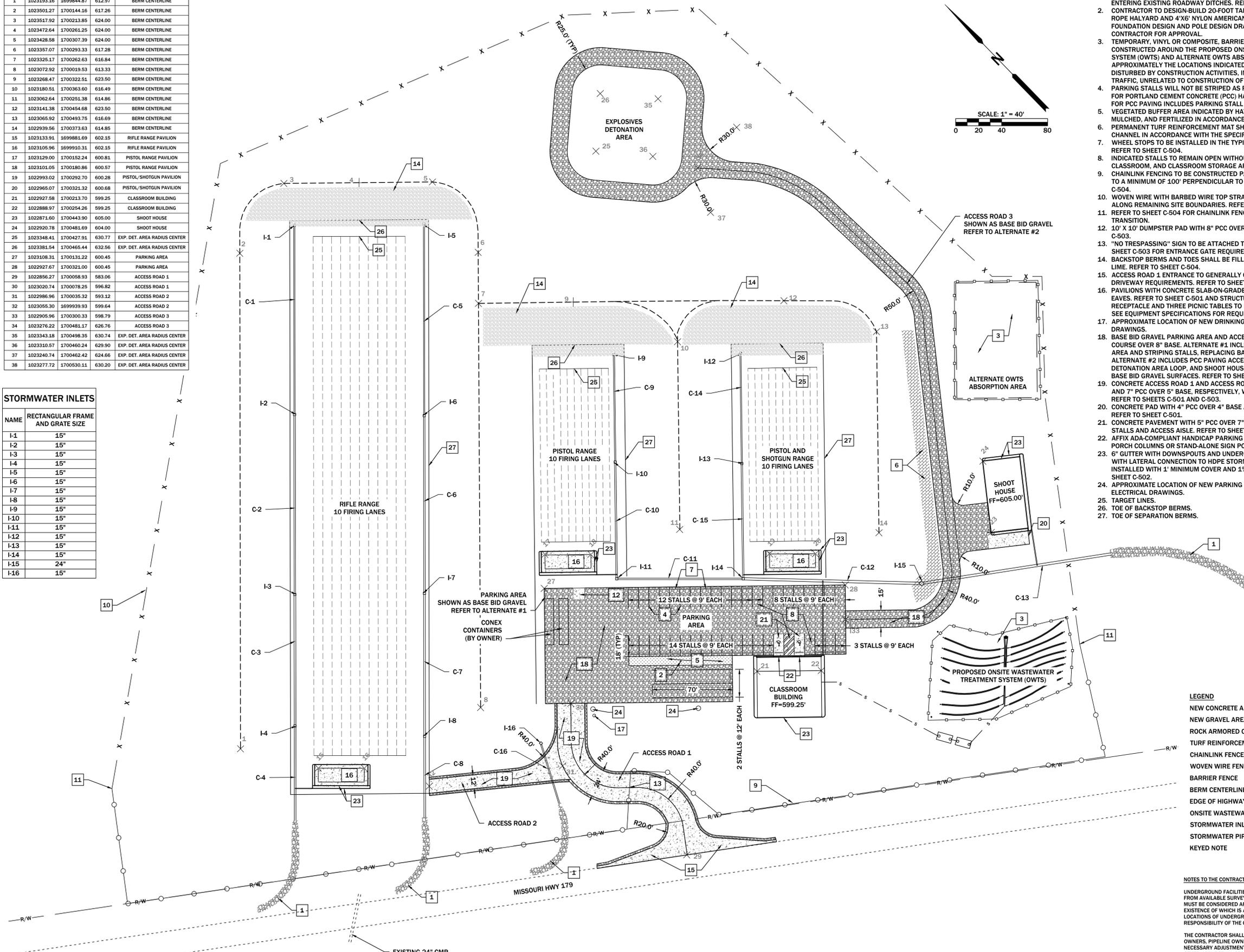
NOTES TO THE CONTRACTOR:
UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS AND THEREFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS AT PRESENT NOT KNOWN. VERIFICATION OF THE LOCATIONS OF UNDERGROUND UTILITIES, SHOWN OR NOT SHOWN, WILL BE THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR.

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MISSOURI ONE CALL SYSTEM (DIG-RITE) 1-800-344-7483

Point #	Northing	Easting	Elevation	Description
1	1023193.16	1699844.87	612.97	BERM CENTERLINE
2	1023501.27	1700144.16	617.26	BERM CENTERLINE
3	1023517.92	1700213.85	624.00	BERM CENTERLINE
4	1023472.64	1700261.25	624.00	BERM CENTERLINE
5	1023428.58	1700307.39	624.00	BERM CENTERLINE
6	1023357.07	1700293.33	617.28	BERM CENTERLINE
7	1023325.17	1700262.63	616.84	BERM CENTERLINE
8	1023272.92	1700019.53	613.33	BERM CENTERLINE
9	1023268.47	1700322.51	623.50	BERM CENTERLINE
10	1023180.51	1700363.60	616.49	BERM CENTERLINE
11	1023062.64	1700251.38	614.86	BERM CENTERLINE
12	1023141.38	1700454.68	623.50	BERM CENTERLINE
13	1023065.92	1700493.75	616.69	BERM CENTERLINE
14	1022939.56	1700373.63	614.85	BERM CENTERLINE
15	1023133.91	1699881.69	602.15	RIFLE RANGE PAVILION
16	1023105.96	1699910.31	602.15	RIFLE RANGE PAVILION
17	1023129.00	1700152.24	600.81	PISTOL RANGE PAVILION
18	1023101.05	1700180.86	600.57	PISTOL RANGE PAVILION
19	1022993.02	1700292.70	600.28	PISTOL, SHOTGUN PAVILION
20	1022965.07	1700321.32	600.68	PISTOL, SHOTGUN PAVILION
21	1022927.58	1700213.70	599.25	CLASSROOM BUILDING
22	1022888.97	1700254.26	599.25	CLASSROOM BUILDING
23	1022871.60	1700443.90	605.00	SHOOT HOUSE
24	1022920.78	1700481.69	604.00	SHOOT HOUSE
25	1023348.41	1700427.91	630.77	EXP. DET. AREA RADIUS CENTER
26	1023381.54	1700465.44	632.56	EXP. DET. AREA RADIUS CENTER
27	1023108.31	1700131.22	600.45	PARKING AREA
28	1022927.67	1700321.00	600.45	PARKING AREA
29	1022856.27	1700058.93	583.06	ACCESS ROAD 1
30	1023020.74	1700078.25	596.82	ACCESS ROAD 1
31	1022986.96	1700035.32	593.12	ACCESS ROAD 2
32	1023055.30	1699939.93	599.64	ACCESS ROAD 2
33	1022905.96	1700300.33	598.79	ACCESS ROAD 3
34	1023276.22	1700481.17	626.76	ACCESS ROAD 3
35	1023343.18	1700498.35	630.74	EXP. DET. AREA RADIUS CENTER
36	1023310.57	1700460.24	629.90	EXP. DET. AREA RADIUS CENTER
37	1023240.74	1700462.42	624.66	EXP. DET. AREA RADIUS CENTER
38	1023277.72	1700930.11	630.20	EXP. DET. AREA RADIUS CENTER

NAME	RECTANGULAR FRAME AND GRATE SIZE
I-1	15"
I-2	15"
I-3	15"
I-4	15"
I-5	15"
I-6	15"
I-7	15"
I-8	15"
I-9	15"
I-10	15"
I-11	15"
I-12	15"
I-13	15"
I-14	15"
I-15	24"
I-16	15"



- KEYED NOTES:**
- TYPICAL ROCK ARMORED CHANNEL AND CHANNEL TRANSITION. CHANNEL TRANSITIONS TO BE CREATED FOR ARMORED CHANNELS DIRECTLY ENTERING EXISTING ROADWAY DITCHES. REFER TO SHEET C-502.
 - CONTRACTOR TO DESIGN-BUILD 20-FOOT TALL, ALUMINUM FLAG POLE WITH ROPE HAYYARD AND 4"X8" NYLON AMERICAN FLAG. ENGINEERED FOUNDATION DESIGN AND POLE DESIGN DRAWINGS TO BE SUBMITTED BY CONTRACTOR FOR APPROVAL.
 - TEMPORARY, VINYL OR COMPOSITE, BARRIER FENCING SHALL BE CONSTRUCTED AROUND THE PROPOSED ONSITE WASTEWATER TREATMENT SYSTEM (OWTS) AND ALTERNATE OWTS ABSORPTION FIELDS IN APPROXIMATELY THE LOCATIONS INDICATED. THESE AREAS SHALL NOT BE DISTURBED BY CONSTRUCTION ACTIVITIES, INCLUDING CONSTRUCTION TRAFFIC, UNRELATED TO CONSTRUCTION OF THE OWTS.
 - PARKING STALLS WILL NOT BE STRIPED AS PART OF THE BASE BID, EXCEPT FOR PORTLAND CEMENT CONCRETE (PCC) HANDICAP STALLS. ALTERNATE #1 FOR PCC PAVING INCLUDES PARKING STALL STRIPING.
 - VEGETATED BUFFER AREA INDICATED BY HATCHING TO BE SEEDED, MULCHED, AND FERTILIZED IN ACCORDANCE WITH THE SPECIFICATIONS.
 - PERMANENT TURF REINFORCEMENT MAT SHALL BE INSTALLED IN PROPOSED CHANNEL IN ACCORDANCE WITH THE SPECIFICATIONS.
 - WHEEL STOPS TO BE INSTALLED IN THE TYPICALLY INDICATED LOCATIONS. REFER TO SHEET C-504.
 - INDICATED STALLS TO REMAIN OPEN WITHOUT WHEEL STOPS FOR RANGE, CLASSROOM, AND CLASSROOM STORAGE AREA ACCESS.
 - CHAINLINK FENCING TO BE CONSTRUCTED PARALLEL TO HIGHWAY 179 AND TO A MINIMUM OF 100' PERPENDICULAR TO THE HIGHWAY. REFER TO SHEET C-504.
 - WOVEN WIRE WITH BARBED WIRE TOP STRANDS TO BE CONSTRUCTED ALONG REMAINING SITE BOUNDARIES. REFER TO SHEET C-504.
 - REFER TO SHEET C-504 FOR CHAINLINK FENCE TO WOVEN WIRE FENCE TRANSITION.
 - 10' X 10' DUMPSTER PAD WITH 8" PCC OVER 6" BASE. REFER TO SHEET C-503.
 - "NO TRESPASSING" SIGN TO BE ATTACHED TO ENTRANCE GATE. REFER TO SHEET C-503 FOR ENTRANCE GATE REQUIREMENTS.
 - BACKSTOP BERMS AND TOES SHALL BE FILLED WITH 3/8" MINUS WASTE LIME. REFER TO SHEET C-504.
 - ACCESS ROAD 1 ENTRANCE TO GENERALLY CONFORM TO MDDOT TYPE III DRIVEWAY REQUIREMENTS. REFER TO SHEET C-501.
 - PAVILIONS WITH CONCRETE SLAB-ON-GRADE, CONSTRUCTED 1' BEYOND EAVES. REFER TO SHEET C-501 AND STRUCTURAL DRAWINGS. ONE TRASH RECEPTACLE AND THREE PICNIC TABLES TO BE INCLUDED AT EACH PAVILION. SEE EQUIPMENT SPECIFICATIONS FOR REQUIREMENTS.
 - APPROXIMATE LOCATION OF NEW DRINKING WATER WELL. REFER TO MEP DRAWINGS.
 - BASE BID GRAVEL PARKING AREA AND ACCESS ROAD 3 WITH 2" SURFACE COURSE OVER 8" BASE. ALTERNATE #1 INCLUDES PCC PAVING PARKING AREA AND STRIPING STALLS, REPLACING BASE BID GRAVEL SURFACE. ALTERNATE #2 INCLUDES PCC PAVING ACCESS ROAD 3, EXPLOSIVES DETONATION AREA LOOP, AND SHOOT HOUSE PULL-OFF AREA, REPLACING BASE BID GRAVEL SURFACES. REFER TO SHEET C-503.
 - CONCRETE ACCESS ROAD 1 AND ACCESS ROAD 2 WITH 8" PCC OVER 6" BASE AND 7" PCC OVER 5" BASE, RESPECTIVELY, WITH 2' GRAVEL SHOULDER. REFER TO SHEETS C-501 AND C-503.
 - CONCRETE PAD WITH 4" PCC OVER 4" BASE AT SHOOT HOUSE ENTRANCE. REFER TO SHEET C-501.
 - CONCRETE PAVEMENT WITH 5" PCC OVER 7" BASE FOR 2 HANDICAP PARKING STALLS AND ACCESS AISLE. REFER TO SHEETS C-503 AND C-504.
 - AFFIX ADA-COMPLIANT HANDICAP PARKING SIGNS TO EITHER BUILDING PORCH COLUMNS OR STAND-ALONE SIGN POSTS AT NO LESS THAN 48" HIGH.
 - 6" GUTTER WITH DOWNSPOUTS AND UNDERGROUND ROOF DRAINAGE PIPING WITH LATERAL CONNECTION TO HDPE STORM SEWER. PIPE SHALL BE INSTALLED WITH 2' MINIMUM COVER AND 1% MINIMUM SLOPE. REFER TO SHEET C-502.
 - APPROXIMATE LOCATION OF NEW PARKING LOT LIGHTING. REFER TO SITE ELECTRICAL DRAWINGS.
 - TARGET LINES.
 - TOE OF BACKSTOP BERMS.
 - TOE OF SEPARATION BERMS.

LEGEND

NEW CONCRETE AREA	
NEW GRAVEL AREA	
ROCK ARMORED CHANNEL	
TURF REINFORCEMENT MAT	
CHAINLINK FENCE	
WOVEN WIRE FENCE	
BARRIER FENCE	
BERM CENTERLINE	
EDGE OF HIGHWAY	
ONSITE WASTEWATER LINE	
STORMWATER INLET	
STORMWATER PIPING	
KEYED NOTE	

NOTES TO THE CONTRACTOR:

UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS AND THEREFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS AT PRESENT NOT KNOWN. VERIFICATION OF THE LOCATIONS OF UNDERGROUND UTILITIES, SHOWN OR NOT SHOWN, WILL BE THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR.

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DESIGN AND CONSTRUCTION

MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
SITE # 6026
ASSET # 8136026001

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: 8/30/2019

CAD DWG FILE: C-103
DRAWN BY: BR
CHECKED BY: BD
DESIGNED BY: BR, ZT

SHEET TITLE:
**SITE PLAN
AND LAYOUT**

SHEET NUMBER:
C-103



Bruce Dawson, P.E.
E-22331

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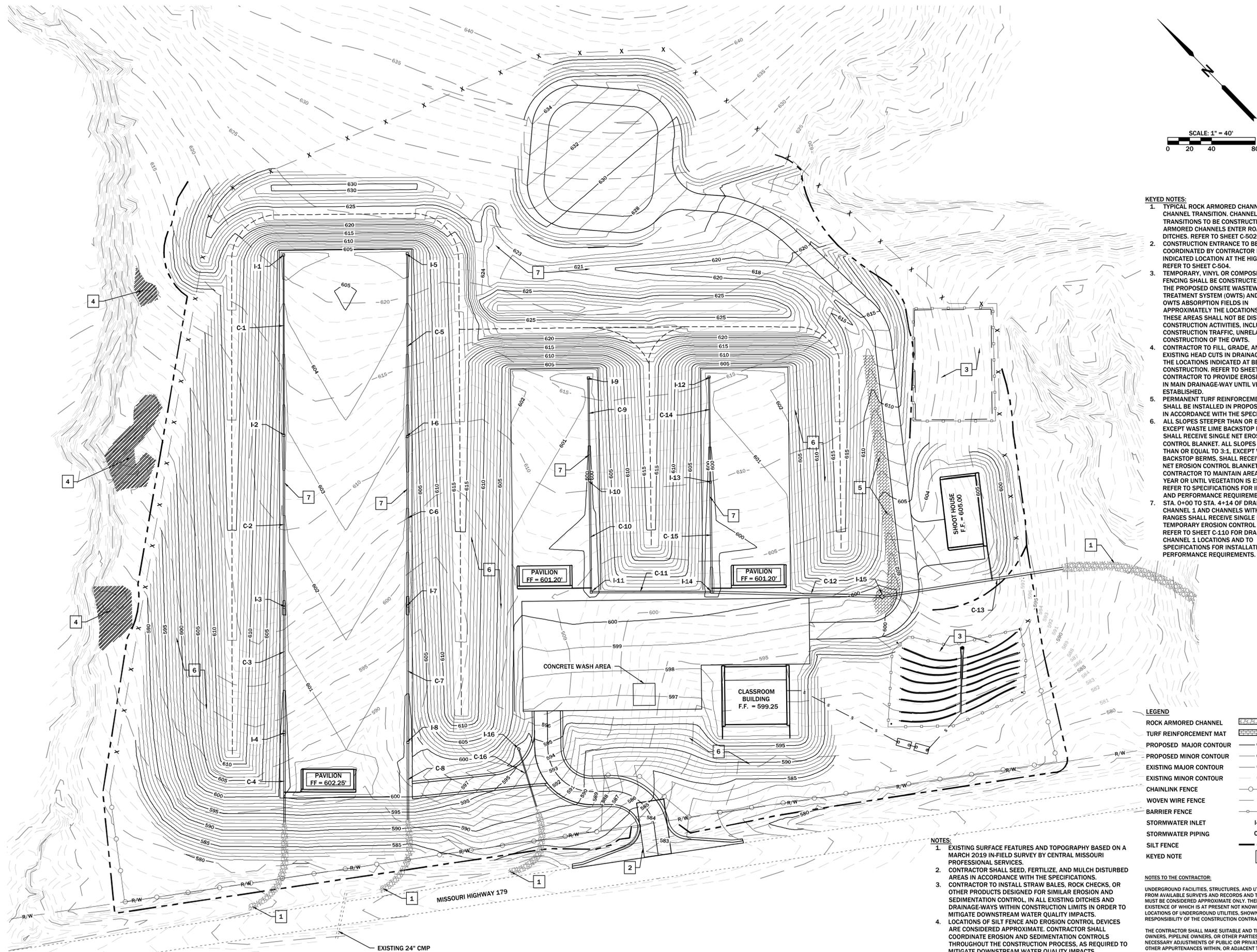
CAD DWG FILE: C-104
DRAWN BY: BR
CHECKED BY: BD
DESIGNED BY: BR, ZT

SHEET TITLE:
**GRADING AND
EROSION CONTROL
PLAN**

SHEET NUMBER:

C-104

6 OF 49 SHEETS
8/30/2019



- KEYED NOTES:**
1. TYPICAL ROCK ARMORED CHANNEL AND CHANNEL TRANSITION. CHANNEL TRANSITIONS TO BE CONSTRUCTED WHERE ARMORED CHANNELS ENTER ROADWAY DITCHES. REFER TO SHEET C-502.
 2. CONSTRUCTION ENTRANCE TO BE COORDINATED BY CONTRACTOR IN THE INDICATED LOCATION AT THE HIGHWAY CREST. REFER TO SHEET C-504.
 3. TEMPORARY VINYL OR COMPOSITE BARRIER FENCING SHALL BE CONSTRUCTED AROUND THE PROPOSED ONSITE WASTEWATER TREATMENT SYSTEM (OWTS) AND ALTERNATE OWTS ABSORPTION FIELDS IN APPROXIMATELY THE LOCATIONS INDICATED. THESE AREAS SHALL NOT BE DISTURBED BY CONSTRUCTION ACTIVITIES, INCLUDING CONSTRUCTION TRAFFIC, UNRELATED TO CONSTRUCTION OF THE OWTS.
 4. CONTRACTOR TO FILL, GRADE, AND VEGETATE EXISTING HEAD CUTS IN DRAINAGE-WAYS AT THE LOCATIONS INDICATED AT BEGINNING OF CONSTRUCTION. REFER TO SHEET C-504. CONTRACTOR TO PROVIDE EROSION CONTROL IN MAIN DRAINAGE-WAY UNTIL VEGETATION IS ESTABLISHED.
 5. PERMANENT TURF REINFORCEMENT MAT SHALL BE INSTALLED IN PROPOSED CHANNEL IN ACCORDANCE WITH THE SPECIFICATIONS.
 6. ALL SLOPES STEEPER THAN OR EQUAL TO 4:1, EXCEPT WASTE LIME BACKSTOP BERMS, SHALL RECEIVE SINGLE NET EROSION CONTROL BLANKET. ALL SLOPES STEEPER THAN OR EQUAL TO 3:1, EXCEPT WASTE LIME BACKSTOP BERMS, SHALL RECEIVE DOUBLE NET EROSION CONTROL BLANKET. CONTRACTOR TO MAINTAIN AREAS FOR ONE YEAR OR UNTIL VEGETATION IS ESTABLISHED. REFER TO SPECIFICATIONS FOR INSTALLATION AND PERFORMANCE REQUIREMENTS.
 7. STA. 0+00 TO STA. 4+14 OF DRAINAGE CHANNEL 1 AND CHANNELS WITHIN FIRING RANGES SHALL RECEIVE SINGLE NET TEMPORARY EROSION CONTROL BLANKET. REFER TO SHEET C-110 FOR DRAINAGE CHANNEL 1 LOCATIONS AND TO SPECIFICATIONS FOR INSTALLATION AND PERFORMANCE REQUIREMENTS.

LEGEND

ROCK ARMORED CHANNEL	
TURF REINFORCEMENT MAT	
PROPOSED MAJOR CONTOUR	
PROPOSED MINOR CONTOUR	
EXISTING MAJOR CONTOUR	
EXISTING MINOR CONTOUR	
CHAINLINK FENCE	
WOVEN WIRE FENCE	
BARRIER FENCE	
STORMWATER INLET	
STORMWATER PIPING	
SILT FENCE	
KEYED NOTE	

- NOTES:**
1. EXISTING SURFACE FEATURES AND TOPOGRAPHY BASED ON A MARCH 2019 IN-FIELD SURVEY BY CENTRAL MISSOURI PROFESSIONAL SERVICES.
 2. CONTRACTOR SHALL SEED, FERTILIZE, AND MULCH DISTURBED AREAS IN ACCORDANCE WITH THE SPECIFICATIONS.
 3. CONTRACTOR TO INSTALL STRAW BALES, ROCK CHECKS, OR OTHER PRODUCTS DESIGNED FOR SIMILAR EROSION AND SEDIMENTATION CONTROL, IN ALL EXISTING DITCHES AND DRAINAGE-WAYS WITHIN CONSTRUCTION LIMITS IN ORDER TO MITIGATE DOWNSTREAM WATER QUALITY IMPACTS.
 4. LOCATIONS OF SILT FENCE AND EROSION CONTROL DEVICES ARE CONSIDERED APPROXIMATE. CONTRACTOR SHALL COORDINATE EROSION AND SEDIMENTATION CONTROLS THROUGHOUT THE CONSTRUCTION PROCESS, AS REQUIRED TO MITIGATE DOWNSTREAM WATER QUALITY IMPACTS.

NOTES TO THE CONTRACTOR:

UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS AND THEREFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS AT PRESENT NOT KNOWN. VERIFICATION OF THE LOCATIONS OF UNDERGROUND UTILITIES, SHOWN OR NOT SHOWN, WILL BE THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR.

THE CONTRACTOR SHALL MAKE SUITABLE AND TIMELY REQUESTS TO ALL UTILITY OWNERS, PIPELINE OWNERS, OR OTHER PARTIES AFFECTED TO MAKE ALL NECESSARY ADJUSTMENTS OF PUBLIC OR PRIVATE UTILITIES, PIPE LINES, OR OTHER APPURTENANCES WITHIN, OR ADJACENT TO THE LIMITS OF CONSTRUCTION, AS SOON AS PRACTICAL OR POSSIBLE.

MISSOURI ONE CALL SYSTEM (DIG-RITE) 1-800-344-7483



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OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND CONSTRUCTION

MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
SITE # 6026
ASSET # 8136026001

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: 8/30/2019

CAD DWG FILE: C-105
DRAWN BY: CP
CHECKED BY: BD
DESIGNED BY: BR, ZT

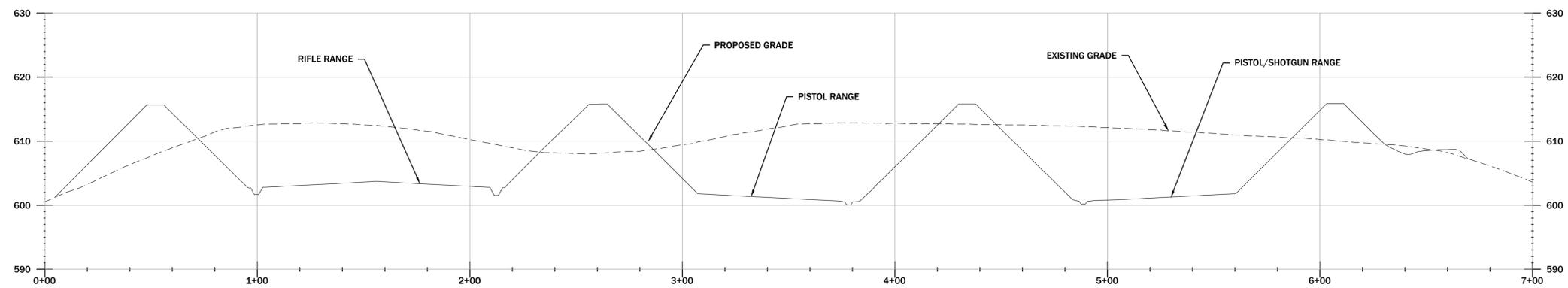
SHEET TITLE:

**FIRING RANGES
PLAN AND PROFILE**

SHEET NUMBER:

C-105

7 OF 49 SHEETS
8/30/2019



A-A'
SCALE:
HORIZONTAL - 1"=30'
VERTICAL - 1"=10'

LEGEND	
TURF REINFORCEMENT MAT	
PROPOSED MAJOR CONTOUR	
PROPOSED MINOR CONTOUR	
EXISTING MAJOR CONTOUR	
EXISTING MINOR CONTOUR	
WOVEN WIRE FENCE	
BARRIER FENCE	



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MANAGEMENT,
DESIGN AND CONSTRUCTION

MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
SITE # 6026
ASSET # 8136026001

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____

ISSUE DATE: 8/30/2019

CAD DWG FILE: C-106
DRAWN BY: CP
CHECKED BY: BD
DESIGNED BY: BR, ZT

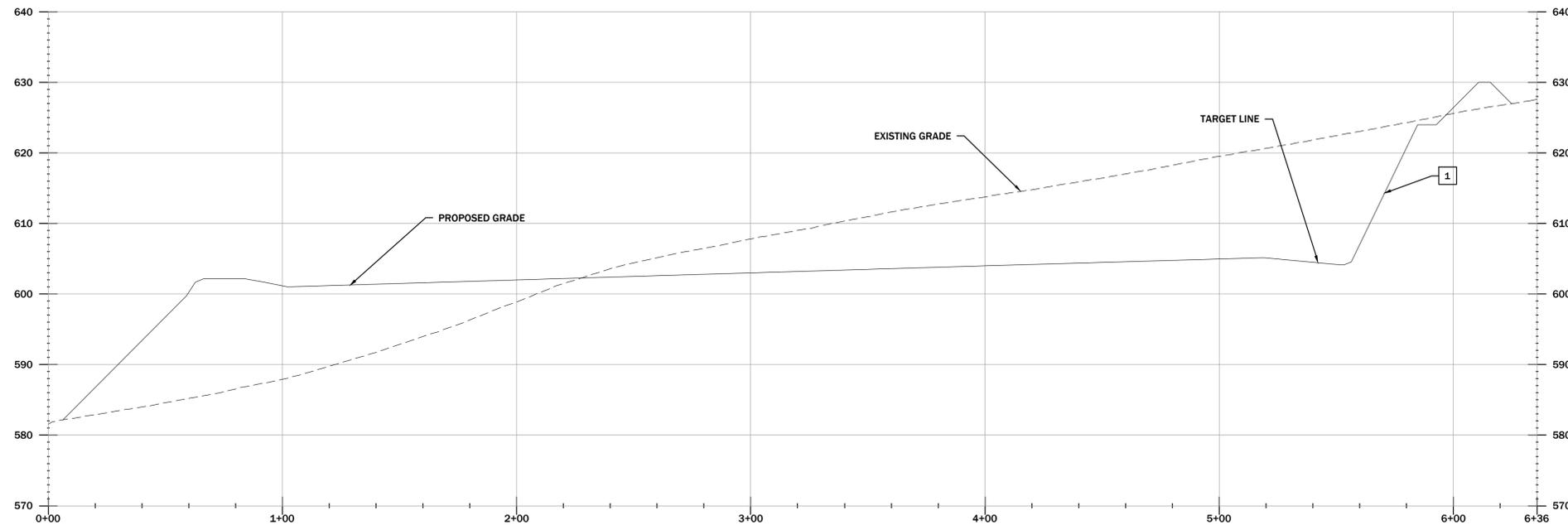
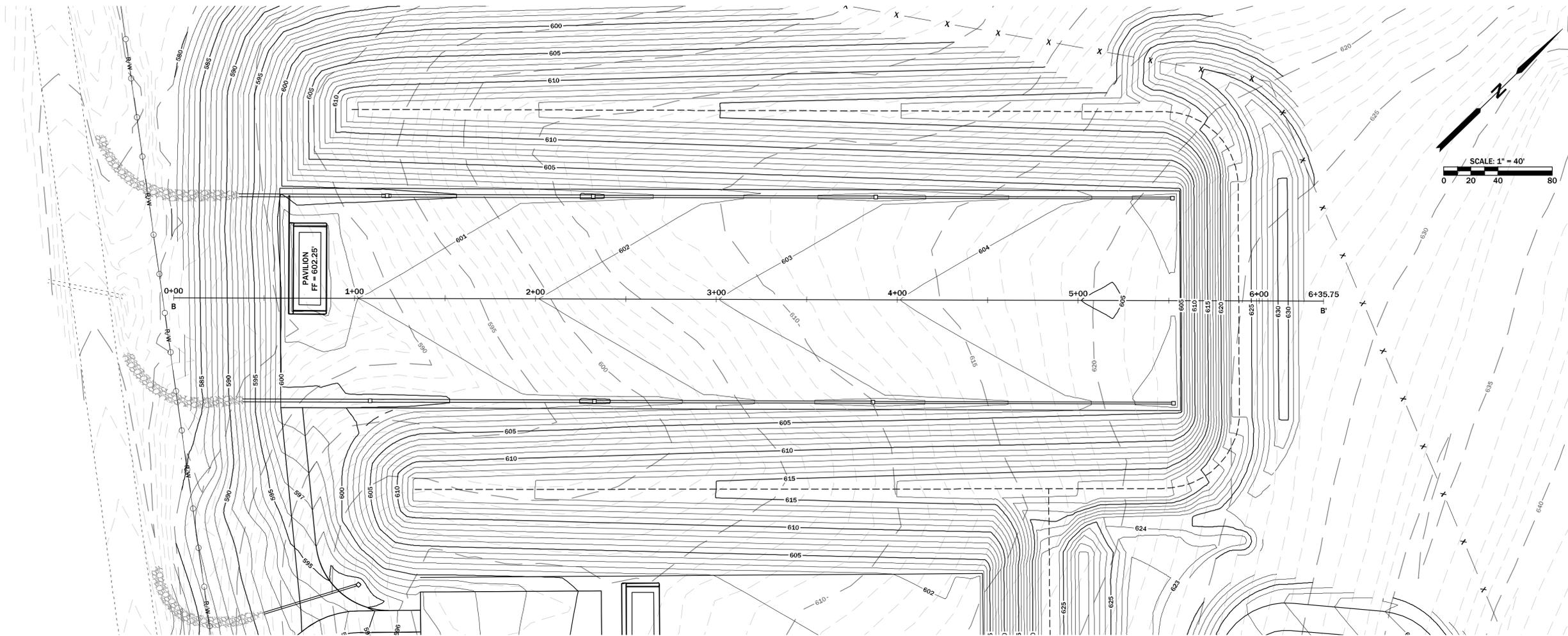
SHEET TITLE:

**RIFLE RANGE
PLAN AND PROFILE**

SHEET NUMBER:

C-106

8 OF 49 SHEETS
8/30/2019



B-B'
SCALE:
HORIZONTAL - 1"=30'
VERTICAL - 1"=10'

KEYED NOTES:
1. SEE BACKSTOP BERM TOE DETAIL ON SHEET C-504 FOR WASTE LIME FACING REQUIREMENTS.

LEGEND
PROPOSED MAJOR CONTOUR — 620 —
PROPOSED MINOR CONTOUR — 618 —
EXISTING MAJOR CONTOUR — 620 —
EXISTING MINOR CONTOUR — 618 —
CHAINLINK FENCE — ○ —
WOVEN WIRE FENCE — x —
KEYED NOTE — 1 —



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MISSOURI STATE
HIGHWAY PATROL

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MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
SITE # 6026
ASSET # 8136026001

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
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DATE: _____
ISSUE DATE: 8/30/2019

CAD DWG FILE: C-107
DRAWN BY: CP
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DESIGNED BY: BR, ZT

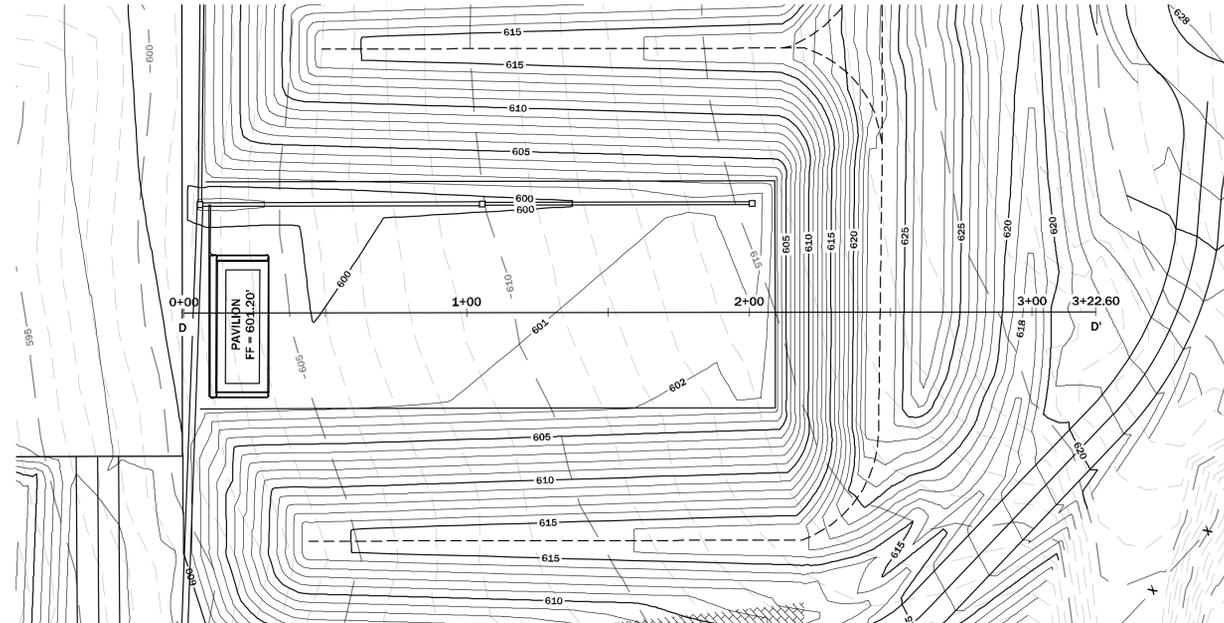
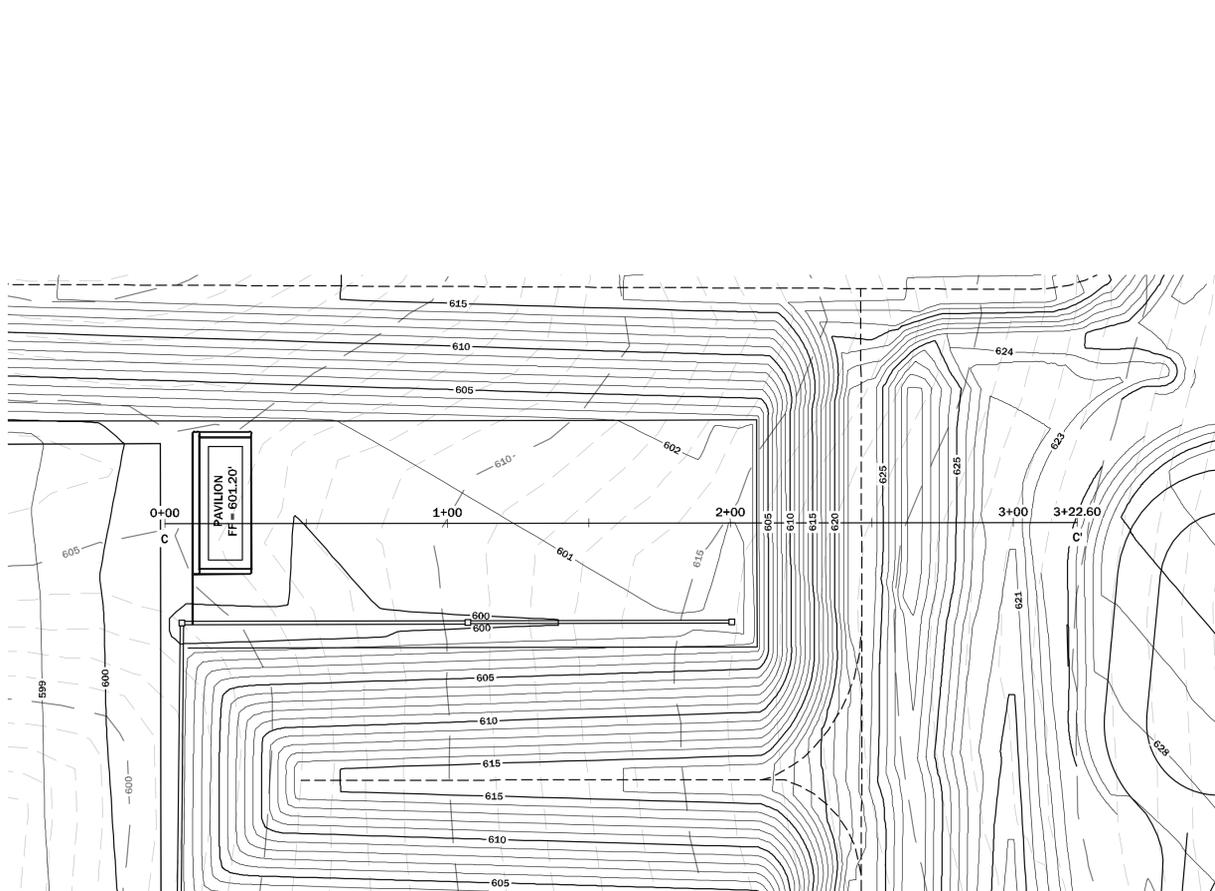
SHEET TITLE:

**PISTOL & PISTOL/
SHOTGUN RANGES
PLAN AND PROFILE**

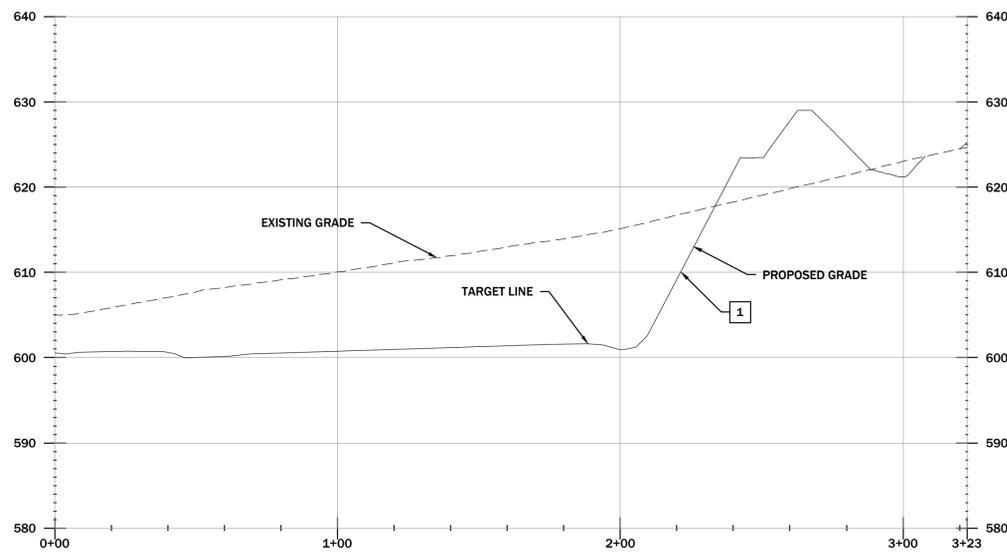
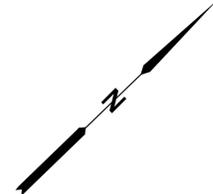
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C-107

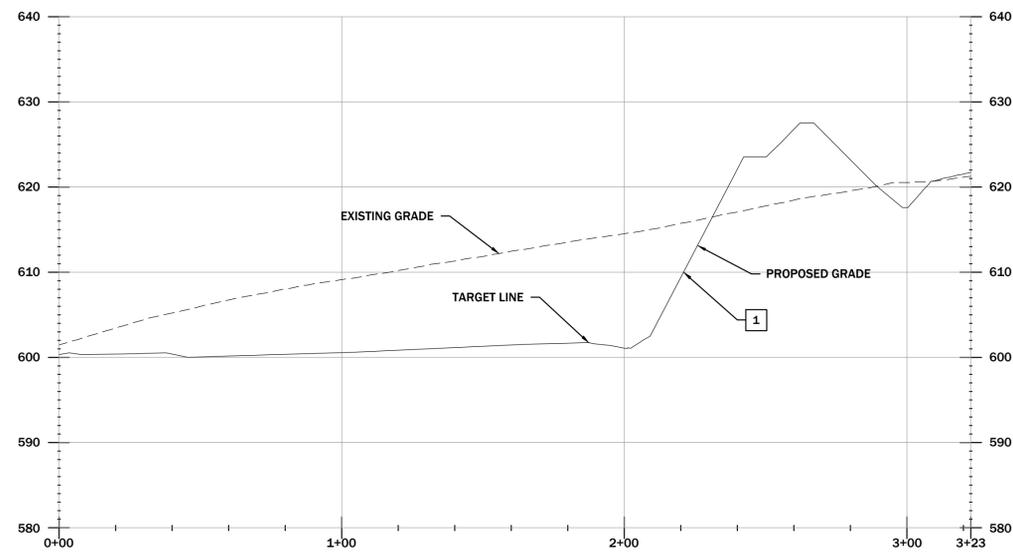
9 OF 49 SHEETS
8/30/2019



SCALE: 1" = 40'
0 20 40 80



C-C'
SCALE:
HORIZONTAL - 1"=30'
VERTICAL - 1"=10'



D-D'
SCALE:
HORIZONTAL - 1"=30'
VERTICAL - 1"=10'

KEYED NOTES:
1. SEE BACKSTOP BERM TOE DETAIL ON SHEET C-504 FOR WASTE LIME FACING REQUIREMENTS.

LEGEND	
TURF REINFORCEMENT MAT	
PROPOSED MAJOR CONTOUR	
PROPOSED MINOR CONTOUR	
EXISTING MAJOR CONTOUR	
EXISTING MINOR CONTOUR	
WOVEN WIRE FENCE	
KEYED NOTE	



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MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
SITE # 6026
ASSET # 8136026001

REVISION: _____
DATE: _____
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ISSUE DATE: 8/30/2019

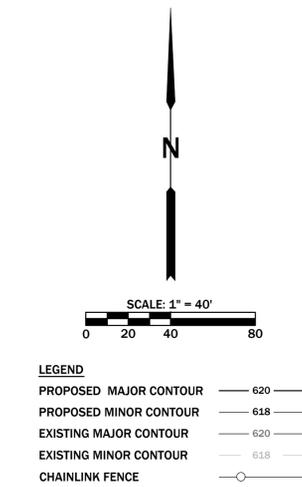
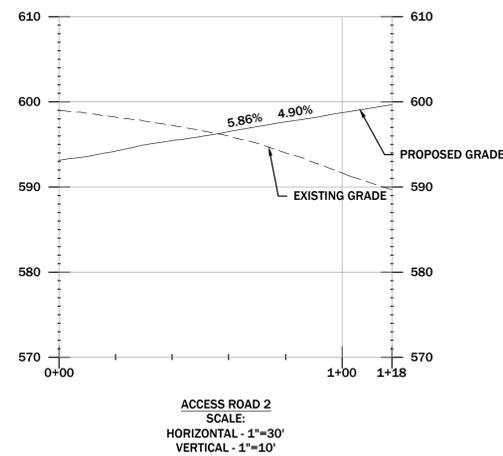
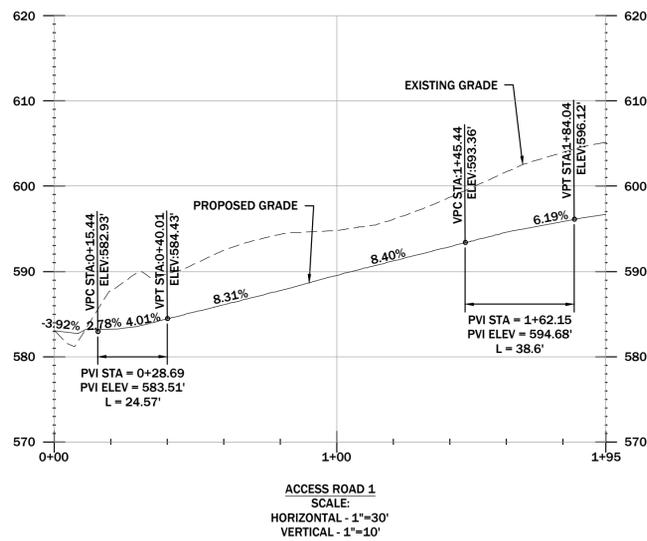
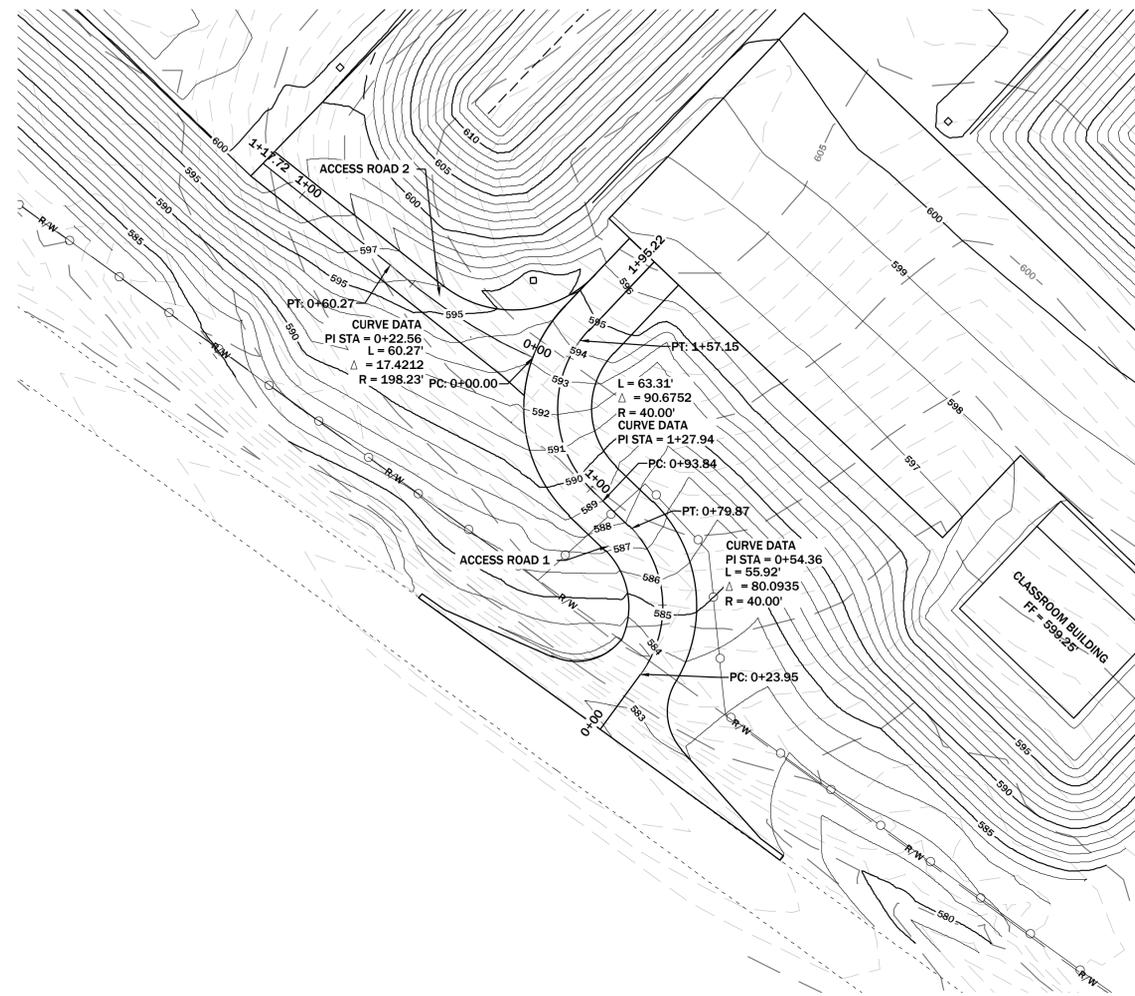
CAD DWG FILE: C-108
DRAWN BY: CP
CHECKED BY: BD
DESIGNED BY: BR, ZT

SHEET TITLE:
**ACCESS ROAD
1 & 2
PLAN AND PROFILE**

SHEET NUMBER:

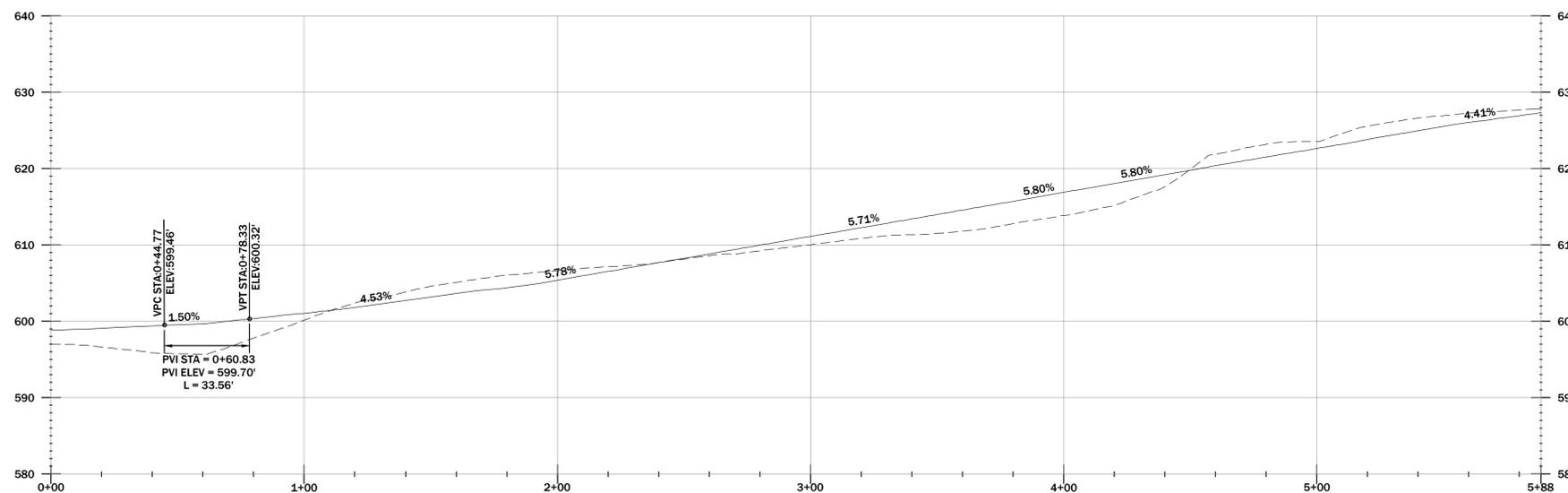
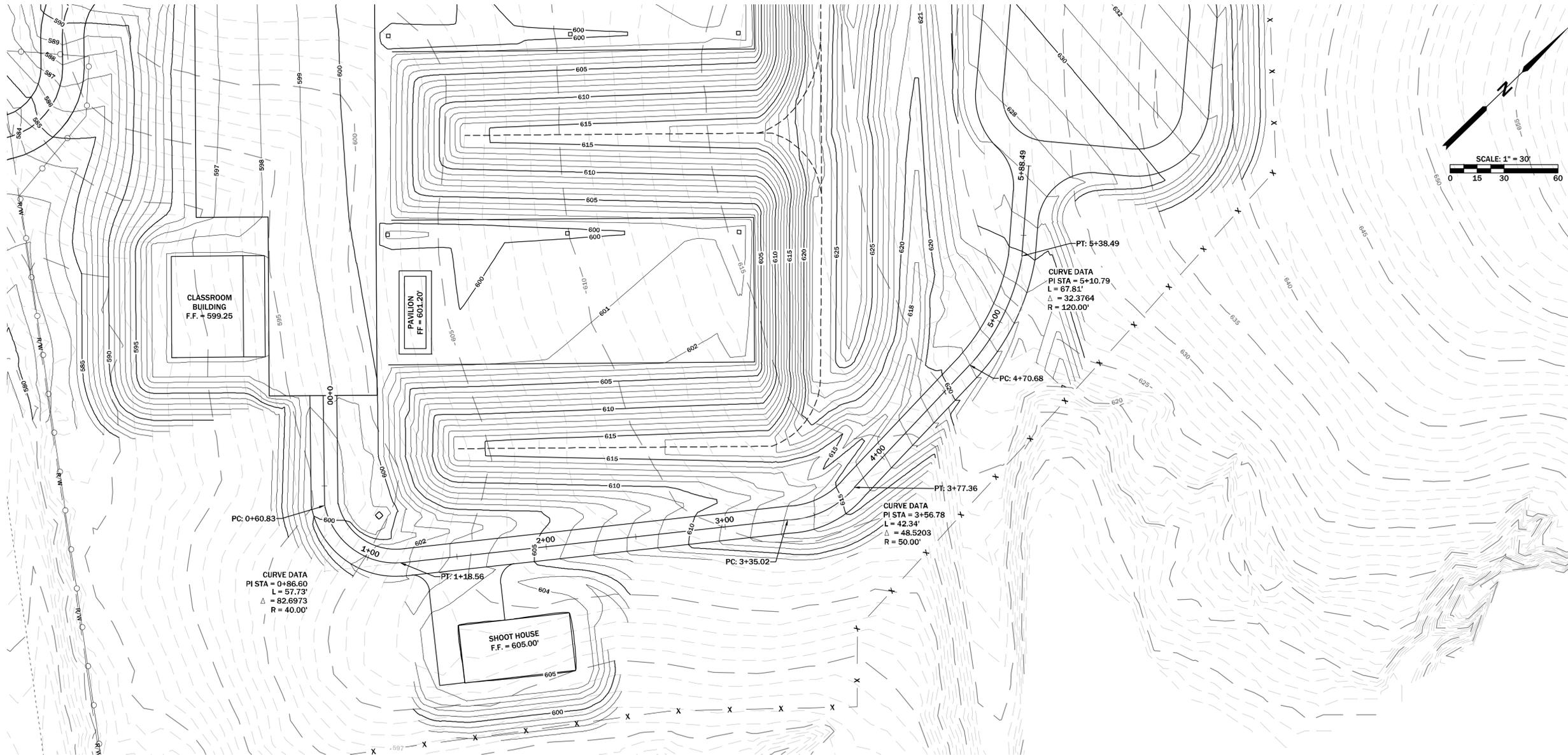
C-108

10 OF 49 SHEETS
8/30/2019



LEGEND
PROPOSED MAJOR CONTOUR — 620 —
PROPOSED MINOR CONTOUR — 618 —
EXISTING MAJOR CONTOUR — 620 —
EXISTING MINOR CONTOUR — 618 —
CHAINLINK FENCE — ○ —

NOTES:
1. REFER TO SHEET C-501 FOR JOINT SPACING, DRIVEWAY GEOMETRY, AND PAVEMENT SECTION DETAILS.



ACCESS ROAD 3
SCALE:
HORIZONTAL - 1"=30'
VERTICAL - 1"=10'

LEGEND

PROPOSED MAJOR CONTOUR	— 620 —
PROPOSED MINOR CONTOUR	— 618 —
EXISTING MAJOR CONTOUR	— 620 —
EXISTING MINOR CONTOUR	— 618 —
CHAINLINK FENCE	○
WOVEN WIRE FENCE	— x —

NOTES:
1. REFER TO SHEET C-503 FOR GRAVEL PAVEMENT SECTION DETAILS.



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MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
SITE # 6026
ASSET # 8136026001

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: 8/30/2019

CAD DWG FILE: C-109
DRAWN BY: CP
CHECKED BY: BD
DESIGNED BY: BR, ZT

SHEET TITLE:
**ACCESS ROAD 3
PLAN AND PROFILE**

SHEET NUMBER:

C-109

11 OF 49 SHEETS
8/30/2019



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MISSOURI STATE
HIGHWAY PATROL

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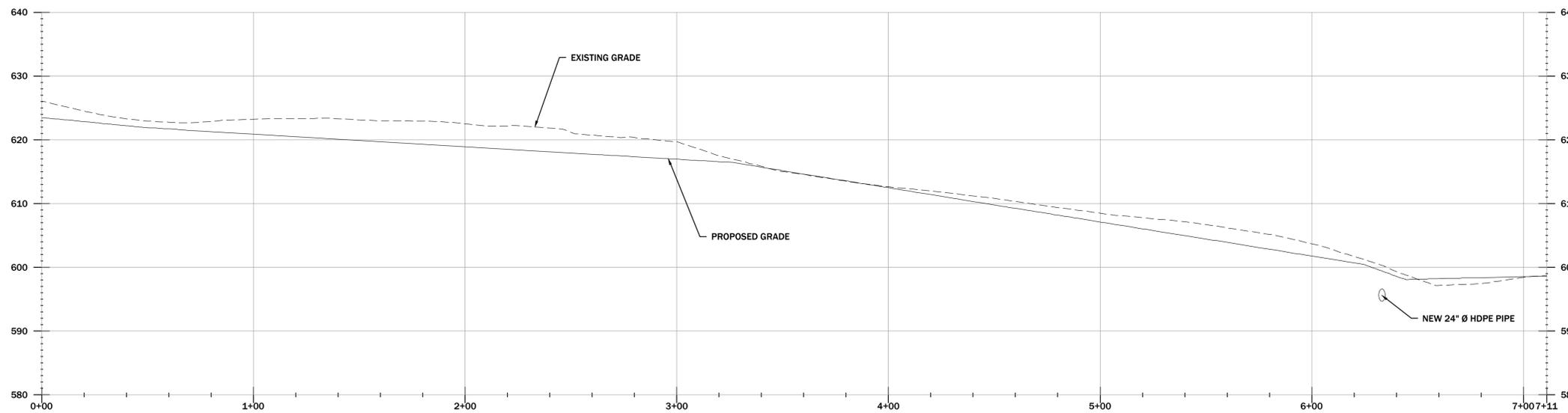
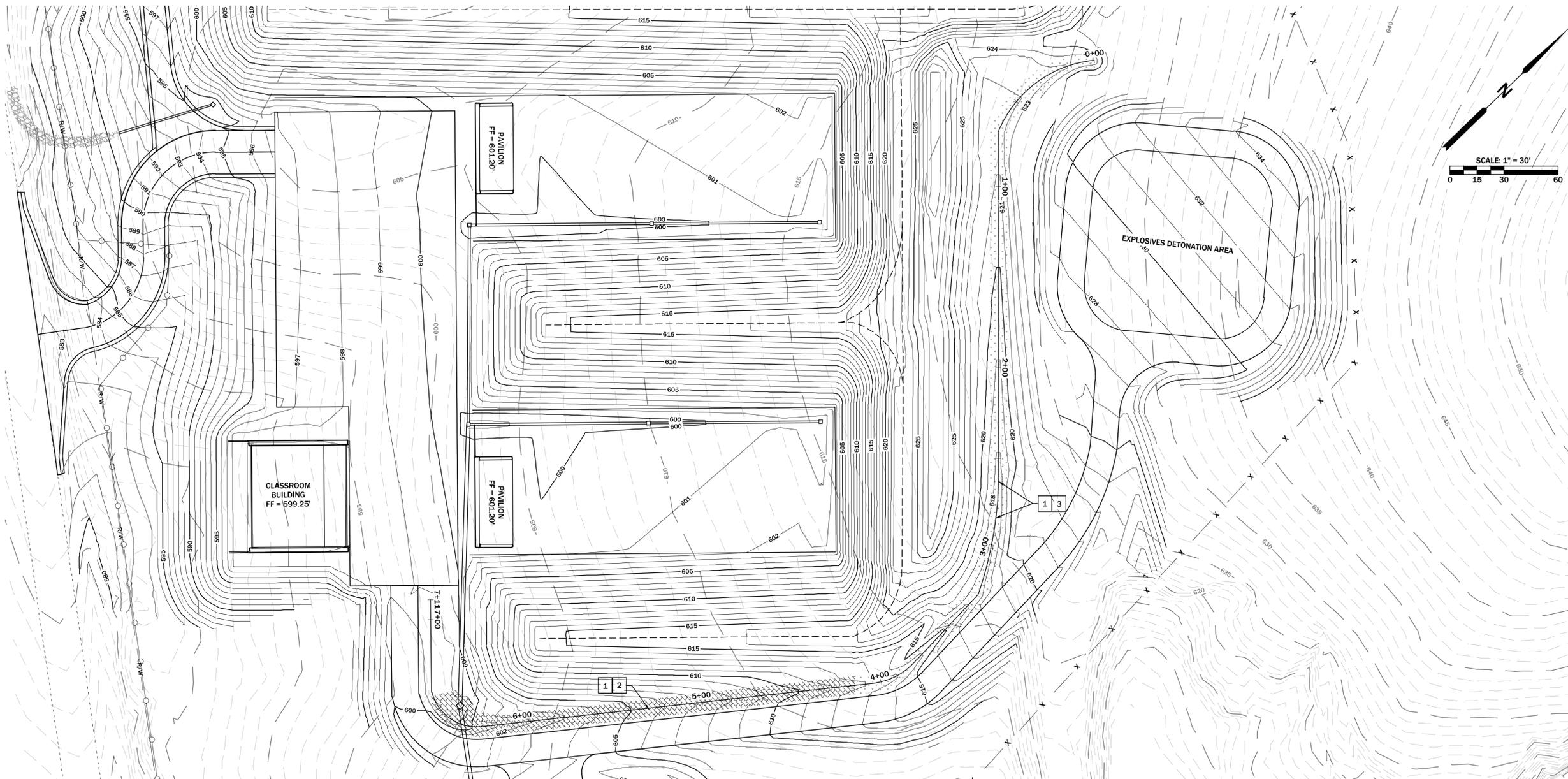
CAD DWG FILE: C-110
DRAWN BY: BR
CHECKED BY: BD
DESIGNED BY: BR, ZT

SHEET TITLE:
**DRAINAGE CHANNEL
1 PLAN AND PROFILE**

SHEET NUMBER:

C-110

12 OF 49 SHEETS
8/30/2019



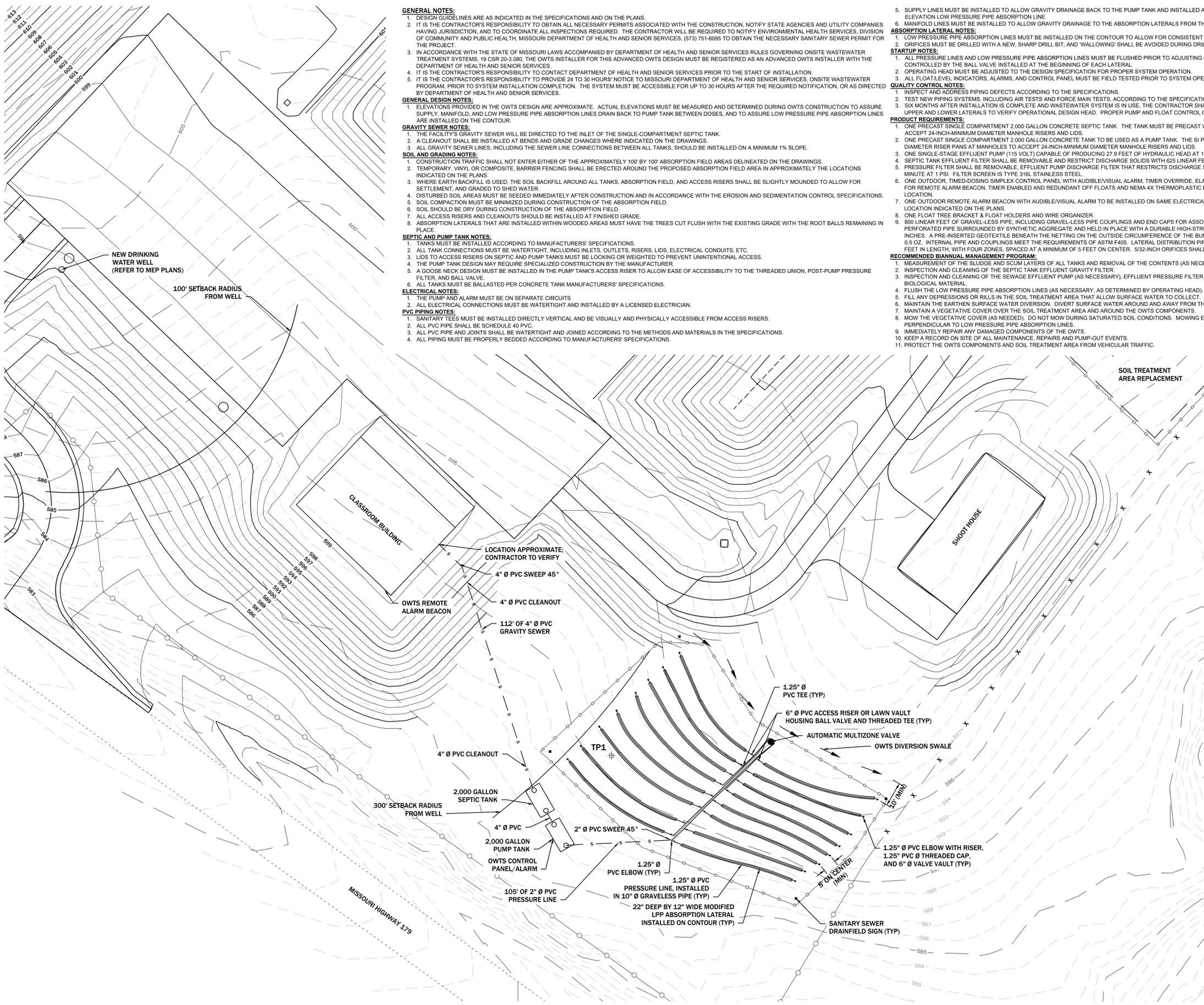
DRAINAGE CHANNEL 1
SCALE:
HORIZONTAL - 1"=30'
VERTICAL - 1"=10'

KEYED NOTES:

- CONSTRUCT DRAINAGE CHANNEL 1 WITH 2' WIDE FLAT BOTTOM AND SIDE SLOPES NO STEEPER THAN 3:1.
- PERMANENT TURF REINFORCEMENT MATTING SHALL BE INSTALLED IN DRAINAGE CHANNEL 1 FROM STA. 4+14.00 TO STA. 6+58.00 AND BETWEEN THE TOPS OF THE CHANNEL. REFER TO SPECIFICATIONS FOR INSTALLATION AND PERFORMANCE REQUIREMENTS.
- SINGLE NET TEMPORARY EROSION CONTROL BLANKET SHALL BE INSTALLED IN DRAINAGE CHANNEL 1 FROM STA. 0+00 TO STA. 4+14.00 AND BETWEEN THE TOPS OF THE CHANNEL. REFER TO SPECIFICATIONS FOR INSTALLATION AND PERFORMANCE REQUIREMENTS.

LEGEND

- EROSION CONTROL BLANKET
- TURF REINFORCEMENT MAT
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- CHAINLINK FENCE
- WOVEN WIRE FENCE
- KEYED NOTE



- GENERAL NOTES:**
- DESIGN GUIDELINES ARE AS INDICATED IN THE SPECIFICATIONS AND ON THE PLANS.
 - IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL NECESSARY PERMITS ASSOCIATED WITH THE CONSTRUCTION, NOTIFY STATE AGENCIES AND UTILITY COMPANIES HAVING JURISDICTION, AND TO COORDINATE ALL INSPECTIONS REQUIRED. THE CONTRACTOR WILL BE REQUIRED TO NOTIFY ENVIRONMENTAL HEALTH SERVICES, DIVISION OF COMMUNITY AND PUBLIC HEALTH, MISSOURI DEPARTMENT OF HEALTH AND SENIOR SERVICES, (573) 751-6095 TO OBTAIN THE NECESSARY SANITARY SEWER PERMIT FOR THE PROJECT.
 - IN ACCORDANCE WITH THE STATE OF MISSOURI LAWS ACCOMPANIED BY DEPARTMENT OF HEALTH AND SENIOR SERVICES RULES GOVERNING ONSITE WASTEWATER TREATMENT SYSTEMS, 19 CSR 20-3.080, THE OWTS INSTALLER FOR THIS ADVANCED OWTS DESIGN MUST BE REGISTERED AS AN ADVANCED OWTS INSTALLER WITH THE DEPARTMENT OF HEALTH AND SENIOR SERVICES.
 - IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT DEPARTMENT OF HEALTH AND SENIOR SERVICES PRIOR TO THE START OF INSTALLATION.
 - IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE 24 TO 30 HOURS' NOTICE TO MISSOURI DEPARTMENT OF HEALTH AND SENIOR SERVICES, ONSITE WASTEWATER PROGRAM, PRIOR TO SYSTEM INSTALLATION COMPLETION. THE SYSTEM MUST BE ACCESSIBLE FOR UP TO 30 HOURS AFTER THE REQUIRED NOTIFICATION, OR AS DIRECTED BY DEPARTMENT OF HEALTH AND SENIOR SERVICES.
- GENERAL DESIGN NOTES:**
- ELEVATIONS PROVIDED IN THE OWTS DESIGN ARE APPROXIMATE. ACTUAL ELEVATIONS MUST BE MEASURED AND DETERMINED DURING OWTS CONSTRUCTION TO ASSURE SUPPLY, MANIFOLD, AND LOW PRESSURE PIPE ABSORPTION LINES DRAIN BACK TO PUMP TANK BETWEEN DOSES, AND TO ASSURE LOW PRESSURE PIPE ABSORPTION LINES ARE INSTALLED ON THE CONTOUR.
- GRAVITY SEWER NOTES:**
- THE FACILITY'S GRAVITY SEWER WILL BE DIRECTED TO THE INLET OF THE SINGLE-COMPARTMENT SEPTIC TANK.
 - A CLEANOUT SHALL BE INSTALLED AT BENDS AND GRADE CHANGES WHERE INDICATED ON THE DRAWINGS.
 - ALL GRAVITY SEWER LINES, INCLUDING THE SEWER LINE CONNECTIONS BETWEEN ALL TANKS, SHOULD BE INSTALLED ON A MINIMUM 1% SLOPE.
- SOIL AND GRADING NOTES:**
- CONSTRUCTION TRAFFIC SHALL NOT ENTER EITHER OF THE APPROXIMATELY 100' BY 100' ABSORPTION FIELD AREAS DELINEATED ON THE DRAWINGS.
 - TEMPORARY VINYL OR COMPOSITE BARRIER FENCING SHALL BE ERECTED AROUND THE PROPOSED ABSORPTION FIELD AREA IN APPROXIMATELY THE LOCATIONS INDICATED ON THE PLANS.
 - WHERE EARTH BACKFILL IS USED, THE SOIL BACKFILL AROUND ALL TANKS, ABSORPTION FIELD, AND ACCESS RISERS SHALL BE SLIGHTLY MOUND TO ALLOW FOR SETTLEMENT, AND GRADED TO SHED WATER.
 - DISTURBED SOIL AREAS MUST BE SEEDED IMMEDIATELY AFTER CONSTRUCTION AND IN ACCORDANCE WITH THE EROSION AND SEDIMENTATION CONTROL SPECIFICATIONS.
 - SOIL COMPACTION MUST BE MINIMIZED DURING CONSTRUCTION OF THE ABSORPTION FIELD.
 - SOIL SHOULD BE DRY DURING CONSTRUCTION OF THE ABSORPTION FIELD.
 - ALL ACCESS RISERS AND CLEANOUTS SHOULD BE INSTALLED AT FINISHED GRADE.
 - ABSORPTION LATERALS THAT ARE INSTALLED WITHIN WOODED AREAS MUST HAVE THE TREES CUT FLUSH WITH THE EXISTING GRADE WITH THE ROOT BALLS REMAINING IN PLACE.
- SEPTIC AND PUMP TANK NOTES:**
- TANKS MUST BE INSTALLED ACCORDING TO MANUFACTURERS' SPECIFICATIONS.
 - ALL TANK CONNECTIONS MUST BE WATERTIGHT, INCLUDING INLETS, OUTLETS, RISERS, LIDS, ELECTRICAL CONDUITS, ETC.
 - LIDS TO ACCESS RISERS ON SEPTIC AND PUMP TANKS MUST BE LOCKING OR WEIGHTED TO PREVENT UNINTENTIONAL ACCESS.
 - THE PUMP TANK DESIGN MAY REQUIRE SPECIALIZED CONSTRUCTION BY THE MANUFACTURER.
 - A GOOSE NECK DESIGN MUST BE INSTALLED IN THE PUMP TANK'S ACCESS RISER TO ALLOW EASE OF ACCESSIBILITY TO THE THREADED UNION, POST-PUMP PRESSURE FILTER, AND BALL VALVE.
 - ALL TANKS MUST BE BALLASTED PER CONCRETE TANK MANUFACTURERS' SPECIFICATIONS.
- ELECTRICAL NOTES:**
- THE PUMP AND ALARM MUST BE ON SEPARATE CIRCUITS.
 - ALL ELECTRICAL CONNECTIONS MUST BE WATERTIGHT AND INSTALLED BY A LICENSED ELECTRICIAN.
- PVC PIPING NOTES:**
- SANITARY TEES MUST BE INSTALLED DIRECTLY VERTICAL AND BE VISUALLY AND PHYSICALLY ACCESSIBLE FROM ACCESS RISERS.
 - ALL PVC PIPE SHALL BE SCHEDULE 40 PVC.
 - ALL PVC PIPE AND JOINTS SHALL BE WATERTIGHT AND JOINED ACCORDING TO THE METHODS AND MATERIALS IN THE SPECIFICATIONS.
 - ALL PIPING MUST BE PROPERLY BEDDED ACCORDING TO MANUFACTURERS' SPECIFICATIONS.

- SUPPLY LINES MUST BE INSTALLED TO ALLOW GRAVITY DRAINAGE BACK TO THE PUMP TANK AND INSTALLED AT LEAST THREE-INCHES BELOW GRADE OF THE LOWEST ELEVATION LOW PRESSURE PIPE ABSORPTION LINE.
 - MANIFOLD LINES MUST BE INSTALLED TO ALLOW GRAVITY DRAINAGE TO THE ABSORPTION LATERALS FROM THE MULTIZONE VALVE.
- ABSORPTION LATERAL NOTES:**
- LOW PRESSURE PIPE ABSORPTION LINES MUST BE INSTALLED ON THE CONTOUR TO ALLOW FOR CONSISTENT DEPTH AND EFFLUENT DISTRIBUTION.
 - ORIFICES MUST BE DRILLED WITH A NEW, SHARP DRILL BIT, AND "WALLOWING" SHALL BE AVOIDED DURING DRILLING.
- STARTUP NOTES:**
- ALL PRESSURE LINES AND LOW PRESSURE PIPE ABSORPTION LINES MUST BE FLUSHED PRIOR TO ADJUSTING OPERATING PRESSURE. OPERATING PRESSURE IS CONTROLLED BY THE BALL VALVE INSTALLED AT THE BEGINNING OF EACH LATERAL.
 - OPERATING HEAD MUST BE ADJUSTED TO THE DESIGN SPECIFICATION FOR PROPER SYSTEM OPERATION.
 - ALL FLOAT LEVEL INDICATORS, ALARMS, AND CONTROL PANEL MUST BE FIELD TESTED PRIOR TO SYSTEM OPERATION.
- QUALITY CONTROL NOTES:**
- INSPECT AND ADDRESS PIPING DEFECTS ACCORDING TO THE SPECIFICATIONS.
 - TEST NEW PIPING SYSTEMS, INCLUDING AIR TESTS AND FORCE MAIN TESTS, ACCORDING TO THE SPECIFICATIONS.
 - SIX MONTHS AFTER INSTALLATION IS COMPLETE AND WASTEWATER SYSTEM IS IN USE, THE CONTRACTOR SHALL CHECK AND ADJUST THE PRESSURE HEAD WITHIN THE UPPER AND LOWER LATERALS TO VERIFY OPERATIONAL DESIGN HEAD. PROPER PUMP AND FLOAT CONTROL OPERATION SHOULD ALSO BE VERIFIED.
- PRODUCT REQUIREMENTS:**
- ONE PRECAST SINGLE COMPARTMENT 2,000 GALLON CONCRETE SEPTIC TANK. THE TANK MUST BE PRECAST WITH 24-INCH-MINIMUM DIAMETER RISER PANS AT MANHOLES TO ACCEPT 24-INCH-MINIMUM DIAMETER MANHOLE RISERS AND LIDS.
 - ONE PRECAST SINGLE COMPARTMENT 2,000 GALLON CONCRETE TANK TO BE USED AS A PUMP TANK. THE SI PRECAST TANK MUST BE PRECAST WITH 24-INCH-MINIMUM DIAMETER RISER PANS AT MANHOLES TO ACCEPT 24-INCH-MINIMUM DIAMETER MANHOLE RISERS AND LIDS.
 - ONE SINGLE-STAGE EFFLUENT PUMP (115 VOLT) CAPABLE OF PRODUCING 27.9 FEET OF HYDRAULIC HEAD AT 15 GPM, OR APPROVED EQUIVALENT.
 - SEPTIC TANK EFFLUENT FILTER SHALL BE REMOVABLE AND RESTRICT DISCHARGE SOLIDS WITH 625 LINEAR FEET OF 1/32" FILTRATION RATED UP TO 8,000 GALLONS PER DAY.
 - PRESSURE FILTER SHALL BE REMOVABLE, EFFLUENT PUMP DISCHARGE FILTER THAT RESTRICTS DISCHARGE SOLIDS TO .062" (1/16") AND OPERATES UP TO 83.8 GALLONS PER MINUTE AT 1 PSI. FILTER SCREEN IS TYPE 316L STAINLESS STEEL.
 - ONE OUTDOOR, TIGHT-DOSING SIMPLEX CONTROL PANEL WITH AUDIBLE/VISUAL ALARM, TIMER OVERRIDE, ELAPSED TIMER METER, EVENT COUNTER, AUXILIARY CONTACT FOR REMOTE ALARM BEACON, TIMER ENABLED AND REDUNDANT OFF FLOATS AND NEMA 4X THERMOPLASTIC ENCLOSURE JUNCTION BOX TO BE INSTALLED AT PUMP TANK LOCATION.
 - ONE OUTDOOR REMOTE ALARM BEACON WITH AUDIBLE/VISUAL ALARM TO BE INSTALLED ON SAME ELECTRICAL CIRCUIT WITH CONTROL PANEL ON CLASSROOM BUILDING IN LOCATION INDICATED ON THE PLANS.
 - ONE FLOAT TREE BRACKET & FLOAT HOLDERS AND WIRE ORGANIZER.
 - 800 LINEAR FEET OF GRAVEL-LESS PIPE, INCLUDING GRAVEL-LESS PIPE COUPLINGS AND END CAPS FOR ASSOCIATED CONNECTIONS. PREASSEMBLED UNITS INCLUDE A 4" PERFORATED PIPE SURROUNDED BY SYNTHETIC AGGREGATE AND HELD IN PLACE WITH A DURABLE HIGH-STRENGTH NETTING IN 10' LENGTHS AND IN A DIAMETER OF 10 INCHES. A PRE-INSERTED GEOTEXTILE BENEATH THE NETTING ON THE OUTSIDE CIRCUMFERENCE OF THE BUNDLE. THE PRE-INSERTED GEOTEXTILE MUST BE A MINIMUM OF 0.5 OZ. INTERNAL PIPE AND COUPLINGS MEET THE REQUIREMENTS OF ASTM F405. LATERAL DISTRIBUTION PIPING SHALL BE COMPOSED OF 1/4", 1-1/4" INCH LATERALS AT 53 FEET IN LENGTH, WITH FOUR ZONES, SPACED AT A MINIMUM OF 5 FEET ON CENTER. 5/32-INCH ORIFICES SHALL BE DRILLED AT LOCATIONS SHOWN IN DETAILS.
- RECOMMENDED BIENNIAL MANAGEMENT PROGRAM:**
- MEASUREMENT OF THE SLUDGE AND SCUM LAYERS OF ALL TANKS AND REMOVAL OF THE CONTENTS (AS NECESSARY) BY AN APPROVED SEPTAGE HAULER.
 - INSPECTION AND CLEANING OF THE SEPTIC TANK EFFLUENT GRAVITY FILTER.
 - INSPECTION AND CLEANING OF THE SEWAGE EFFLUENT PUMP (AS NECESSARY), EFFLUENT PRESSURE FILTER, AND FLOATS TO VERIFY THEY ARE VOID OF DEBRIS AND BIOLOGICAL MATERIAL.
 - FLUSH THE LOW PRESSURE PIPE ABSORPTION LINES (AS NECESSARY, AS DETERMINED BY OPERATING HEAD).
 - FILL ANY DEPRESSIONS OR RILLS IN THE SOIL TREATMENT AREA THAT ALLOW SURFACE WATER TO COLLECT.
 - MAINTAIN THE EARTHEN SURFACE WATER DIVERSION. DIVERT SURFACE WATER AROUND AND AWAY FROM THE SOIL TREATMENT AREA AND ALL OWTS COMPONENTS.
 - MAINTAIN A VEGETATIVE COVER OVER THE SOIL TREATMENT AREA AND AROUND THE OWTS COMPONENTS.
 - MOW THE VEGETATIVE COVER (AS NEEDED). DO NOT MOW DURING SATURATED SOIL CONDITIONS. MOWING EQUIPMENT MUST HAVE LOW GROUND PRESSURE. MOW PERPENDICULAR TO LOW PRESSURE PIPE ABSORPTION LINES.
 - IMMEDIATELY REPAIR ANY DAMAGED COMPONENTS OF THE OWTS.
 - KEEP A RECORD ON SITE OF ALL MAINTENANCE, REPAIRS AND PUMP-OUT EVENTS.
 - PROTECT THE OWTS COMPONENTS AND SOIL TREATMENT AREA FROM VEHICULAR TRAFFIC.

LEGEND

PROPOSED MAJOR CONTOUR	— 620 —
PROPOSED MINOR CONTOUR	— 618 —
EXISTING MAJOR CONTOUR	— 620 —
EXISTING MINOR CONTOUR	— 618 —
EDGE OF HIGHWAY	- - - - -
BARRIER FENCE	— ○ —
CHAINLINK FENCE	— x —
WOVEN WIRE FENCE	— x —
ON-SITE WASTEWATER LINE	— s —
TEST PIT	⊕
DIVERSION SWALE	— ▸ —
SANITARY SIGN	■

NOTES TO THE CONTRACTOR:

UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS AND THEREFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS AT PRESENT NOT KNOWN. VERIFICATION OF THE LOCATIONS OF UNDERGROUND UTILITIES, SHOWN OR NOT SHOWN, WILL BE THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR.

THE CONTRACTOR SHALL MAKE SUITABLE AND TIMELY REQUESTS TO ALL UTILITY OWNERS, PIPELINE OWNERS, OR OTHER PARTIES AFFECTED TO MAKE ALL NECESSARY ADJUSTMENTS TO PUBLIC OR PRIVATE UTILITIES, PIPE LINES, OR OTHER APPURTENANCES WITHIN, OR ADJACENT TO THE LIMITS OF CONSTRUCTION, AS SOON AS PRACTICAL OR POSSIBLE.

MISSOURI ONE CALL SYSTEM (DIG-RITE) 1-800-344-7483



GREDELL Engineering Resources, Inc.
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DESIGN AND CONSTRUCTION

MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
SITE # 6026
ASSET # 8136026001

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: 8/30/2019

CAD DWG FILE: C-111
DRAWN BY: BR
CHECKED BY: TG
DESIGNED BY: TAD, BR

SHEET TITLE:
**ON-SITE
WASTEWATER
TREATMENT**

SHEET NUMBER:
C-111
13 OF 49 SHEETS
8/30/2019



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REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: 8/30/2019

CAD DWG FILE: C-201
DRAWN BY: BR
CHECKED BY: BD
DESIGNED BY: BR

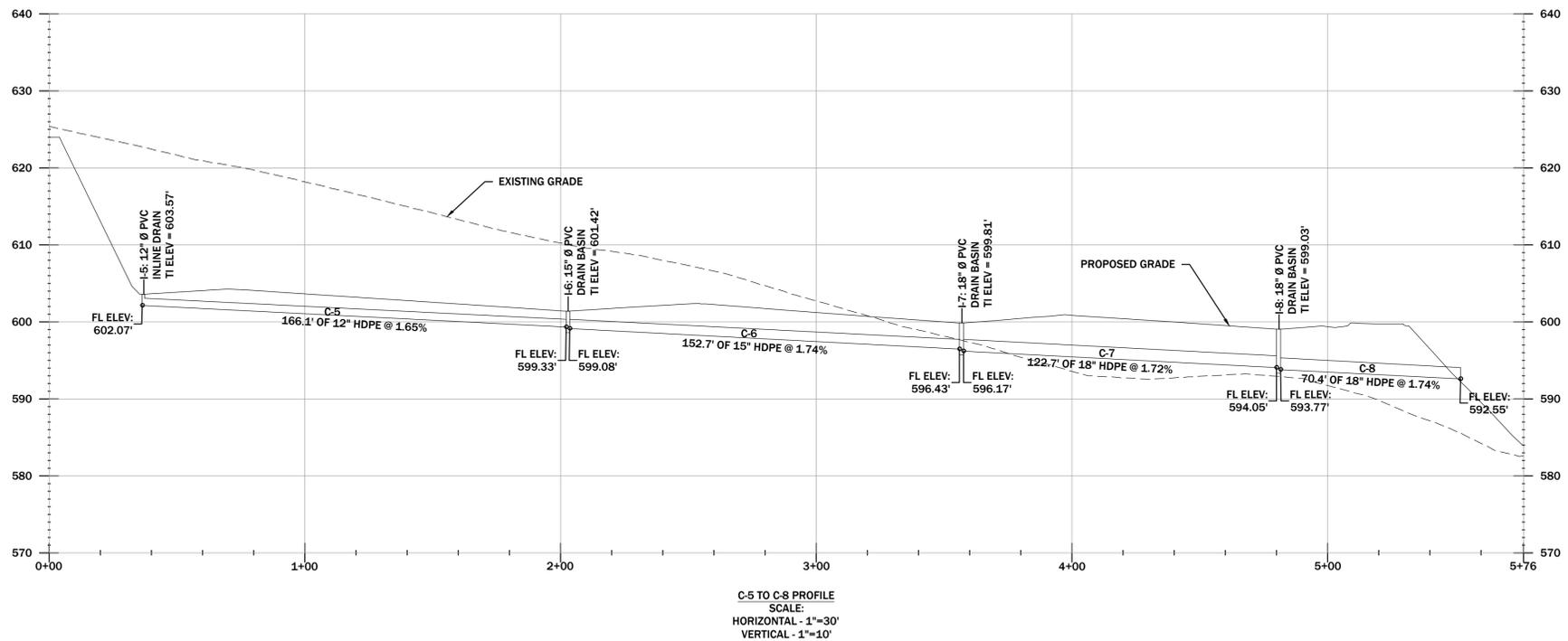
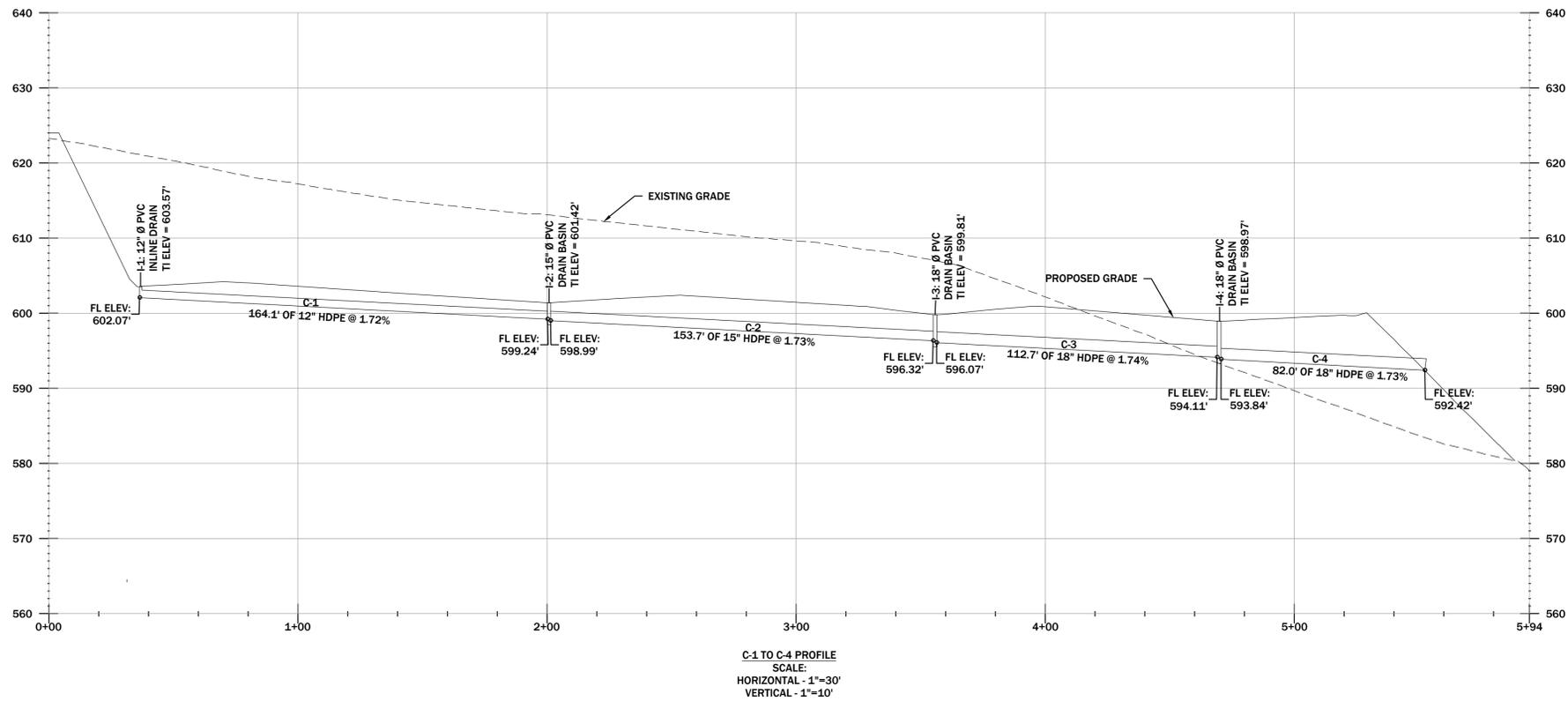
SHEET TITLE:
**STORM DRAINAGE
PROFILES**

SHEET NUMBER:

C-201

14 OF 49 SHEETS
8/30/2019

STORMWATER INLETS	
NAME	RECTANGULAR FRAME AND GRATE SIZE
I-1	15"
I-2	15"
I-3	15"
I-4	15"
I-5	15"
I-6	15"
I-7	15"
I-8	15"





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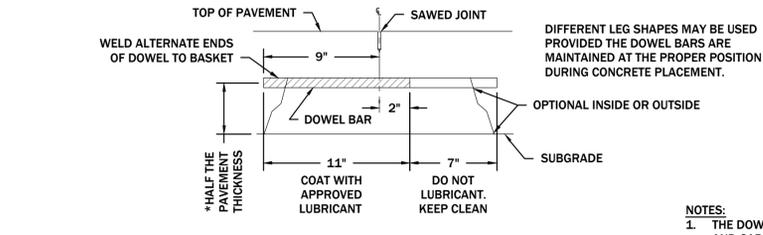
CAD DWG FILE: C-501
DRAWN BY: BR
CHECKED BY: BD
DESIGNED BY: BR, ZT

SHEET TITLE:
**CONCRETE PAVING
DETAILS**

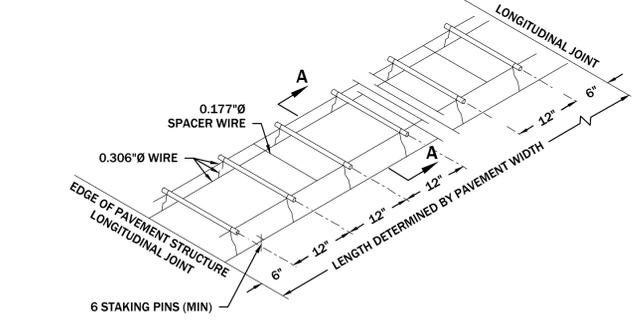
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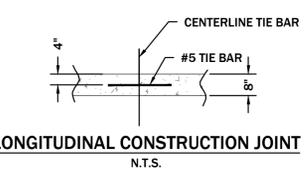
16 OF 49 SHEETS
8/30/2019



SECTION A-A
N.T.S.

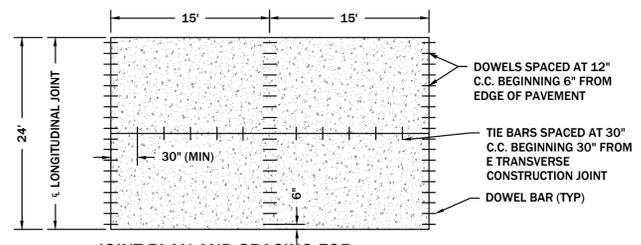


CONCRETE DOWEL DETAIL
N.T.S.

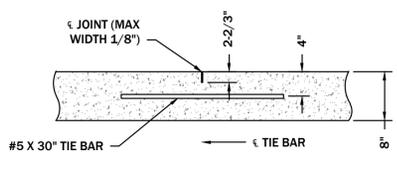


LONGITUDINAL CONSTRUCTION JOINT
N.T.S.

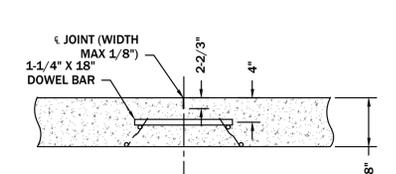
- NOTES:
1. TIE BARS SHALL HAVE A MINIMUM LENGTH OF 30 INCHES AND SHALL BE PLACED A MAXIMUM OF 30 INCHES CENTER TO CENTER.
 2. DO NOT TIE CONCRETE PAVEMENT TO WALLS, SIDEWALKS OR OTHER NON-PAVEMENT FEATURES.



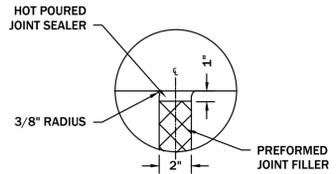
JOINT PLAN AND SPACING FOR CONTRACTION JOINT
N.T.S.



LONGITUDINAL JOINTS
N.T.S.

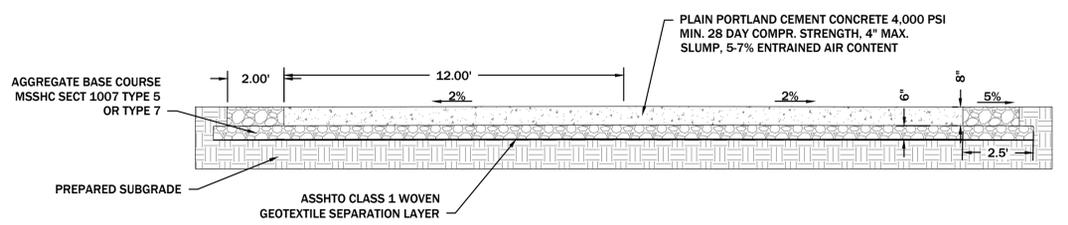


TRANSVERSE CONTRACTION JOINT
N.T.S.

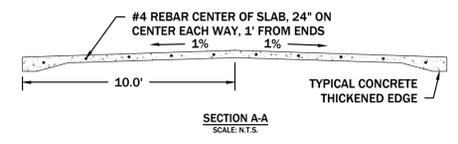


JOINT SEALING DETAIL
N.T.S.

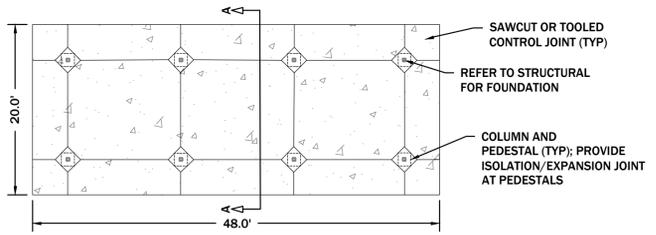
- NOTES:
1. THE FINAL POSITION OF ALL DOWELS AND TIE BARS SHALL BE PERPENDICULAR TO THE PLANE OF THE JOINT AND PARALLEL TO THE SURFACE OF THE PAVEMENT AND PARALLEL TO EACH OTHER.
 2. CONTRACTOR TO SUBMIT PROPOSED JOINT LAYOUT PRIOR TO CONSTRUCTION.



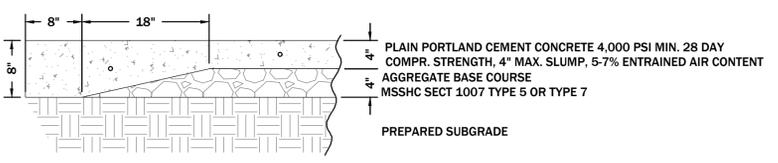
TYPICAL ACCESS ROAD 1 PAVEMENT SECTION
SCALE: 1" = 3"



SECTION A-A
SCALE: N.T.S.

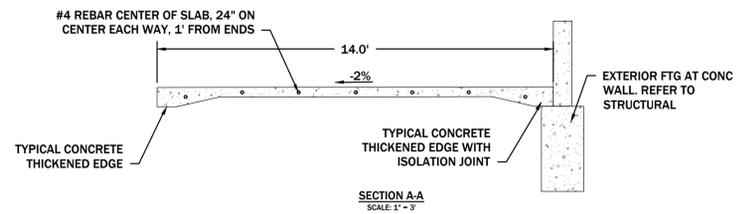


TYPICAL PAVILION AREA CONCRETE PAD
SCALE: 1" = 10'

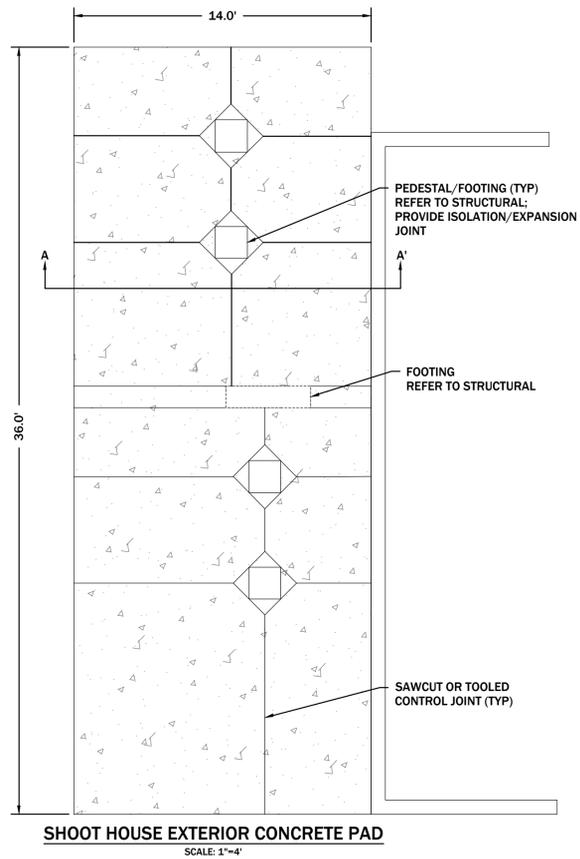


TYPICAL CONCRETE THICKENED EDGE
SCALE: 1" = 1'

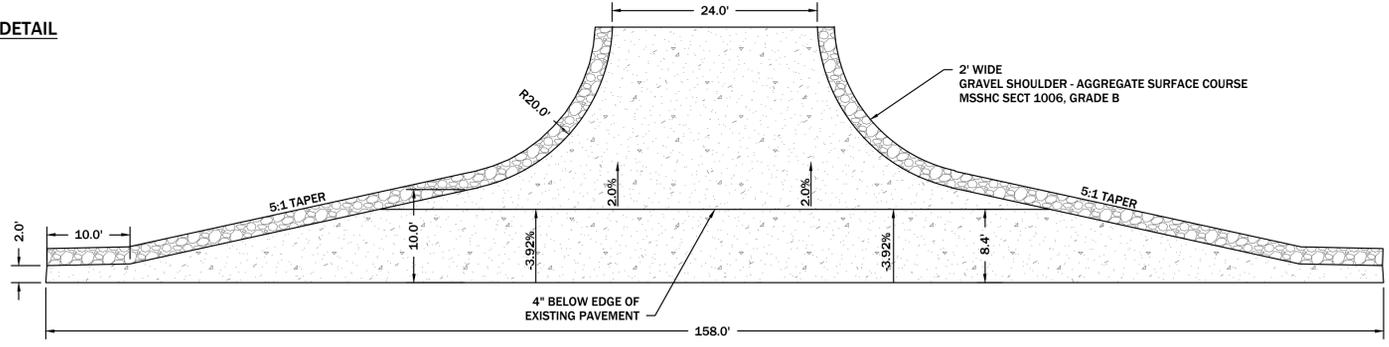
NOTE:
"PEDESTRIAN AREA" REFERS TO PAVILION PADS AND CONCRETE PAD OUTSIDE OF SHOOT HOUSE.



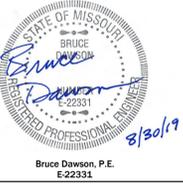
SECTION A-A
SCALE: 1" = 3"



SHOOT HOUSE EXTERIOR CONCRETE PAD
SCALE: 1" = 4"



DRIVEWAY DETAIL
SCALE: 1" = 1'



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MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

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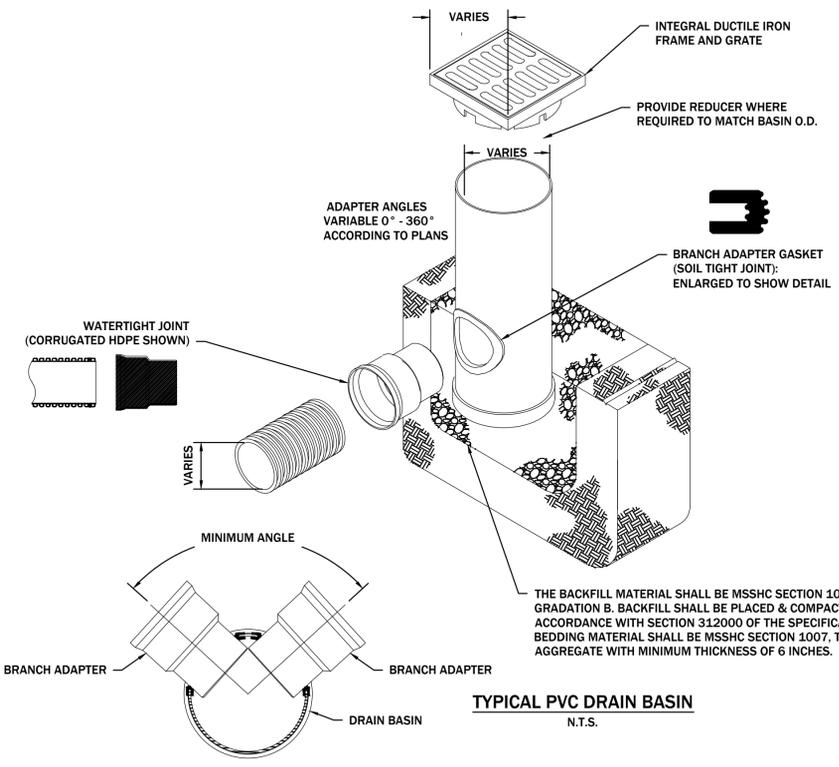
CAD DWG FILE: C-502
DRAWN BY: BR
CHECKED BY: BD
DESIGNED BY: BR

SHEET TITLE:
**STORM DRAINAGE
DETAILS**

SHEET NUMBER:

C-502

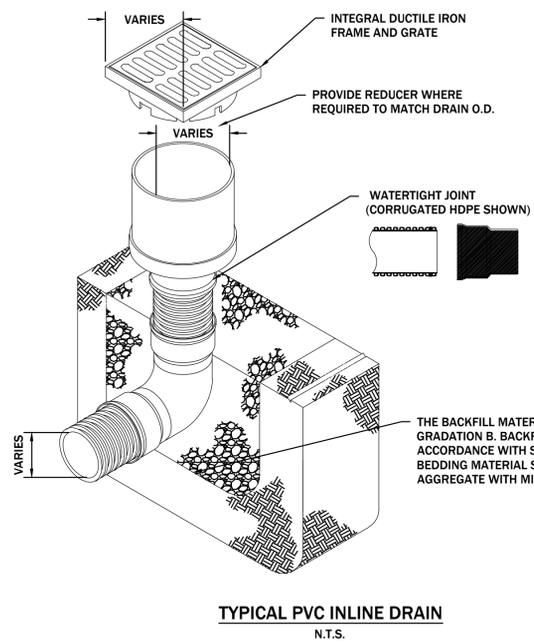
17 OF 49 SHEETS
8/30/2019



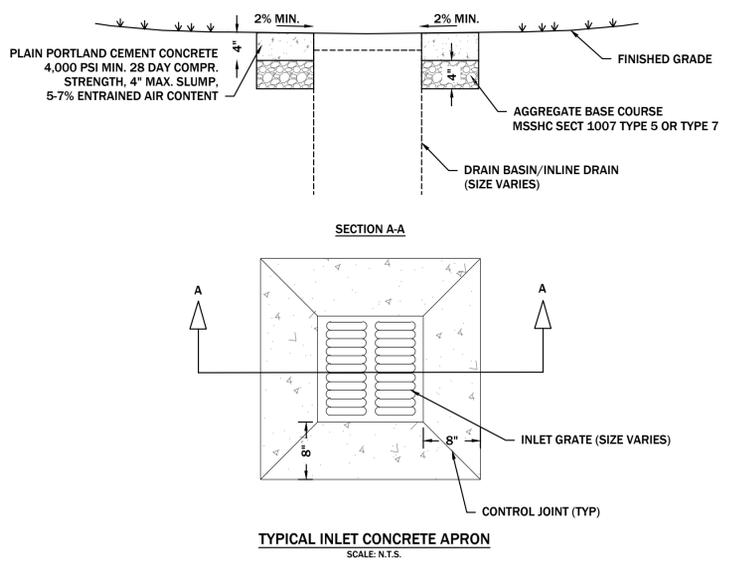
**TYPICAL PVC DRAIN BASIN:
TOP VIEW**
N.T.S.

MINIMUM ANGLE BETWEEN ADAPTERS			
ADAPTER SIZE	15° Ø BASIN	18° Ø BASIN	30° Ø BASIN
12" - 15"	112°	-	-
15" - 18"	-	110°	-
18" - 18"	-	150°	-
15" - 15"	-	90°	-
15" - 24"	-	-	85°
24" - 24"	-	-	90°

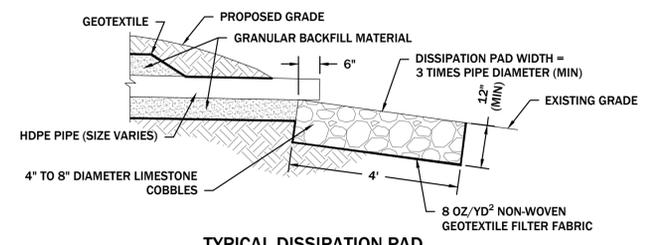
- NOTES:
- GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05, CAPABLE OF SUPPORTING 10,000 LBS AXLE LOAD.
 - DRAIN BASINS AND INLINE DRAINS SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
 - SEE PVC DRAIN BASIN TOP VIEW FOR MINIMUM ANGLE BETWEEN DRAIN BASIN ADAPTERS.
 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE & PVC SEWER (4" - 24").
 - SEE STORMWATER PROFILES AND STORMWATER INLETS TABLE FOR DIMENSIONS OF DUCTILE IRON GRATE INLETS, DRAIN BASINS, AND INLINE DRAINS.
 - REDUCER SHALL BE INSTALLED WHERE NECESSARY TO MATCH INTEGRAL DUCTILE IRON FRAME AND GRATE TO BASIN OR DRAIN O.D.
 - CONCRETE APRON TO BE CONSTRUCTED AT EACH INLET LOCATION.



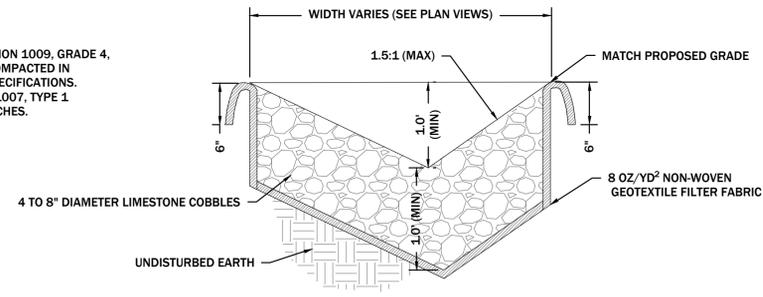
TYPICAL PVC INLINE DRAIN
N.T.S.



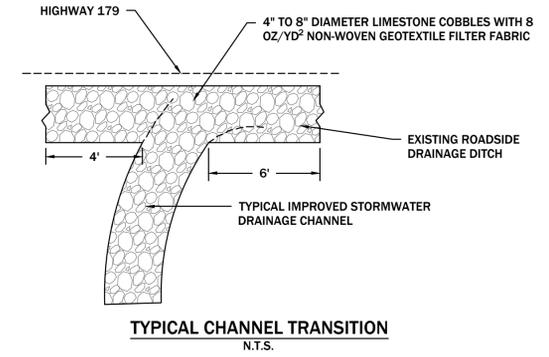
TYPICAL INLET CONCRETE APRON
SCALE: N.T.S.



TYPICAL DISSIPATION PAD
N.T.S.



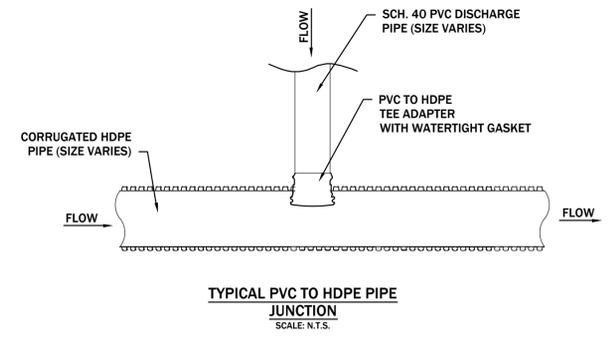
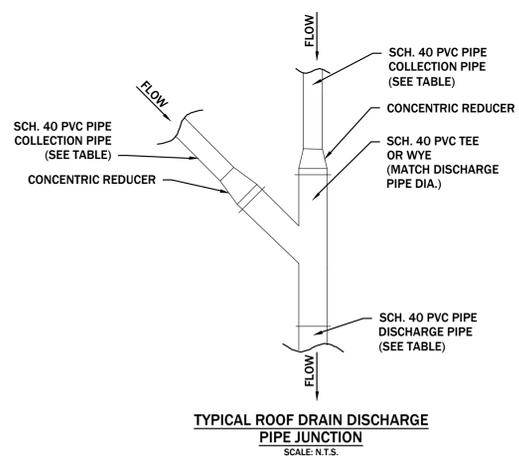
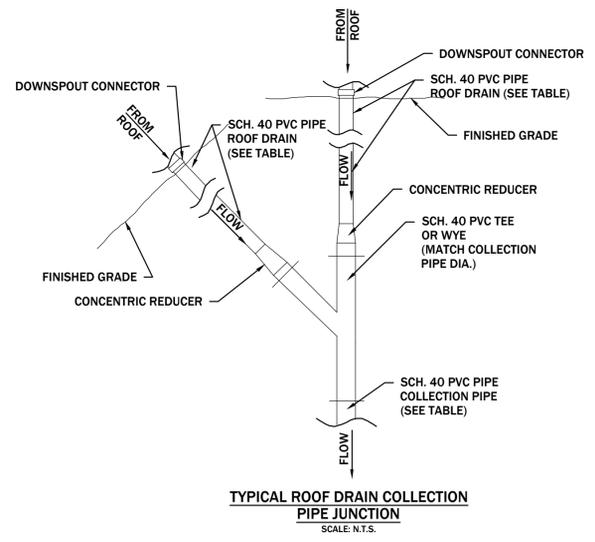
TYPICAL ROCK ARMORED CHANNEL
N.T.S.



TYPICAL CHANNEL TRANSITION
N.T.S.

- NOTES:
- "COLLECTION PIPE" DEFINED AS A PIPE WHICH CARRIES THE FLOW OF 2 ROOF DRAINS.
 - "DISCHARGE PIPE" DEFINED AS A PIPE WHICH CARRIES THE FLOW OF 3-4 ROOF DRAINS AND/OR 2 COLLECTION PIPES.

ROOF DRAIN DISCHARGE SYSTEM PIPING SIZES			
COMPONENT	PAVILIONS	SHOOT HOUSE	CLASSROOM BUILDING
ROOF DRAIN DIA.	3"	4"	4"
COLLECTION PIPE DIA.	4"	6"	6"
DISCHARGE PIPE DIA.	6"	8"	8"



TYPICAL PVC TO HDPE PIPE JUNCTION
SCALE: N.T.S.



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ASSET # 8136026001

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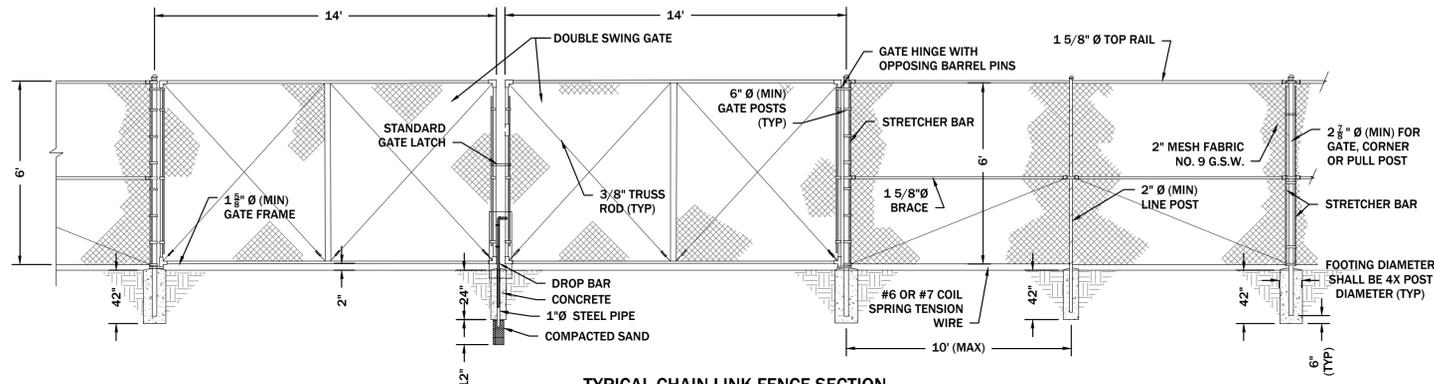
CAD DWG FILE: C-503
DRAWN BY: BR
CHECKED BY: BD
DESIGNED BY: BR, ZT

SHEET TITLE:
SITE DETAILS

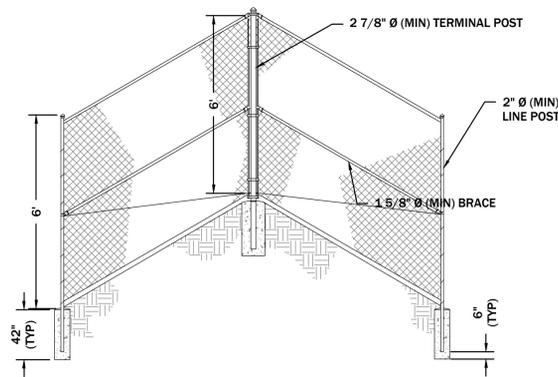
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C-503

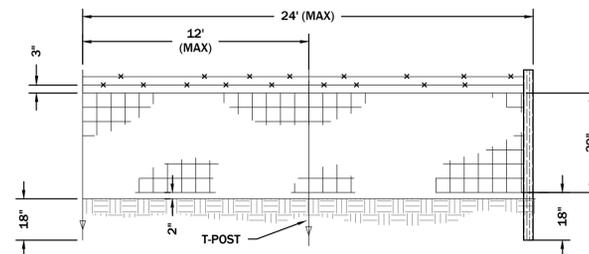
18 OF 49 SHEETS
8/30/2019



TYPICAL CHAIN LINK FENCE SECTION
N.T.S.



TYPICAL CHAIN LINK CORNER SECTION
SCALE= N.T.S.

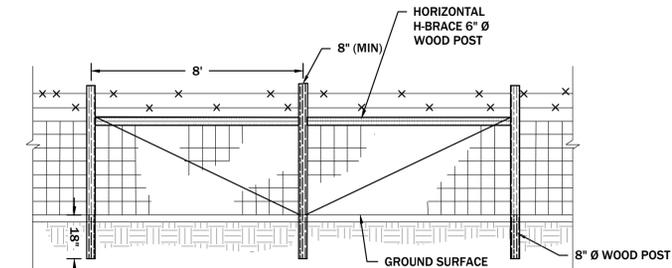


TYPICAL WOVEN WIRE FENCE SECTION
SCALE= N.T.S.

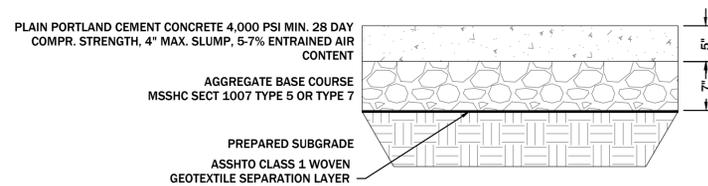
NOTE:
1. 4" Ø WOOD POST SHALL BE PLACED DURING STRAIGHT-PULL SECTIONS WHERE NECESSARY TO MAINTAIN INTEGRITY OF WOVEN WIRE FENCE.



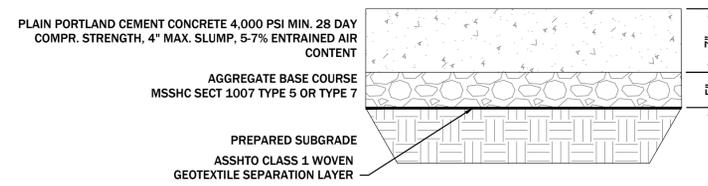
TRESPASSING SIGN DETAIL
N.T.S.



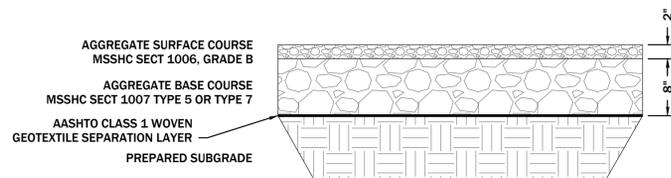
TYPICAL WOVEN WIRE FENCE H-BRACE SECTION
SCALE= N.T.S.



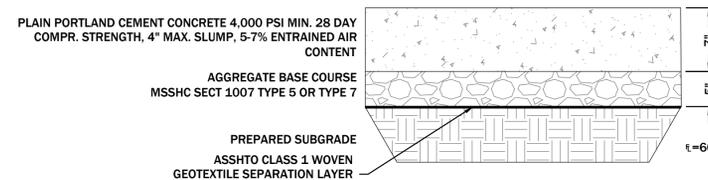
TYPICAL CONCRETE HANDICAP PARKING SECTION
SCALE: 1" = 1'



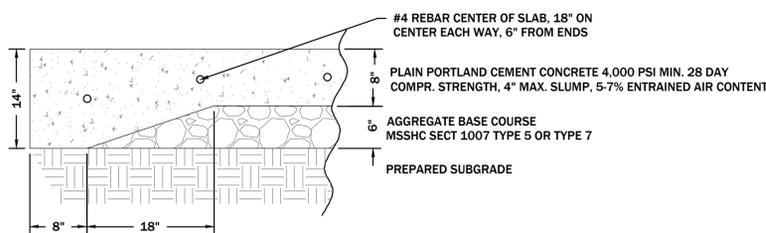
TYPICAL ACCESS ROAD 2 PAVEMENT SECTION
SCALE: 1" = 1'



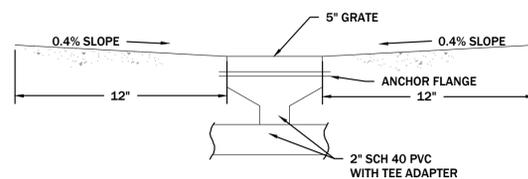
TYPICAL PARKING AREA/GRAVEL ROAD SECTION
SCALE: 1" = 1'



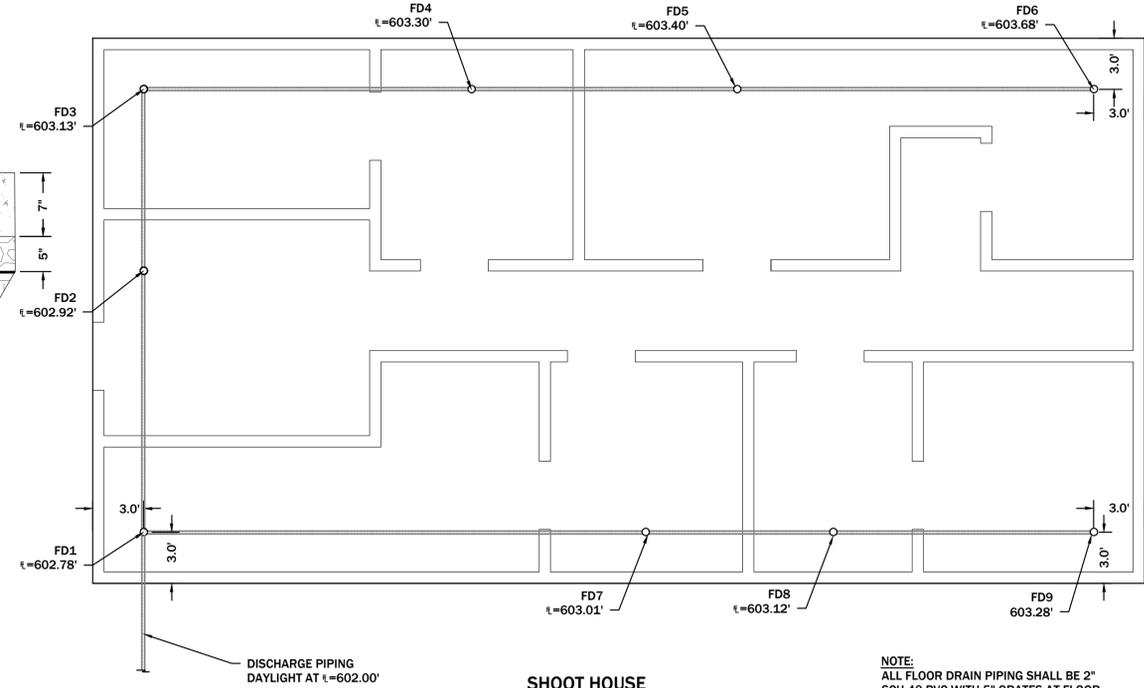
TYPICAL ALTERNATE #1 AND #2 PAVEMENT SECTION
SCALE: 1" = 1'



TYPICAL CONCRETE DUMPSTER PAD SECTION WITH THICKENED EDGE
SCALE: 1" = 1'



TYPICAL FLOOR DRAIN FLOOR SLOPE
SCALE= N.T.S.



SHOOT HOUSE FLOOR DRAIN LAYOUT
SCALE= N.T.S.

NOTE:
ALL FLOOR DRAIN PIPING SHALL BE 2" SCH 40 PVC WITH 5" GRATES AT FLOOR DRAIN LOCATIONS. REFER TO SPECIFICATIONS FOR REQUIREMENTS.



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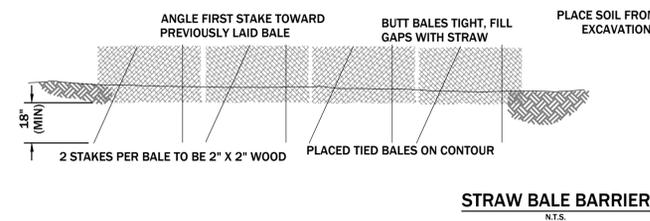
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DRAWN BY: CP
CHECKED BY: BD
DESIGNED BY: BR

SHEET TITLE:
SITE DETAILS

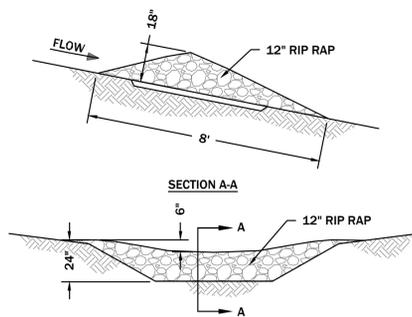
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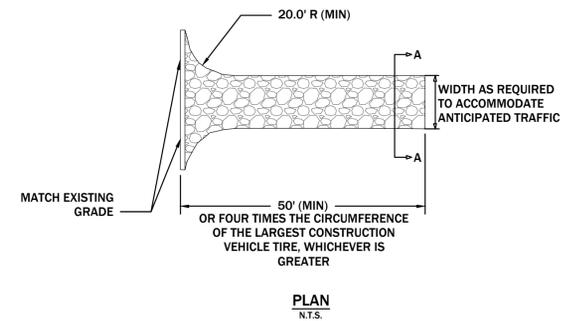
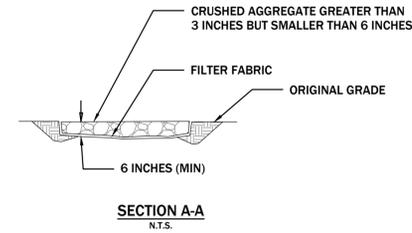
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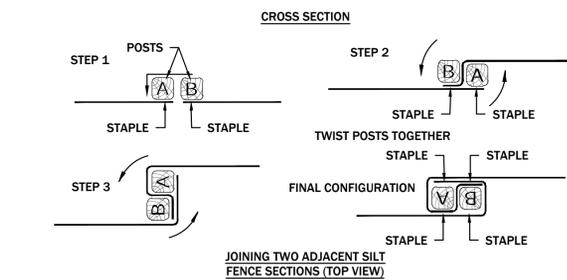
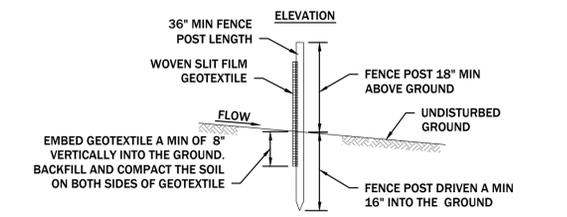
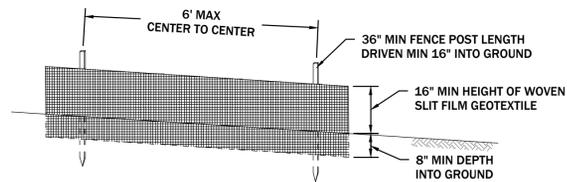
- STRAW BALE BARRIER NOTES:**
1. ANGLE FIRST STAKE TOWARD PREVIOUSLY LAID BALE.
 2. BUTT BALES TIGHT, FILL GAPS WITH STRAW.
 3. TWO STAKES PER BALE TO BE 2" X 2" WOOD.
 4. PLACE TIED BALES ON CONTOUR.



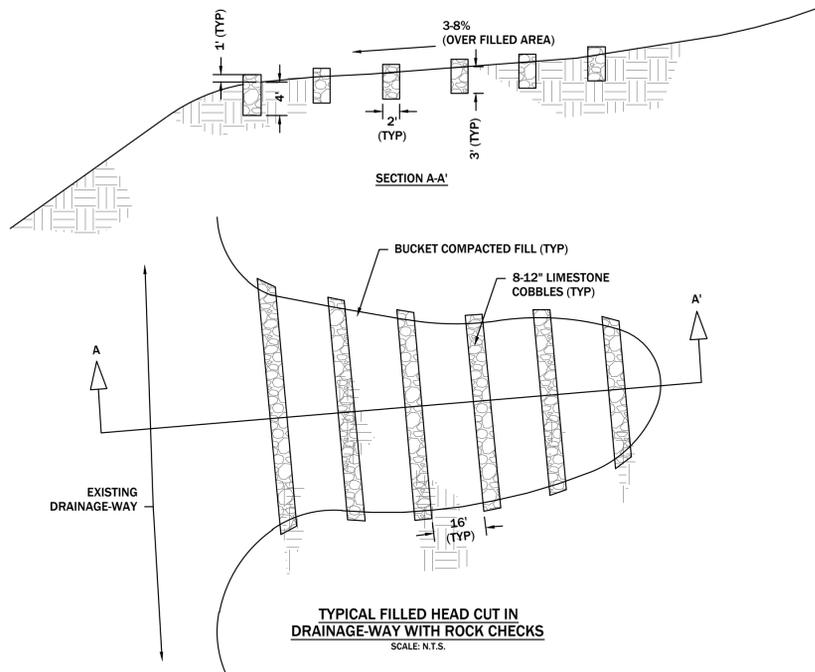
- ROCK CHECK DAM NOTES:**
1. FOR STABILITY THE BASE OF THE DAM SHALL BE KEYPED INTO THE SOIL 6".
 2. GEOTEXTILE SHALL BE USED UNDER THE STONE TO PROVIDE A STABLE FOUNDATION.
 3. REGULAR INSPECTIONS ARE TO BE MADE TO ENSURE THAT THE CENTER OF THE DAM IS LOWER THAN THE EDGES. EROSION CAUSED BY HIGH FLOWS AROUND THE EDGES OF THE DAM SHALL BE CORRECTED.
 4. SEDIMENT SHALL BE REMOVED WHEN IT REACHES ONE HALF OF THE ORIGINAL HEIGHT OF THE DAM.
 5. INSTALL ADDITIONAL ROCK CHECK DAMS AS MAY BE REQUIRED DURING SITE GRADING.



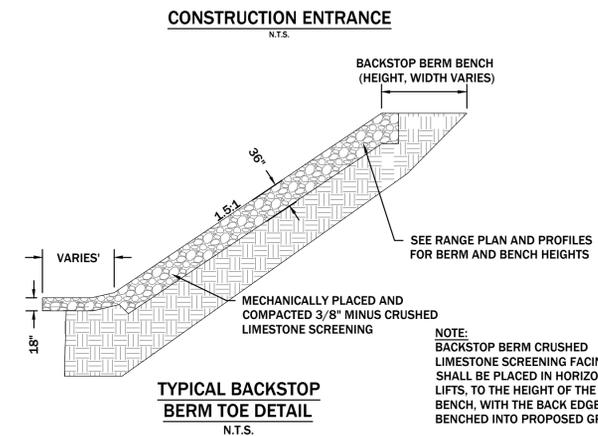
- CONSTRUCTION ENTRANCE NOTES:**
1. STONE SIZE - USE 2" STONE OR RECLAIMED OR RECYCLED EQUIVALENT.
 2. LENGTH - AS REQUIRED BUT NOT LESS THAN 50 FEET
 3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
 4. FILTER CLOTH - SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE. PROVIDE AASHTO CLASS 2 SEPARATION GEOTEXTILE.
 5. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY.
 6. WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS OF WAY. WHEN WASHING IS REQUIRED IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.



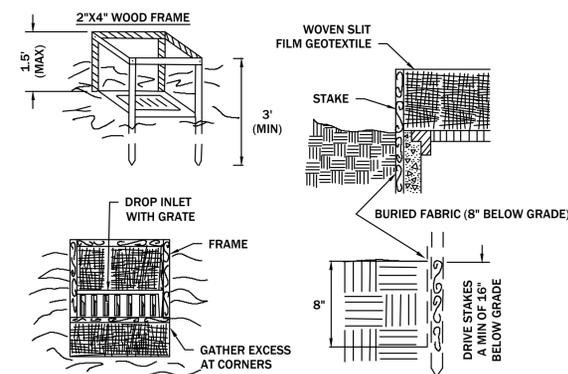
TYPICAL SILT FENCE
N.T.S.



TYPICAL FILLED HEAD CUT IN DRAINAGE-WAY WITH ROCK CHECKS
SCALE: N.T.S.

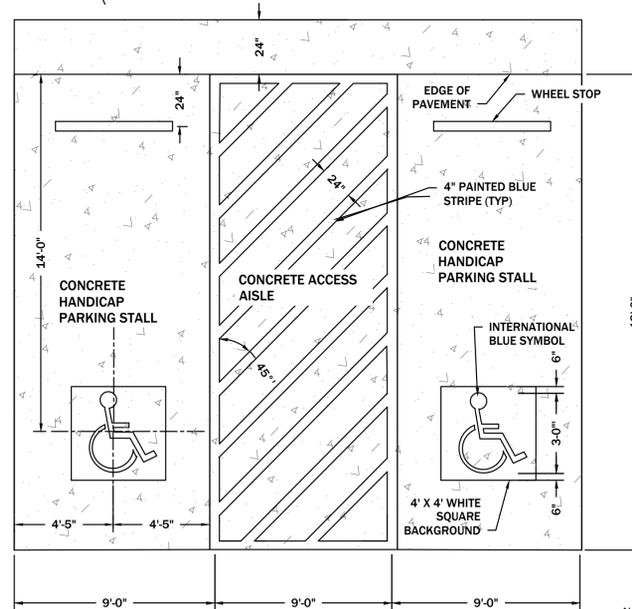


TYPICAL BACKSTOP BERM TOE DETAIL
N.T.S.



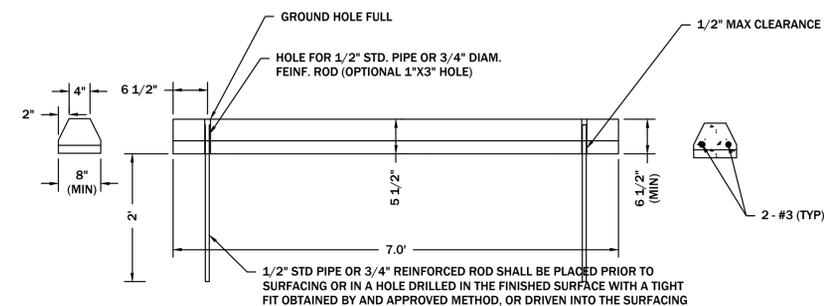
- NOTES:**
1. FABRIC SHALL BE 16" MINIMUM HEIGHT OF WOVEN SLIT FILM GEOTEXTILE.
 2. CUT FABRIC FROM A CONTINUOUS ROLL TO ELIMINATE JOINTS. IF JOINTS ARE NEEDED THEY WILL BE OVERLAPPED TO THE NEXT STAKE.
 3. STAKE MATERIALS WILL BE STANDARD 2" X 4" WOOD OR EQUIVALENT. METAL WITH A MINIMUM LENGTH OF 3 FEET.
 4. SPACE STAKES EVENLY AROUND INLET 3 FEET APART AND DRIVE A MINIMUM OF 16" INCHES DEEP. SPANS GREATER THAN 3 FEET MAY BE BRIDGED WITH THE USE OF WIRE MESH BEHIND THE FILTER FABRIC FOR SUPPORT.
 5. FABRIC SHALL BE EMBEDDED 8 INCHES MINIMUM BELOW GROUND, BACKFILLED, AND COMPACTED. IT SHALL BE SECURELY FASTENED TO THE STAKES AND FRAME.
 6. A 2" X 4" WOOD FRAME SHALL BE COMPLETED AROUND THE CREST OF THE FABRIC FOR OVER FLOW STABILITY.

SILT FENCE INLET PROTECTION
N.T.S.

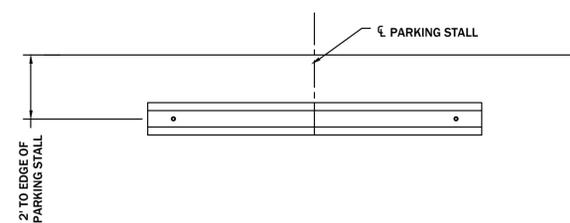


CONCRETE HANDICAP PARKING STALLS DETAIL
N.T.S.

NOTE:
ACCESS AISLE AND PARKING STALLS TO HAVE NO MORE THAN 2% SLOPE IN ANY DIRECTION



PRECAST CONCRETE WHEEL STOP DETAIL
N.T.S.



PRECAST CONCRETE WHEEL STOP DETAIL
N.T.S.



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OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND CONSTRUCTION

MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
SITE # 6026
ASSET # 8136026001

REVISION: _____
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ISSUE DATE: 8/30/2019

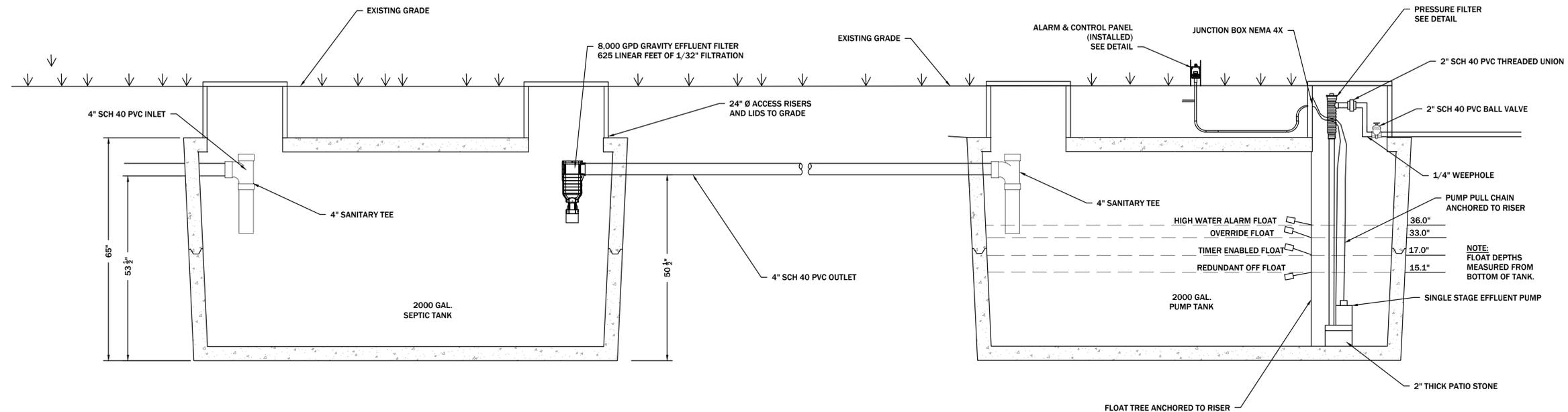
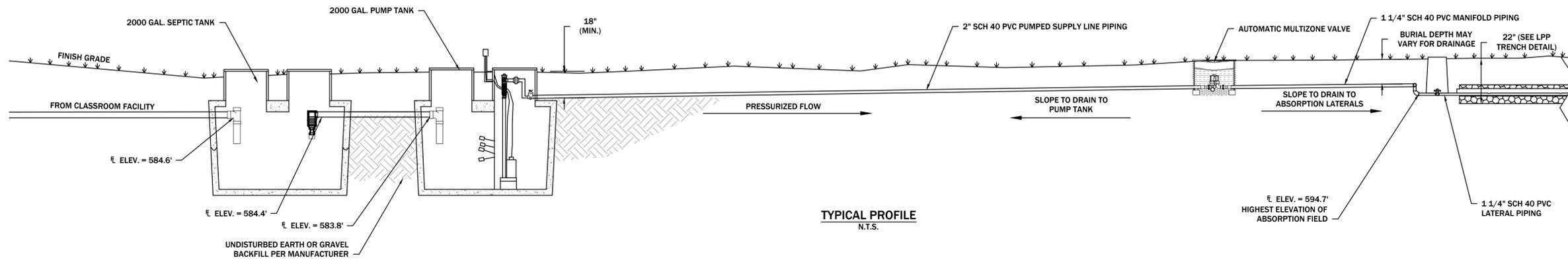
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DRAWN BY: CP
CHECKED BY: TG
DESIGNED BY: TD, BR

SHEET TITLE:
**WASTEWATER
DETAILS**

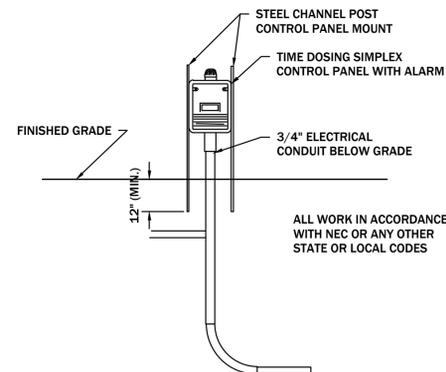
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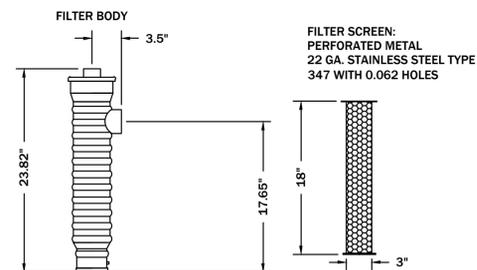
20 OF 49 SHEETS
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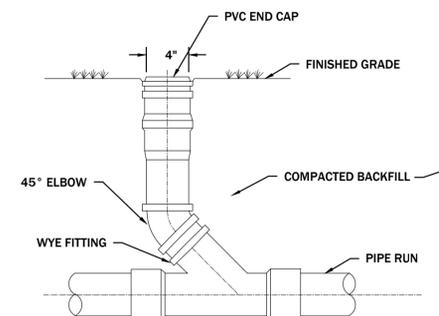
2000 GAL. SEPTIC AND PUMP TANK DETAIL
N.T.S.



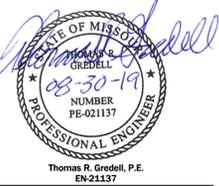
CONTROL PANEL DETAIL
N.T.S.



FIELD ASSEMBLED PRESSURE FILTER DETAIL
N.T.S.



TYPICAL CLEANOUT DETAIL
N.T.S.



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CAD DWG FILE: C-506
DRAWN BY: BR
CHECKED BY: TG
DESIGNED BY: TD, BR

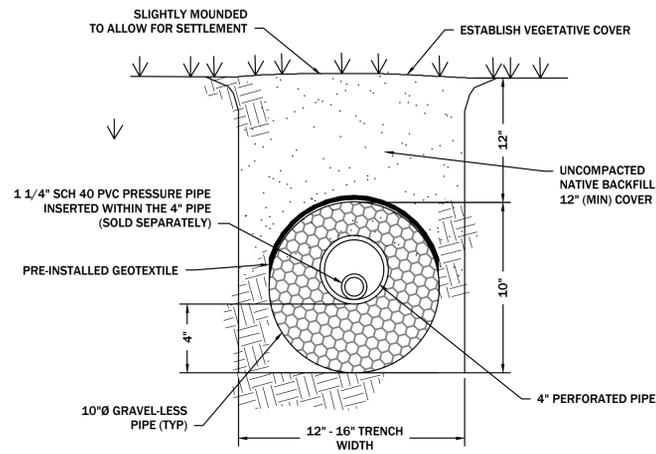
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**WASTEWATER
DETAILS**

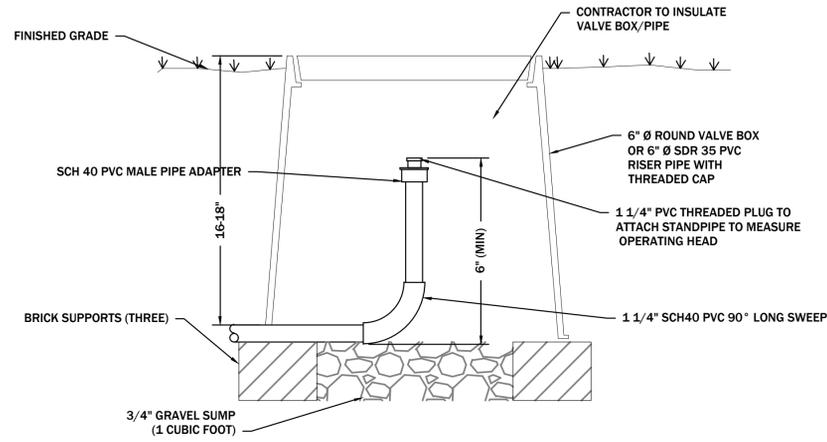
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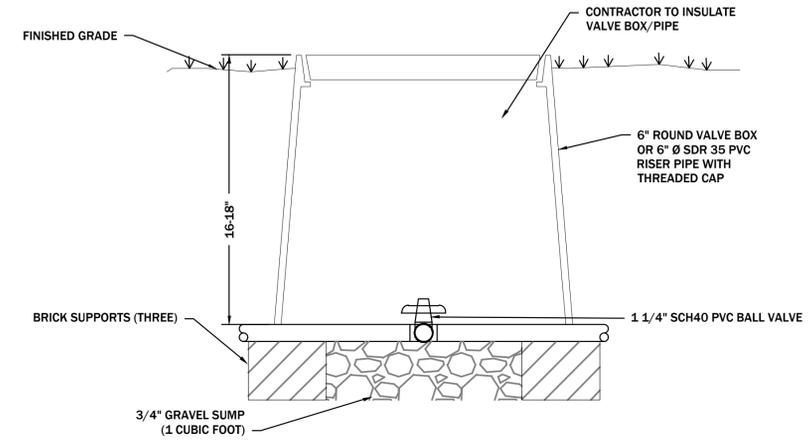
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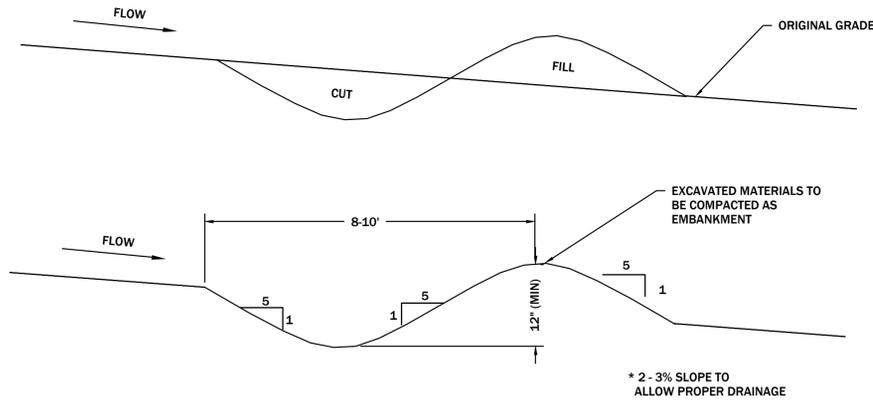
TYPICAL ABSORPTION TRENCH DETAIL
N.T.S.



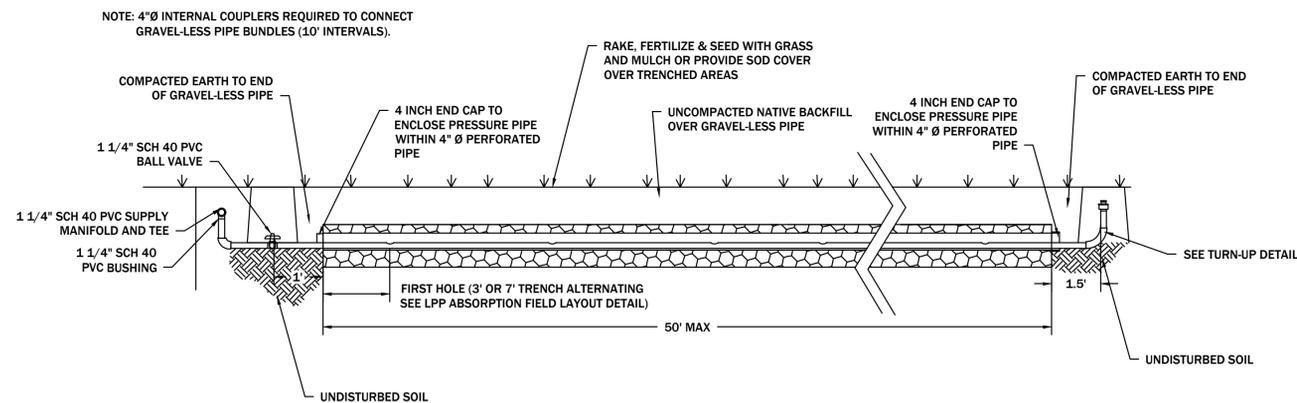
TURN UP DETAIL
N.T.S.



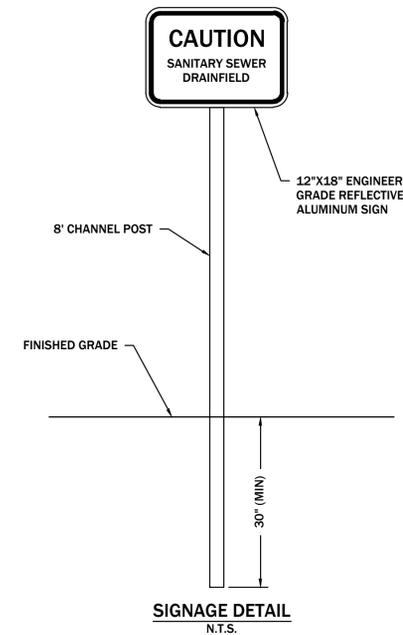
BALL VALVE DETAIL
N.T.S.



DIVERSION SWALE
N.T.S.



LPP TRENCH SECTION DETAIL
N.T.S.



SIGNAGE DETAIL
N.T.S.



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CAD DWG FILE: C-507
DRAWN BY: BR
CHECKED BY: TG
DESIGNED BY: TD, BR

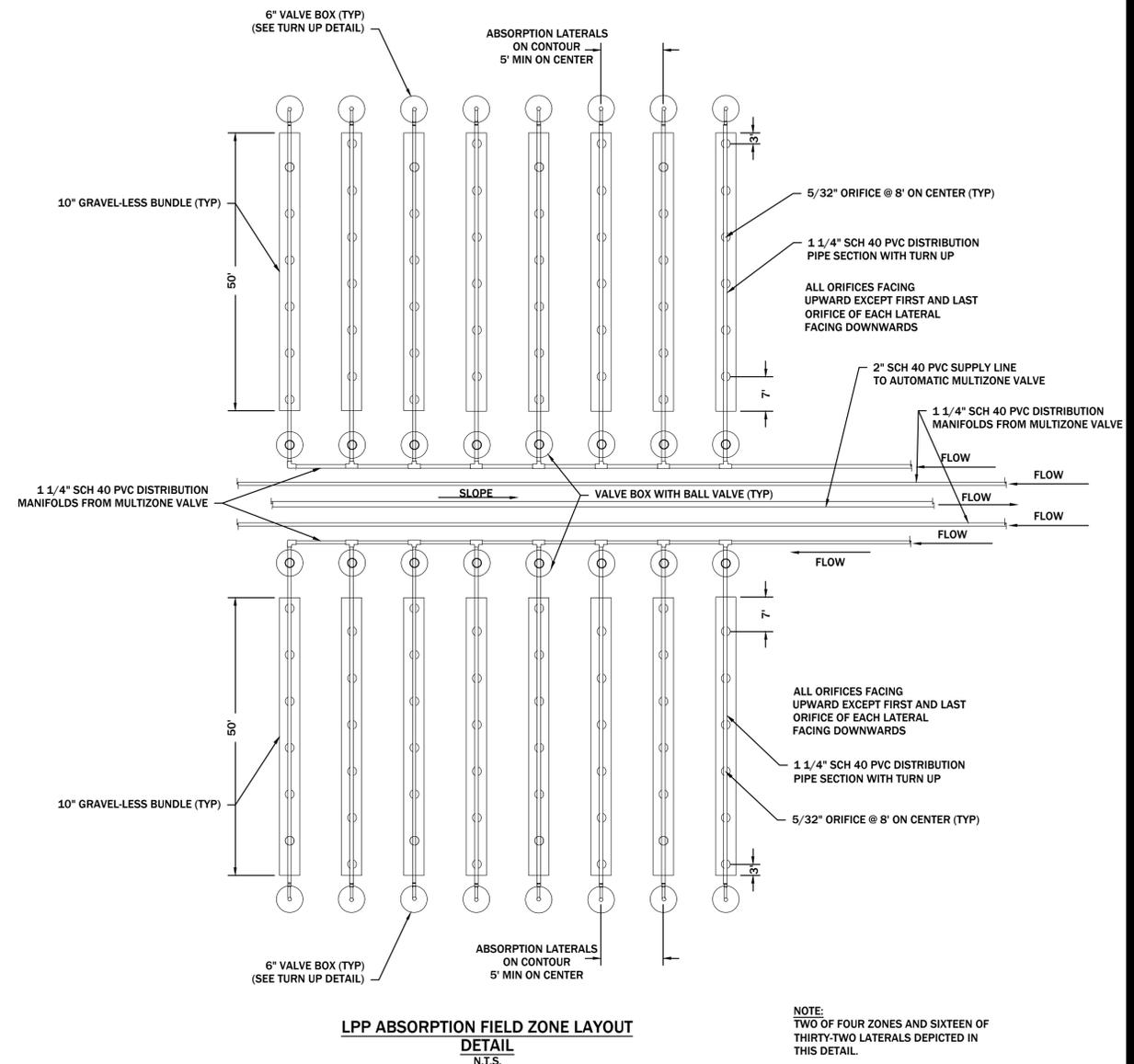
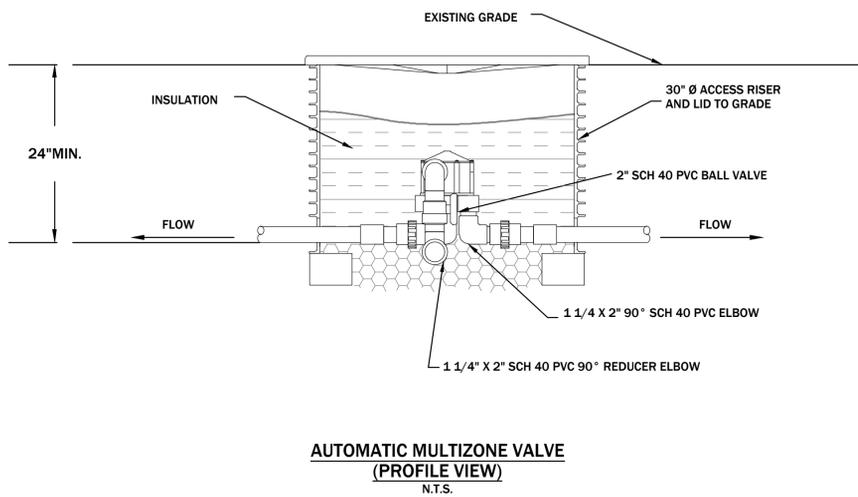
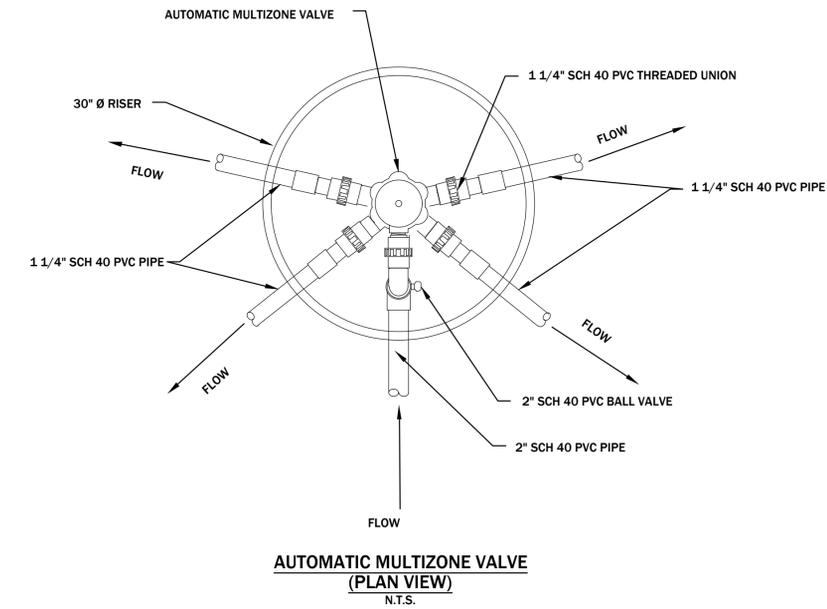
SHEET TITLE:

**WASTEWATER
DETAILS**

SHEET NUMBER:

C-507

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8/30/2019



STRUCTURAL DESIGN CRITERIA AND GENERAL SPECIFICATIONS

1. **Building Code:**
 A. 2015/ASCE 7-10
 B. Pre-engineered metal building column base reactions were estimated. Maximum column reactions shall be less than or equal to those shown on the schedule (S601) when subjected to the required code design loads. If calculated reactions are higher, the contractor shall be responsible for the time and cost for the redesign of the foundation system. If the contractor uses a third party for redesign, the contractor is responsible for the cost of the review of the new foundation design by the engineer.
 C. Allstate Consultants LLC is the structural engineer of record, SER, and assumes responsibility only for what appears on these drawings and is not responsible for all other plans, specifications, estimates, reports, or other documents or instruments not sealed by an engineer with our firm relating to, or intended to be used for, in any part or parts of the project to which these drawings refer.

2. **Design Loads:**
 A. Occupancy Category II (IBC table 1604.5)
 B. Roof dead load
 1) Shout house and Pavilions = 15 psf (10 psf top chord of trusses, 5 psf bottom chord of trusses)
 2) Metal building collateral = 10 psf
 C. Floor dead load
 1) Classroom vault lid = 100 psf
 D. Floor live load
 1) Classroom vault lid = 125 psf
 E. Roof live load = 20 psf (unreduced)
 F. Snow load
 1) Ground snow load, Pg = 20 psf
 2) Thermal factor, Ct = 1.2
 3) Exposure factor, Ce = 1.0
 4) Importance factor, Ie = 1.0
 5) Flat roof snow load, Pt = 16.8 psf
 6) Rain-on-snow surcharge = 0 psf (reduced per ASCE 7 section 7.10)
 7) Design snow load, Ps = 16.8 psf
 8) Shout house unbalanced snow load
 a. Inward load (min) = 5.0 psf
 b. Leeward load (max) = 33.7 psf (ridge to 5.5') and 16.8 psf (5.5' to eave)
 9) Pavilion unbalanced snow load
 a. Inward load (min) = 5.0 psf
 b. Leeward load (max) = 30.6 psf (ridge to 6.66') and 16.8 psf (6.66' to eave)
 10) Classroom unbalanced snow load by metal building supplier

- G. Ponding
 1) Ponding is not a design concern since roof slope is 1/4":12 or greater.
 H. External building wind loading – Analytical Procedure
 1) Basic wind speed (3 second gust), V = 115 mph
 2) Exposure Category C
 3) Internal pressure coefficient at shout house and classroom, GCp1 = ±0.55 (partially enclosed)
 4) Internal pressure coefficient at pavilions, GCp1 = ±0.00 (open building)
 5) Design pressure for components and cladding (q = 3.5')
 a. Shout house walls (based on 100 sq ft)
 i) 22.5 psf (0.6WL) – zone 4 (typical)
 ii) 24.5 psf (0.6WL) – zone 5 (corners)
 b. Net uplift at shout house (based on 75 sq ft and 5 psf DL)
 i) 24.5 psf (0.6D+0.6WL) – zone 2 (typical)
 ii) 37.0 psf (0.6D+0.6WL) – zone 3 (corners)
 c. Net uplift at pavilions (based on 36 sq ft and 5 psf DL)
 i) 17.5 psf (0.6D+0.6WL) – zone 2 (typical)
 ii) 17.5 psf (0.6D+0.6WL) – zone 3 (corners)

- I. Seismic loading – Equivalent Lateral Force Procedure
 1) Importance Factor, Ie = 1.0
 2) Site Class D, per the geotechnical memo
 3) Site = 0.20 (Ss = 10.0%)
 4) Sd1 = 0.162 (S1 = 10.1%)
 5) Seismic Design Category C
 6) Base shear – Shout House
 a. System: Ordinary Reinforced Concrete Shear Walls
 i) Response coefficient, R = 1.25
 ii) Deflection amplification factor, Cd = 4
 iii) System over strength factor, = 2
 b. Base shear, V = 0.051W
 7) Base shear – Pavilions
 a. System: Ordinary Steel Centrifuge Columns
 i) Response coefficient, R = 1.25
 ii) Deflection amplification factor, Cd = 1.25
 iii) System over strength factor, = 2
 b. Base shear, V = 0.162W
 8) Base shear – Classroom by metal building supplier
 9) Maximum story drift = 0.020in
 J. Foundation design (see geotechnical memo)
 1) Max net allowable soil bearing = 2,500 psf

3. **General Notes:**
 A. Substitution requests, for products other than those specified herein, shall be submitted by the contractor to the engineer along with calculations that demonstrate that the substituted product is capable of achieving the pertinent equivalent performance values (minimum) of the specified product having a research report recognizing the product for the appropriate design procedure and/or standard(s) as required by the building code.
 B. Roof and catwalk framing shall be laid out in equal spacing per bay unless noted otherwise (2'-0" max spacing of wood trusses and 12'-0" at catwalk framing).
 C. The notes on the structural drawings are applicable to all drawings in addition to the project specifications. These notes take precedence over the specifications and architectural drawings.
 D. Do not hang any mechanical, electrical, etc. from bridging, roof deck, or non-structural load supporting elements. All such items shall be supported from joists, beams, or structural load supporting elements.
 E. Drawings provide a system for the in-place structure. Methods of construction to achieve the in-place system are not addressed unless specifically noted. Supporting floors or similar conditions shall be placed prior to backfilling against foundation walls or provide wall bracing designed and certified by an independent professional engineer. Bracing designs shall be submitted to the engineer for approval.
 F. During erection of the building, the contractor shall be responsible for temporary bracing to withstand all loads to which the structure may be subjected, including lateral loads, stockpiles of material and equipment. Such bracing shall be left in place as long as required for safety and until all framing, including roof deck is in place.
 G. It is the contractor's (installer, subcontractor, tradesman, material supplier, general contractor, etc.) responsibility to be familiar with any local, city, county, state or federal regulations, codes, ordinances, etc. that may apply to their work, materials, equipment or methods of construction.
 H. It is the contractor's responsibility to supervise, direct, or have control over all work done by any contractor. The engineer/design professional does not have the authority to stop work. The contractor shall have authority for or shall be responsible for the means, methods, techniques, sequences or procedures of construction selected or used by any contractor for safety precautions and programs incident to the contractor's work.
 I. Unless noted, submit shop drawings of all fabricated materials for review. Design drawings shall not be reproduced for use as shop drawings without written consent of engineer. Shop drawings will not be reviewed unless they were checked, bear the initial of the checker and are stamped "approved" by the general contractor. See submittal requirements in the following notes as well the following:
 1) Product specifications for engineered systems and accessories including wood, steel, and concrete systems.
 2) Material certificates for structural materials including wood, steel, and concrete.
 J. Where a detail, typical detail, section, typical section, or a note is shown for one condition, it shall apply for all the like or similar conditions unless noted otherwise.
 K. All dimensions shown on these drawings shall be verified by the contractor prior to the approval of shop drawings by the engineer. Conflicts on the structural, architectural, MEP, civil, or other drawings shall be communicated to the engineer prior to completing any work.
 L. All dimensions shown on these drawings shall be coordinated with the approved metal building shop drawings by the contractor. Discrepancies shall be communicated to the engineer prior to completing any work.

4. **Special Inspection General Requirements:**
 A. See "Schedule of Special Inspection Services" for the statement of special inspections as required by IBC 1704.
 B. Special inspection agencies
 1) Agencies shall be under direct supervision of a professional engineer registered in the state of Missouri.
 2) Laboratory facilities shall meet applicable ASTM/ICC specifications.
 3) Except for registered professional engineers, all testing technicians, inspectors, and engineers performing special inspections shall be certified per building code requirements as applicable for the item tested.
 4) The special inspector shall furnish inspection reports in a timely manner as the project progresses to the building official, owner (or owner's agent), architect, engineer, and general contractor. During the construction process, the special inspector shall inform the contractor and the engineer immediately if any deviations or nonconformities from the contract documents are discovered.
 5) A final special inspection report (per IBC 1704) shall be submitted after the completion of all of the structural systems described herein.

5. **Structural Engineer Of Record (SER) Site Visits:**
 A. Contractor shall notify architect/engineer five (5) working days prior to the following construction milestones:
 1) Footings/walls: after reinforcing is placed and before pouring concrete.
 2) Roof structure: after structure is erected and before roofing is installed.
 B. Failure to notify architect/engineer of any construction milestone may result in contractor having to remove work for the purpose of review at contractor's expense.
 C. Premature notification for site visit will result in an additional site visit with all expenses and fees paid by the contractor.

6. **Geotechnical Data and Foundation System (Division 2):**
 A. The following design information is from the geotechnical memo by Credel Engineering Resources, Inc. dated 6-27-2019.
 B. Footings shall bear on a minimum of 2'-0" of controlled fill composed of native soils as directed by a geotechnical engineer.
 C. Footings bearing on controlled fill are designed for a maximum net bearing capacity of 2,500 psf.
 D. The bottom of the footing excavation shall be cleaned of all loose soil and then be thoroughly compacted with a mechanical tamper prior to installing reinforcing steel.
 E. A minimum of 18" of compacted gravel base, including drainage course (see notes), shall be placed under slabs-on-grode per geotechnical engineers recommendations.
 F. All topsoil and other unsuitable bearing material shall be removed. A geotechnical engineer shall inspect the excavated area to ensure all materials requiring removal have been removed, all necessary surface compaction is performed, and to verify the soil bearing capacity used for design.
 G. Frost cover from exterior grade to bottom of footing shall not be less than 3'-0". Foundation systems may require lowering to provide frost depth.
 H. Crushed stone/gravel for reference shall be the following or equivalent.
 1) Base rock/well graded rock, ASTM D2940, with at least 95 percent passing a 1 1/2" sieve and not more than 8 percent passing a #200 sieve. Missouri Standard Specification for Highway Construction (MSSHC) Type 1 Aggregate for Base is an acceptable equivalent.
 2) Drainage course/open graded rock/clean rock, ASTM C33, size 57. MSSHC Grade 4 Aggregate for Drainage is an acceptable equivalent.
 3) Fine graded course/sand, ASTM D448 unwashed size 10 not clean sand with uniform particle size.

- I. Slabs-on-grade shall be placed over 6" of compacted drainage course (4" of drainage course with the upper 2" chokd off with fine graded course of GC option) typical. A 15 mil reinforced polyethylene vapor barrier (ASTM E 1745, Class A) shall be placed above the drainage course and below the slab at the classroom building only. Single ply is prohibited. Provide Stego Wrap by Stego Industries or approved equivalent. All joints and penetrations shall be topped 6" minimum and sealed with seam tape and mastic as recommended by the manufacturer.
 J. Backfill against footings inside the building shall be made with compacted base rock or equivalent. Similarly, base rock backfill against foundation systems at the exterior of the building shall be placed under all paved areas as well as ancillary site items (i.e., stairs-on-grade, planters, and benches). This exterior base rock backfill shall extend out a minimum of 36" from the exterior face of the building.
 K. Compact backfill at building to a minimum of 95 percent of standard maximum dry density, at a moisture content between +1 and +4 percent of optimum moisture content for soil and between -2 and +2 percent of optimum moisture content (workable moisture level) for crushed stone/clean graded rock/clean rock, ASTM C33, size 57. MSSHC Grade 4 Aggregate for Drainage is an acceptable equivalent.
 L. Open graded or clean rock fill material shall be compacted to a minimum relative density of 70 percent, as determined in accordance with ASTM D 4253 and 4254 per recommendations of the geotechnical report.
 M. The foundation system is designed for the local parameters contained herein. This design does not consider or account for the global stability of the site or slopes.
 N. Site grading shall be configured to allow adequate drainage away from the structure. See site grading plan for this information. Unless more detailed information is provided on the plans slope exterior grade away from the structure a minimum of 6" in the first 10' to prevent ponding water and direct water from gutters/drainage a minimum of 10' beyond the building footprint.

7. **Reinforced Concrete (Division 3):**
 A. Design codes: Building Code Requirements for Reinforced Concrete (ACI 318), latest adoption.
 B. Material strengths
 1) Concrete compressive strength (fc) at 28 days:
 a. Footings (Exposure Class F2) 3,000 psi
 b. Exterior walls (Exposure Class F1) 4,000 psi
 c. Interior slabs-on-grade (Exposure Class F0) 4,000 psi (3/4" aggregate, 540 lbs/cu yd of cementitious content min
 2) Slump (plus or minus 1 inch)
 a. All concrete used otherwise, when water reducing admixture is added to increase concrete slump shall have a slump of 5" maximum before the admixture is added and 8" maximum after.
 3) Air Content
 a. All concrete exposed to weather shall be air entrained per ACI requirements (5% to 6% for 3/4" max aggregate), plus or minus 1.5%.
 4) The contractor/producer is required to furnish concrete that is designed to the average strength level that will meet the higher of the fc (a) as specified for structural requirements, (b) values of fc associated with the specified exposure classification per ACI 318, or (c-1) values of fc that were developed from correlating strength with the results of ASTM C1202 tests, or (c-2) values of fc that were developed from correlating strength with water/cement ratio.
 5) Reinforcing steel
 a. Bars and ties ASTM A615, Grade 60 (Fy=60ksi)
 b. Mechanical butt splices, Bar-Lock coupler by Bar-Lock (MBT) or Zap Screwlok by BarSplice or equivalent, capacity shall exceed 125% of specified yield of reinforcing.
 C. Grout or non-shrink grout (for setting plates or anchors, filling bearing pockets, etc.) shown on plans shall be Sikadur 212 by Sika (ASTM C1107) or equivalent.
 D. Post-installed anchors --- adhesive/epoxy anchors
 1) Post-installed anchors shall only be used where specified on the construction documents. The contractor shall obtain approval from the engineer prior to installing post-installed anchors in place of missing or misplaced cast-in-place anchors. Care shall be taken in placing post-installed anchors to avoid conflicts with existing rebar. Nails shall be drilled (hammer drilled in concrete and core drilled in masonry) and cleaned in accordance with the manufacturer's written instructions. For horizontal or vertically inclined anchor orientation carrying sustained tension loads, the installer must be certified by an ADI/CRS Adhesive Anchor Installer Certification program. See general notes for substitution requests.
 a. Concrete anchors
 i) Adhesive/epoxy anchors for use in cracked and uncracked concrete, Simpson Strong-Tie "AT-XP" or equivalent (tested in accordance with ACI 308.4-R and ICC-ES ECR-1038)
 ii) Design load strength has been based on cracked concrete, ACI 355.4 temperature Category B and installations into dry holes into concrete that has cured for at least 21 days.
 E. Notes:
 1) Placement of concrete and reinforcement shall be in accordance with ACI and CRS standards. Lap or dowel continuous bars with Class B splices per ACI 318 unless noted otherwise. Lap or dowel bars 50 bar diameters minimum. No welding of reinforcing is permitted.
 2) All reinforcement, anchors, anchor bolts, embed plates, etc. shall be secured in position prior to placing concrete.
 3) Provide 1/2" cherner at all exposed corners unless notes otherwise.
 4) Exposed concrete surfaces shall be finished to a uniform appearance per ACI 301.
 5) Exposed concrete surface shall be free of defects and holes no larger than 1/2 inch diameter. Defects and holes shall be patched with epoxy mortar or specially mixed grout to match the wall color. Patches shall be slightly recessed from the wall surface. At a distance of no more than 20 feet and no less than 15 feet, the completed wall shall not reveal imperfections such as color variations, patches, or voids that impart the appearance of the wall. Any imperfections visible at this distance shall be removed and repaired.
 6) Reinforcing shown on details is for concept only, follow CRS placement and cover requirements unless noted otherwise.
 7) Furnish the following concrete cover at reinforcing bars unless shown otherwise on the drawings:
 a. Slabs-on-grade place reinforcing in center of slab
 b. Pedestals 2" cover at ties
 c. Footings 3" cover at bottom and sides
 d. Walls 2" cover where exposed to soil or weather and 1" where not exposed to soil and weather
 e. Interior suspended slabs 1" cover
 8) Maximum aggregate size shall not exceed 3/4 the concrete cover (i.e. 3/4" max aggregate for 1" cover)
 9) At corners/intersections of all walls, footings, grade beams, etc., supply corner bars 4'-0" long (2'-0" each direction) minimum matching size and spacing of all horizontal bars. See details for longer lengths if required.
 10) Floor control joints(s) unless noted, shall be located steel columns, and spaced equally with maximum spacing in feet for interior slab-on-grade of thickness in inches times 3.0. Unless noted, maximum joint spacing in feet of exterior slabs shall be slab thickness in inches times 2.0. The joint spacing shall not be greater than 15'. The ratio of slab panel dimensions shall not exceed 1.5:1. Control joints spacing shall be reduced at hot and/or dry climate. Saw cut slab (3/16" wide times slab thickness divided by 4) as soon as the surface is firm enough so that it will not be damaged by the blade. The optimum time to cut the slab will be the contractor's responsibility. Generally, in moderate weather conditions, this time will be within 4 to 12 hours after the slab is placed.
 a. The contractor shall submit slab-on-grade joint layout for approval.
 11) Reinforcing for slabs-on-grade shall be #4's at 24" o.c. each way. Terminate this reinforcing at construction joints, see details typical.
 11) Slab-on-grade reinforcing shall be supported on wire bar-type supports (provide sand piles if required) of sufficient height to insure that reinforcing is at the proper location with maximum spacing of 4'-0". Reinforcing pull-up method is not permitted.
 12) Provide (2) #5x5'-0" long min diagonal bars at corners of wall, floor, and roof openings typical. Also, provide (2) #5's min at jamb and head of wall openings. Extend head and jamb reinforcing 32 post openings typical.
 13) Provide #4's at 12" o.c. in all walls min, unless noted otherwise.
 14) size top of foundation or travel finish shall be finished to match adjacent unformed surfaces. The foundation must be square, level, and smooth. Anchor bolts must be located by means of a template. DO NOT hand set anchor bolts. Joint Sealant shall be Skaflex 15LM by Sika Corporation U.S. or equivalent.
 16) Concrete should be protected from premature drying in accordance to ACI recommendations (including ACI 308.1). It is recommended that exposed concrete surfaces (not intended to be covered by finishes such as flooring) be moisture cured for a minimum of 7 days.
 F. Shop Drawings and Deferred Submittals
 1) Concrete mix designs – specify placement location of each mix.
 2) Concrete slab-on-grade control joint layout.
 3) Reinforcing steel in concrete showing wall elevations and control joints typical.

- 4) Epoxy anchor system specifications.

8. **Structural Steel (Division 5):**
 A. Design Code: Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings (AISC), latest adoption.
 B. Material strengths:
 1) Angles, channels, plates (including raised pattern floor plate), and bars ASTM A36 (Fy=36ksi)
 2) Rectangular and Square HSS, ASTM A500 Grade C (Fy=50ksi)
 3) Connection bolts ASTM A325, Type 1, ASTM A563 heavy hex carbon-steel nuts and ASTM F436 hardened carbon-steel washers. Bolts are designed as snug tight unless noted otherwise.
 4) Anchor rods, ASTM F1554 Grade 36 (Fy=36ksi) Adhesive/epoxy anchors and threaded rods, ASTM F1554 Grade 36 (Fy=36ksi)
 5) Welds E70XX (Fex=70ksi) electrodes per AWS D1.1 – steel
 6) Headed Anchor Studs (HAS)/shear studs and threaded base studs Nelson Type, ASTM A108 (Fy=50ksi) and AWS D1.1. Attachment shall develop the full strength of the lag/slug
 7) Deformed bar anchors (DBA) welded to steel Nelson Type ASTM A498 (Fy=70ksi)
 C. Notes:
 1) All structural steel shall be fabricated and erected according to the specifications of The American Institute of Steel Construction (AISC), latest adoption.
 2) Exposed structural steel shall have: welds contoured and blended, minimized blocking tolerances, welding aids removed, welds ground smooth, access holes filed and ground smooth, continuous welds, minimized weld show-thru, minimized shop and mill marks, edges ground smooth, and evenly applied primer/paint.
 3) Connection Design (reference the AISC Code of Standard Practice)
 a. Option 1
 i) Structural steel connection design for all connections is shown in the Structural Drawings. No engineering is necessary for these connections.
 4) Steel column base plate anchor rod holes and washer plates shall be as follows unless noted otherwise (reference AISC Steel Design Guide 1, Second Edition, Table 2.3.3). Washer plates shall be welded to base plates with 1/4" fillet weld on three sides.
 a. 3/4"x9" anchor rod, 1 5/16" hole, 2"x2x1/4" washer
 6) Metal building supplier is responsible for the design of all connections for framing members to metal building elements unless detailed on the drawings.
 7) Steel shop drawings shall include erection plans showing beam to beam/column/wall, joint to beam/column/wall connections, beam elevations as well as lateral load resisting frame elevations and their connections, etc.
 8) All steel shown on the plans as well as misc embedded steel items shall be G185 galvanized per ASTM A123. Patch welds and imperfections with approved cold galvanizing compound (CRZ Zinc-II or equivalent – ASTM A780) typical.
 9) Bolts shall be placed at 3' spacing, 1 1/4" edge distance, standard gage, and two standard holes unless noted otherwise.
 10) Shop connections may be welded or bolted using 3/4" (A325) diameter bolts. Field connections shall be bolted using 3/4" (A325) diameter bolts.
 11) All structural steel shop and field welding shall be completed by an AWS certified welder.
 12) Field cutting of structural members including resections and calculations.
 13) Shop drawings and without written authorization of architect/engineer.

- D. Shop Drawings and Deferred Submittals:
 1) Structural and miscellaneous steel including plan member layout, erection drawings showing elevations and connection assemblies. Member layout shall clearly show place marks that are referenced and easily identifiable in the submittal. Multiple submittal shop drawings shall include an overall plan of the entire project showing member sizes and layout.
 2) Pre-engineered metal building erection drawings including reactions and calculations.
 3) Sizes and layout for stairs/guard rails shown on structural drawings are schematic. Stair stringers and other support members shall be attached with standard AISC connections or with 2 1/2" bearing minimum. A live load of 100 psf shall be used in the stair design. A live load of 50 plf or a 200 lb concentrated load shall be used for handrail/guardrail design and applied at the top of the rail. Fully detail stair and handrail connections, including attachments to supporting members. The contractor shall submit fabrication drawings and calculations for review signed and sealed by a professional engineer registered in the state of Missouri.
 9. **Cold-Formed Metal Framing/Metal Studs (Division 5):**
 A. Design, fabrication and erection shall conform to AISI "Specifications for the Design of Cold Formed Steel Structural Members", latest edition. The contractor shall submit fabrication drawings for review. These fabrication drawings shall include overall member layout, wall sections, and all connections as well as other required drawings.
 B. Cold-formed steel framing members and connections shall conform to the acceptance criteria ICC AC45 and AC208 respectively.
 C. Where Steel Stud Manufacturers Association (SSMA) designation is called out on the drawings, the metal studs shown on the drawings are designed for dead, live, and wind loads as well as other misc loads (i.e., header loads, snow/roof, etc.). The cold-formed metal supplier shall supply SSMA members as indicated.
 D. For bidding purposes only, consider the following minimum wall studs and spacing. Related costs such as engineering and shop drawing production shall also be included in the bid.
 1) Interior non-bearing walls
 a. Minimum, 30 mil (20 ga – drywall) wall studs at 16" o.c.
 b. Unsupported wall height, h < 15'-0": 3625125-30 (20 ga – drywall) at 16" o.c.
 c. 15'-0" < h < 16'-11": 3625125-43 (18 ga) at 16" o.c.
 E. Galvanized material:
 1) All galvanized studs, joists and accessories shall have a G60 coating.
 2) All galvanized 18 and 20 gage studs, tracks, bridging, and closures and accessories shall be formed from steel that corresponds to the requirements of ASTM A653, Grade 33 (Fy=33ksi).
 3) Provide galvanized SHFG joists connectors or equivalent by the Steel Network for wall, header/inter, floor, ceiling, and roof framing connections to supporting elements typical.
 F. Unless noted, all self-drilling tapping screw fasteners shall be in compliance with ASTM C1513 or an approved / recognized design standard. All screws shall be non-corrosive unless noted otherwise (do not use stainless steel or copper-coated fasteners).
 G. Unless noted, tracks shall be some depth as studs or joists and the same gage as the studs or joists minimum. Tracks shall be connected to supports at 16" o.c. maximum. Studs or joists shall be connected to tracks at each side.
 H. Provide the following connection of the base of walls to the foundation typical unless noted otherwise.
 1) Interior wall track, (1) 0.145x1" embed Hilti X-U.P.A.F.'s to slab at each stud
 I. The quantity of studs (i.e., king or jamb studs at headers) and joists dispaced or cut for opening shall be placed half on each side of opening.
 J. All non-load bearing light gage steel framing shall be designed to accommodate a minimum of 3/4" vertical deflection of primary structure using WEGJoig or equivalent ties. These walls shall be designed for a minimum of 5 psf lateral load.
 K. Provide bridging for non-load bearing wall studs per SSMA or as required by cold-formed steel supplier specialty engineer.
 L. Provide the following headers for non-load bearing walls unless noted.
 1) (2) 3625162-43 (18 gage) for spans up to 4'-0".
 M. Live load deflection design limits shall not be greater than the following.
 1) All other walls, horizontal 1/240 times wall height.
 N. Fasten points to supports with #8 screws unless noted otherwise. Screw spacing shall be 6" o.c. at panel edges and 12" o.c. field (intermediate supports) unless noted otherwise.
 O. Shop Drawings:
 1) Cold-formed steel elevations and connection assemblies as well at related wall sections.

10. **Wood Framing – Rough Carpentry, Wood Products, And Wood Trusses (Division 5):**
 A. Design codes:
 1) National Design Specification for Wood Construction (NDS), latest adoption.
 2) Install rough carpentry work to comply with American Institute of Timber Construction (AITC), Timber Construction (TC) Manual, latest adoption and recommendations of the product manufacturer.
 B. Material strengths:
 1) Preservative pressure treated lumber shall be Southern Pine, No. 1 Grade (graded under SPF rules) for 2x members.
 2) Lumber for miscellaneous uses may be "standard" grade light-framing-size lumber of any species for support of other construction, including roof/stop equipment and support bases, cant strips, bucks, rollers, blocking, furring, grounds, stripping and similar members.
 3) All wood structural panels shall be identified with the appropriate grade trademark of The American Plywood Association (APA), and shall meet the requirements of product standard PS-1. Unless noted plywood shall be C-DX exposure 1 with grade and thickness indicated on plans and notes.
 4) All beams denoted as Parallel or Parallel Strand Lumber (PSL), shall be manufactured by Trusjoist Corporation, or equivalent and have the following minimum properties:
 a. Allowable bending stress 2,800 psi
 b. Allowable shear stress 290 psi
 c. Modulus of elasticity 2,000,000 psi
 d. All members shall be preservative treated for exterior application as provided by Trusjoist Parallel Plus PSL with preservative protection or equivalent.
 5) Fasteners:
 a. Nails, wire, brads, and staples: ASTM F547.
 b. All nails shall be common wire nails unless noted otherwise. Nails shall be driven so that heads are flush with wood surface. Over or under driven nails will not be acceptable. Nail sizes on drawings shall be as shown unless noted otherwise.
 i) 16d, 0.162" shank diameter, 3 1/2" length
 ii) 10d, 0.148" shank diameter, 3" length
 iii) #4, 0.131" shank diameter, 2 1/2" length
 iv) #6, 0.113" shank diameter, 2" length
 c. Alternate fastener size, number and pattern may be provided with power driven fasteners. Ref Engineering Services Report (ESR) 1539.
 d. Wood screws: ANSI B18.6.1.
 e. Lag bolts: ANSI B18.2.1.
 f. Bolts: ASTM A307, Grade A, or ASTM A36.

- C. Wood Truss Members:
 1) Trusses shown on plans are for configuration only. Contractor shall submit shop drawings with Missouri professional engineers seal showing actual member stresses and joint plate sizes conforming to loading figures constructed by the truss supplier. Truss layout/plan drawings shall be submitted. These layout/plan drawings shall indicate snow/roof/unbalanced loads and other additional live loads. Sealed shop drawings shall be based on the loading criteria shown on the structural plans or sealed calculations shall be submitted for approval. The structural loading input parameters and loads (including snow/roof loads, unbalanced snow loads, concentrated live loads, etc.) shall be clearly stated on the sealed shop drawings for review.
 2) Systems shall be designed for loadings previously described on this sheet.
 3) All wood truss to wood truss (or wood girder) connections shall be by wood truss supplier. Shop drawings shall be submitted for these connections typical.
 4) Temporary and permanent wood truss bracing/bridging location and size shall be designed and indicated by the truss manufacturer/typical (BOS 1, Guide to Good Practice for Handling, Installing and Bracing of Metal Plate Connected Wood Trusses and WDA, Commentary for Permanent Bracing of Metal Plate Connected Wood Trusses).
 5) Live load deflection design limits shall not be greater than the following.
 a. Roof trusses, vertical 1/360 times projected span.
 6) Provide 1/8" of camber for each 6'-0" of truss span unless noted otherwise.
 7) Truss connections shall be made so that the capacity of the member is not adversely effected typical.
 D. Notes:
 1) Stick built framing members shall not have finger-jointed or other splices unless indicated on the plans.
 2) Wood ledgers/rollers with equal spaced attachments shall be attached an 2" minimum to 5" maximum from each end or splice location typical.
 3) Lay structural panels with face grain perpendicular to supporting members and stagger end joints 4'-0".
 4) Install panels continuously over two or more spans.
 5) Panel clips at 24" o.c. (or one per span min) shall be used for roof decking.
 6) Fasten panels to supports with #8 nails unless noted otherwise. Nail spacing shall be 6" o.c. at panel edges and 12" o.c. field (intermediate supports) unless noted otherwise.
 7) Do not hang any mechanical, electrical, etc. from roof deck unless noted otherwise.
 8) 1/8" space shall be allowed at all panel ends and edges per APA requirements typical.
 9) Roof decking shall be 5/8" APA rated sheathing with a 32/16 span rating unless noted otherwise.
 10) All wood framing members referenced are nominal sizes, dressed S4S. Provide actual sizes, as required by PS20. Provide seasoned lumber S-Dry or KD with 19 percent maximum moisture content at time of dressing.
 11) All beams, headers, firlts and columns shall be connected with appropriate metal connectors equal to Simpson Strong-Tie. All metal framing accessories noted are standards of Simpson Strong-Tie. Supply metal framing accessories equivalent to Simpson Strong-Tie.
 12) Misc. fastener connections shall be in accordance with the nailing schedule of the building code. Where rough carpentry is exposed to weather, in ground contact, or in areas of high relative humidity, provide hot-dip zinc-coated fasteners per ASTM A153 or ANSI Type 304 stainless steel fasteners.
 13) All trusses shall be toe-nailed to top plates with (3) 16d common nails in addition to the connectors shown on the details unless noted otherwise.
 14) Fasteners, anchorage, and connectors in pressure treated wood shall be galvanized with a minimum of a G185 coating for preservative pressure treated wood. Alternate pressure treatments and connector protection shall be submitted to the engineer for approval.
 15) Unless noted all wood beams to column connections shall be made with 1/4" thick "U" plate with (2) 3/4" thru bolts similar to Simpson CC/ECC column cap.
 16) Preservative pressure treat lumber and plywood with water-borne preservatives to comply with AWPA UC2 and UC3b, respectively, and with requirements indicated below.
 a. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
 b. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
 c. For uses under roof, after treatment, kiln-dry lumber and plywood to a maximum moisture content, respectively, of 19 percent and 15 percent. Treat indicated items and the following:
 i) Wood cants, rollers, curbs, equipment, support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 ii) Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 d. Complete fabrication of treated items prior to treatment, where possible. If cut after treatment, seal cut surfaces to comply with AWPA M4. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.
 E. Shop Drawings and Deferred Submittals:
 1) Wood truss drawings including plan layout, truss elevations, and connection assemblies.

11. **Pre-Engineered Metal Building (Division 13):**
 A. Design Code: Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings (AISC), and Metal Building Mfg Assoc (MBMA), latest adoption of the Metal Building Systems Manual.
 B. Systems shall be designed for loadings previously described on this sheet.
 C. Notes:
 1) Steel shall be fabricated and erected according to the specifications of The American Institute of Steel Construction (AISC) and Metal Building Mfg Assoc (MBMA), latest adoption.
 2) Pre-engineered metal building supplier shall design the building for the loads indicated on the drawings or calculations may be submitted to architect/engineer. G.C. shall be responsible for the cost of foundation redesign if actual foundation reactions are larger than loads indicated typical.
 3) Structural steel shall be shipped with standard shop primer. See architectural specifications for primer and paint coating (if required).
 4) Metal building supplier shall submit shop drawings and calculations that bear the seal of a professional engineer in the state of Missouri to the engineer for approval.
 5) Metal building system shall have deflection limits not greater than the following.
 a. Wall/girts horizontal deflection of less than 1/120 flexible and not greater than 1.5' span length
 b. Vertical/purlins live load deflection of less than 1/180 and not greater than 1.5' span length
 6) Anchors for pre-engineered metal building columns shall be designed by others, at the expense of the contractor, following the review of the final anchor bolt layout and reactions by the engineer.
 7) Metal building supplier is responsible for the design of all connections for framing members to metal building elements unless detailed on the drawings.
 8) Reactions shown on plans are total working loads unless noted otherwise. Connection designer may use a load factor of 1.6 if completing LRFD/strength design.
 D. Shop Drawings and Deferred Submittals:
 1) Pre-engineered metal building erection drawings including reactions and calculations.



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STATE OF MISSOURI
 MICHAEL L. PARSON,
 GOVERNOR



08-36-2019
 DAVE WEBER - ENGINEER
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 1505 East High Street
 Jefferson City, Missouri

OFFICE OF ADMINISTRATION
 DIVISION OF FACILITIES
 MANAGEMENT,
 DESIGN AND CONSTRUCTION

MISSOURI STATE
 HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
 HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
 SITE # 6026
 ASSET # 8136026001

REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 ISSUE DATE: 8/30/2019

CAD DWG FILE: S-001
 DRAWN BY: BH, KP, BS
 CHECKED BY: DW
 DESIGNED BY: BH, KP

SHEET TITLE:
**STRUCTURAL
 DESIGN CRITERIA
 AND NOTES**

SHEET NUMBER:

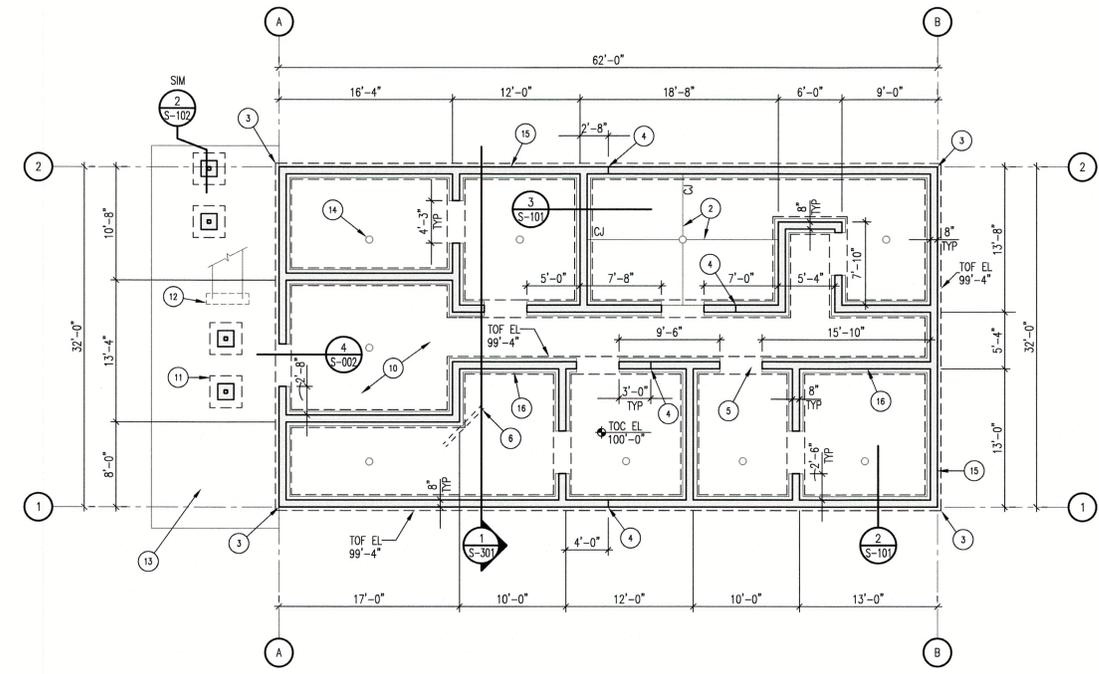
S-001

23 OF 49 SHEETS
 8/30/2019



08-30-2019
 DAVE WEBER - ENGINEER
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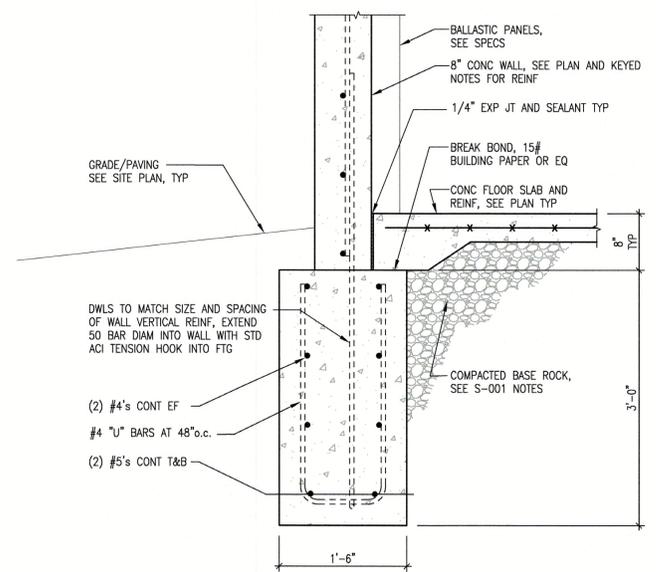
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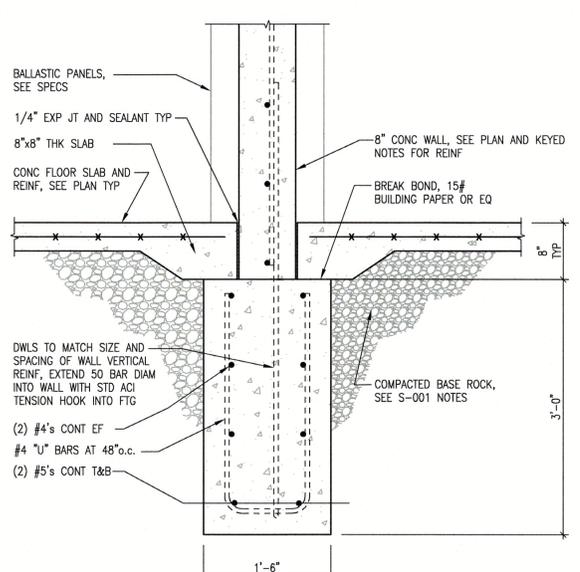
SHOOT HOUSE FOUNDATION PLAN
 REF. 1/8" = 1'-0"

- FOUNDATION GENERAL NOTES**
- NOTES AND KEYNOTES ON THIS SHEET APPLY TO ALL FOUNDATION ELEMENTS OF STRUCTURE (S10x SHEETS) TYP
 - SEE SHEET S-001 FOR DESIGN LOAD INFORMATION, GENERAL NOTES, AND SOIL ALLOWABLE BEARING CAPACITIES
 - SEE S-001 NOTES AND GEOTECHNICAL MEMO FOR REQUIRED LOW VOLUME CHANGE (LVC) FILL UNDER THE SLAB-ON-GRADE
 - SLAB-ON-GRADE CONSTRUCTION JOINT AND SAW JOINT SEE DET 2/S-002 AND 3/S-002 RESPECTIVELY. SEE NOTES ON S-001 FOR TYP LOCATION OF CONTROL JOINTS IN SLABS-ON-GRADE UNLESS SHOWN OTHERWISE ON PLANS
 - COORDINATE LOCATION OF CONSTRUCTION JOINTS WITH ENGINEER/ARCH BEFORE PLACING CONCRETE
 - PAVING, WALKWAY, AND SITE RETAINING WALL LOCATIONS/DETAILS SEE SITE PLAN TYPICAL
 - ALL DIMENSIONS SHOWN ON FOUNDATION PLANS SHOULD BE COORDINATED WITH THE ARCHITECTURAL (CLASSROOM) PLANS TO ENSURE CORRECT PLACEMENT OF STRUCTURAL ITEMS (INCLUDING COLUMNS, FOOTINGS, THICKENED SLABS, WALLS, ETC)
 - UNLESS NOTED, DIMENSIONS ARE TO THE OUTSIDE OF FOUNDATION WALLS
 - SLOPE SLAB-ON-GRADE 1/2" IN OUTER 6" AT EXTERIOR DOOR LOC OF BLDG, SEE 4/S-002 TYP
 - CONCRETE WALL AND FOOTING CORNER REINFORCEMENT, SEE NOTES ON S-001 AND DET ON S-601
 - GIVE TOP OF FOUNDATION A TROWEL FINISH. THE FOUNDATION MUST BE SQUARE, LEVEL, AND SMOOTH
 - CENTER CONC FOOTINGS AND PEDESTALS ON STEEL COLUMNS. PLACE CONC FOOTINGS CENTERED UNDER LOAD BEARING CMU/CIP WALLS TYP UNO
 - PROVIDE CONTROL JOINTS IN ALL CIP CONCRETE WALLS AT 40'-0" MAX, SEE DET 5/S-002
 - REF CIVIL PLANS FOR CONVERSION BTWN STRUCT EL AND CIVIL EL TYP

- FOUNDATION KEYED NOTES**
- 4" CONC SLAB-ON-GRADE W/ #4's AT 24" O.C. EW CTR UNO. SEE S-001 NOTES FOR REINF, CRUSHED STONE BASE AND VAPOR BARRIER TYP
 - SLAB-ON-GRADE CONST JT/SAW JT, SEE GENERAL NOTES ON THIS SHEET, S-001 NOTES AND DETS
 - SUPPLY CORNER BARS AT CORNERS OF ALL WALLS, FOOTINGS, GRADE BEAMS, TRENCH FOOTINGS, ETC. SEE NOTES ON S001 AND DET 3/S-601 TYP
 - CONSTRUCTION JOINT IN WALL, SEE DET 6/S-002
 - CONT SLAB OVER TRENCH FTG AT OPNG TYP
 - (2) #5x5'-0" LG DIAG BARS AT REENTRANT CORNERS, SEE S-001 NOTES TYP
 - EXTEND BOT OF INTERIOR FTG TO T.O. ADJACENT EXTERIOR FTG
 - OUTSIDE F.O. CONC WALL/SLAB SEE DETS AND ARCH
 - MTL BLDG COL BY MTL BLDG SUPPLIER, TYP AT ALL COLUMNS
 - 5" CONC SLAB-ON-GRADE W/ #4's AT 24" O.C. EW CTR UNO. SEE S-001 NOTES FOR REINF AND CRUSHED STONE BASE TYP
 - 2'-0"x2'-0"x30" THK FTG AND 18"x18" PED, TYP AT STAIR LANDINGS, SEE DET 2/S-102 SIM. SEE S-601 DETS FOR PED REINF AND PROVIDE (3) #5's EW, T&B AT FTG. TOF EL = 99'-0" AND T.O. PED EL = 100'-0"
 - 12" WIDE x 3'-0" THK FTG FOR STAIR STRINGER SUPPORT W/ #4's AT 15" O.C. EW. TOF EL = 100'-0"
 - EXTERIOR PAVING, SEE CIVIL
 - DRAIN TYP, SEE CIVIL
 - 8" THK EXTERIOR WALLS SHALL BE REINFORCED WITH #5's AT 12" O.C. EW, CENTERED IN WALL
 - 8" THK INTERIOR WALLS SHALL BE REINFORCED WITH #4's AT 12" O.C. EW, CENTERED IN WALL
 - SPAN DIRECTION OF BOTTOM REINF TYP
 - (1) #4 HAIRPIN WITH 8'-0" LEG TYP AT ENDWALLS. PLACE HAIRPINS OUTSIDE OF ANCHOR RODS TYP. PLACE AT CENTER OF SLAB AND TIE TO SLAB REINF
 - 8 1/2" x 8 1/2" OPNG, COORD LOC W/ MEP
 - (2) #5's BOTTOM AT 3" O.C. MAX W/ 4" CLR AT OPNG TYP



EXTERIOR FTG AT CONC WALL
 REF. 1/8" = 1'-0"



INTERIOR FTG AT CONC WALL
 REF. 1/8" = 1'-0"

OFFICE OF ADMINISTRATION
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 DESIGN AND CONSTRUCTION

MISSOURI STATE
 HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
 HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
 SITE # 6026
 ASSET # 8136026001

REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 ISSUE DATE: 8/30/2019

CAD DWG FILE: S-101
 DRAWN BY: BH, KP, BS
 CHECKED BY: DW
 DESIGNED BY: BH, KP

SHEET TITLE:
**SHOOT HOUSE
 FOUNDATION
 PLAN**

SHEET NUMBER:

S-101



GREDELL Engineering Resources, Inc.
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 MO CORP. ENGINEERING LICENSE NO. E-2001001669D

OFFICE OF ADMINISTRATION
 DIVISION OF FACILITIES
 MANAGEMENT,
 DESIGN AND CONSTRUCTION

MISSOURI STATE
 HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
 HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
 SITE # 6026
 ASSET # 8136026001

REVISION: _____
 DATE: _____
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 DATE: _____
 REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____

ISSUE DATE: 8/30/2019

CAD DWG FILE: S-102
 DRAWN BY: BH, KP, BS
 CHECKED BY: DW
 DESIGNED BY: BH, KP

SHEET TITLE:
**PAVILION
 FOUNDATION
 PLAN**

SHEET NUMBER:

S-102

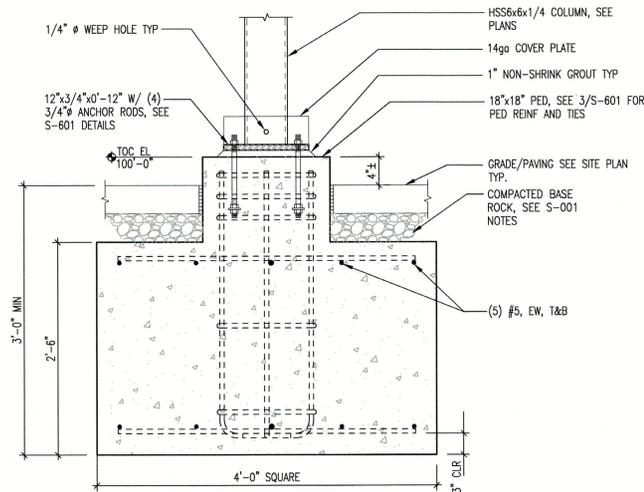
26 OF 49 SHEETS
 8/30/2019

FOUNDATION GENERAL NOTES

- NOTES AND KEYNOTES ON THIS SHT APPLY TO ALL FOUNDATION ELEMENTS OF STRUCTURE (S10x SHEETS) TYP
- SEE SHEET S-001 FOR DESIGN LOAD INFORMATION, GENERAL NOTES, AND SOIL ALLOWABLE BEARING CAPACITIES
- SEE S-001 NOTES AND GEOTECHNICAL MEMO FOR REQUIRED LOW VOLUME CHANGE (LVC) FILL UNDER THE SLAB-ON-GRADE
- SLAB-ON-GRADE CONSTRUCTION JOINT AND SAW JOINT SEE DET 2/S-002 AND 3/S-002 RESPECTIVELY. SEE NOTES ON S-001 FOR TYP LOCATION OF CONTROL JOINTS IN SLABS-ON-GRADE UNLESS SHOWN OTHERWISE ON PLANS
- COORDINATE LOCATION OF CONSTRUCTION JOINTS WITH ENGINEER/ARCH BEFORE PLACING CONCRETE
- PAVING, WALKWAY, AND SITE RETAINING WALL LOCATIONS/DETAILS SEE SITE PLAN TYPICAL
- ALL DIMENSIONS SHOWN ON FOUNDATION PLANS SHOULD BE COORDINATED WITH THE ARCHITECTURAL (CLASSROOM) PLANS TO ENSURE CORRECT PLACEMENT OF STRUCTURAL ITEMS (INCLUDING COLUMNS, FOOTINGS, THICKENED SLABS, WALLS, ETC)
- UNLESS NOTED, DIMENSIONS ARE TO THE OUTSIDE OF FOUNDATION WALLS
- SLOPE SLAB-ON-GRADE 1/2" IN OUTER 6" AT EXTERIOR DOOR LOC OF BLDG, SEE 4/S-002 TYP
- CONCRETE WALL AND FOOTING CORNER REINFORCEMENT, SEE NOTES ON S-001 AND DET ON S-601
- GIVE TOP OF FOUNDATION A TROWEL FINISH. THE FOUNDATION MUST BE SQUARE, LEVEL, AND SMOOTH
- CENTER CONC FOOTINGS AND PEDESTALS ON STEEL COLUMNS. PLACE CONC FOOTINGS CENTERED UNDER LOAD BEARING CMU/CIP WALLS TYP UNO
- PROVIDE CONTROL JOINTS IN ALL CIP CONCRETE WALLS AT 40'-0" o.c. MAX, SEE DET 5/S-002
- REF CIVL PLANS FOR CONVERSION BTWN STRUCT EL AND CIVIL EL TYP

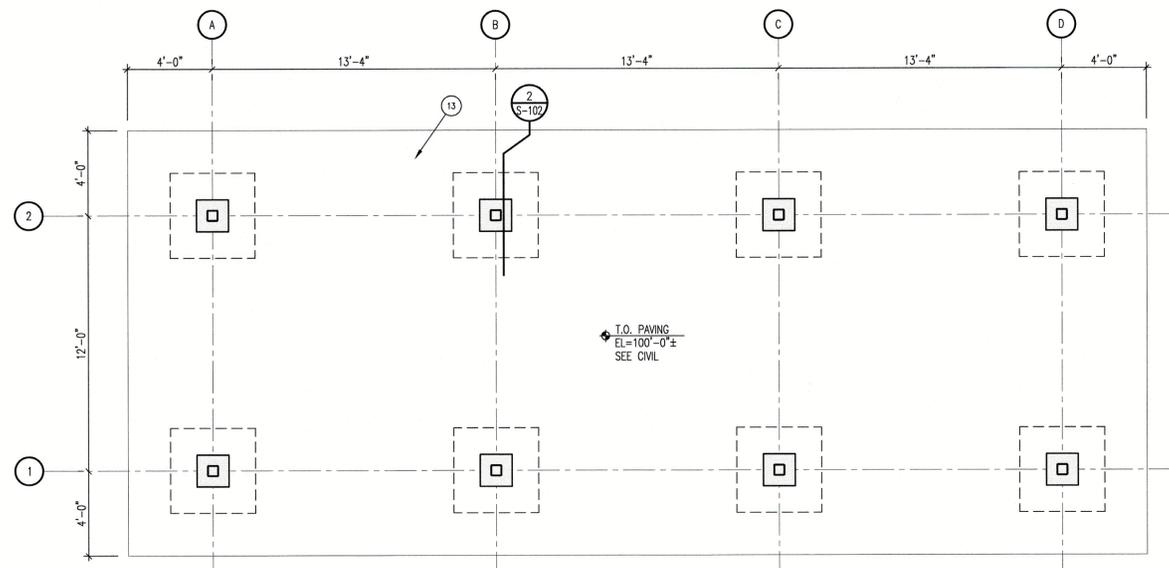
FOUNDATION KEYED NOTES

- 4" CONC SLAB-ON-GRADE W/ #4's AT 24" o.c. EW CTR UNO. SEE S-001 NOTES FOR REINF, CRUSHED STONE BASE AND VAPOR BARRIER TYP
- SLAB-ON-GRADE CONST JT/SAW JT, SEE GENERAL NOTES ON THIS SHT, S-001 NOTES AND DETS
- SUPPLY CORNER BARS AT CORNERS OF ALL WALLS, FOOTINGS, GRADE BEAMS, TRENCH FOOTINGS, ETC. SEE NOTES ON S001 AND DET 3/S-601 TYP
- CONSTRUCTION JOINT IN WALL, SEE DET 6/S-002
- CONT SLAB OVER TRENCH FTG AT OPNG TYP
- (2) #5x5'-0" LG DIAG BARS AT REENTRANT CORNERS, SEE S-001 NOTES TYP
- EXTEND BOT OF INTERIOR FTG TO T.O. ADJACENT EXTERIOR FTG
- OUTSIDE F.O. CONC WALL/SLAB SEE DETS AND ARCH
- MIL BLDG COL BY MIL BLDG SUPPLIER, TYP AT ALL COLUMNS
- 5" CONC SLAB-ON-GRADE W/ #4's AT 24" o.c. EW CTR UNO. SEE S-001 NOTES FOR REINF AND CRUSHED STONE BASE TYP
- 2'-0"x2'-0"x30" THK FTG AND 18"x18" PED, TYP AT STAIR LANDINGS, SEE DET 2/S-102 SIM. SEE S-601 DETS FOR PED REINF AND PROVIDE (3) #5's EW, T&B AT FTG. TOF EL = 99'-0" AND T.O. PED EL = 100'-0"
- 12" WIDE x 3'-0" THK FTG FOR STAIR STRINGER SUPPORT W/ #4's AT 15" o.c. EW. TOF EL = 100'-0"
- EXTERIOR PAVING, SEE CIVIL
- DRAIN TYP, SEE CIVIL
- 8" THK EXTERIOR WALLS SHALL BE REINFORCED WITH #5's AT 12" o.c. EW, CENTERED IN WALL
- 8" THK INTERIOR WALLS SHALL BE REINFORCED WITH #4's AT 12" o.c. EW, CENTERED IN WALL
- SPAN DIRECTION OF BOTTOM REINF TYP
- (1) #4 HARPIN WITH 8'-0" LEG TYP AT ENDWALLS. PLACE HARPPINS OUTSIDE OF ANCHOR RODS TYP. PLACE AT CENTER OF SLAB AND TIE TO SLAB REINF
- B 1/2" x 8 1/2" OPNG, COORD LOC W/ MEP
- (2) #5's BOTTOM AT 3' o.c. MAX W/ 4" CLR AT OPNG TYP



PEDESTAL/FOOTING

2
 S-102
 1" = 1'-0"



RIFLE, PISTOL AND PISTOL/SHOTGUN RANGE PAVILION FOUNDATION PLAN

REF. 2
 S-102
 1/4" = 1'-0"



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OFFICE OF ADMINISTRATION
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MISSOURI STATE
 HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
 HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
 SITE # 6026
 ASSET # 8136026001

REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 ISSUE DATE: 8/30/2019

CAD DWG FILE: S-103
 DRAWN BY: BH, KP, BS
 CHECKED BY: DW
 DESIGNED BY: BH, KP

SHEET TITLE:
**CLASSROOM
 FOUNDATION
 PLAN**

SHEET NUMBER:

S-103

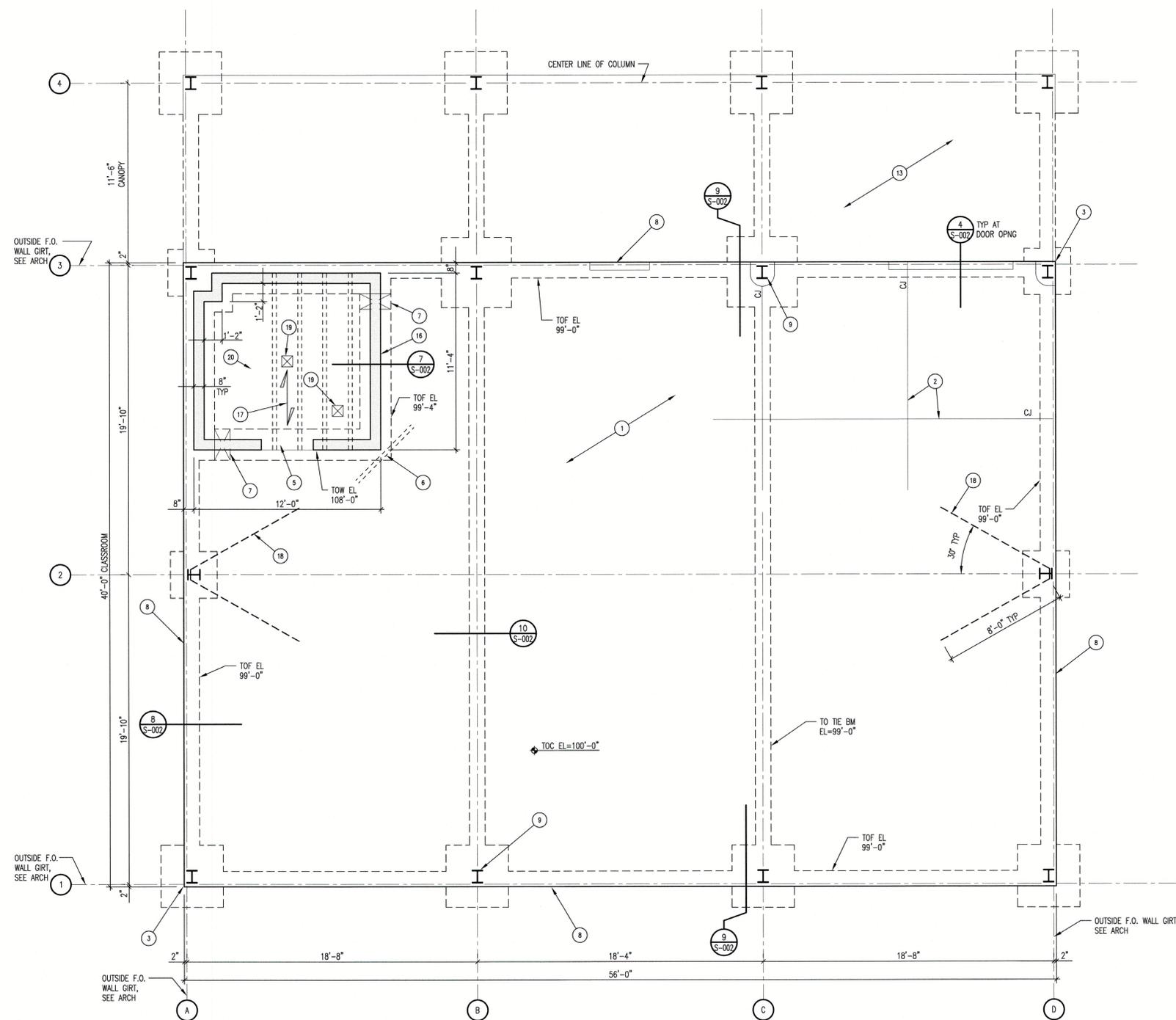
27 OF 49 SHEETS
 8/30/2019

FOUNDATION GENERAL NOTES

- NOTES AND KEYNOTES ON THIS SHEET APPLY TO ALL FOUNDATION ELEMENTS OF STRUCTURE (S10x SHEETS) TYP.
- SEE SHEET S-001 FOR DESIGN LOAD INFORMATION, GENERAL NOTES, AND SOIL ALLOWABLE BEARING CAPACITIES.
- SEE S-001 NOTES AND GEOTECHNICAL MEMO FOR REQUIRED LOW VOLUME CHANGE (LVC) FILL UNDER THE SLAB-ON-GRADE.
- SLAB-ON-GRADE CONSTRUCTION JOINT AND SAW JOINT SEE DET 2/S-002 AND 3/S-002 RESPECTIVELY. SEE NOTES ON S-001 FOR TYP LOCATION OF CONTROL JOINTS IN SLABS-ON-GRADE UNLESS SHOWN OTHERWISE ON PLANS.
- COORDINATE LOCATION OF CONSTRUCTION JOINTS WITH ENGINEER/ARCH BEFORE PLACING CONCRETE.
- PAVING, WALKWAY, AND SITE RETAINING WALL LOCATIONS/DETAILS SEE SITE PLAN TYPICAL.
- ALL DIMENSIONS SHOWN ON FOUNDATION PLANS SHOULD BE COORDINATED WITH THE ARCHITECTURAL (CLASSROOM) PLANS TO ENSURE CORRECT PLACEMENT OF STRUCTURAL ITEMS (INCLUDING COLUMNS, FOOTINGS, THICKENED SLABS, WALLS, ETC).
- UNLESS NOTED, DIMENSIONS ARE TO THE OUTSIDE OF FOUNDATION WALLS.
- SLOPE SLAB-ON-GRADE 1/2" IN OUTER 6" AT EXTERIOR DOOR LOC OF BLDG, SEE 4/S-002 TYP.
- CONCRETE WALL AND FOOTING CORNER REINFORCEMENT, SEE NOTES ON S-001 AND DET ON S-601.
- GIVE TOP OF FOUNDATION A TROWEL FINISH. THE FOUNDATION MUST BE SQUARE, LEVEL, AND SMOOTH.
- CENTER CONC FOOTINGS AND PEDESTALS ON STEEL COLUMNS. PLACE CONC FOOTINGS CENTERED UNDER LOAD BEARING CMU/CIP WALLS TYP UNO.
- PROVIDE CONTROL JOINTS IN ALL CIP CONCRETE WALLS AT 40'-0" o.c. MAX, SEE DET 5/S-002.
- REF CIVIL PLANS FOR CONVERSION BTWN STRUCT EL AND CIVIL EL TYP.

FOUNDATION KEYED NOTES

- 4" CONC SLAB-ON-GRADE W/ #4's AT 24" o.c. EW CTR UNO. SEE S-001 NOTES FOR REINF, CRUSHED STONE BASE AND VAPOR BARRIER TYP.
- SLAB-ON-GRADE CONST JT/SAW JT, SEE GENERAL NOTES ON THIS SHEET, S-001 NOTES AND DETS.
- SUPPLY CORNER BARS AT CORNERS OF ALL WALLS, FOOTINGS, GRADE BEAMS, TRENCH FOOTINGS, ETC. SEE NOTES ON S001 AND DET 3/S-601 TYP.
- CONSTRUCTION JOINT IN WALL, SEE DET 6/S-002.
- CONT SLAB OVER TRENCH FTG AT OPNG TYP.
- (2) #5x5'-0" LG DIAG BARS AT REENTRANT CORNERS, SEE S-001 NOTES TYP.
- EXTEND BOT OF INTERIOR FTG TO T.O. ADJACENT EXTERIOR FTG.
- OUTSIDE F.O. CONC WALL/SLAB SEE DETS AND ARCH.
- MTL BLDG COOL BY MTL BLDG SUPPLIER, TYP AT ALL COLUMNS.
- 5" CONC SLAB-ON-GRADE W/ #4's AT 24" o.c. EW CTR UNO. SEE S-001 NOTES FOR REINF AND CRUSHED STONE BASE TYP.
- 2'-0"x2'-0"x30" THK FTG AND 18"x18" PED, TYP AT STAIR LANDINGS, SEE DET 2/S-102 SIM. SEE S-601 DETS FOR PED REINF AND PROVIDE (3) #5's EW, T&B AT FTG. TOF EL = 99'-0" AND T.O. PED EL = 100'-0".
- 12" WIDE x 3'-0" THK FTG FOR STAIR STRINGER SUPPORT W/ #4's AT 15" o.c. EW. TOF EL = 100'-0".
- EXTERIOR PAVING, SEE CIVIL.
- DRAIN TYP, SEE CIVIL.
- 8" THK EXTERIOR WALLS SHALL BE REINFORCED WITH #5's AT 12" o.c. EW, CENTERED IN WALL.
- 8" THK INTERIOR WALLS SHALL BE REINFORCED WITH #4's AT 12" o.c. EW, CENTERED IN WALL.
- SPAN DIRECTION OF BOTTOM REINF TYP.
- (1) #4 HARPIN WITH 8'-0" LEG TYP AT ENDWALLS. PLACE HARPINS OUTSIDE OF ANCHOR RODS TYP. PLACE AT CENTER OF SLAB AND TIE TO SLAB REINF.
- 8 1/2" x 8 1/2" OPNG, COORD LOC W/ MEP.
- (2) #5's BOTTOM AT 3" o.c. MAX W/ 4" CLR AT OPNG TYP.



CLASSROOM PLAN
 1/4" = 1'-0"
 REF.



08-30-2019
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MISSOURI STATE
 HIGHWAY PATROL

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MISSOURI STATE
 HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
 SITE # 6026
 ASSET # 8136026001

REVISION:
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 DATE:
 REVISION:
 DATE:
 ISSUE DATE: 8/30/2019

CAD DWG FILE: S-151
 DRAWN BY: BH, KP, BS
 CHECKED BY: DW
 DESIGNED BY: BH, KP

SHEET TITLE:
**SHOOT HOUSE
 CATWALK AND ROOF
 FRAMING PLANS**

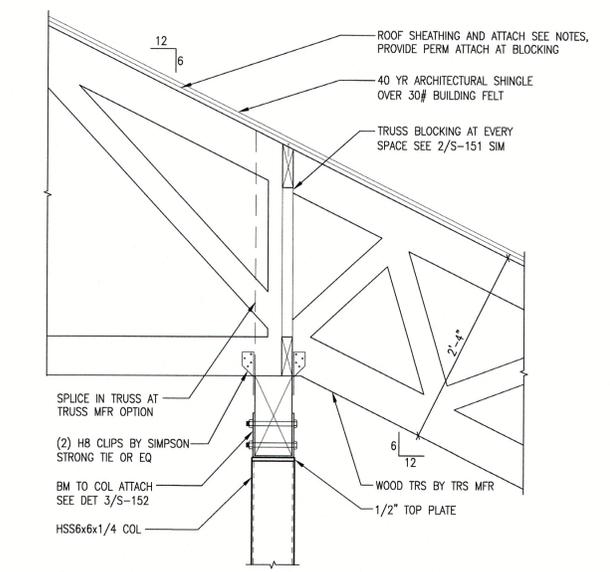
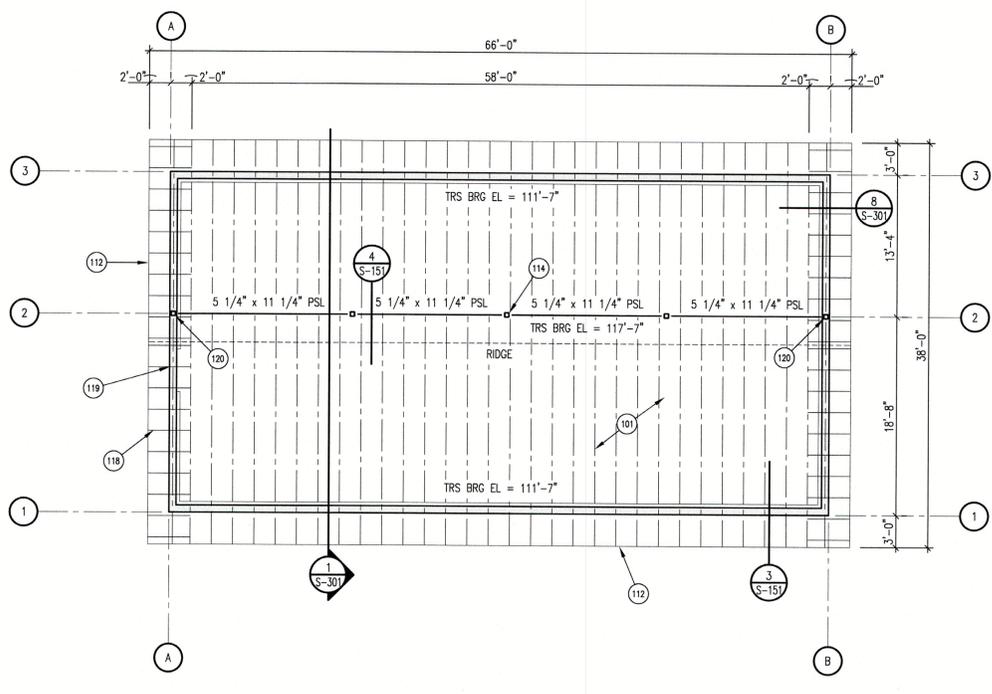
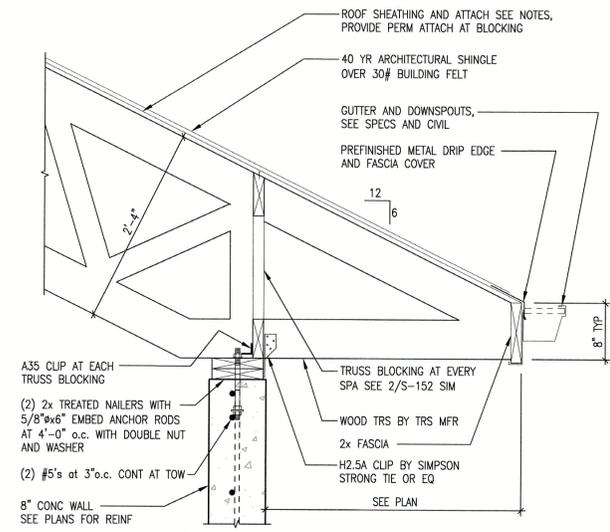
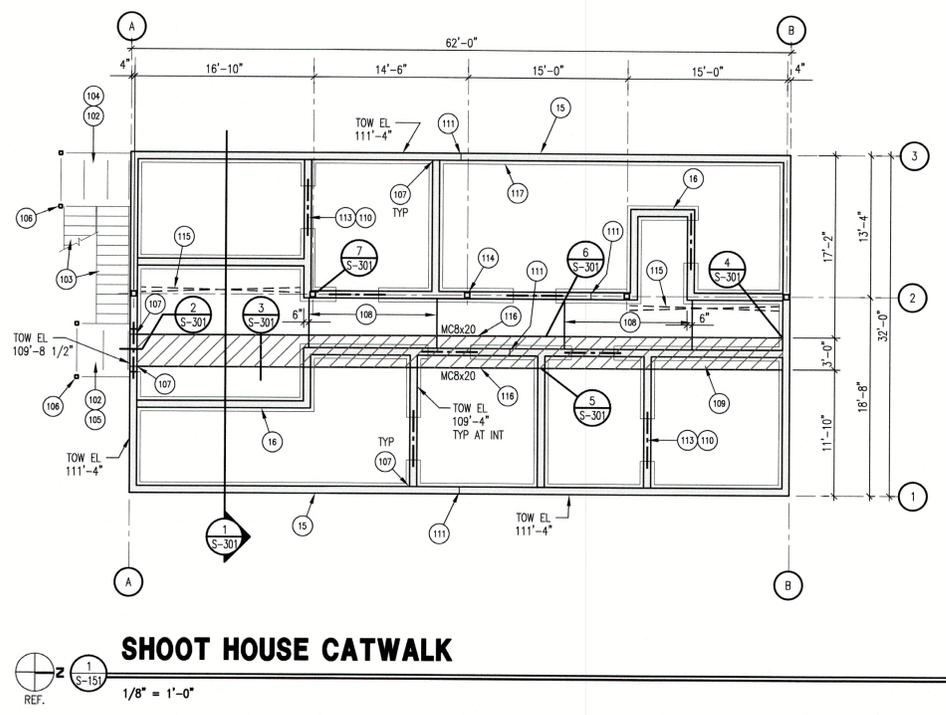
SHEET NUMBER:

S-151

28 OF 49 SHEETS
 8/30/2019

- FRAMING GENERAL NOTES**
- THESE NOTES AND KEYNOTES ON THIS SHEET APPLY TO ALL FRAMING ELEMENTS OF STRUCTURE (S-15x SHEET) TYP
 - SEE SHEET S-001 FOR DESIGN LOADS AND GENERAL NOTES
 - SEE FOUNDATION PLAN AND ARCHITECTURAL (CLASSROOM) PLANS TO ENSURE CORRECT PLACEMENT OF STRUCTURAL ITEMS (INCLUDING COLUMNS, FOOTINGS, THICKENED SLABS, BEARING WALLS, ETC.)
 - WOOD TRUSS NET UPLIFT, SEE S-001 NOTES TYP
 - WOOD TRUSS PERMANENT BRACING, SEE 11/S-002
 - SEE DET 12/S-002 FOR NON-STRUCTURAL WALL BRACING TO TRUSSES TYP
 - PROVIDE CONTROL JOINTS IN ALL CIP WALLS AT 40'-0" O.C. MAX, SEE DET 5/S-002

- FRAMING KEYED NOTES**
- 5/8" ROOF SHEATHING OVER WOOD TRUSSES AT 24" O.C. MAX. SEE THE S001 NOTES FOR ATTACH AND SPECS
 - STAIR LANDING SYSTEM: SEE THE S-001 NOTES FOR DEFERRED SUBMITTAL
 - STAIR LANDING FLOOR SHALL BE GALVANIZED GW 1/2"x3/16" BAR GRATING BY McNICHOLS OR EQ
 - PROVIDE C10x15.3 AT PERIM OF STAIR LANDINGS. ATTACH TO CONC WALL W/ 5/8"x4" EMBED EPOXY ANCHORS AT 16" O.C. MAX STAGGERED T&B, SEE DET 2/S-301. TOP EL = BOT EL OF GRATING
 - PROVIDE C5x9'S AT 30" O.C. MAX FOR GRATING SUPPORT
 - PROVIDE 1 1/2" GALV OSHA GUARDRAIL SYSTEM WITH 4" TALL KICKPLATE
 - STAIR SYSTEM: SEE THE S-001 NOTES FOR DEFERRED SUBMITTAL
 - MC12x14.3 STAIR STRINGER. PROVIDE FULL PEN WELDS AT DOG LEGS OR CHANGES IN DIRECTION. SEE THE S001 NOTES FOR WELD TESTING
 - PROVIDE L2x2x1/4x4'-0" LONG X-BRACING ASSEMBLY BELOW STAIR TREADS. PROVIDE BRACING AT T&B OF FLIGHT
 - STAIRS SHALL BE 3'-0" WIDE
 - STAIR TREADS SHALL BE GALVANIZED GW-150 TREADS BY McNICHOLS OR EQ
 - STAIR RISER HEIGHTS SHALL BE 6" AND THE TREAD DEPTH SHALL BE 11"
 - 5'-0"x6'-7" LANDING, TOP EL OF GRATING = 104'-0"
 - 5'-0"x5'-0" LANDING, TOP EL OF GRATING = 109'-6"
 - HSS4x4x1/4 AT STAIR LANDINGS TYPICAL, (4) TOTAL. SEE S-601 DETS FOR BASEPLATE
 - STEP IN TOW
 - C8x11.5, SEE DET 4/S-301 FOR ATTACH TO WALL
TOP OF BM EL = 109'-4"
 - CATWALK FLOOR SHALL BE GALVANIZED GW 1 1/2"x3/16" BAR GRATING BY McNICHOLS OR EQ. TOP OF GRATING EL = 109'-10"
 - ALL OPENINGS AT SHOOT HOUSE SHALL BE 4'-3"x6'-9 1/2". PROVIDE TREATED 2x NAILERS AT JAMBS AND HEAD OF OPINGS, ATTACH TO CONCRETE WITH TAPCON FLAT HEAD SCREWS OR EQ AT 24" O.C. MIN
 - CONSTRUCTION JOINT IN WALL, SEE DET 6/S-002
 - OUTSIDE F.O. FASCIA, SEE DETS
 - PROVIDE (2) #5'S AT JAMBS AND HEAD OF WALL OPENINGS TYP. EXTEND HEAD AND JAMB REINF 32" PAST OPENINGS TYP. PROVIDE (2) #5x5'-0" LONG DIAGONAL BARS AT CORNERS OF WALL OPENINGS
 - HSS6x6x1/4 COL TYP, (5) TOTAL
 - L2x2x1/4 X-BRACING AT END BAYS, (2) TOTAL. ATTACH TO COL W/ 1/4" FILLET WELD ALL AROUND WITHIN 6" OF TOP AND BOTTOM OF COL
 - TO BM EL = 110'-0"
 - BALLASTIC PANEL TYP, SEE SPECS
 - 2x6 OUTLOOKERS AT 24" O.C. MAX AT GABLE END TRUSSES, SEE DETS
 - PROVIDE OPNG IN GABLE WOOD TRUSS AT SOUTH CATWALK 3'-3" WIDE x 6'-8" TALL ABOVE T.O. GRATE
 - ATTACH GABLE TRUSS TO HSS6x6 COLUMNS AT GRID LINE A AND B WITH A35 CLIPS BY SIMPSON STRONG TIE OR EQ AT 24" O.C. AND T&B. ATTACH 2x6 NAILER TO HSS6x6 EACH SIDE WITH TB SCREWS BY SIMPSON STRONG TIE OR EQ AT 12" O.C. MAX





08-30-2019
 DAVE WEBER - ENGINEER
 MO # 28957

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PROJECT # R1806-01
 SITE # 6026
 ASSET # 8136026001

REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 ISSUE DATE: 8/30/2019

CAD DWG FILE: S-152
 DRAWN BY: BH, KP, BS
 CHECKED BY: DW
 DESIGNED BY: BH, KP

SHEET TITLE:
PAVILION ROOF FRAMING PLAN

SHEET NUMBER:

S-152

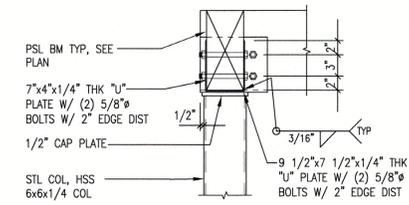
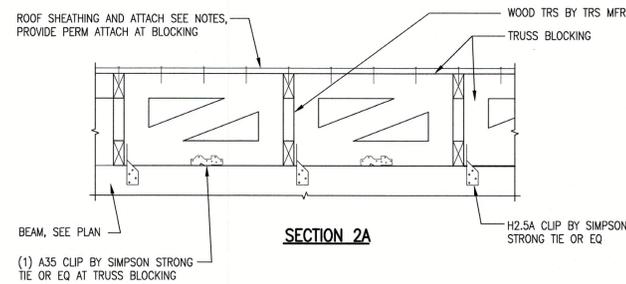
29 OF 49 SHEETS
 8/30/2019

FRAMING GENERAL NOTES

- THESE NOTES AND KEYNOTES ON THIS SHEET APPLY TO ALL FRAMING ELEMENTS OF STRUCTURE (S-15x SHEET) TYP
- SEE SHEET S-001 FOR DESIGN LOADS AND GENERAL NOTES
- SEE FOUNDATION PLAN AND ARCHITECTURAL (CLASSROOM) PLANS TO ENSURE CORRECT PLACEMENT OF STRUCTURAL ITEMS (INCLUDING COLUMNS, FOOTINGS, THICKENED SLABS, BEARING WALLS, ETC.)
- WOOD TRUSS NET UPLIFT, SEE S-001 NOTES TYP
- WOOD TRUSS PERMANENT BRACING, SEE 11/S-002
- SEE DET 12/S-002 FOR NON-STRUCTURAL WALL BRACING TO TRUSSES TYP
- PROVIDE CONTROL JOINTS IN ALL CIP WALLS AT 4'-0" o.c. MAX. SEE DET 5/S-002

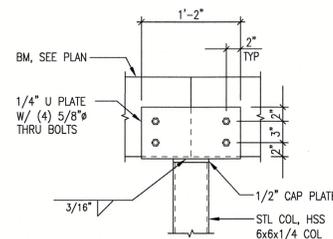
FRAMING KEYED NOTES

- 5/8" ROOF SHEATHING OVER WOOD TRUSSES AT 24" o.c. MAX. SEE THE S001 NOTES FOR ATTACH AND SPECS
- STAIR LANDING SYSTEM: SEE THE S-001 NOTES FOR DEFERRED SUBMITTAL
 - STAIR LANDING FLOOR SHALL BE GALVANIZED GW 1 1/2"x3/16" BAR GRATING BY McNICHOLS OR EQ
 - PROVIDE C10x15.3 AT PERM OF STAIR LANDINGS. ATTACH TO CONC W/ 5/8"x4" EMBED EPOXY ANCHORS AT 16" o.c. MAX STAGGERED T&B, SEE DET 2/S-301. TOP EL = BOT EL OF GRATING
 - PROVIDE C5x9'S AT 30" o.c. MAX FOR GRATING SUPPORT
 - PROVIDE 1 1/2" GALV GSHA GUARDRAIL SYSTEM WITH 4" TALL KICKPLATE
- STAIR SYSTEM: SEE THE S-001 NOTES FOR DEFERRED SUBMITTAL
 - MC12x14.3 STAIR STRINGER. PROVIDE FULL PEN WELDS AT DOG LEGS OR CHANGES IN DIRECTION. SEE THE S001 NOTES FOR WELD TESTING
 - PROVIDE L2x2x1/4x4'-0" LONG X-BRACING ASSEMBLY BELOW STAIR TREADS. PROVIDE BRACING AT T&B OF FLIGHT
 - STAIRS SHALL BE 3'-0" WIDE
 - STAIR TREADS SHALL BE GALVANIZED GW-150 TREADS BY McNICHOLS OR EQ
 - STAIR RISER HEIGHTS SHALL BE 6" AND THE TREAD DEPTH SHALL BE 11"
- 5'-0"x6'-7" LANDING, TOP EL OF GRATING = 104'-0"
- 5'-0"x5'-0" LANDING, TOP EL OF GRATING = 109'-6"
- HSS4x4x1/4 AT STAIR LANDINGS TYPICAL, (4) TOTAL. SEE S-601 DETS FOR BASEPLATE
- STEP IN TOW
- CBx11.5, SEE DET 4/S-301 FOR ATTACH TO WALL. TOP OF BM EL = 109'-4"
- CATWALK FLOOR SHALL BE GALVANIZED GW 1 1/2"x3/16" BAR GRATING BY McNICHOLS OR EQ. TOP OF GRATING EL = 109'-10"
- ALL OPENINGS AT SHOOT HOUSE SHALL BE 4'-3"x6'-9 1/2". PROVIDE TREATED 2x NAILERS AT JAMBS AND HEAD OF OPENINGS, ATTACH TO CONCRETE WITH TAPOON FLAT HEAD SCREWS OR EQ AT 24" o.c. MIN
- CONSTRUCTION JOINT IN WALL, SEE DET 6/S-002
- OUTSIDE F.O. FASCIA, SEE DETS
- PROVIDE (2) #5'S AT JAMBS AND HEAD OF WALL OPENINGS TYP. EXTEND HEAD AND JAMB REINF 32" PAST OPENINGS TYP. PROVIDE (2) #5x5'-0" LONG DIAGONAL BARS AT CORNERS OF WALL OPENINGS
- HSS6x6x1/4 COL TYP, (5) TOTAL
- L2x2x1/4 X-BRACING AT END BAYS, (2) TOTAL. ATTACH TO COL W/ 1/4" FILLET WELD ALL AROUND WITHIN 6" OF TOP AND BOTTOM OF COL
- TO BM EL = 110'-0"
- BALLASTIC PANEL TYP, SEE SPECS
- 2x6 OUTLOOKERS AT 24" o.c. MAX AT GABLE END TRUSSES, SEE DETS
- PROVIDE OPNG IN CABLE WOOD TRUSS AT SOUTH CATWALK 3'-3" WIDE x 6'-8" TALL ABOVE T.O. GRATE
- ATTACH CABLE TRUSS TO HSS6x6 COLUMNS AT GRID LINE A AND B WITH A35 CLIPS BY SIMPSON STRONG TIE OR EQ AT 24" o.c. AND T&B. ATTACH 2x6 NAILER TO HSS6x6 EACH SIDE WITH TB SCREWS BY SIMPSON STRONG TIE OR EQ AT 12" o.c. MAX



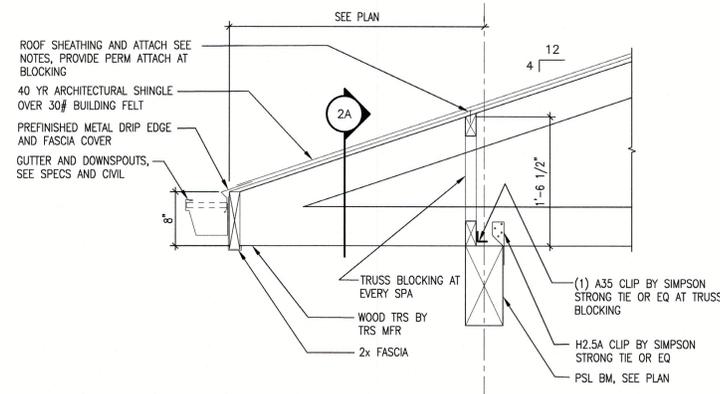
CORNER BM CONN TO COL

1" = 1'-0" NOTE: ROOF FRAMING NOT SHOWN FOR CLARITY. SEE DETS FOR FRAMING AND ATTACH



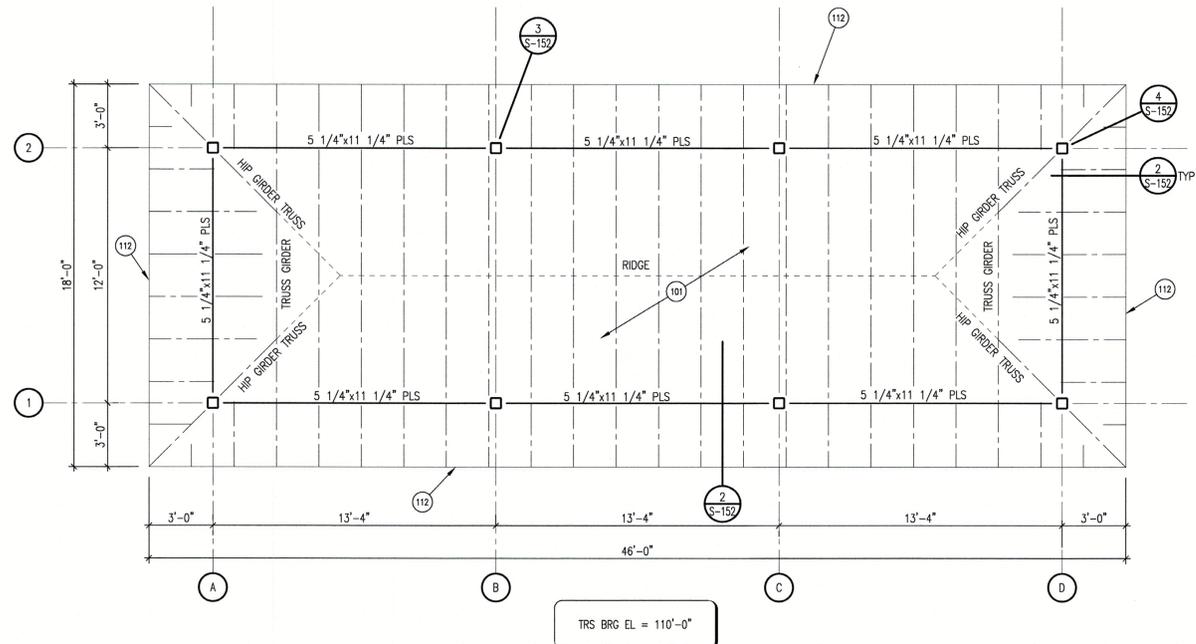
TYP BM TO COL CONN

1" = 1'-0" NOTE: ROOF FRAMING NOT SHOWN FOR CLARITY. SEE DETS FOR FRAMING AND ATTACH



WOOD TRUSS BRG AT BM

1" = 1'-0"



RIFLE, PISTOL, AND PISTOL/SHOTGUN RANGE PAVILION ROOF FRAMING PLAN

1" = 1'-0"

TRS BRG EL = 110'-0"



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 MISSOURI STATE CERTIFICATE
 OF AUTHORITY #200704004

STATE OF MISSOURI
 MICHAEL L. PARSON,
 GOVERNOR



08-30-2019
 DAVE WEBER - ENGINEER
 MO # 28957

GREDELL Engineering Resources, Inc.
 ENVIRONMENTAL ENGINEERING LAND - AIR - WATER
 1505 East High Street
 Jefferson City, Missouri
 Telephone: (573) 659-9078
 Facsimile: (573) 659-9079
 MO CORP. ENGINEERING LICENSE NO. E-2001001669-D

OFFICE OF ADMINISTRATION
 DIVISION OF FACILITIES
 MANAGEMENT,
 DESIGN AND CONSTRUCTION

MISSOURI STATE
 HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
 HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
 SITE # 6026
 ASSET # 8136026001

REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 ISSUE DATE: 8/30/2019

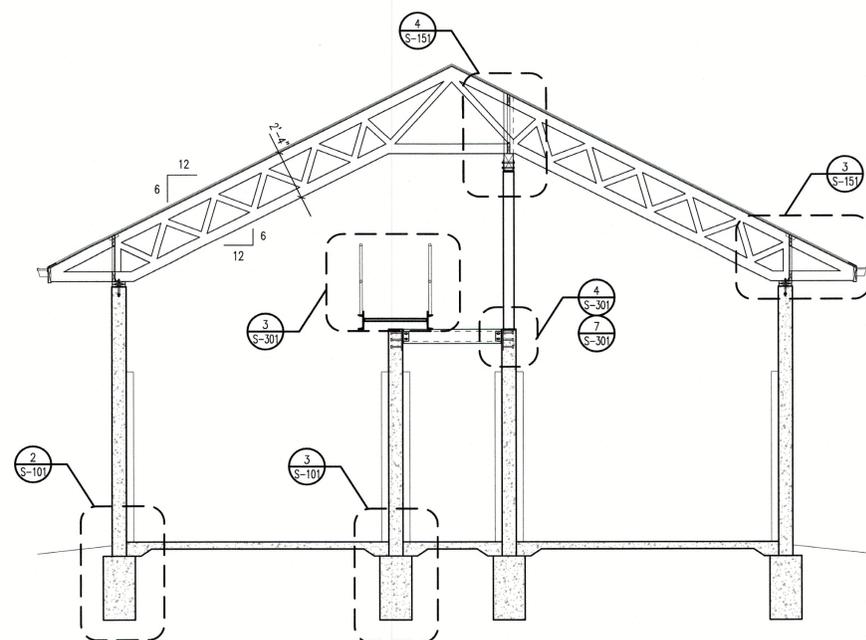
CAD DWG FILE: S-301
 DRAWN BY: BH, KP, BS
 CHECKED BY: DW
 DESIGNED BY: BH, KP

SHEET TITLE:
**SHOOT HOUSE
 SECTION AND
 DETAILS**

SHEET NUMBER:

S-301

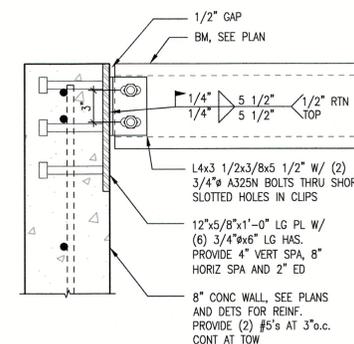
30 OF 49 SHEETS
 8/30/2019



SHOOT HOUSE SECTION

1
S-301

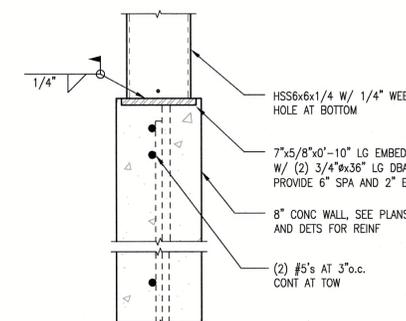
1/4" = 1'-0"



BM TO WALL CONN

4
S-301

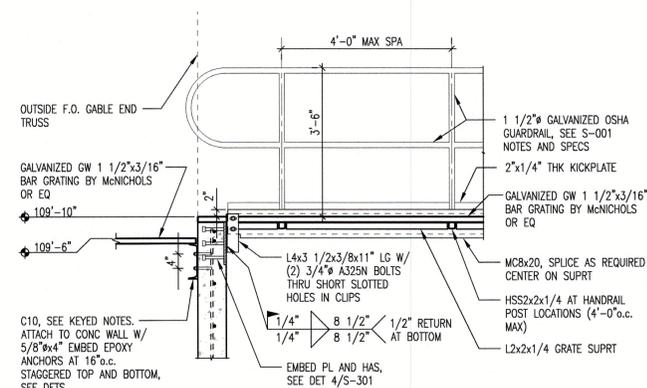
1 1/2" = 1'-0"



COL AT TOW

7
S-301

1 1/2" = 1'-0"

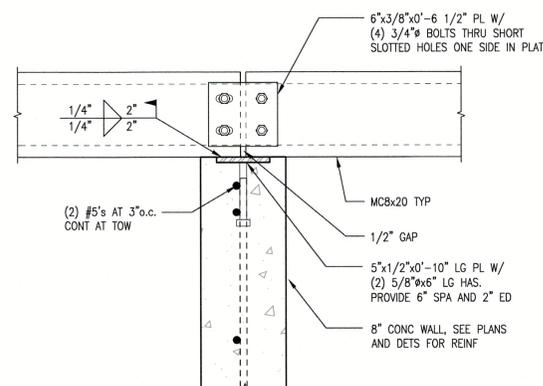


CATWALK AT EXTERIOR WALL

2
S-301

1/2" = 1'-0"

NOTE: PROVIDE 3'-3" WIDE STEP DOWN IN WALL FOR CATWALK GRATE SUPPORT

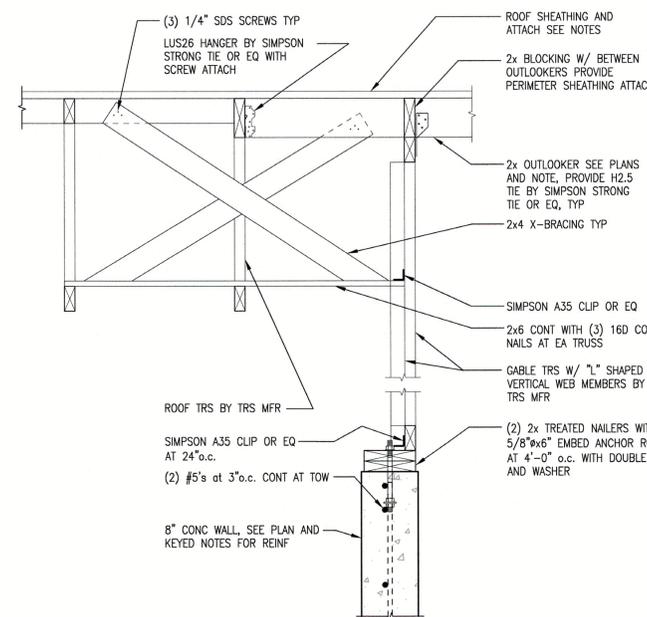


BM TO TOP OF WALL CONN

5
S-301

1 1/2" = 1'-0"

NOTE: GRATING AND GUARDRAILS NOT SHOWN FOR CLARIFY

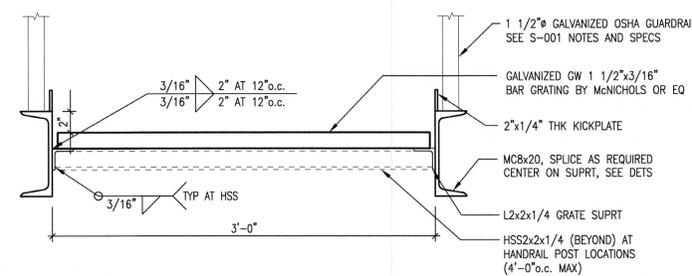


**WOOD TRUSS
 BRACING ASSEMBLY AT GABLE**

8
S-301

1" = 1'-0"

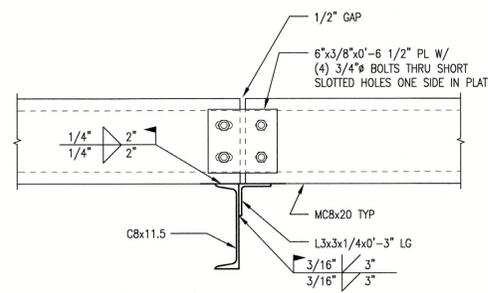
NOTE: SPACE BRACING ASSEMBLY AT MID SPAN OF TRS'S AND 6'-0" o.c. MAX



CATWALK SECTION

3
S-301

1 1/2" = 1'-0"



BM SPLICE AT CHANNEL

6
S-301

1 1/2" = 1'-0"

NOTE: GRATING AND GUARDRAILS NOT SHOWN FOR CLARIFY



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OFFICE OF ADMINISTRATION
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MISSOURI STATE
 HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
 HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
 SITE # 6026
 ASSET # 8136026001

REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 ISSUE DATE: 8/30/2019

CAD DWG FILE: S-601
 DRAWN BY: BH, KP, BS
 CHECKED BY: DW
 DESIGNED BY: BH, KP

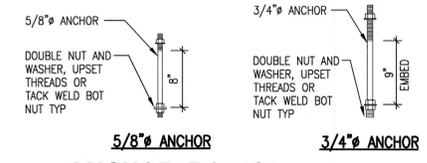
SHEET TITLE:
**STRUCTURAL
 SCHEDULE AND
 DETAILS**

SHEET NUMBER:

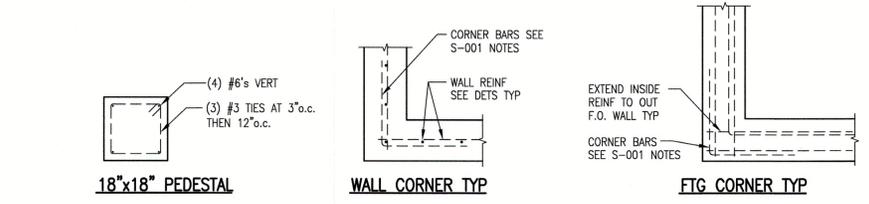
S-601

1 S-601 CONCRETE FOOTING, PEDESTAL, & STEEL COLUMN SCHEDULE											
MARK	FOOTING			TOP EL.	PEDESTAL		MTL. BLDG REACTIONS (KIPS)			REMARKS	MARK
	SIZE	THK	REINF		SIZE	TOP EL.	VERT (UP)	VERT (DN)	HORIZ		
1-A	4'-0"x4'-0"	30"	(5) #5's EW, T&B	99'-0"			8.5	40	20		1-A
1-B	4'-0"x4'-0"	30"	(5) #5's EW, T&B	99'-0"			8.5	40	20		1-B
1-C	4'-0"x4'-0"	30"	(5) #5's EW, T&B	99'-0"			8.5	40	20		1-C
1-D	4'-0"x4'-0"	30"	(5) #5's EW, T&B	99'-0"			8.5	40	20		1-D
2-A	3'-0"x3'-0"	30"	(4) #5's EW, T&B	99'-0"			7.0	22	7		2-A
2-D	3'-0"x3'-0"	30"	(4) #5's EW, T&B	99'-0"			7.0	22	7		2-D
3-A	3'-0"x3'-0"	30"	(4) #5's EW, T&B	99'-0"			7.0	22	7		3-A
3-B	4'-6"x4'-6"	30"	(5) #5's EW, T&B	99'-0"			9.5	50	20		3-B
3-C	4'-6"x4'-6"	30"	(5) #5's EW, T&B	99'-0"			9.5	50	20		3-C
3-D	3'-0"x3'-0"	30"	(4) #5's EW, T&B	99'-0"			7.0	22	7		3-D
4-A	4'-0"x4'-0"	30"	(5) #5's EW, T&B	99'-0"			4.0	40	20		4-A
4-B	4'-0"x4'-0"	30"	(5) #5's EW, T&B	99'-0"			4.0	40	20		4-B
4-C	4'-0"x4'-0"	30"	(5) #5's EW, T&B	99'-0"			4.0	40	20		4-C
4-D	4'-0"x4'-0"	30"	(5) #5's EW, T&B	99'-0"			4.0	40	20		4-D

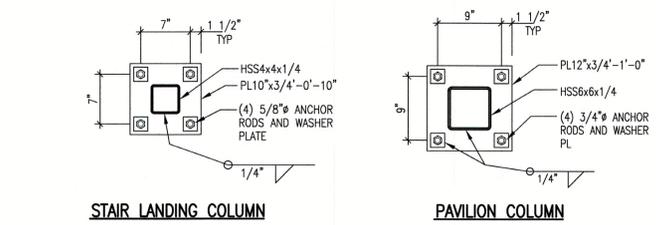
NOTES:
 1. TYPICAL ANCHOR RODS SEE DETAIL 2/S-601.
 2. TYPICAL STEEL COLUMN BASE PLATES SEE DETAIL 4/S-601.
 3. TYPICAL CONCRETE PEDESTAL REINFORCING SEE DETAIL 3/S-601.
 4. COLUMNS MAY BE SHIFTED 1/2" MAXIMUM ON BASE PLATE TO ACCOUNT FOR MISPLACED ANCHOR BOLT GROUPS PROVIDED THAT COLUMN DOES NOT INTERFERE W/ NUTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IN-SITU ANCHOR BOLT LOCATIONS W/ PLANS. REPORT ERRORS MORE THAN 1/2" TO ENGINEER. NO FIELD CUTTING OR ALTERATIONS TO STRUCTURAL STEEL SHALL BE MADE W/ OUT WRITTEN CONSENT FROM ENGINEER. UNLESS NOTED ALL CONNECTIONS MUST BE MADE IN THE SHOP.
 5. STEEL COLUMN BASE PLATES SHALL TYPICALLY BE ANCHORED TO THE FOUNDATION WITH A NUT AND WASHER PLATE, SEE PLANS/SPECS. PROVIDE 1" NON-SHRINK GROUT UNDER BASE PLATE TYP.
 6. BASE PLATE HOLES FOR ANCHOR RODS AND WASHER PLATES SPECIFIED ARE INTENDED TO COMPLY WITH THE RECOMMENDATIONS OF THE AISC STEEL DESIGN GUIDE 1 BASE PLATE AND ANCHOR ROD DESIGN, SEE S001 NOTES TYP.
 7. FOOTINGS AND PEDESTALS ARE CENTERED UNDER COLUMNS UNLESS NOTED OR SHOWN ON PLANS.
 8. PROVIDE THREE (3) TIES AT 3" o.c. AT TOP OF ALL PEDESTALS UNO BEGINNING 2" FROM TOP THEN SPACING INDICATED ON DETS. ALSO, PROVIDE ONE (1) TIE 2" FROM BOT OF ALL PEDESTALS UNO.
 9. MTL. BLDG (PRE-ENGINEERED BLDG) REACTIONS WERE ESTIMATED. MAXIMUM COLUMN REACTIONS SHALL BE LESS THAN OR EQUAL TO THOSE SHOWN ON THIS SCHEDULE WHEN SUBJECTED TO THE REQUIRED CODE DESIGN LOADS. IF CALCULATED REACTIONS ARE HIGHER THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TIME AND COST FOR THE REDESIGN OF THE FOUNDATION SYSTEM. REACTIONS SHOWN ARE IN KIP OR FT-KIP. IF THE CONTRACTOR USES A THIRD PARTY FOR REDESIGN THE CONTRACTOR IS RESPONSIBLE FOR THE COST OF THE REVIEW OF THE NEW FOUNDATION DESIGN BY THE ENGINEER.



5/8" ANCHOR
3/4" ANCHOR
ANCHOR ROD(S)
 1" = 1'-0"



18"x18" PEDESTAL
WALL CORNER TYP
FTG CORNER TYP
 NOTE: PLACE PEDESTALS/COLUMNS MONOLITHICALLY WITH CONC WALL TYP.



STAIR LANDING COLUMN
PAVILION COLUMN
TYPICAL BASE PLATE(S)
 1" = 1'-0" NOTES: SEE S-001 NOTES FOR WASHER PLATE CONFIG AND ATTACH TO BASE PLATE TYP. PROVIDE 14ga COVER PLATE OVER EXPOSED ANCHOR RODS TYP-SEE DETS.



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MISSOURI STATE
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MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MO

PROJECT # R1806-01
SITE # 6026
FACILITY # 8136026001

REVISION:
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: 08-30-2019

CAD DWG FILE: A-101
DRAWN BY: CTN
CHECKED BY: CLG
DESIGNED BY: TAA

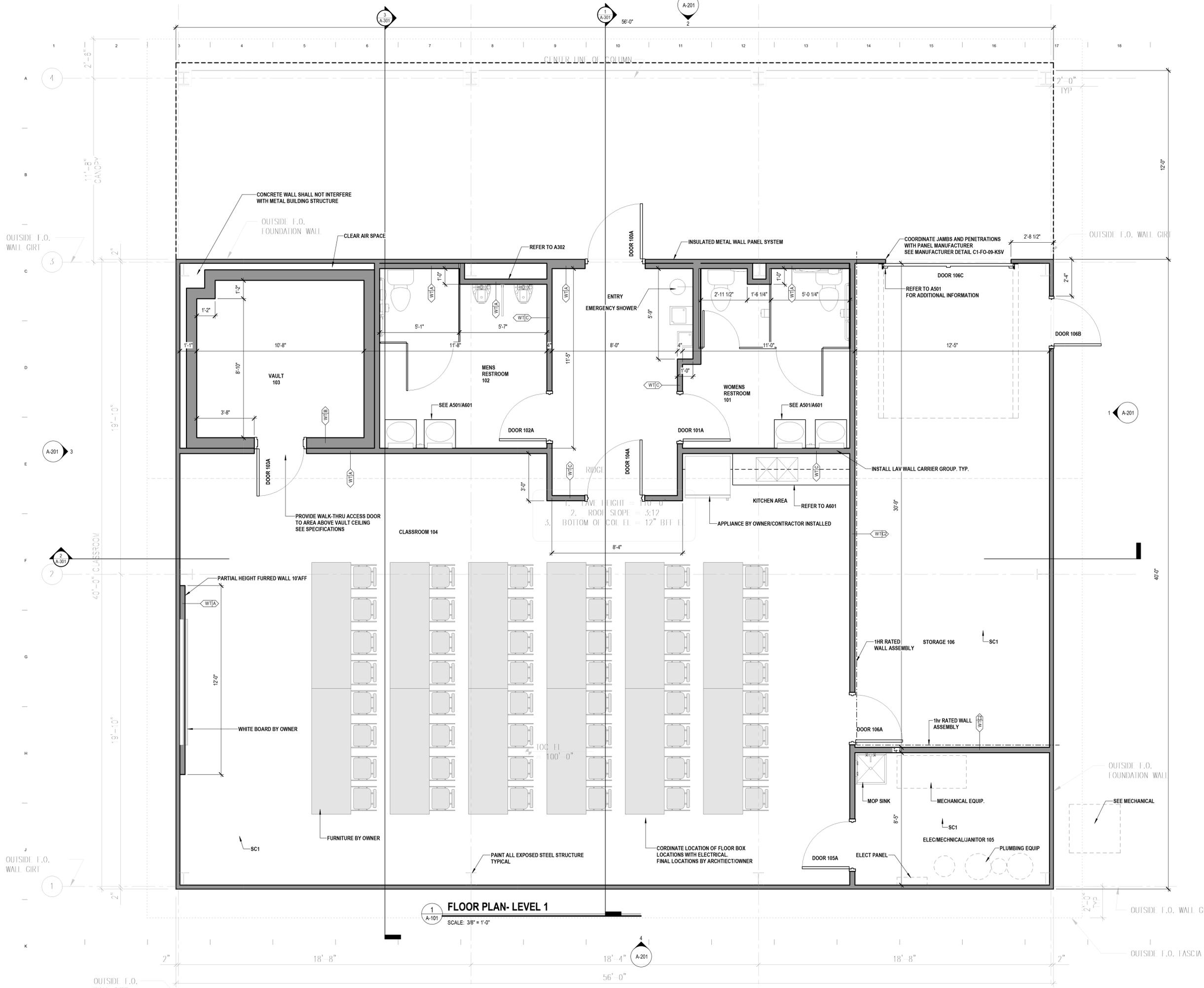
SHEET TITLE:
FLOOR PLAN

SHEET TITLE:

A101

32 OF 49 SHEETS

08-30-2019



FLOOR PLAN- LEVEL 1
SCALE: 3/8" = 1'-0"



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JEFFERSON CITY, MO

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ASSET # 8136026001

REVISION:
DATE: _____
REVISION:
DATE: _____
REVISION:
DATE: _____
ISSUE DATE: 08-30-2019

CAD DWG FILE: A-102
DRAWN BY: CTN
CHECKED BY: CLG
DESIGNED BY: TAA

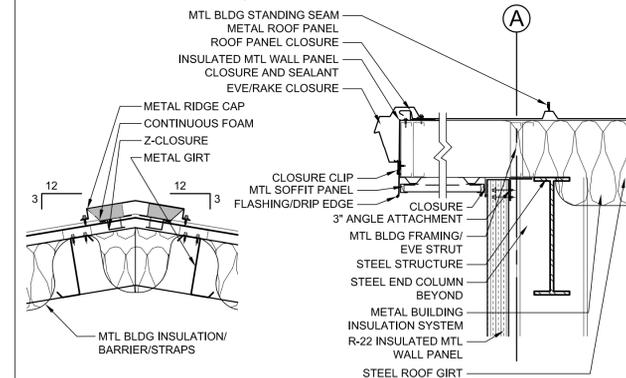
SHEET TITLE:
**ROOF
PLAN**

SHEET TITLE:
A-102

33 OF 49 SHEETS
08-30-2019

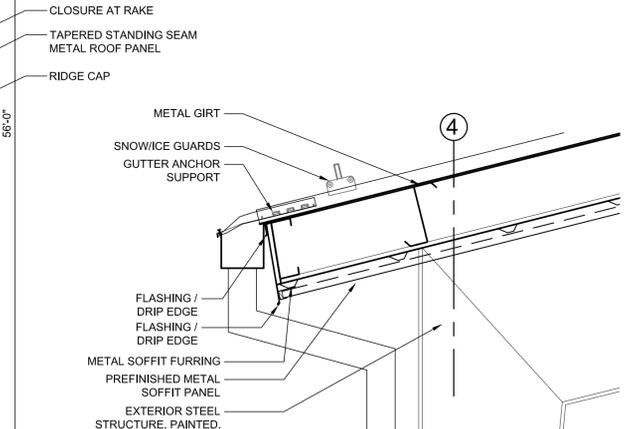
GENERAL NOTES

- ALL COLD FORMED CARBON OR LOW-ALLOY STEEL FRAMING SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND PER SSMA 'STEEL STUD MANUFACTURER'S ASSOCIATION' AND SHALL BE IN ACCORDANCE WITH AISI GENERAL AND AISI-NAS ('AISI' - AMERICAN IRON AND STEEL INSTITUTE)
- OPENINGS/PENETRATIONS ARE NOT ALL SHOWN.
- COORDINATE WITH METAL BUILDING MANUFACTURER AND METAL WALL PANEL MANUFACTURER FOR ALL ASSOCIATED FRAMING, STRUTS, GIRTS, FLASHINGS AND CLOSURE REQUIREMENTS TO PROVIDE A SECURE AND WEATHER TIGHT BUILDING ENVELOPE.
- REFER TO A300 AND A500 SHEETS FOR ADDITIONAL SECTION DETAILS.
- SEE STRUCTURAL DETAILS FOR FURTHER INFORMATION.
- SEE SHEET A101 FOR RATED WALL LOCATIONS (INTERIOR WALL FRAMING AT STORAGE ROOM)

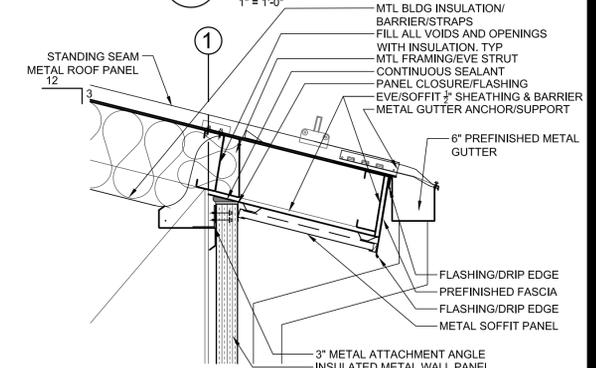


D17 ROOF DETAIL
A102 1" = 1'-0"

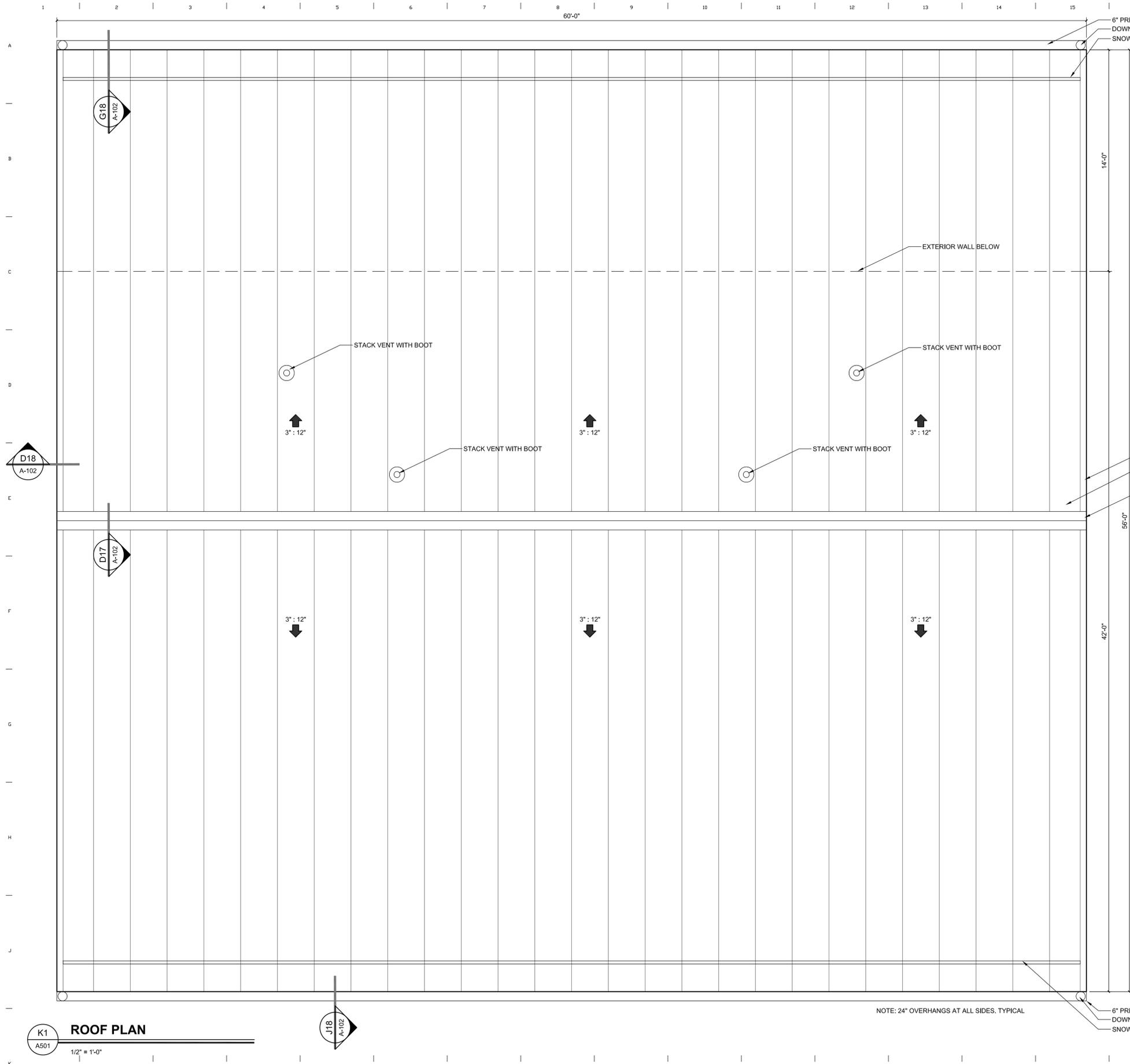
D18 ROOF DETAIL
A102 1" = 1'-0"



G18 ROOF DETAIL
A102 1" = 1'-0"



J18 ROOF DETAIL
A102 1" = 1'-0"



NOTE: 24" OVERHANGS AT ALL SIDES, TYPICAL

K1 ROOF PLAN
A501 1/2" = 1'-0"





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REVISION: _____
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DATE: _____

ISSUE DATE: 08-30-2019

CAD DWG FILE: A-201
DRAWN BY: CTN
CHECKED BY: CLG
DESIGNED BY: TAA

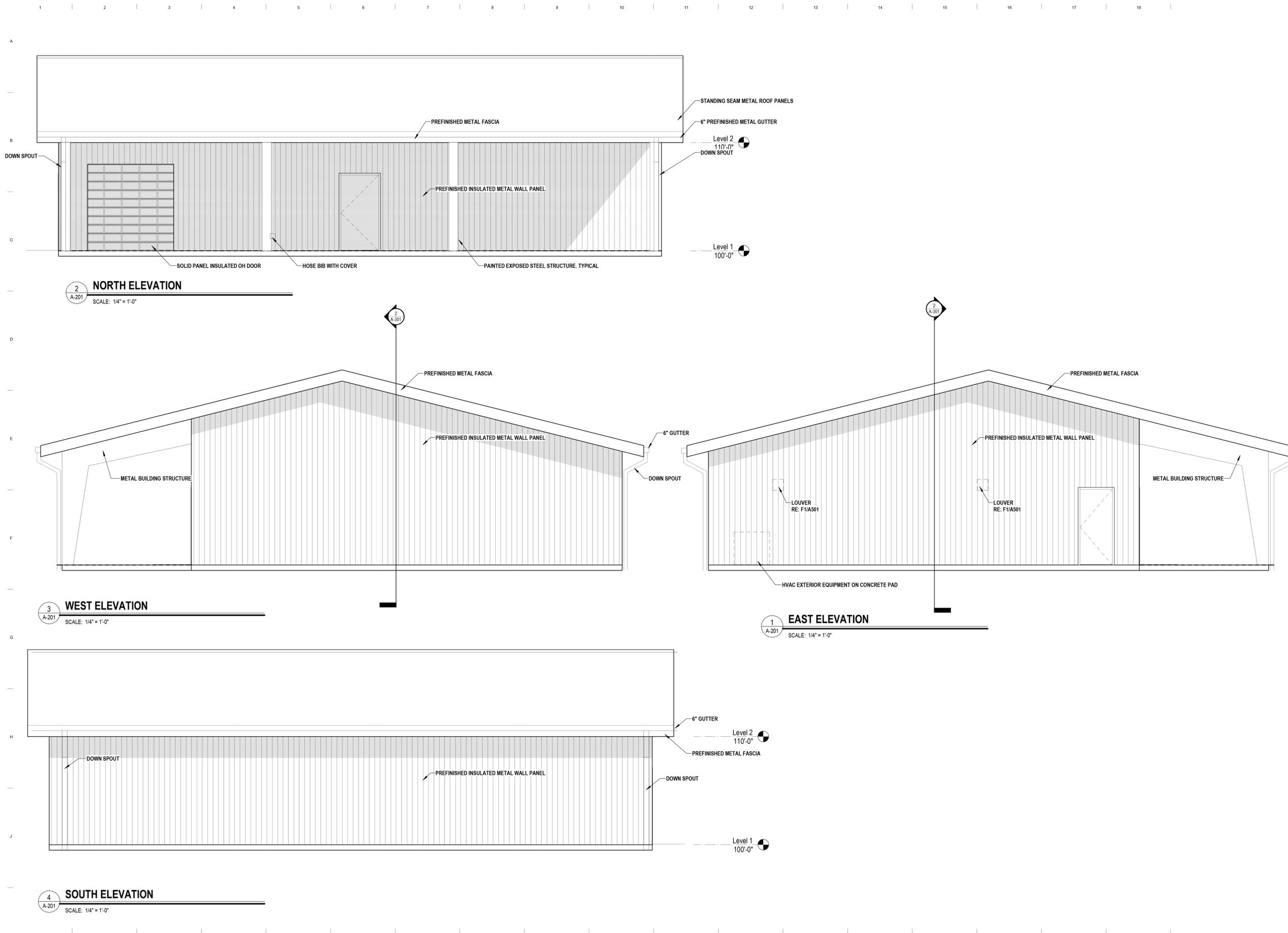
SHEET TITLE:

**BUILDING
ELEVATIONS**

SHEET TITLE:

A201

34 OF 49 SHEETS





OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
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MISSOURI STATE
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CAD DWG FILE: A-301
DRAWN BY: CTN
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DESIGNED BY: TAA

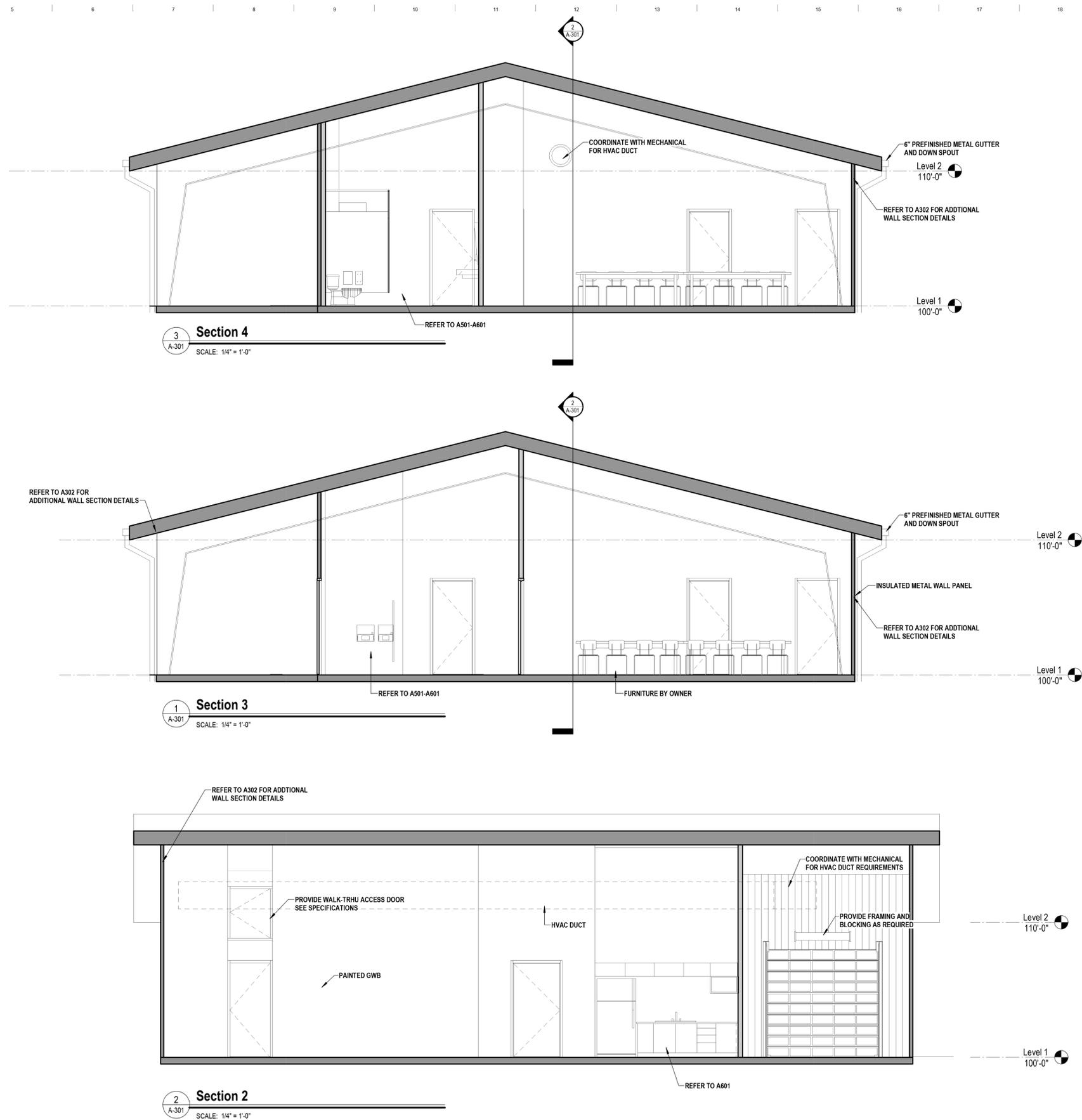
SHEET TITLE:

BUILDING
SECTIONS

SHEET TITLE:

A301
35 OF 49 SHEETS

08-30-2019



Section 4

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

Section 3

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

Section 2

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



The Architects Alliance inc.
Jefferson City, Missouri
Missouri Certificate of Authority
000143 Exp. 12/31/2019
631 West Main Street, Jefferson City, MO 65101
573.636.5000

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
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MISSOURI STATE
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HIGHWAY PATROL

JEFFERSON CITY, MO

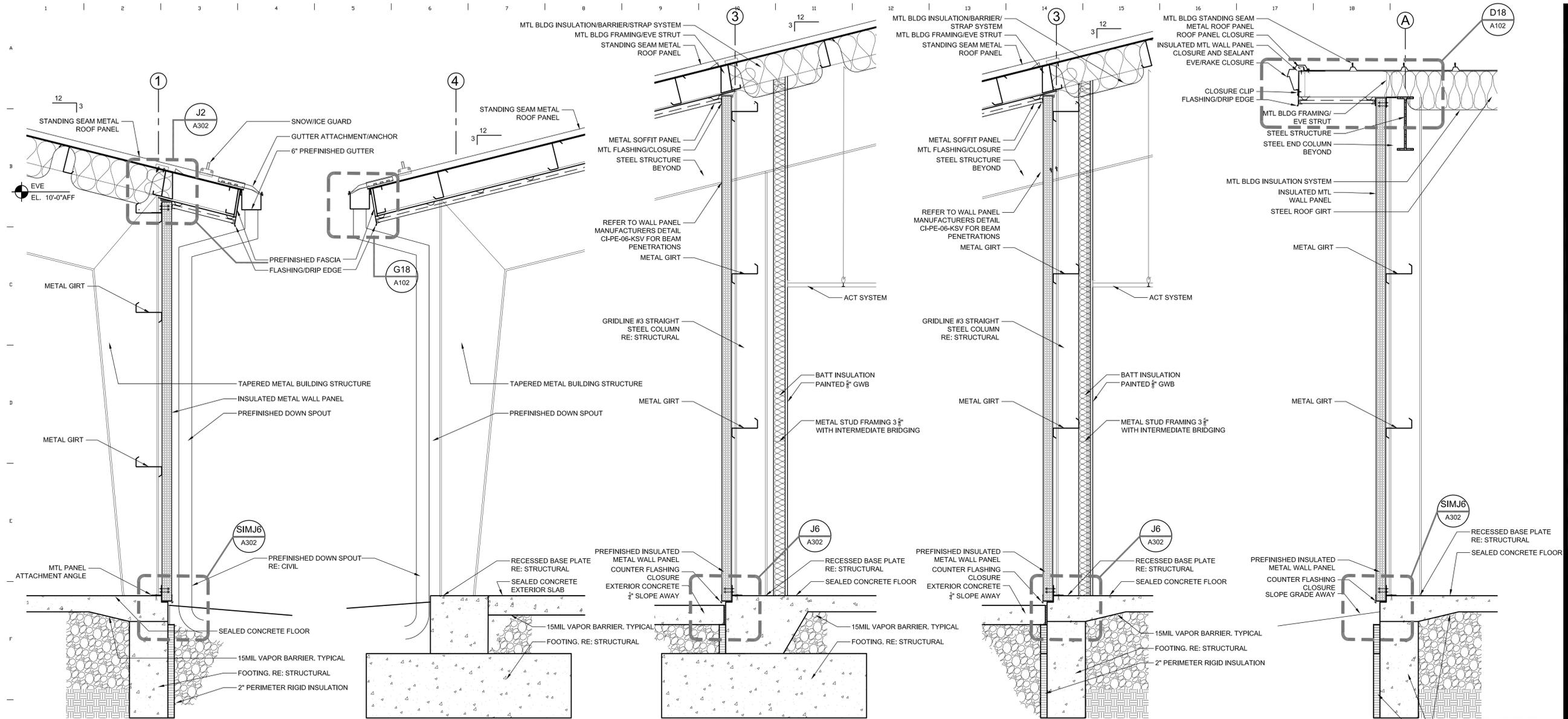
PROJECT # R1806-01
SITE # 6026
ASSET # 8136026001

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: 08-30-2019

CAD DWG FILE: A-302
DRAWN BY: CTN
CHECKED BY: CLG
DESIGNED BY: TAA

SHEET TITLE:
**BUILDING
SECTIONS**

SHEET TITLE:
A-302



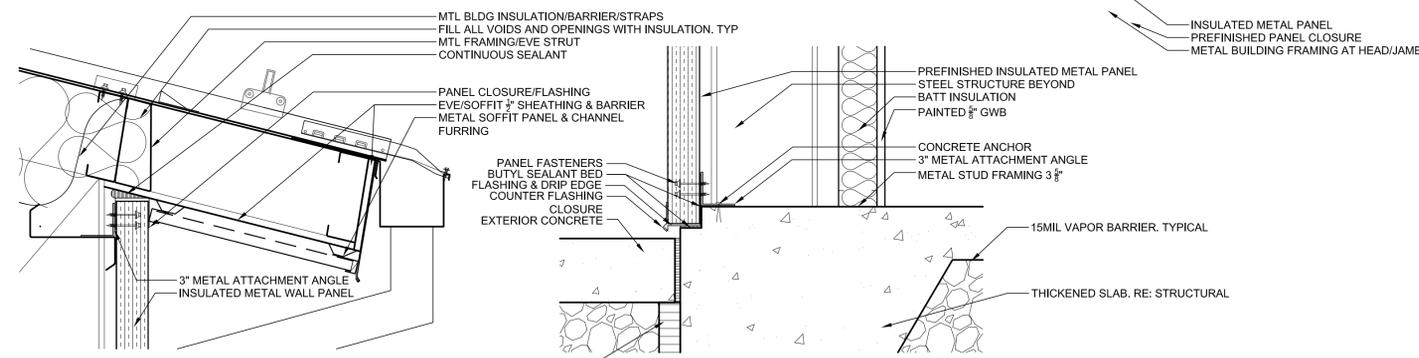
G2 WALL SECTION
A302 3/4" = 1'-0"

G2 WALL SECTION
A302 3/4" = 1'-0"

G2 WALL SECTION
A302 3/4" = 1'-0" RESTROOM FURRED WALL LOCATION

G2 WALL SECTION
A302 3/4" = 1'-0" TYPICAL SECTION AT GL#3

G2 WALL SECTION
A302 3/4" = 1'-0"

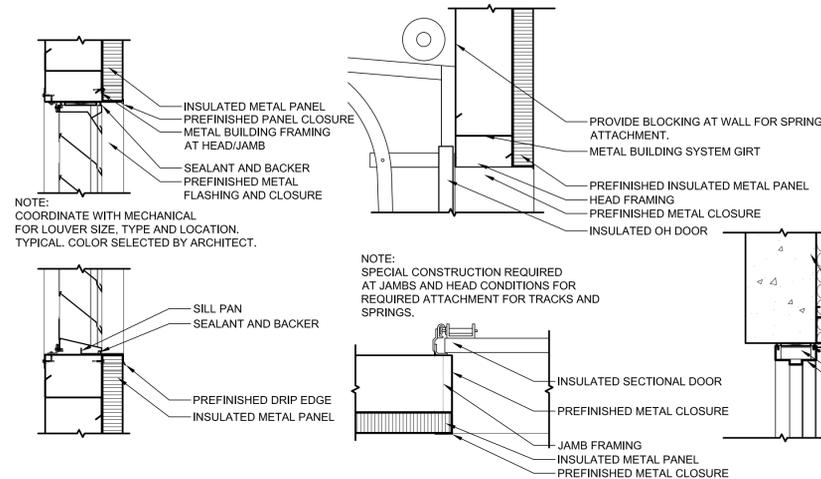


J2 WALL SECTION
A302 3/4" = 1'-0"

J6 WALL SECTION
A302 3/4" = 1'-0"

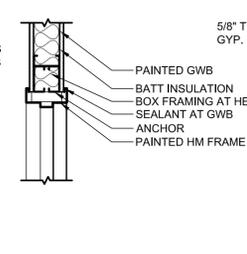
DOOR SCHEDULE										
DOOR MARK	QUANTITY	DOOR SIZE	DOOR TYPE	FRAME TYPE	RATING	DETAILS			HDWR. GROUP	REMARKS
						HEAD	JAMB	SILL		
GROUND LEVEL										
100-A	1	3'-4" X 7'-2" X 1-3/4"	HM	HM		H6/A501	H6/A501	SPEC		INSULATED/Full Perimeter Seals
101-A	1	3'-0" X 7'-2" X 1-3/4"	HM	HM		F9/A501	F9/A501	SPEC		
102-A	2	3'-0" X 7'-2" X 1-3/4"	HM	HM		F9/A501	F9/A501	SPEC		
103-A	1	3'-0" X 7'-0" X 1-3/4"	SPECIAL	HM		F6/A501	F6/A501	SPEC		SPECIALIZED VAULT DOOR SYSTEM
104-A	1	3'-4" X 7'-0" X 1-3/4"	HM	HM		F9/A501	F9/A501	SPEC		HALF GLASS VISION PANEL
105-A	1	3'-0" X 7'-0" X 1-3/4"	HM	HM		F9/A501	F9/A501	SPEC		
106-A	1	3'-0" X 7'-0" X 1-3/4"	HM	HM	60MIN	F9/A501	F9/A501	SPEC		INSULATED/Full Perimeter Seals
106-B	1	3'-0" X 7'-0" X 1-3/4"	HM	HM		H6/A501	H6/A501	SPEC		INSULATED/Full Perimeter Seals, Drip Edge
106-C	1	8' X 8' X 2"	OH	OH		F4/A501	F4/A501	SPEC		INSULATED/Full Perimeter Seals

ALL HM FRAMES TO BE FACTORY PRIMED AND FIELD PAINTED, FULL WELD CONSTRUCTION
 1. ALL SECTIONAL OVERHEAD AND COILING DOORS SHALL BY HEAVY DUTY HARDWARE AND INSULATED.
 2. ALL RESTROOM, JANITOR AND MECHELEC. SHALL BE UNDERCUT
 3. ALL FINAL KEY SCHEDULES SHALL BE COORDINATED WITH OWNER/ARCHITECT PRIOR TO PURCHASE OF KEYING SYSTEMS.
 4. PROVIDE ALL RATED DOORS WITH CLOSERS (HARDWARE) TYPICAL. COORDINATE WITH SPECIFICATIONS.
 5. ALL EXTERIOR DOORS/FRAMES SHALL BE INSULATED.

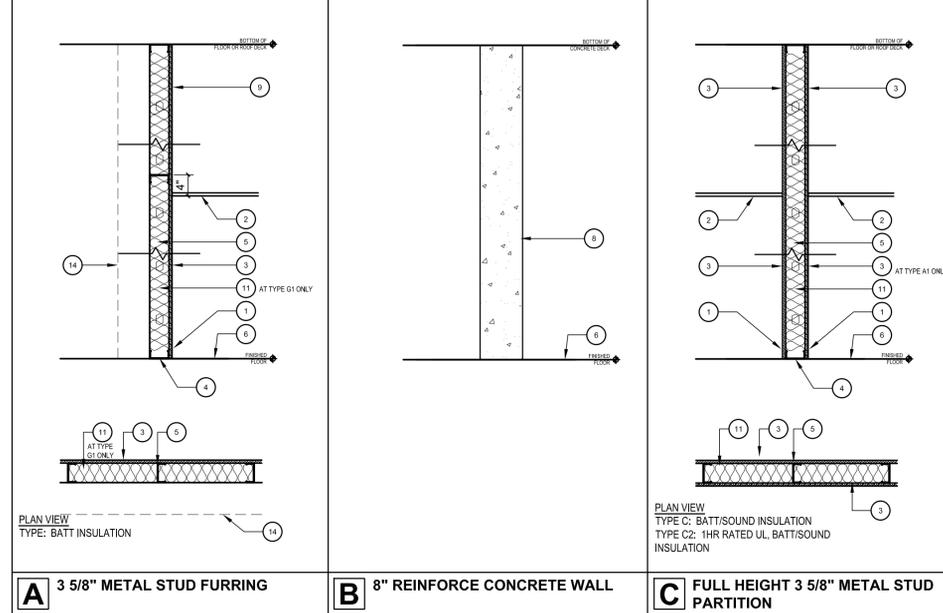
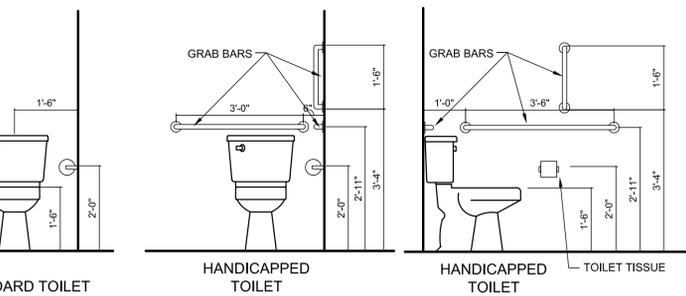
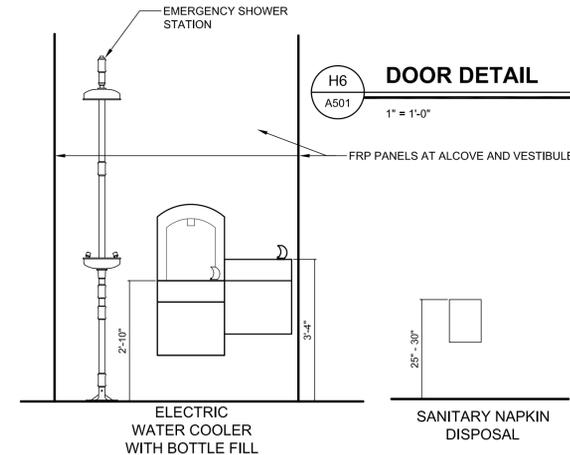
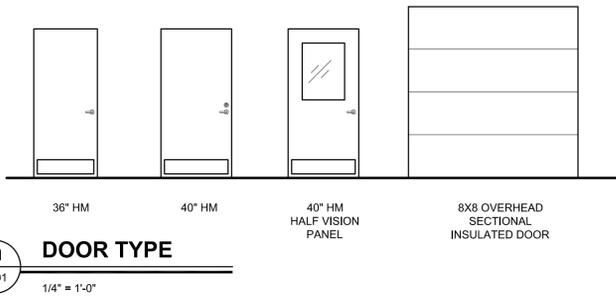


NOTE: SEE STRUCTURAL FOR HEAD LINTEL REQUIREMENTS AT DOOR AND CONCRETE WALL CONSTRUCTION.

NOTE: SPECIAL CONSTRUCTION REQUIRED AT VAULT DOOR. COORDINATE WITH DOOR MANUFACTURE FOR ANCHORS AND RECOMMENDED INSTALLATIONS REFER TO SPECIFICATIONS.



NOTE: CONTROL JOINT TO BE LOCATED AT 30" MAX. INTERVALS U.N.O. WHERE DISSIMILAR CONSTRUCTION MEET AND REMAIN IN THE SAME PLANE, AND WHERE EXPANSION / CONTROL JOINTS OCCUR IN THE BUILDING STRUCTURE.

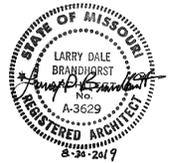


GENERAL NOTES

- ALL COLD FORMED CARBON OR LOW-ALLOY STEEL STUD FRAMING SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND PER SSMA "STEEL STUD MANUFACTURER'S ASSOCIATION" AND SHALL BE IN ACCORDANCE WITH AISI GENERAL AND AISI-NAS ("AISI" - AMERICAN IRON AND STEEL INSTITUTE)
- WINDOWS AND OPENINGS/PENETRATIONS ARE NOT SHOWN.
- FINISHES ARE NOT SHOWN
- ALL PENETRATIONS AND OPENINGS SHALL BEAR U.L. LISTING EQUAL TO WALL RATING (IN FIRE-RATED WALLS)
- SEE STRUCTURAL DETAILS FOR FURTHER INFORMATION
- NOT ALL NOTES MAY APPLY TO THIS SHEET - SEE ADDITIONAL WALL CONSTRUCTION TYPE SHEETS
- SEE SHEET A101 FOR RATED WALL LOCATIONS (WALL FRAMING AT STORAGE ROOM)

KEYNOTES

- BASE, WHERE OCCURS - SEE FLOOR FINISH PLAN
- CEILING, WHERE OCCURS - SEE REFLECTED CEILING PLANS. CEILING HEIGHTS MAY VARY ON EACH SIDE OF WALL.
- 5/8" GYPSUM WALLBOARD TYPE "X".
- HILT LOW VELOCITY SHOT PINS, .145" DIAMETER X 1" LONG, AT 16" O.C. PER I.C.C. ESR-1663 2" MAX FROM END.
- 3/2" STUDS TO BE ROLL FORMED CHANNEL TYPE GALVANIZED METAL, CONFORMING TO ASTM C645. SEE STRUCTURAL FOR GAUGE PER HEIGHT REQUIREMENTS. VERTICAL STUDS SHALL BE SPACED 16" O.C. U.N.O. PROVIDE DOUBLE STUDS AT DOOR JAMBS. BRIDGE STUDS AT MID-HEIGHT WITH 1 1/2" CHANNELS THROUGH STUDS SECURED IN PLACE LAP CHANNELS BY NESTING ONE INSIDE THE OTHER TO A DEPTH OF AT LEAST 8" AND WIRE TOGETHER.
- FLOOR FINISH PER ROOM SCHEDULE
- SEE STRUCTURAL FOR BRACING AND CONNECTION TO STRUCTURE ABOVE
- CONCRETE WALL (8") AT VAULT. SEE STRUCTURAL
- EXTEND GYP DB/FRAMING AND INSULATION TO UNDERSIDE OF FLOOR/ROOF DECK TYPICAL AT ALL WALL FRAMING CONDITIONS.
- MINERAL WOOL BATTS: BEARING U.L. CLASSIFICATION MARKING FRICTION FITTED BETWEEN STUDS. THICKNESS TO MATCH STUDS.
- PARTITION - SEE PLAN FOR TYPE
- WALL OR OPEN SPACE AS OCCURS



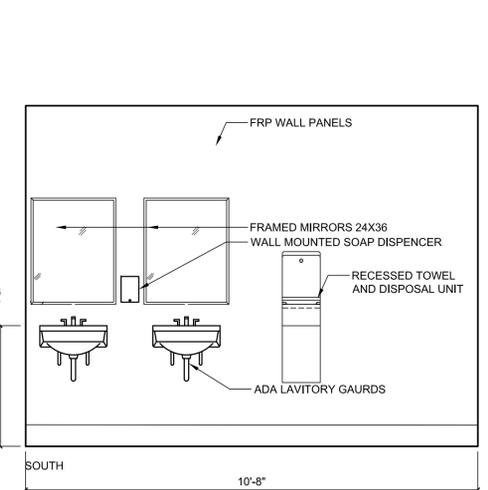
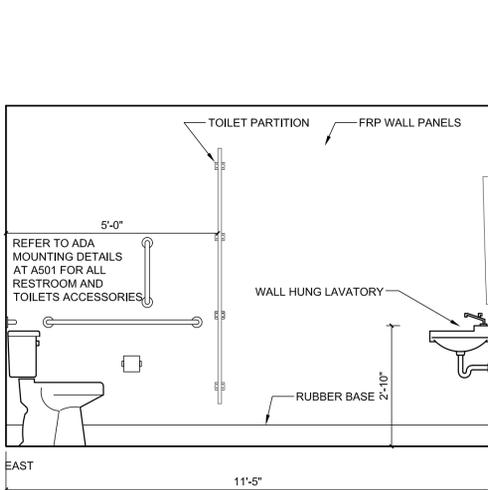
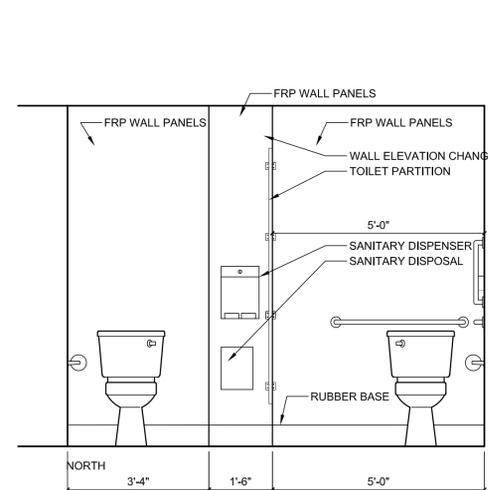
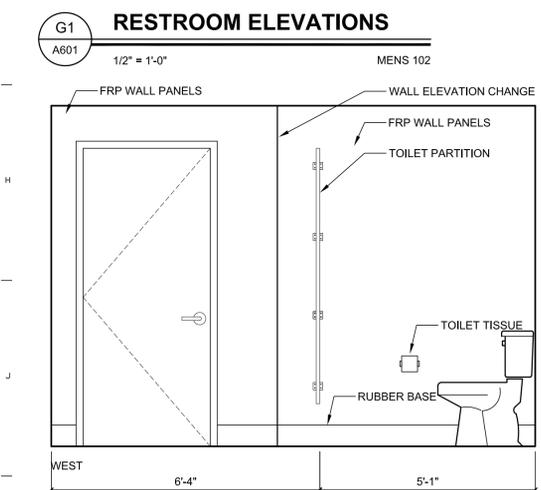
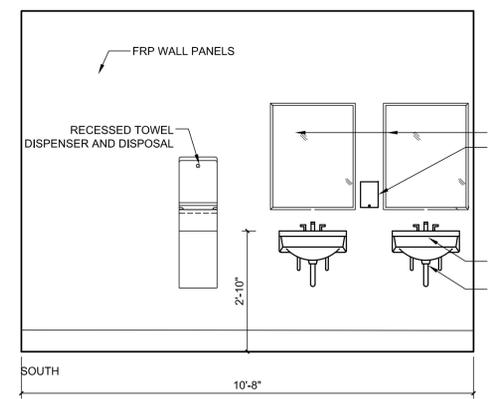
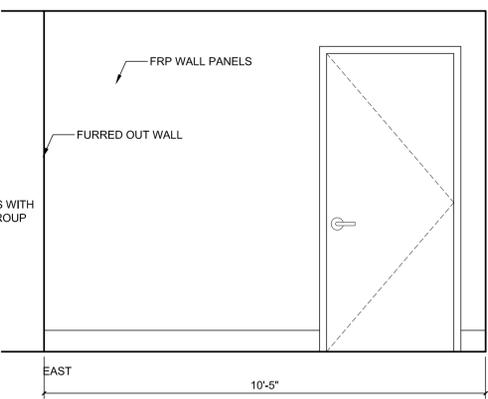
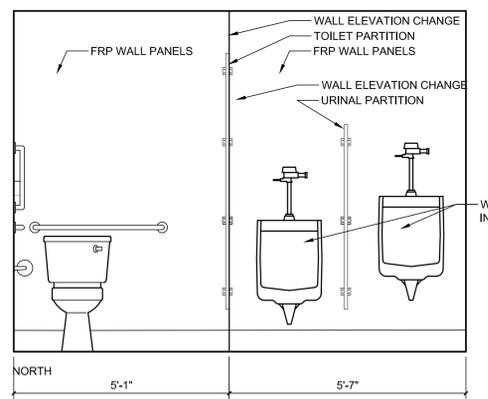
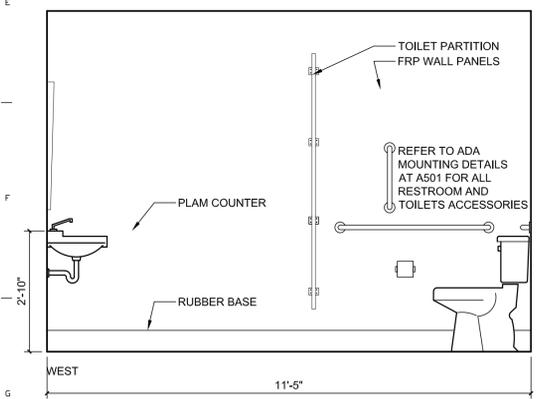
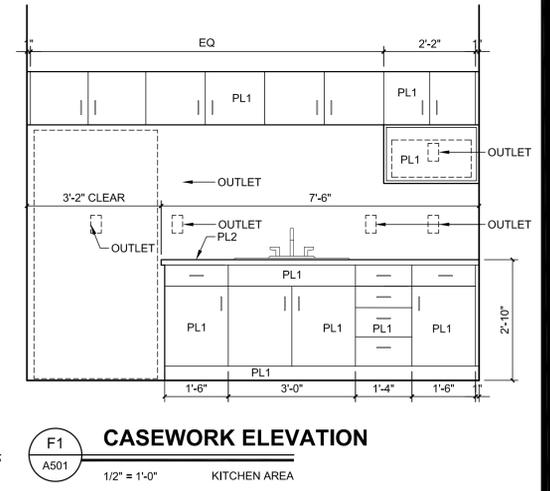
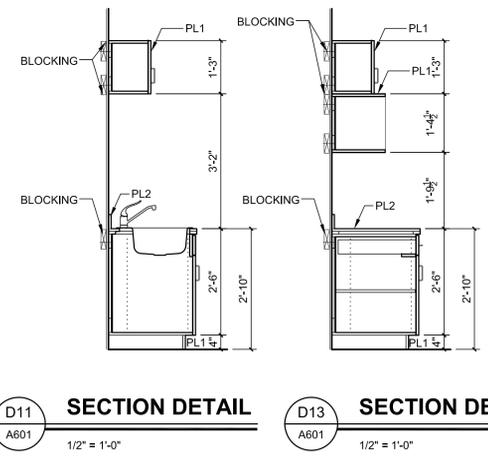
INTERIOR FINISH LEGEND						
CODE	MATERIAL	MANUFACTURER	DESCRIPTION			LOCATION
			PRODUCT	COLOR	DIMENSION	
A1	ACOUSTICAL CEILING PANELS AND GRID	ARMSTRONG	ULTIMA/ PRELUDE XL 15'16" HEAVY DUTY GRID	WHITE	24" x 24"	
FRP	WALL PANEL	FRP	WALL PANELS	WHITE		STORAGE, RESTROOMS AND JANITOR
TR1	TRANSITION	FRP	FRP SEAM AND EDGE TRIM	MATCHING	-	SEAMS AND EDGES
P1	PAINT	SWPPG	SEMI-GLOSS (WALLS), FLAT (SOFFITS)	T.B.D.	-	FIELD
P2	PAINT	SWPPG	SEMI-GLOSS (WALLS), FLAT (SOFFITS)	T.B.D.	-	ACCENT
P3	PAINT	SWPPG	SEMI-GLOSS (WALLS), FLAT (SOFFITS)	T.B.D.	-	ACCENT
P6	PAINT	SWPPG	GLOSS	T.B.D.	-	DOOR FRAMES
P7	PAINT	SWPPG	EXTERIOR GLOSS	T.B.D.	-	STEEL
EP1	EPOXY PAINT	SWPPG	EXTERIOR GLOSS	TBD	-	CONCRETE W/ FILLER/PRIMER
PL1	PLASTIC LAMINATE	WILSON ART	FULL RANGE COMMERCIAL COLLECTION	T.B.D.		COUNTERS
PL2	PLASTIC LAMINATE	WILSON ART	FULL RANGE COMMERCIAL COLLECTION	T.B.D.		CASEWORK
R1	RESILIENT BASE	JOHNSONITE	4" COVED	T.B.D.	-	ALL GWB LOCATIONS
SC1	SEALED CONCRETE		CHEMICAL & OIL RESISTANT SEALER	-	-	ALL INTERIOR AND EXTERIOR CONCRETE SLABS

- GENERAL NOTES**
- ALL INTERIOR GYPSUM WALLBOARD FINISHES SHALL BE LEVEL 4.
 - ALL INTERIOR WALLS AND CEILING FINISHES SHALL BE CLASSIFIED IN ACCORDANCE WITH ASTM-84 AND SHALL HAVE A FLAME SPREAD/SMOKE DEVELOPED INDEXES INCREASED.
 - ALL INTERIOR WALLS AND CEILING FINISHES SHALL HAVE THE FOLLOWING FLAME SPREAD/SMOKE DEVELOPED CHARACTERISTICS:
 - VERTICAL EXIT PASSAGES STAIR ENCLOSURE CLASS B, FLAME SPREAD 26-75
 - EXIT CORRIDORS CLASS B FLAME SPREAD 26-75, SMOKE DEVELOPED
 - ROOMS AND ENCLOSED SPACES CLASS C FLAME SPREAD 76-200, SMOKE DEVELOPS
 - PAINT ALL EXPOSED STEEL
 - CARPET AND CERAMIC TILE PATTERNS TO BE CONFIRMED BY ARCHITECT
 - ALL COUNTER AND CASEWORK EDGE CONDITIONS TO HAVE 3MM EDGE BANDING

FINISH SCHEDULE										
ROOM #	ROOM NAME	FLOORS	BASE	WALLS				CEILING	C.G. HEIGHT	REMARKS
				NORTH	EAST	SOUTH	WEST			
1ST FLOOR										
100	VESTIBULE	SC1	R1	P1/FRP	P1/FRP	P1	P1	ACT1	8'	FRP AT FOUNTAIN ALCOVE
101	RESTROOM WOMENS	SC1	R1	FRP	FRP	FRP	FRP	ACT1	8'	
102	RESTROOM MENS	SC1	R1	FRP	FRP	FRP	FRP	ACT1	8'	
103	VAULT	SC1	R1	EP1	EP1	EP1	EP1	OTS/EP1	8'	OTS TO CONCRETE
104	CLASSROOM	SC1	R1	P1	P1	P1	P3	OTS	OTS	PAINT STEEL
105	ELEC/MECH/JANITOR	SC1	R1	EP1	EP1	EP1	EP1	OTS	OTS	
106	STORAGE	SC1	R1	FRP	FRP	FRP	FRP	OTS	OTS	PAINT STEEL
107	KITCHENETTE	SC1	R1	P2	P1	P1	P1	OTS	OTS	
	EXTERIOR CANOPY	SC1	R1							PAINT STEEL

GENERAL NOTES

- ALL FOUNTAIN ALCOVE AND RESTROOM WALLS SHALL HAVE FRP PANELS INSTALLED OVER MOLD AND MOISTURE RESISTANCE GWB AND SHALL PROVIDE ACCESSORIES FOR JOINT COVERS AND SHALL SEAL ALL SEAMS, JOINTS AND FLOOR EDGE CONDITIONS.
- FINAL FINISH SELECTIONS BY ARCHITECT
 - ALL FRAMED GWB WALL LOCATIONS SHALL HAVE RUBBER BASE.
 - ALL OUTSIDE CORNER SHALL RECEIVED MOLDED RUBBER BASE CORNERS
 - ALL DOORS AND CASEWORK DOORS AND DRAWERS SHALL RECEIVE SILENCERS



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MANAGEMENT,
DESIGN AND CONSTRUCTION

MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MO

PROJECT # R1806-01
SITE # 6026
ASSET # 8136026001

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: 08-30-2019

CAD DWG FILE: A-601
DRAWN BY: CTN
CHECKED BY: CLG
DESIGNED BY: TAA

SHEET TITLE:
**SCHEDULES
AND DETAILS**

SHEET TITLE:
A-601



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MISSOURI STATE
HIGHWAY PATROL

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REVISION: _____
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CAD DWG FILE: P-100
DRAWN BY: GES
CHECKED BY: JLD
DESIGNED BY: GES

SHEET TITLE:
**PLUMBING
SITE
PLAN**

SHEET NUMBER:

P-100

39 OF 49 SHEETS
08/30/2019

GENERAL PLUMBING NOTES

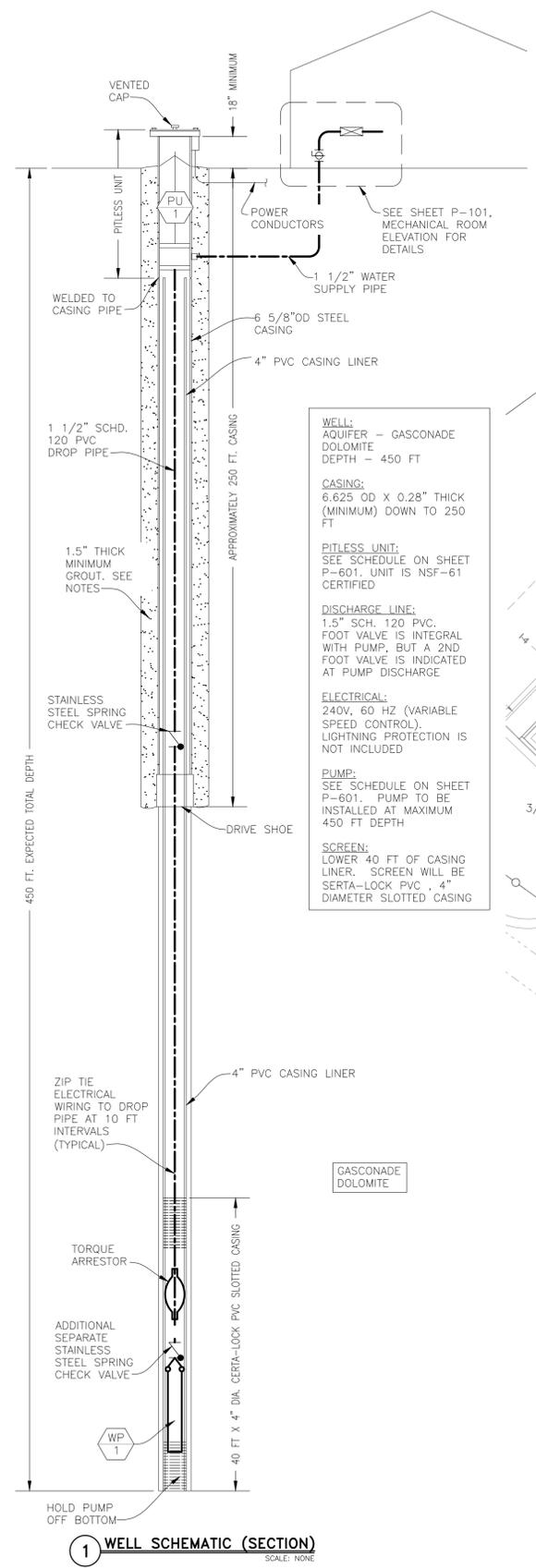
- PIPE SIZES ARE MARKED ALONG THE LENGTH OF RUNS ON THE PLAN. IF THE PIPE SIZE CHANGES ON EITHER SIDE OF A FITTING, A REDUCER FITTING IS IMPLIED. PLUMBING PIPE LAYOUTS ARE DRAWN FOR DESIGN INTENT AND CLARITY. CONTRACTOR SHALL MINIMIZE THE NUMBER OF TURNS AND FITTINGS WHERE EVER POSSIBLE WHILE MAINTAINING DESIGN INTENT.
- FABRICATION, INSTALLATION AND TESTING OF ALL PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH ALL STATE AND LOCAL PLUMBING CODES.
- COORDINATE ALL CASE WORK, MILL WORK, FREE STANDING PLUMBING FIXTURES, FLOOR, WALL FINISHES AND EQUIPMENT WITH ARCHITECTURAL DRAWINGS.
- PROVIDE SUITABLE SUPPORTS FOR STABILITY OF ALL PLUMBING FIXTURES AND PIPE.
- PROVIDE PRODUCT DATA SUBMITTALS FOR WELL PUMP AND CONTROLLER, WELL CASING, PITLESS WELL UNIT, WELL LINER, DROP PIPE, WELL HEAD, AND SUBGRADE HORIZONTAL HDPE PIPE. ALSO PROVIDE SUBMITTALS FOR CLASSROOM PLUMBING FIXTURES AND EQUIPMENT.

PUBLIC WELL GENERAL NOTES

- NEW WELL IS CLASSIFIED AS A TRANSIENT NON-COMMUNITY PUBLIC WELL. DRILLING CONTRACTOR IS TO FOLLOW ALL REQUIREMENTS AS OUTLINED IN THE STANDARDS FOR NON-COMMUNITY PUBLIC WATER SUPPLIES (1982).
- PUBLIC WELL CHARACTERISTICS: CAPABLE OF ~30 GPM AT 450 FT DEPTH.
- CONTRACTOR SHALL PROVIDE PRICING FOR THE FOLLOWING PUBLIC WELL FEATURES WITH A UNIT PRICE PER FOOT FOR WELL DEPTH, CASING DEPTH, LINER DEPTH, GROUT DEPTH AND PUMP DEPTH:
 - 450' DEEP 10" DIAMETER BOREHOLE (PER FOOT UNIT PRICE FOR DEPTH VARIANCE)
 - 250' OF 6 5/8" x 0.28" THICK BLACK STEEL WELL CASING WITH PACKER ON BOTTOM OF CASING WITH CEMENT GROUT VIA TREMIE OR POSITIVE DISPLACEMENT. (PER FOOT UNIT PRICE FOR DEPTH VARIANCE). WELL STEEL CASING SHALL MEET OR EXCEED AWWA STANDARD A-100.
 - 450' OF 4" CERTA-LOK OR EQUIVALENT PVC WELL LINER. (PER FOOT UNIT PRICE FOR DEPTH VARIANCE). BOTTOM 40 FT OF WELL LINER SHALL BE SERA-LOK SLOTTED PVC WELL CASING WITH 0.013" SLOT WIDTH AT 1/4" SLOT SPACING.
 - PERMANENT WELL CASING SHALL BE SURROUNDED BY A MINIMUM OF 1.5" OF GROUT. GROUT SHALL BE INSTALLED UNDER PRESSURE BY MEANS OF A GROUT PUMP FROM THE BOTTOM OF THE ANNULAR OPENING UPWARD IN ONE CONTINUOUS OPERATION UNTIL THE ANNULAR OPENING IS FILLED. (PER FOOT UNIT PRICE FOR DEPTH VARIANCE). CEMENT SHALL CONFORM TO ASTM STANDARD C150, WITH NOT MORE THAN 6 GALLONS OF WATER PER SACK. ADDITIVES MAY BE USED TO INCREASE FLUIDITY SUBJECT TO APPROVAL BY THE MISSOURI DEPT. OF NATURAL RESOURCES (MDNR). PRIOR TO GROUTING THROUGH CREVICED OR FRACTURED FORMATIONS, BENTONITE OR SIMILAR MATERIALS MAY BE ADDED TO THE ANNULAR OPENING IN THE MANNER INDICATED FOR GROUTING. AFTER CEMENT GROUTING IS APPLIED, WORK ON THE WELL SHALL BE DISCONTINUED UNTIL THE CEMENT HAS PROPERLY SET (MINIMUM PERIOD OF 72 HOURS). PRESSURE GROUTING OF THE CASING IS TO BE WITNESSED BY THE MISSOURI DEPT. OF NATURAL RESOURCES (MDNR).
 - 450' PUMP DEPTH APPROXIMATE. SUPPLY KWIK-SET 1 1/2" SCH. 120 PVC OR EQUIVALENT DROP PIPE. (PER FOOT PRICE FOR PUMP DEPTH VARIANCE).
 - ROCK CUTTINGS SHALL BE COLLECTED EVERY 5 FT TO THE TOTAL DEPTH OF THE WELL.
 - A 24 HR PUMP DRAWDOWN TEST WILL BE REQUIRED UNLESS A WAIVER IS RECEIVED FROM MDNR. WATER SAMPLES SHALL BE COLLECTED IMMEDIATELY FOLLOWING PUMP TEST.
 - PROVIDE ALL REQUIRED WATER TESTS AS SPECIFIED IN THE STANDARD.
 - PROVIDE DRAWING AND SPECIFICATION CONTRACTOR'S REDLINES TO ENGINEER.
- THE BASIC WELL FEATURES SHALL CONSIST OF THE FOLLOWING:
 - A PITLESS WELL UNIT. NOTE: PITLESS ADAPTERS ARE NOT PERMITTED.
 - TORQUE ARRESTOR: INSTALLED DIRECTLY ABOVE SUBMERSIBLE PUMP TO PROTECT PUMP AND WELL COMPONENTS FROM STARTING TORQUE DAMAGE.
 - CHECK VALVE: LOCATED IMMEDIATELY ABOVE THE PUMP. INSTALL SECOND CHECK VALVE APPROXIMATELY 200 FT ABOVE THE FIRST ONE. BOTH WILL PREVENT BACKFLOW INTO THE PUMP AND HOLD THE HEAD OF WATER IN THE SYSTEM.
 - PRESSURE SENSOR AND PUMP CONTROLLER LOCATED IN MECHANICAL ROOM.
 - MISCELLANEOUS PARTS: CABLE TIES, HEAT SHRINK SPLICE KIT, PIPE CLAMPS, CABLE GUARDS, PUMP WIRE.
 - SANITIZE WELL AND POTABLE WATER PIPING IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES, AND PER CODE.

PUBLIC WELL KEYED NOTES

- (A)** FINAL LOCATION FOR A NEW WELL PLACEMENT TO BE COORDINATED WITH OWNER PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANUP OF ALL SPOILS. WELL SHALL BE LOCATED CONSISTENT WITH THE GENERAL LAYOUT AND SURROUNDING AREA GIVING DUE CONSIDERATION OF THE SIZE OF THE LOT, CONTOUR OF THE LAND, THE WATER TABLE, SOIL DEPOSITS, ROCK FORMATION, LOCAL GROUNDWATER CONDITIONS AND OTHER FACTORS NECESSARY TO IMPLEMENT THE BASIC POLICIES THAT FOLLOW:
- LOCATE WELL IN AN AREA WHICH HAS GOOD SURFACE DRAINAGE AND AT A HIGHER ELEVATION THAN POSSIBLE SOURCES OF CONTAMINATION, YET EASILY ACCESSED FOR REPAIRS, MAINTENANCE, AND INSPECTIONS.
 - AREA SHOULD BE SLOPED AS TO PREVENT THE ACCUMULATION AND PONDING OF SURFACE WATER WITHIN 10 FEET (10') OF THE WELL.
 - THE WELL SHALL BE THREE HUNDRED FEET (300') FROM ABOVE GROUND STORAGE OF LIQUID PETROLEUM PRODUCTS.
 - LOCATE A MINIMUM OF THREE HUNDRED FEET (300') FROM SUBSURFACE DRAIN FIELD.
 - LOCATE A MINIMUM OF FIFTY FEET (50') FROM A BURIED SEWER LINE.
 - LOCATE A MINIMUM OF TEN FEET (10') FROM COUNTY ROAD RIGHT-OF-WAY.
 - THE TOP OF THE WELL CASING SHALL EXTEND AT LEAST 18" ABOVE THE FINISHED GRADE.
 - IT IS THE RESPONSIBILITY OF THE WELL INSTALLATION CONTRACTOR TO ENSURE THAT THE ANNULAR SPACE IS SEALED AND THAT THE CASING DOES NOT LEAK.
 - PROVIDE ALL REQUIRED DOCUMENTATION AS SPECIFIED BY THE MISSOURI DEPARTMENT OF NATURAL RESOURCES INCLUDING WELL LOGS...
- (B)** RUN NEW 1.5" HDPE WATER LINE FROM WELL PITLESS UNIT TO INTERIOR OF CLASSROOM BUILDING.
- (C)** CONTRACTOR TO INSTALL TWO (2) 4' TALL 4" PIPE BOLLARD NEAR WELL CASING. EMBED A MINIMUM OF 4' BELOW GRADE. PAINT WITH 1 COAT PRIMER AND 2 COATS YELLOW ALKYD BASED PAINT WITH HARDENER.



WELL:
AQUIFER - GASCONADE
DOLOMITE
DEPTH - 450 FT

CASING:
6.625 OD X 0.28" THICK
(MINIMUM) DOWN TO 250 FT

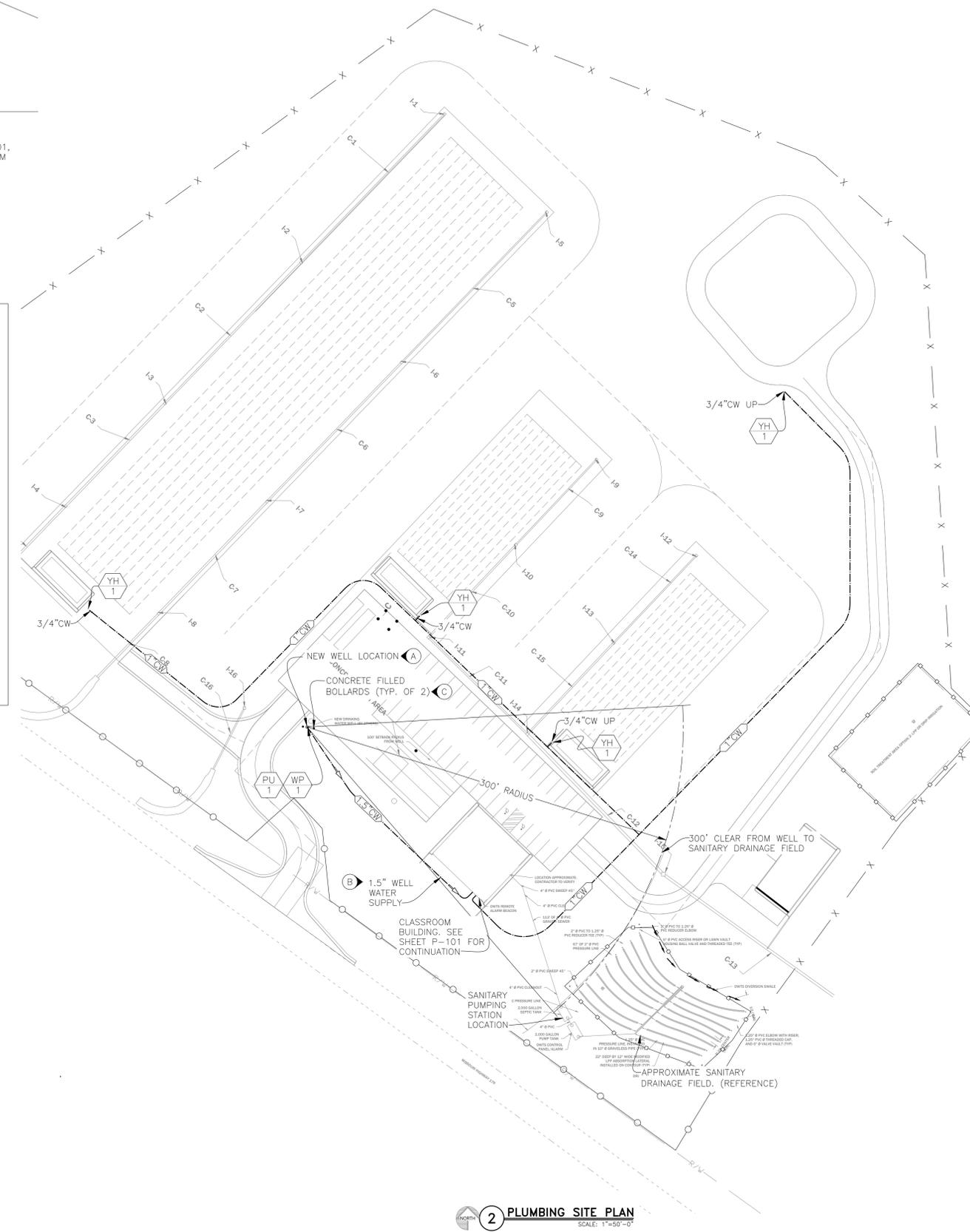
PITLESS UNIT:
SEE SCHEDULE ON SHEET
P-601. UNIT IS NSF-61
CERTIFIED

DISCHARGE LINE:
1.5" SCH. 120 PVC.
FOOT VALVE IS INTEGRAL
WITH PUMP, BUT A 2ND
FOOT VALVE IS INDICATED
AT PUMP DISCHARGE

ELECTRICAL:
240V, 60 HZ (VARIABLE
SPEED CONTROL).
LIGHTNING PROTECTION IS
NOT INCLUDED

PUMP:
SEE SCHEDULE ON SHEET
P-601. PUMP TO BE
INSTALLED AT MAXIMUM
450 FT DEPTH

SCREEN:
LOWER 40 FT OF CASING
LINER. SCREEN WILL BE
SERA-LOK PVC, 4"
DIAMETER SLOTTED CASING



2 PLUMBING SITE PLAN
SCALE: 1"=50'-0"

1 WELL SCHEMATIC (SECTION)
SCALE: NONE

PLUMBING LEGEND	
	PIPE BREAK (CONTINUES ON)
	DEVICE SCHEDULE TAG
	PIPE SIZE (IN INCHES) (AND TYPE)
	KEYED NOTE SPECIFIC TO LOCATION ON PLAN
	POTABLE COLD WATER LINE (CW)
	POTABLE HOT WATER LINE (HW)
	POTABLE HOT WATER RETURN LINE (HWR)
	SANITARY BUILDING DRAIN (S)
	PLUMBING VENT (V)
	DIRECTION OF FLOW

GENERAL NOTES

- SEE SHEET P-100 FOR ADDITIONAL NOTES THAT APPLY TO THIS SHEET.
- REFER TO ARCHITECTURAL PLANS FOR ALL RATED PENETRATIONS. INSTALL PENETRATION PROTECTION SYSTEMS PER U.L. OR OTHER APPROVED AND LISTED PENETRATION SYSTEMS.

GENERAL SANITARY SEWER NOTES

- SLOPE SANITARY SEWER AND VENT PIPING 2.5 INCHES AND SMALLER AT 1/4 INCH PER FOOT (2 PERCENT) MINIMUM. SLOPE SANITARY SEWER PIPING 3 INCHES TO 6 INCHES AT 1/8 INCH PER FOOT (1 PERCENT) MINIMUM. DRY VENTS MUST RISE ABOVE DRAIN CENTER LINE AT ANGLES OF 45 DEGREES OR GREATER FROM HORIZONTAL.

GENERAL PUBLIC WATER NOTES

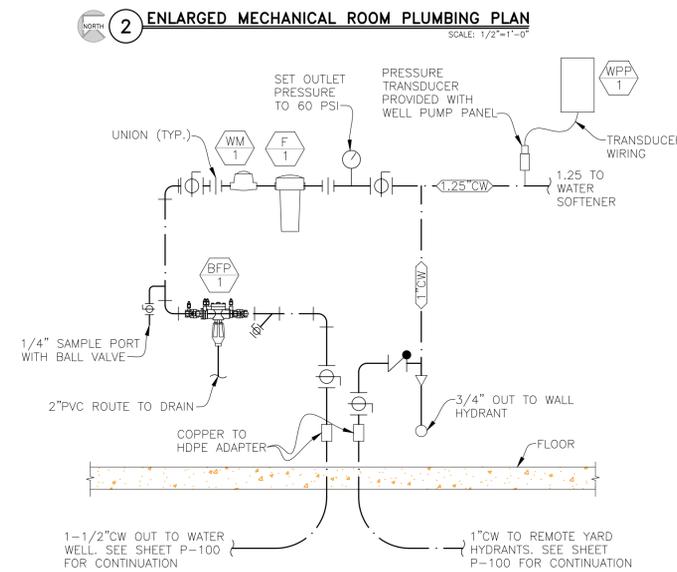
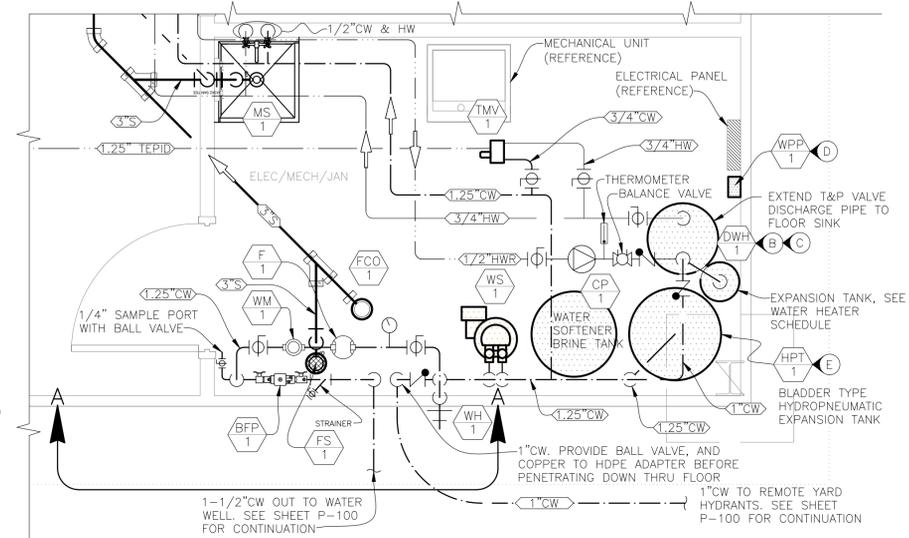
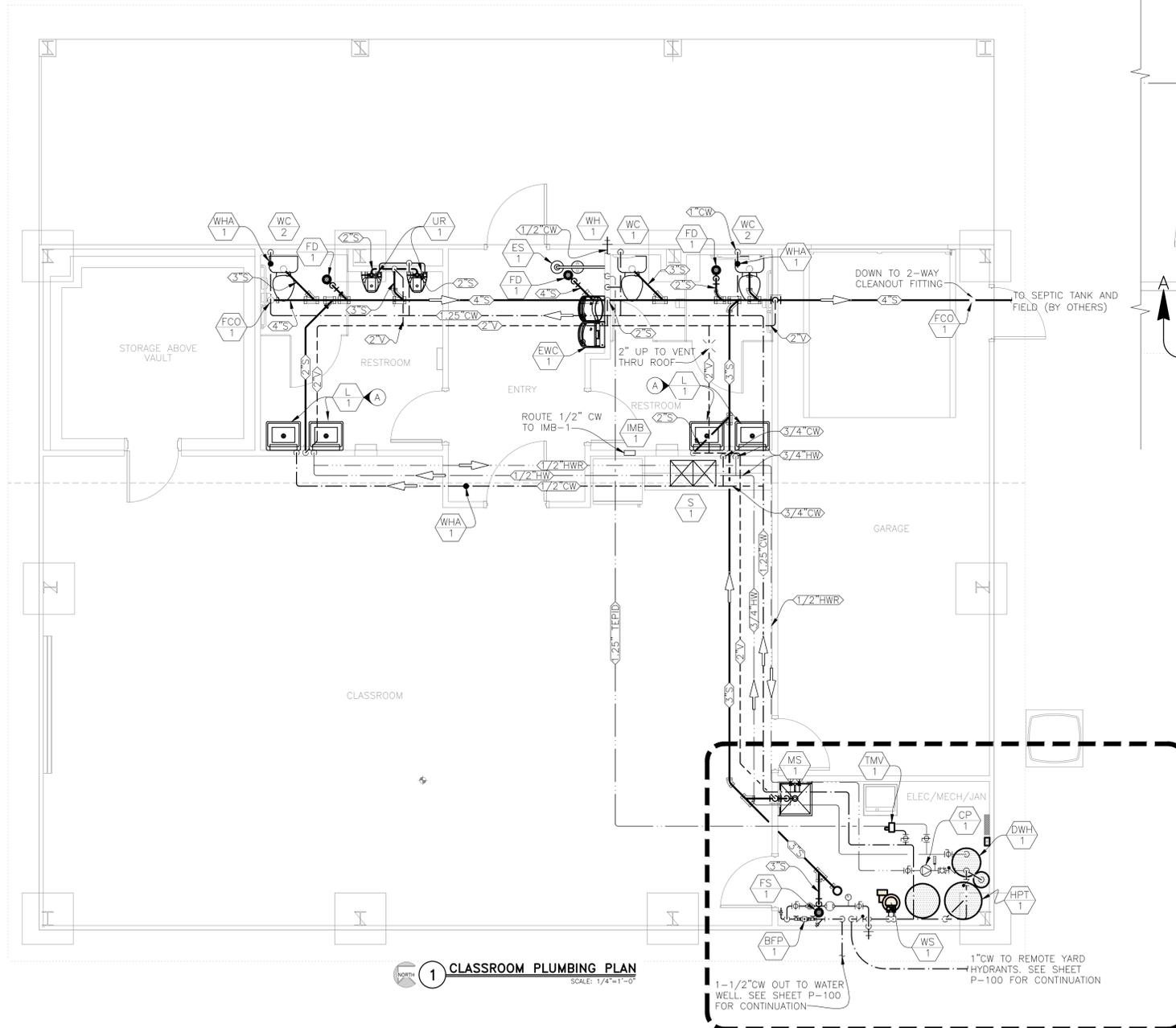
- STERILIZE POTABLE WATER PIPING IN ACCORDANCE WITH LOCAL WATER PROVIDER REQUIREMENTS AND LOCAL HEALTH DEPARTMENT REGULATIONS.
- DO NOT INSTALL POTABLE WATER PIPE IN AREAS SUBJECT TO FREEZING TEMPERATURES.
- EXTERIOR WATER SUPPLY SYSTEM PIPE SHALL BE INSTALLED NOT LESS THAN 6 INCHES BELOW THE FROST LINE AND NOT LESS THAN 18 INCHES BELOW GRADE.
- PROTECT ALL WATER PIPE THROUGH CONCRETE PENETRATIONS WITH PLASTIC OR INSULATION SLEEVE.

GENERAL PUBLIC WATER NOTES (CONTINUED)

- PROTECT COPPER PIPE AGAINST CONTACT WITH DISSIMILAR METALS. ALL HANGERS, SUPPORTS, ANCHORS, AND CLIPS SHALL BE COPPER OR COPPER PLATED. WHERE COPPER PIPE IS CARRIED ON IRON TRAPEZE HANGERS WITH OTHER PIPE, PROVIDE A PERMANENT ELECTROLYTIC ISOLATION MATERIAL, SUCH AS EPDM RUBBER, TO PREVENT CONTACT WITH DISSIMILAR METALS.
- BRANCH ISOLATION / SHUTOFF VALVES: PROVIDE FULL PORT, BALL TYPE (UNLESS OTHERWISE NOTED), AND INSTALL IN A LOCATION THAT PERMITS ACCESS FOR SERVICE WITHOUT DAMAGE TO THE BUILDING OR FINISHED MATERIALS.
- PLUMBING FIXTURE AND EQUIPMENT SHUT-OFF STOPS SHALL BE QUARTER TURN, BALL OR CERAMIC DISK TYPE VALVES. STOPS SHALL HAVE 1/2" COMPRESSION INLET AND COMPRESSION OR THREADED/GASKET OUTLET. PLASTIC/POM STEM PRODUCTS AND/OR COMPRESSION SHUTOFFS SHALL NOT BE USED.
- PROVIDE COMPLETE FIXTURES AND INCLUDE FLEX-PIPE SUPPLIES, STOPS, VALVES, FAUCETS, DRAINS, TRAPS, TAIL PIECES, ESCUTCHEONS, ETC. CONTRACTOR SHALL LEAK TEST FINISHED WATER PIPING IN ACCORDANCE WITH ASME-B31.3 LEAK/PRESSURE TESTING GUIDELINES.

KEYED NOTES

- PROVIDE DRAIN AND WATER SUPPLY ADA INSULATION AS MANUFACTURED BY TRUBRO, OR EQUIVALENT FOR UNDER-LAVATORY PIPING.
- ROUTE PVC DRAIN PIPE FROM WATER HEATER DRIP PAN TO FLOOR DRAIN.
- SET WATER HEATER TO 130°F SETTING.
- WELL PUMP VFD CONTROLLER PROVIDED BY PLUMBING CONTRACTOR, INSTALLED BY ELECTRICAL CONTRACTOR.
- PROVIDE DRAIN, PRESSURE GAUGE, AIR BLOW-OFF, AIR FILL VALVE (SCHRAEDER TYPE) VALVE AND SIGHT GLASS.



SEE ENLARGED MECHANICAL ROOM PLUMBING PLAN, THIS SHEET

STATE OF MISSOURI
MICHAEL L. PARSON,
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OFFICE OF ADMINISTRATION
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MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
SITE# 6026
ASSET# 8136026001

REVISION: _____
DATE: _____
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DATE: _____
ISSUE DATE: 08/30/2019

CAD DWG FILE: P-101
DRAWN BY: GES
CHECKED BY: JLD
DESIGNED BY: GES

SHEET TITLE:
**CLASSROOM
PLUMBING
PLAN**

SHEET NUMBER:

P-101

40 OF 49 SHEETS
08/30/2019



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CAD DWG FILE: P-601
DRAWN BY: GES
CHECKED BY: JLD
DESIGNED BY: GES

SHEET TITLE:
**PLUMBING
SCHEDULES AND
DETAILS**

SHEET NUMBER:

P-601

41 OF 49 SHEETS
08/30/2019

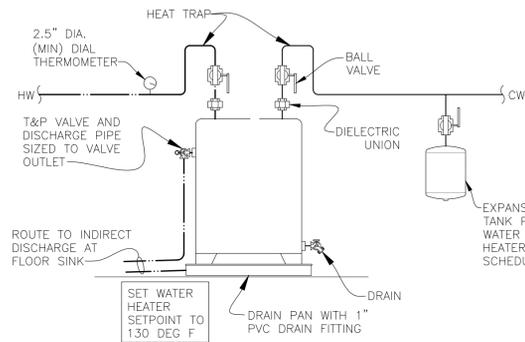
WATER HEATER SCHEDULE					
TAG	MFG / MODEL	DESCRIPTION	CONNECTIONS	REMARKS	NOTES
DWH 1	RHEEM PROE20	WATER HEATER 20 GALLONS ELECTRIC	0.75" INLET/OUTLET TOP TAPS 240 VAC, 3000 WATTS	WATER HEATER; TANK TYPE, SINGLE ELEMENT PROVIDE WITH T&P VALVE AND PLASTIC DRIP PAN	1
NOTES					
1	WATTS PLT-5	TANK EXPANSION	3/4" NPT	TANK: EXPANSION. POTABLE WATER, POLYPROPYLENE LINER, FLEXIBLE BUTYL DIAPHRAGM, ADJUSTABLE, PRE-CHARGED, 50 GALLON MAX	

WATER SUPPLY PUMP AND ACCESSORIES SCHEDULE					
TAG	MFG/MODEL	DESCRIPTION	CONNECTIONS	REMARKS	NOTES
WP 1	GOULDS 25GS50	SUBMERSIBLE WELL PUMP	1.25 THD PIPE CONNECTION SEE ELECTRICAL SHEETS	26 STAGE PUMP, 5 HP MOTOR, 304 SS, NORYL IMPELLER, HERMETICALLY SEALED WINDINGS 30 GPM AT 385 FT TOTAL DYNAMIC HEAD	
WFP 1	GOULDS AQUAVAR SPD	WELL PUMP VFD CONTROL PANEL	5 HP RATED 240VAC INPUT WITH OUTPUT FILTER	PROVIDED BY PLUMBING CONTRACTOR, INSTALLED BY ELECTRICAL CONTRACTOR. PROVIDE WITH PRESSURE TRANSDUCER	
HPT 1	GOULDS V350	DIAPHRAGM TANK	1.25 THD PIPE CONNECTION	115.9 GALLONS TOTAL VOLUME 31.3 GALLONS DRAWDOWN AT 50 PSI MAX DRAWDOWN = 70 GAL.	
WM 1	BADGER RECORDALL MODEL 55	BRONZE WATER METER	1 THD PIPE CONNECTION	1 PSI DROP AT 26 GPM	
F 1	3M AQUA-PURE AP802	WATER FILTER	1 NPT CONNECTION	45 GPM RATING ON FILTER HOUSING. REPLACEMENT CARTRIDGE AP810-2	
PU 1	BAKER MONITOR 5PS67WBWEO	PITLESS UNIT	1.5" DROP PIPE 1.5" DISCHARGE PIPE 6" WELDED TO CASING	TOP TO BE 18" MINIMUM ABOVE GRADE	
NOTES					
WATER FILTER F-1 EQUIVALENT MANUFACTURERS: • PELICAN WATER SYSTEMS; WWW.PELICAN.COM; • PURET WATER TREATMENT TECHNOLOGIES: WWW.PURETUSA.COM					
WATER METER WM-1 EQUIVALENT MANUFACTURERS: • SENSUS; WWW.SENSUS.COM • CARLTON METER; WWW.CARONMETER.COM					
PITLESS UNIT PU-1 EQUIVALENT MANUFACTURERS: • MERRILL MANUFACTURING; MERRILLMFG.COM • MAASS MIDWEST, INC; MASSMIDWEST.COM					

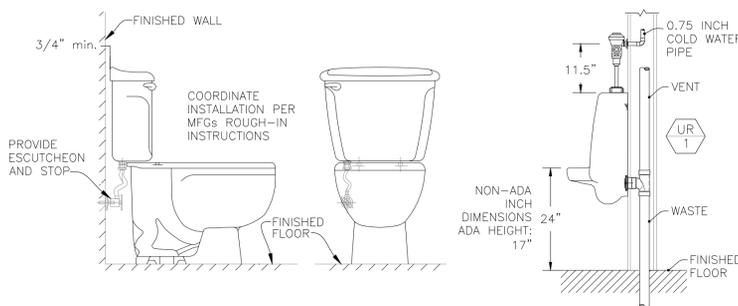
EMERGENCY WASH FIXTURE SCHEDULE					
TAG	MODEL	DESCRIPTION	CONNECTIONS	REMARK	NOTES
ES 1	BRADLEY S19314EW	EYE WASH & SHOWER	1.25" IPT SUPPLY 1.25" IPT WASTE 20 GPM USAGE	PEDESTAL MOUNTED COMBO UNIT	
TMV 1	BRADLEY S19-2150	THERMOSTATIC MIXING VALVE	3/4" CW AND HW IN 1" TEPID WATER OUT	INSTALL DIAL THERMOMETER ON OUTLET	

GENERAL NOTES

1 MANUFACTURERS PROVIDED IN SCHEDULES ARE BASIS OF DESIGN. REFERENCE SPECIFICATIONS LOCATED IN PROJECT MANUAL, OR AS INDICATED IN SCHEDULE NOTES FOR ADDITIONAL APPROVED MANUFACTURERS.

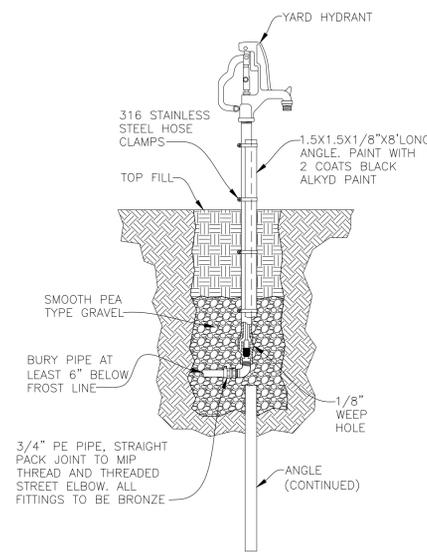


1 WATER HEATER INSTALLATION DETAIL
NO SCALE

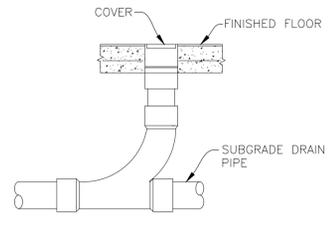


2 TANK TYPE TOILET DETAIL
NO SCALE

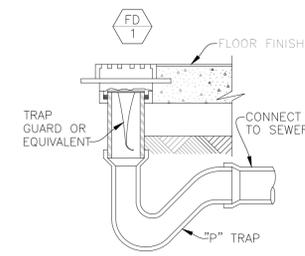
3 URINAL
NO SCALE



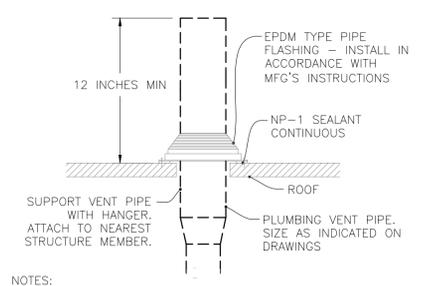
6 YARD HYDRANT DETAIL
NO SCALE



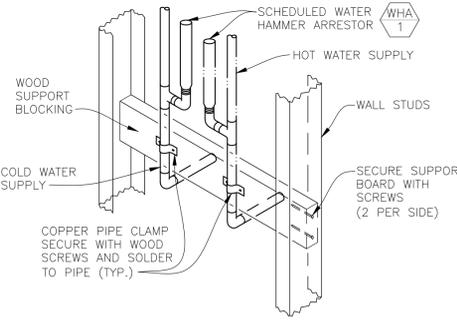
4 FLOOR CLEANOUT DETAIL
NO SCALE



5 FLOOR DRAIN DETAIL
NO SCALE



7 PLUMBING VENT THROUGH ROOF
NO SCALE



8 SINK/LAV WATER ROUGH-IN DETAIL
NO SCALE

TOILET SCHEDULE					
TAG	MODEL	DESCRIPTION	CONNECTIONS	REMARK	NOTES
WC 1	ZURN Z5552-K	WATER CLOSET W/TANK	3 INCH WASTE 0.5 INCH SUPPLY	SIPHON JET TOILET, 1.6 GPF, ELONGATED 3" TANK TYPE FLUSH VALVE.	1,2,3
WC 2	ZURN Z5551-K	WATER CLOSET W/TANK	3 INCH WASTE 0.5 INCH SUPPLY	SIPHON JET TOILET, 1.6 GPF, ELONGATED 3" TANK TYPE FLUSH VALVE.	1,2,3
NOTES					
1	Z5955-SS-EL-AM	TOILET SEAT SPLIT FRONT	SS BOLTS TO TOILET	MFG: ZURN, OPEN FRONT ELONGATED, STANDARD WHITE, LESS COVER, W/SS CHECK HINGE, ANTI-MICROBIAL PROTECTION.	
2	PROVIDE: CLOSET BOLTS, WAX RING, BRAIDED SUPPLY, 1/4 TURN STOP VALVE				
3	ANY SUBSTITUTION SHALL REQUIRE SIPHON-JET TYPE FLUSH DESIGN				

URINAL SCHEDULE					
TAG	MFG/MODEL	DESCRIPTION	CONNECTIONS	REMARK	NOTES
UR 1	ZURN Z5758.207.00	URINAL WITH FLUSHVALVE	2" WASTE 3/4" TOP SPUD 3/4" WATER	VITREOUS CHINA URINAL, 1/8 GPF WASHOUT FLUSHING, STANDARD RIM 17 INCHES TO RIM: ADA, 24" NON-ADA	1,2
NOTES					
1	MOUNT URINAL ON WALL WITH WALL HANGER				
2	ZURN Z6003AV-ULF	MANUAL FLUSH VALVE	3/4" WATER 3/4" OUTLET	CHROME PLATED, TPE CHLORAMINE RESISTANT DIAPHRAGM	

LAVATORY SCHEDULE					
TAG	MODEL	DESCRIPTION	CONNECTIONS	REMARK	NOTES
L 1	ZURN Z5344	LAVATORY, WALL HUNG	1.25 INCH WASTE 3-HOLE FOR FAUCET FRONT OVERFLOW	20X18" AND 6.375" DEEP VITREOUS CHINA	1,2,3,4
NOTES					
1	ZURN Z812B4-XL-21F	FAUCET, CENTERSET GOOSENECK	0.5 INCH COLD/HOT 4" CENTERSET WATER	WITH 1.0 GPM FEMALE LAMINAR FLOW OUTLET CERAMIC DISK CARTRIDGES, CHROME FINISH, 4" WRIST BLADE HANDLES	
3	PROVIDE: Z8743 DRAIN, Z8400-PC PTRAP, W/CLEAN-OUT				
4	ZURN Z8946-3	PIPE PROTECTOR	PVC STRAP	COMBINATION KIT: (1) TRAP, (2) STOP SUPPLY PROTECTORS AND (1) OFFSET DRAIN PROTECTOR	

SINK SCHEDULE					
TAG	MODEL	DESCRIPTION	CONNECTIONS	REMARK	NOTES
S 1	ELKAY LR3321	DOUBLE BOWL SINK	33" Lx21" D OVERALL 3 - 1/2" DRAIN 7.7/8" DEEP	#18 GAUGE 304 STAINLESS STEEL THREE HOLE, WITH STRAINER SIDE AND BOTTOM SOUND DEADENING PADS	1,2
MS 1	Z-1996-24-SF	MOP SINK	0.5" COLD WATER 0.5" HOT WATER 3" WASTE	MFG: ZURN, BASIN/FLOOR SINK -SF INDICATES SERVICE, FAUCET INCLUDED, 24"x24"x10"	
NOTES					
1	ZURN B1310LF	FAUCET, SINK	0.5 INCH COLD/HOT WATER	MFG: DELTA, SINGLE HANDLE CHROME FINISH	
2	PROVIDE: Z8743 DRAIN, Z8400-PC PTRAP, W/CLEAN-OUT				

VALVE SCHEDULE					
TAG	MODEL	DESCRIPTION	CONNECTIONS	REMARK	NOTES
BFP 1	WATTS LF009-QT-5-U	RPZ TYPE BACKFLOW PREVENTER	1" SIZE	LEAD FREE CONSTRUCTION QUARTER TURN BALL VALVES AND UNION CONNECTIONS PROVIDE WITH STRAINER	
IMB 1	SIoux CHIEF 696-1010MF	VALVE, ICE MAKER OUTLET BOX	0.5" MPT-FSWT	VALVE: ICE MAKER OUTLET BOX WITH BALL VALVE AND AIR CUSHION HAMMER ARRESTER.	
WHA 1	SIoux CHIEF 652-AS	WATER HAMMER ARRESTER	VARIOUS 1/2"-2" SWEAT	WATER HAMMER ARRESTOR (AIR CUSHION)	
WH 1	ZURN Z1321-C	HOSE BIBB (WALL HYDRANT)	3/4" COLD WATER	HOSE BIBB (WALL HYDRANT): ECOLOTROL, KEY OPERATED, ENCASED, NON-FREEZE, ANTI-SIPHON, AUTO DRAINING	
YH 1	ZURN Z1396	YARD HYDRANT	3/4" CONNECTION	3 FT BURY DEPTH, CAST IRON HEAD AUTO DRAINING. PROVIDE WITH VACUUM BREAKER	

DRAIN WASTE AND VENT SCHEDULE					
TAG	MODEL	DESCRIPTION	CONNECTIONS	REMARKS	NOTES
FD 1	ZURN EZ5	PVC FLOOR DRAIN WITH 5" STRAINER	SEE PLANS FOR PIPE SIZE	NICKEL BRONZE STRAINER, CONCRETE SHIELD ADJUSTABLE STRAINER HEIGHT, SHIMS FOR TILT CORRECTION, AND PVC SOCKET PIPE CONNECTION	1
FS 1	ZURN Z1902	FLOOR SINK 12"x12" TOP 10" DEEP	SEE PLANS FOR PIPE SIZE	CAST IRON BODY, WHITE ACID RESISTANT PORCELAIN ENAMEL INTERIOR AND TOP, WHITE ABS ANTI-SPLASH DOME STRAINER, NO HUB CONNECTION	1
FCO 1	ZURN EZC	FLOOR CLEANOUT	SEE PLANS FOR PIPE SIZE	PVC BODY, NICKEL BRONZE TOP (ROUND), SOCKET PIPE CONNECTION, WITH CONCRETE SHIELD, SHIMS FOR TILT CORRECTION.	1
NOTES					
1	PROVIDE WITH PREVENT TRAP GUARD, OR EQUIVALENT				

WATER SOFTENER SCHEDULE					
MARK	MFG/MODEL	DESCRIPTION	CONNECTIONS	SPECIFICATION	NOTES
WS 1	CULLIGAN CTM-60	WATER SOFTENER	1.5" WATER 120VAC 1.5" DRAIN	WATER SOFTENER PROVIDE WITH 24" x 40" HIGH BRINE TANK	

DRINKING FOUNTAIN SCHEDULE					
TAG	MODEL	DESCRIPTION	CONNECTIONS	REMARK	NOTES
EWC 1	ELKAY LZSTL8WSLP	ELECTRIC WATER COOLER	1.5" SCH.40 WASTE 3/8" COLD WATER	DRINKING FOUNTAIN, TWO STATION WITH BOTTLE FILLER LIGHT GRAY GRANITE FINISH, 8 GPH, FLA=5, 120VAC	

HOT WATER CIRCULATION PUMP SCHEDULE					
TAG	MFG/MODEL	DESCRIPTION	CONNECTIONS	REMARK	NOTES
CP 1	NBF-12U	CIRC. PUMP	UNION	MFG: BELL & GOSSETT PROVIDE WITH TC-1 AUTOMATIC TIMER KIT	



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OFFICE OF ADMINISTRATION
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DESIGN AND CONSTRUCTION

MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
SITE# 6026
ASSET# 8136026001

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: 08/30/2019

CAD DWG FILE: M-101
DRAWN BY: TJS
CHECKED BY: JLD
DESIGNED BY: TJS

SHEET TITLE:
**CLASSROOM
MECHANICAL
HVAC PLAN**

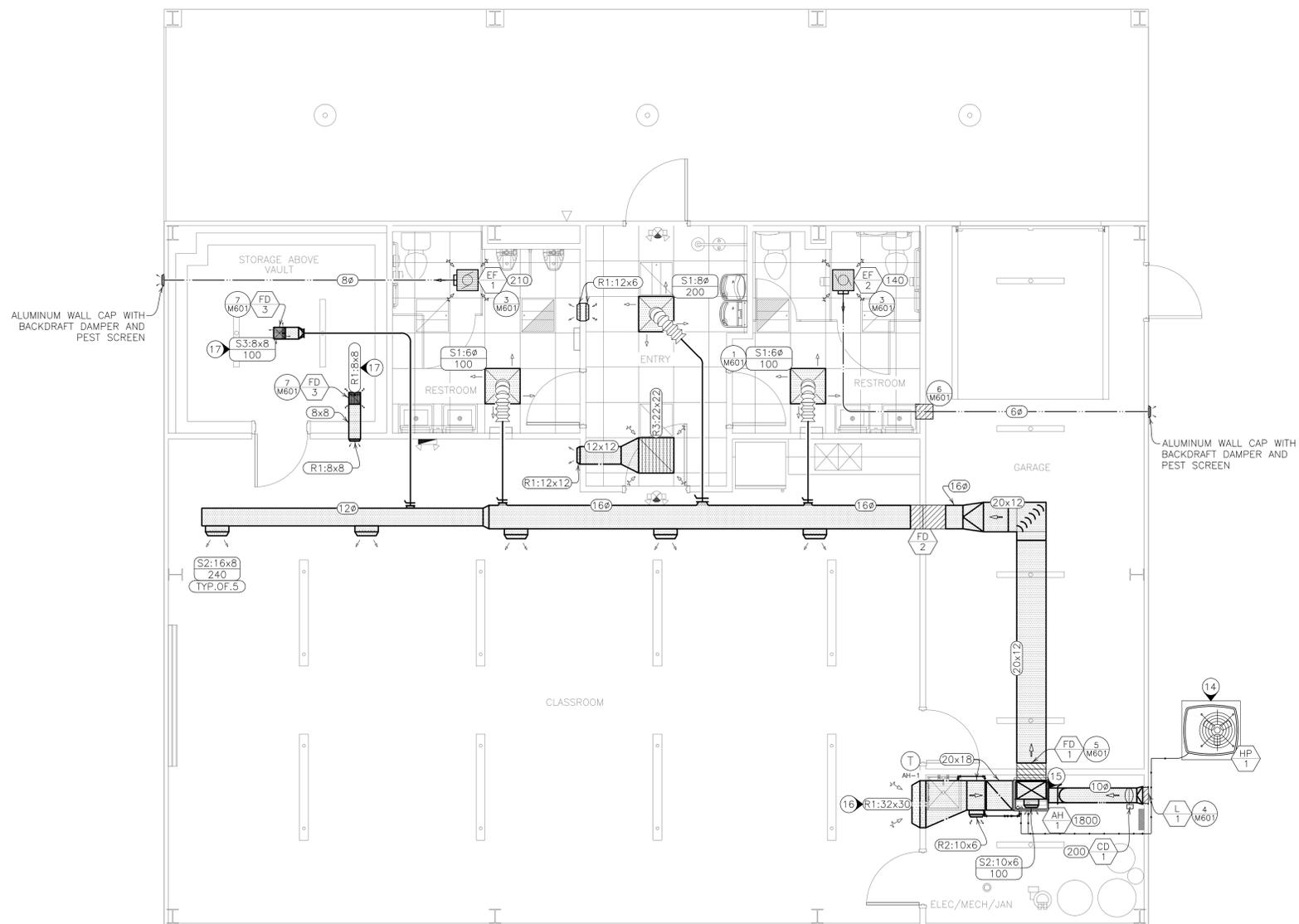
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M-101

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08/30/2019

HVAC LEGEND

(T)	THERMOSTAT	—	HVAC EQUIPMENT
←	DIRECTION OF FLOW	—	SUPPLY AIR
AA N	DEVICE SCHEDULE TAG	—	RETURN AIR
(N LNN)	DETAIL REFERENCE, NUMBER/SHEET	—	EXHAUST AIR
(S1:6ø 50)	SUPPLY AIR DEVICE: SIZE (INCHES)/CFM	—	OUTSIDE AIR
(R1:18x30)	RETURN AIR DEVICE: SIZE (INCHES)	—	REFRIGERANT PIPE
(12x12)	DUCT SIZE (INCHES)	—	CONDENSATE DRAIN PIPE
(3500)	AIR FLOW (CUBIC FEET PER MINUTE)	—	DUCT TAKEOFF AND BALANCE DAMPER
(TYP.OF.2)	TYPICAL OF 2 LIKE DEVICES THIS GROUP	—	BALANCE DAMPER



NOTES

- FABRICATION, INSTALLATION AND TESTING OF ALL HVAC SYSTEMS SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL MECHANICAL CODE, ALL STATE AND LOCAL CODES, AND ALL MANUFACTURER INSTALLATION GUIDELINES.
- ALL METALLIC AND FLEXIBLE DUCTS SHALL BE CONSTRUCTED AND INSTALLED AS SPECIFIED IN THE IMC AND SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
- DUCT HAS BEEN DESIGNED TO FIT IN THE SPACE AVAILABLE AND TO AVOID CONFLICTS. CONTRACTOR SHALL FIELD VERIFY FOR ANY UNFORESEEN CONFLICTS PRIOR TO FABRICATING DUCT. CONTRACTOR SHALL COORDINATE WITH OTHER DISCIPLINES TO ENSURE ADEQUATE SPACE IS AVAILABLE FOR DUCT. IF DUCT IS ROUTED ABOVE OTHER FIT, COORDINATE ELEVATION OF EACH DUCT PRIOR TO INSTALLATION TO ENSURE IT WILL FIT IN THE SPACE AVAILABLE. DESIGN INSULATION THICKNESS IS 1.5 INCH.
- COORDINATE WITH ELECTRICAL CONTRACTOR TO PROVIDE AND INSTALL ALL LINE VOLTAGE WIRING AND CONDUIT. MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL LOW VOLTAGE WIRING FOR MECHANICAL SYSTEMS. COORDINATE WITH ELECTRICAL CONTRACTOR TO PROVIDE AND INSTALL ALL CONDUIT FOR LOW VOLTAGE WIRING.
- TEST ALL EQUIPMENT FOR PROPER OPERATION. PROVIDE OPERATION MANUALS AND AS-BUILT DRAWINGS TO THE ENGINEER WITHIN 10 DAYS OF SYSTEM ACCEPTANCE.
- CERTIFIED TESTING, ADJUSTING, AND BALANCING CONTRACTOR SHALL TEST AND BALANCE ALL SYSTEMS TO SPECIFIED VALUES AND PREPARE A BALANCE REPORT. REPORT SHALL BE SENT TO THE ENGINEER FOR APPROVAL PRIOR TO FINAL COMPLETION. BALANCE DAMPERS ARE REQUIRED ON ALL SUPPLY AIR DEVICES. IF DEVICE DOES NOT HAVE DAMPER MOUNTED IN NECK PER DEVICE SCHEDULE, PROVIDE DAMPER BD-1 AT BRANCH TAKE-OFF IN ACCESSIBLE LOCATION. REFERENCE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- ALL DUCTWORK WITH TWO DIMENSION <wxd> INDICATES RECTANGULAR DUCT. ALL <dø> INDICATES ROUND DUCT. DIMENSIONS ARE INCHES MEASURED INSIDE. DUCT JOINTS SHALL BE CONNECTED USING DUCTMATE 725/735/745 DUCT CONNECTOR OR EQUAL. PROVIDE STANDARD TURNING VANES OR CURVED ELBOW WITH SQUARE THROAT ON RECTANGULAR DUCTS. ROUND DUCT SHALL MAINTAIN A CENTERLINE TURNING RADIUS OF 1.5 X DUCT DIAMETER. FLEXIBLE DUCT SHALL BE 5 FEET MAXIMUM LENGTH AND BE SUPPORTED TO MINIMIZE STATIC PRESSURE DROP.
- ALL INSULATION SHALL MEET THE ASTM E 84 FLAME/SMOKE SPREAD INDEX OF 25/50 MAXIMUM. DUCT SEAMS SHALL BE SEALED.
 - SUPPLY DUCT EXPOSED IN THE CLASSROOM SHALL BE INSULATED DUAL WALL SPIRAL. INSULATION SHALL BE 1 INCH THICK WITH MINIMUM THERMAL CONDUCTANCE OF 0.25 BTU/HR/SF/F WITH VAPOR BARRIER.
 - SUPPLY DUCT IN THE STORAGE ROOM AND OUTDOOR AIR DUCT SHALL BE EXTERNALLY INSULATED WITH 1.5 INCH THICK R6 INSULATION WITH VAPOR BARRIER.
 - RETURN DUCT SHALL BE LINED WITH 1 INCH LINACOUSTIC RC BY JOHNS MANVILLE. REFERENCE SPECIFICATIONS FOR ADDITIONAL MANUFACTURERS.
 - EXHAUST DUCT INSULATION SHALL BE EXTERNAL. INSULATION SHALL BE 1 INCH THICK WITH MINIMUM THERMAL CONDUCTANCE OF 0.25 BTU/HR/SF/F WITH VAPOR BARRIER.
- PROVIDE SUITABLE SUPPORTS FOR STABILITY OF ALL HVAC DEVICES AND DUCT. AIR HANDLING EQUIPMENT SHALL BE PROVIDED WITH FLEXIBLE SUPPLY AND RETURN AIR DUCT CONNECTORS AT UNITS. AIR HANDLER RETURN DUCT CONNECTIONS ARE ON THE BOTTOM OF THE UNIT. FABRICATE A STAND FOR THE AIR HANDLER SUCH THAT THE UNIT IS NOT SUPPORTED BY THE RETURN DUCT.
- PROVIDE A TRAPPED CONDENSATE DRAIN PIPE FOR THE EVAPORATOR. CONDENSATE PIPE SHALL BE 0.75 INCH INSIDE DIAMETER SCHEDULE 40 PVC. SLOPE IN THE DIRECTION OF DISCHARGE A MINIMUM OF 1/8" PER FOOT. COORDINATE CONDENSATE DRAIN DISCHARGE LOCATION WITH PLUMBING CONTRACTOR. SEE DETAIL 2 SHEET M-601.
- INSULATE ALL REFRIGERANT PIPES WITH 0.75 INCH THICK FLEXIBLE ELASTOMERIC CELLULAR INSULATION THAT COMPLIES WITH ASTM C534 GRADE 1. THE REFRIGERANT PIPES SHALL BE SUPPORTED WITH A MAXIMUM SPAN BETWEEN HANGERS OF 5 FEET. ALL HORIZONTAL VAPOR LINES SHALL BE LEVEL. USE LONG RADIUS ELBOWS WHEREVER POSSIBLE.
- WEATHER SEAL OUTSIDE WALL REFRIGERANT PIPE PENETRATIONS. INSTALL ALUMINUM JACKET TO ANY EXTERIOR REFRIGERATE PIPE.
- ANY EXHAUST AIR DISCHARGE SHALL BE 3 FEET HIGHER THAN ANY INTAKE OPENING WITHIN 10 HORIZONTAL FEET.
- PROVIDE CONCRETE MOUNTING PAD. ENSURE PAD IS LEVEL. COORDINATE WITH GENERAL CONTRACTOR TO COMPACT SOIL UNDER PAD PRIOR TO INSTALLATION TO PREVENT SETTLING.
- ROUTE OUTDOOR AIR DUCT TO CONNECT TO RETURN DUCT LOCATED UNDER AIR HANDLER AH-1.
- MOUNT RETURN GRILLE HIGH ON WALL. ROUTE RETURN DUCT ABOVE MOP SINK. COORDINATE WITH PLUMBING CONTRACTOR TO ENSURE PROPER CLEARANCE FOR MOP SINK.
- COORDINATE WITH GENERAL CONTRACTOR TO PROVIDE OPENINGS IN CONCRETE VAULT CEILING FOR FIRE DAMPERS.

SEQUENCE OF OPERATION

AIR HANDLER AH-1 FAN SHALL OPERATE CONTINUOUSLY DURING OCCUPIED TIME PERIODS AND THE HEATING/COOLING SHALL OPERATE AS NEEDED TO MAINTAIN OCCUPIED ROOM TEMPERATURE SETPOINT. THE SYSTEM SHALL RUN INTERMITTENTLY TO MAINTAIN THE UNOCCUPIED ROOM TEMPERATURE SETPOINT. THE OUTDOOR AIR DAMPER SHALL BE CLOSED DURING UNOCCUPIED TIME PERIODS.

DE-HUMIDIFICATION CONTROL SHALL BE PROVIDED BY THERMOSTAT. COOLING SHALL BE ENABLED IF THE ROOM HUMIDITY RISES ABOVE SETPOINT. IF THE ROOM TEMPERATURE DECREASES BELOW THE COOLING SETPOINT, THE THERMOSTAT SHALL ENERGIZE THE AUXILIARY HEAT TO INCREASE THE LEAVING AIR TEMPERATURE TO MAINTAIN ROOM TEMPERATURE COOLING SETPOINT.

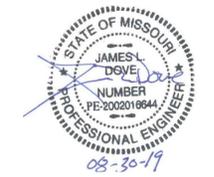
OUTDOOR AIR DAMPER CD-1 SHALL BE CONTROLLED BY A CO2 SENSOR IN THE THERMOSTAT. THE THERMOSTAT SHALL SEND A SIGNAL TO MODULATE THE OUTDOOR AIR DAMPER OPEN WITH A RISE IN CO2 CONCENTRATION. THE DAMPER SHALL ONLY OPEN ENOUGH TO KEEP CO2 LEVELS BELOW SETPOINT.

EXHAUST FANS SHALL BE ENERGIZED WITH THE LIGHTS. COORDINATE WITH ELECTRICAL CONTRACTOR.

CONTROLS CONTRACTOR SHALL TEST AND PROGRAM THERMOSTAT FOR PROPER OPERATION AND INSTRUCT OWNER IN THE PROPER USE OF THERMOSTAT.

SETPOINTS SHALL BE ADJUSTABLE. SET INITIAL VALUES AS FOLLOWS:

- COOLING OCCUPIED/UNOCCUPIED: 72°F/80°F
- HEATING OCCUPIED/UNOCCUPIED: 70°F/65°F



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MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

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HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
SITE# 6026
ASSET# 8136026001

REVISION: _____
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CHECKED BY: JLD
DESIGNED BY: TJS

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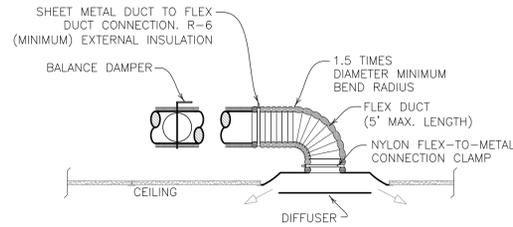
**MECHANICAL
HVAC DETAILS
AND SCHEDULES**

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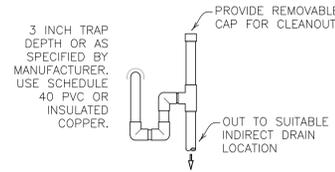
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08/30/2019

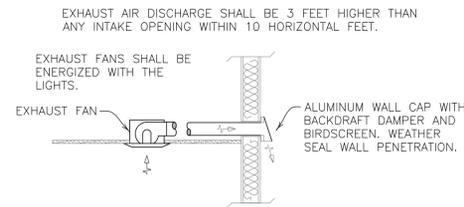
HEAT PUMP SCHEDULE								
MARK	MODEL	DESCRIPTION	EFFICIENCY	COOLING CAPACITY	HEATING CAPACITY	ELECTRICAL	LINE SIZE	NOTES
HP 1	TRANE 4TWR7 060A1	5 TON 2 STAGE	16.25 SEER 12 EER	TC: 54.24 MBh SC: 41.42 MBh EAT: 77/64°F	54.5 MBh 70°F EAT 47°F OUTDOOR TEMP	240V 1 PHASE SEE ELECTRICAL PLANS FOR REQUIREMENTS	1-1/8" SUCTION LINE 3/8" LIQUID LINE	1
NOTES								
1	PROVIDE LOW AMBIENT CONTROLS, SIGHT GLASS, LIQUID LINE DRYER, INSULATE REFRIGERANT LINES.							



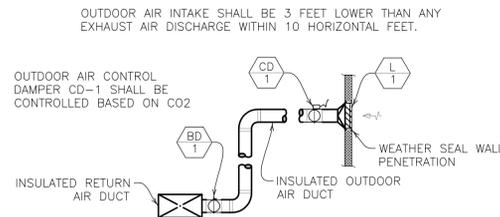
1 BRANCH DUCT AND DIFFUSER (TYPICAL)
NO SCALE



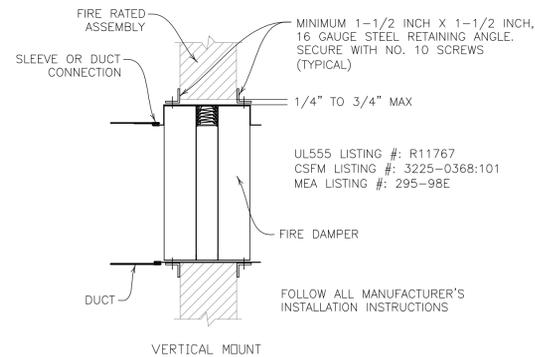
2 EVAPORATOR CONDENSATE TRAP
NO SCALE



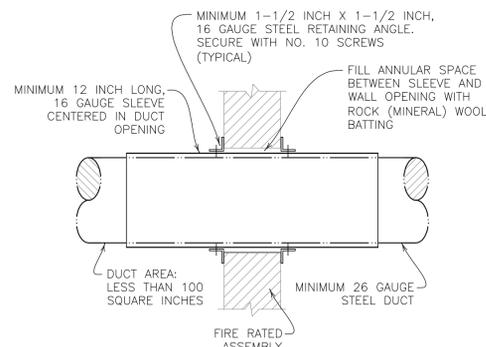
3 TOILET EXHAUST SYSTEM
NO SCALE



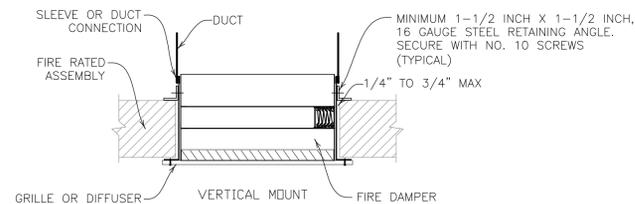
4 OUTDOOR AIR INTAKE
NO SCALE



5 TYPICAL VERTICAL FIRE DAMPER INSTALLATION
NO SCALE



6 DUCT THROUGH FIRE RATED ASSEMBLY WITHOUT DAMPER
NO SCALE



7 TYPICAL HORIZONTAL FIRE DAMPER INSTALLATION
NO SCALE

AIR HANDLER SCHEDULE						
TAG	MODEL	DESC.	AIRFLOW	AUXILIARY HEAT	ELECTRIC	NOTES
AH 1	TRANE TEM6A0C 60H51	AIR HANDLER W/ELECTRIC BACKUP HEAT	SUPPLY: 1800 CFM ESP: 0.7 IN WG OA: 200 CFM	STAGE 1: 9.6 KW STAGE 2: 14.4 KW	240V 1 PHASE SEE ELECTRICAL PLANS FOR REQUIREMENTS	1
NOTES						
1	PROVIDE SINGLE POINT WIRING KIT & MANUFACTURER'S ACCESSORY FILTER RACK					

EXHAUST FAN SCHEDULE					
TAG	MFG/MODEL	DESC.	AIRFLOW/ELECTRICAL	SPECIFICATION	NOTES
EF 1	JENCO FF200	CEILING MOUNTED EXHAUST FAN	210 CFM @ 0.125 IN WG SP 120V 1 PHASE 1.8 AMP/127 WATTS	MOTOR: DIRECT DRIVE; FAN: FORWARD CURVED CENTRIFUGAL; CASING: 20 GAUGE GALVANIZED STEEL WITH WHITE POLYMERIC GRILLE; AMCA SEAL; UL LISTING	1
EF 2	JENCO FF150	CEILING MOUNTED EXHAUST FAN	140 CFM @ 0.25 IN WG SP 120V 1 PHASE 1.3 AMP/100 WATTS	MOTOR: DIRECT DRIVE; FAN: FORWARD CURVED CENTRIFUGAL; CASING: 20 GAUGE GALVANIZED STEEL WITH WHITE POLYMERIC GRILLE; AMCA SEAL; UL LISTING	1
NOTES					
1	INCLUDES INTEGRAL BACKDRAFT DAMPER & MOUNTING BRACKETS. PROVIDE ACCESSORY SPEED CONTROL. OPERATE WITH LIGHTS. COORDINATE WITH ELECTRICAL CONTRACTOR.				
2	PROVIDE WALL CAP WITH BACKDRAFT DAMPER & BIRDSCREEN.				

DAMPER SCHEDULE					
TAG	MFG/MODEL	DIMENSIONS	DESCRIPTION	SPECIFICATION	NOTES
CD 1	POTTORFF CD-25R	10" DIAMETER	CONTROL DAMPER WITH FRAME	FRAME: 12"x20 GAGE GALVANIZED STEEL; BLADES: 14 GAGE; POLYETHYLENE; BEARINGS: SYNTHETIC. CONCEALED LINKAGE	1
BD 1	POTTORFF CD-10R	SEE PLANS FOR DUCT SIZE	BALANCE DAMPER ROUND	6 INCH WIDE, 22 GA GALVANIZED STEEL FRAME; SINGLE 22 GA GALVANIZED BLADE WITH CONTROL SHAFT & MANUAL LOCKING QUADRANT	1
NOTES					
1	PROVIDE QUADRANT STANDOFF BRACKET FOR 1.5 INCH INSULATION				
2	CONTROLS CONTRACTOR SHALL PROVIDE ACTUATOR, 18 IN-LB TORQUE				

FIRE DAMPER SCHEDULE					
TAG	MFG/MODEL	DESCRIPTION	SPECIFICATION	NOTES	
FD 1	POTTORFF VFD-10D-B	1.5 HR DYNAMIC FIRE DAMPER CURTAIN STYLE BLADE	OUT OF AIRSTREAM CURTAIN; INSTALLED VERTICAL OR HORIZONTAL; GALVANIZED STEEL 22 GAUGE FRAME & 24 GAUGE BLADE; FUSIBLE LINK 165°F	1	
FD 2	POTTORFF FD-125R	1.5 HR STATIC FIRE DAMPER ROUND BLADE	INTEGRAL 16 INCH X 20 GAUGE GALVANIZED STEEL SLEEVE; INSTALLED VERTICAL OR HORIZONTAL; 14 GAUGE BLADE; FUSIBLE LINK 165°F	2	
FD 3	POTTORFF VFD-10D-A	1.5 HR DYNAMIC FIRE DAMPER CURTAIN STYLE BLADE	IN AIRSTREAM CURTAIN; INSTALLED VERTICAL OR HORIZONTAL; GALVANIZED STEEL 22 GAUGE FRAME & 24 GAUGE BLADE; FUSIBLE LINK 165°F	3	
NOTES					
1	PROVIDE INTEGRAL 12" SLEEVE, DUCT CONNECTIONS, & RETAINING ANGLE SYSTEM (20 GAUGE)				
2	PROVIDE FACTORY MOUNTED DUCT ACCESS DOOR				
3	PROVIDE INTEGRAL 12" SLEEVE & RETAINING ANGLE SYSTEM (20 GAUGE)				
4	PROVIDE DUCT CONNECTIONS ON ONE SIDE & FLANGE FOR USE WITH GRILLE ON THE OTHER SIDE				

AIR DEVICE SCHEDULE					
TAG	MODEL	DESC.	STYLE	REMARK	NOTES
S1	SPD	SUPPLY	STEEL, WHITE, SQUARE PLAQUE DIFFUSER	RADIAL PATTERN; 24x24 MODULE; 24x24 FACE LAY-IN MOUNT	1
S2	520D	SUPPLY W/DAMPER	STEEL LOUVERED GRILLE	DOUBLE DEFLECTION; FRONT BLADES PARALLEL TO SHORT DIMENSION; SURFACE MOUNT	3
S3	520	SUPPLY	STEEL LOUVERED GRILLE	DOUBLE DEFLECTION; FRONT BLADES PARALLEL TO SHORT DIMENSION; SURFACE MOUNT	1,2
R1	535	RETURN	STEEL, WHITE LOUVERED GRILLE	FIXED BLADES; 45° DEFLECTION; 1/2" BLADE SPACING; SURFACE MOUNT	1
R2	535D	RETURN W/DAMPER	STEEL, WHITE LOUVERED GRILLE	FIXED BLADES; 45° DEFLECTION; 1/2" BLADE SPACING; SURFACE MOUNT	1
R3	535	RETURN	STEEL, WHITE LOUVERED GRILLE	FIXED BLADES; 45° DEFLECTION; 1/2" BLADE SPACING; LAY-IN MOUNT	1
NOTES					
1	MANUFACTURER: PRICE, SEE PLAN FOR SIZE				
2	PROVIDE VOLUME CONTROL DAMPER D-1 AT BRANCH TAKE OFF TO DIFFUSER. SEE DAMPER SCHEDULE.				
3	SET FRONT BLADES TO 45° DEFLECTION				

LOUVER SCHEDULE					
TAG	MFG/MODEL	DESCRIPTION	SPECIFICATION	NOTES	
L 1	POTTORFF EDD-445 12"x12"	LOUVER	MILL FINISH 6063-T5 EXTRUDED ALUMINUM; 4" DEEP FLANGE FRAME; DRAINABLE FRONT BLADES	1	
NOTES					
1	PROVIDE BIRD/PEST SCREEN AND BAKED ENAMEL FINISH. COORDINATE FINISH COLOR WITH ARCHITECT.				

HVAC CONTROL SCHEDULE					
TAG	MODEL	DESCRIPTION	REMARK	NOTES	
1	SCHNEIDER ELECTRIC SE8650USB00P	7 DAY PROGRAMMABLE CONTROLLER	COLOR TOUCH SCREEN DISPLAY; AUTO COOL/HEAT CHANGEOVER; CO2 SENSOR INPUT; OUTDOOR AIR DAMPER CONTROL; DEHUMIDIFICATION CONTROL	1	
NOTES					
1	INSTALL 60 INCHES ABOVE FINISH FLOOR				
2	PROVIDE THE FOLLOWING ACCESSORY SENSORS: OCCUPANCY, OUTDOOR AIR, RELATIVE HUMIDITY, AND CO2				
3	PROVIDE DAMPER ACTUATOR TO MODULATE OUTDOOR AIR DAMPER CD-1 OPEN ON INCREASE IN CO2				

NOTES

INDICATES KEYED NOTES

- 1 ALL EXPOSED LINE VOLTAGE WIRING SHALL BE PULLED IN PROPERLY SIZED CONDUIT (EMT) WITH APPROVED FITTINGS. ALL WIRE IS TO BE COPPER. ALL CONDUIT IS TO BE RUN NEATLY AND PARALLEL TO BUILDING LINES. INSTALL PULL BOXES ON ANY RUNS THAT REQUIRE MORE THAN 360° WORTH OF BENDS. USE OF MC CABLE IN CONCEALED AREAS OF BUILDING IS ALLOWED AND MUST BE SUPPORTED PER NEC REQUIREMENTS.
- 2 ALL LINE VOLTAGE WIRE SHALL BE TYPE THHN OR THWN, #12 COPPER OR LARGER, UNLESS OTHERWISE NOTED. ANY 20A LOADS FED FURTHER THAN 55' SHALL BE INCREASED TO A #10 COPPER CONDUCTOR.
- 3 ALL WORK SHALL BE DONE IN STRICT CONFORMANCE WITH THE LOCAL BUILDING CODES AND REGULATIONS AND CURRENT NEC. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ELECTRICAL PERMITTING FEES AND COORDINATION WITH LOCAL AUTHORITY ON INSTALLATION INSPECTIONS.
- 4 A GREEN INSULATED GROUNDING CONDUCTOR SHALL BE INSTALLED TO ALL ELECTRICAL DEVICES AND SOLIDLY CONNECTED TO THE METAL FRAME OF THE DEVICE.
- 5 ELC (ELECTRICAL CONTRACTOR) SHALL FURNISH AND INSTALL ALL LIGHTING FIXTURES AND LAMPS. SEE LIGHT FIXTURE SCHEDULE ON SHEET E-501.
- 6 COVER PLATES IN ALL AREAS SHALL BE STAINLESS STEEL. ALL DEVICES SHALL BE SPECIFICATION GRADE AND WHITE IN COLOR. COORDINATE ALL MOUNTING HEIGHTS SHOWN ARE TO CENTER LINE. ALL LIGHT SWITCHES SHOWN ON METAL OUTER WALLS ARE TO BE SURFACE MOUNTED AND 1/2" EMT RUN UP TO CEILING OR ACCESSIBLE SPACE.
- 7 ALL MOTOR CONNECTIONS ARE TO BE WITH FLEXIBLE CONDUIT, NOT TO EXCEED 6' IN LENGTH.
- 8 ALL NEW ELECTRICAL PANELS ARE TO HAVE COPPER BUSSING.
- 9 GUARANTEE ALL WORKMANSHIP AND MATERIALS FOR A MINIMUM OF ONE YEAR FROM FINAL ACCEPTANCE UNLESS OTHERWISE STATED IN CONSTRUCTION SPECIFICATIONS.
- 10 COORDINATE HEIGHT OF THIS LIGHT FIXTURE WITH THE HEIGHT OF THE GARAGE DOOR. MOUNT WITH 6" CLEAR OF DOOR.
- 11 MOUNT LIGHT FIXTURE TO CEILING AT EQUAL DISTANCES. MOUNT TO JUNCTION BOX ON UNDERSIDE OF PORCH CEILING. USE 3/4" CONDUIT FOR PENDANT, 24", AND BEND TO HAVE FIXTURE PARALLEL TO PORCH BELOW. PAINT CONDUIT TO MATCH FIXTURE COLOR.
- 12 ELC TO INSTALL A SECOND SET OF 2 FIXTURES WITH AN ADDITIONAL LIGHT SWITCH AND ROOM CONTROLLER IN STORAGE ROOM ABOVE VAULT. LAYOUT WILL BE THE SAME AS THE VAULT. SWITCH WILL BE AT 48" AFF NEXT TO VAULT LIGHT SWITCH. FIXTURES ARE NOT SHOWN FOR CLARITY.
- 13 RESTROOM EXHAUST FAN TO BE OPERATED BY MOTION DETECTOR THROUGH 2 LOAD CONTROLLER. SET DELAY TO 15 MINUTES. COORDINATE WITH OWNER.

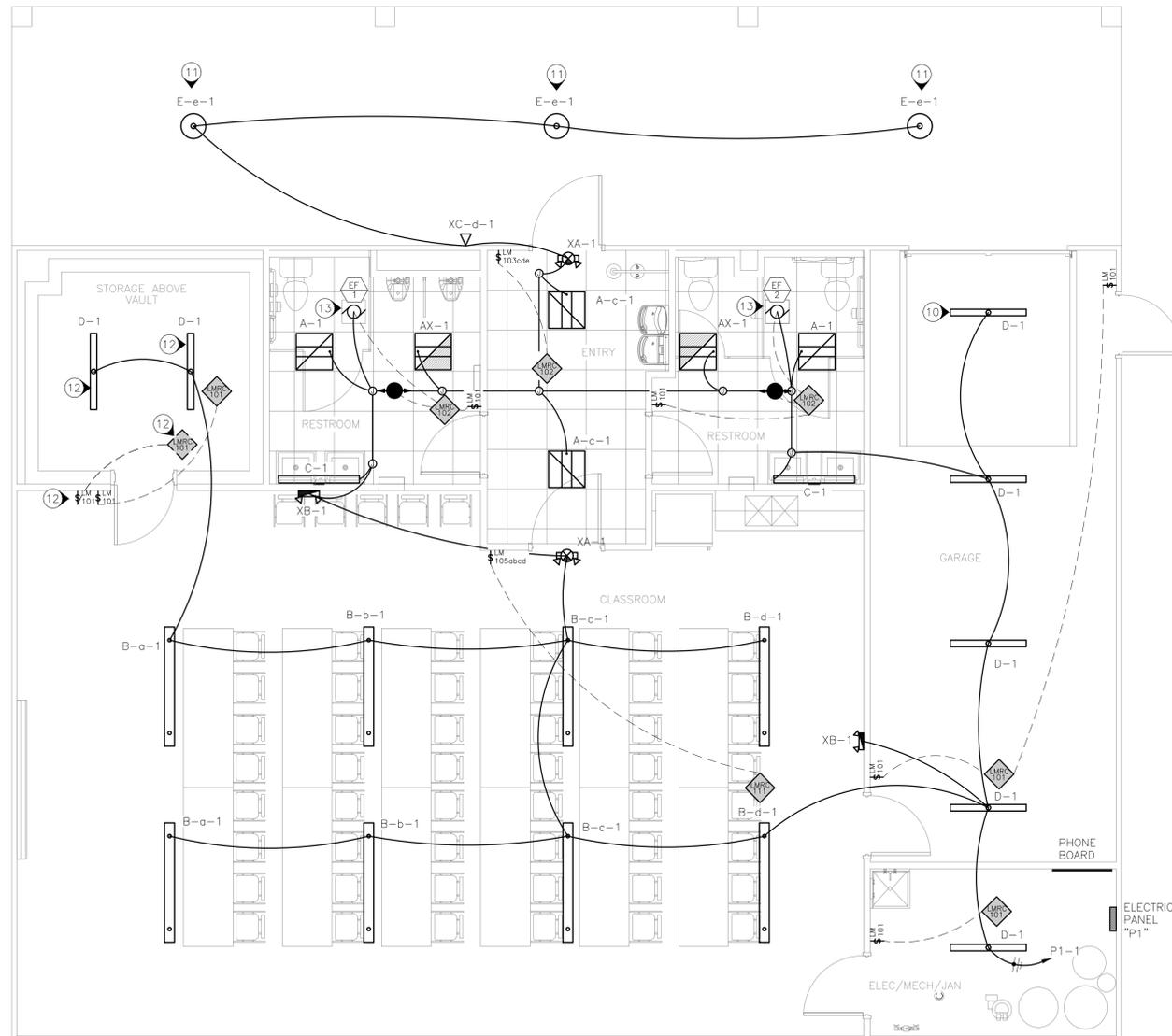
ELECTRICAL LEGEND

FIXTURE TYPE	SWITCH DESIGNATION	CIRCUIT NUMBER

WAIT STOPPER SYMBOLS

	LMSW-101 ONE BUTTON DIGITAL WALL SWITCH
	LMSW-103 THREE BUTTON DIGITAL WALL SWITCH
	LMSW-105 5-BUTTON SCENE DIGITAL DIMMING WALL SWITCH
	LMRC-101 SINGLE LOAD ROOM CONTROLLER
	LMRC-102 DUAL LOAD ROOM CONTROLLER
	LMRC-111 DIMMING ROOM CONTROLLER - SINGLE LOAD
	LMUC-100-2 OCCUPANCY SENSOR

HUBBELL, LEVITON AND LUTRON ARE 3 MANUFACTURER'S THAT MAY ALSO BE USED TO CONTROL LIGHTS



1 CLASSROOM ELECTRICAL LIGHTING PLAN
SCALE: 1/4"=1'-0"

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR



PROFESSIONAL SEAL



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OFFICE OF ADMINISTRATION
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MANAGEMENT,
DESIGN AND CONSTRUCTION

MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
SITE# 6026
ASSET# 8136026001

REVISION: _____
DATE: _____
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REVISION: _____
DATE: _____
ISSUE DATE: 08/30/2019

CAD DWG FILE: E-101
DRAWN BY: MDS
CHECKED BY: JLD
DESIGNED BY: JLD

SHEET TITLE:
**CLASSROOM
ELECTRICAL
LIGHTING PLAN**

SHEET NUMBER:

E-101

44 OF 49 SHEETS
08/30/2019



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REVISION: _____
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ISSUE DATE: 08/30/2019

CAD DWG FILE: E-501
DRAWN BY: MDS
CHECKED BY: JLD
DESIGNED BY: JLD

SHEET TITLE:
ELECTRICAL
RISER AND
DETAILS

SHEET NUMBER:

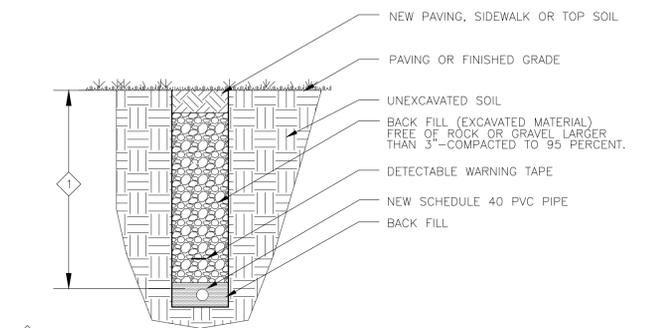
E-501

46 OF 49 SHEETS
08/30/2019

NOTES

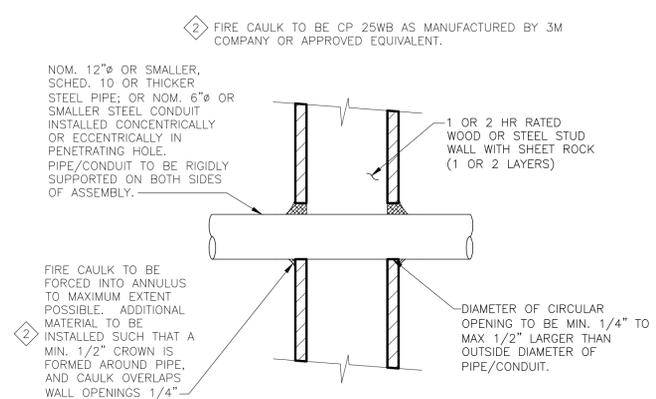
INDICATES KEYED NOTES

- 1 RUN 2" EMT UP FROM METER ENCLOSURE TO WEATHER HEAD. COORDINATE WITH AMEREN.
- 2 225A, 1Ø, 3W, 120/240V, 42 SPACE, MAIN BREAKER, COPPER BUSSING, TYPE 1 ENCLOSURE (SQ-D NQ42L2C OR EQUIVALENT—SEE SPECIFICATION SECTION 26 2416—PANELBOARDS FOR OTHER APPROVED MANUFACTURER'S).
- 3 INSTALL A #2 CU CONDUCTOR TO BUILDING METAL FRAME.
- 4 INSTALL A #2 CU GRND TO CONCRETE ENCASED ELECTRODE. NFPA 250.52-A.3 CONCRETE ENCASED ELECTRODE: AN ELECTRODE ENCASED BY AT LEAST 2 IN. OF CONCRETE, LOCATED WITHIN AND NEAR THE BOTTOM OF A CONCRETE FOUNDATION OR FOOTING THAT IS IN DIRECT CONTACT WITH THE EARTH, CONSISTING OF AT LEAST 20 FT OF ONE OR MORE BARE OR ZINC GALVANIZED OR OTHER ELECTRICALLY CONDUCTIVE COATED STEEL REINFORCING BARS OR RODS OF NOT LESS THAN 1/2 IN. IN DIAMETER, OR CONSISTING OF AT LEAST 20 FT OF BARE COPPER CONDUCTOR NOT SMALLER THAN 4 AWG. REINFORCING BARS SHALL BE PERMITTED TO BE BONDED TOGETHER BY THE USUAL STEEL TIE WIRES OR OTHER EFFECTIVE MEANS.
- 5 INSTALL #6 CU GRND W/ GROUND ROD AND ENSURE SERVICE GROUNDING IS 25 OHMS OR LESS (GROUND ROD 5/8" X 8' COPPER OR COPPER CLAD).
- 6 (2) 4/0 CU THWN, (1) 3/0 CU THWN IN (1) 2 1/2" EMT CONDUIT.

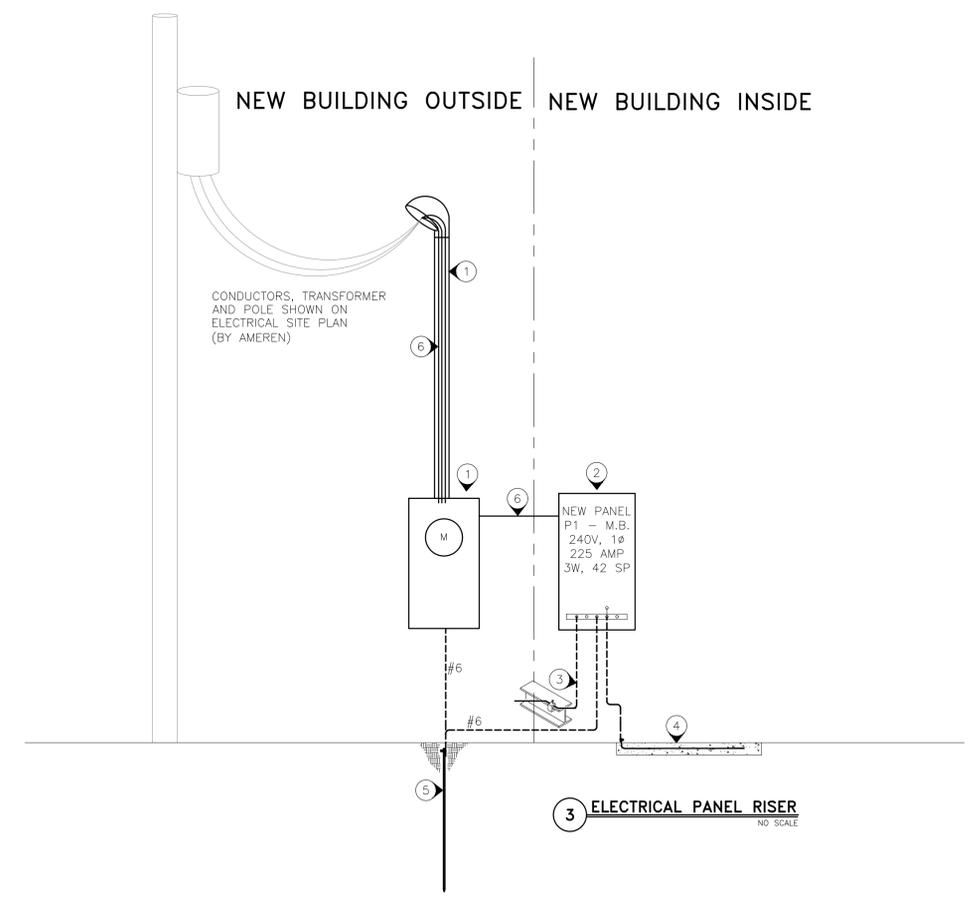


1 18" MINIMUM BELOW GRADE AND 24" MINIMUM BENEATH STREETS, ALLEYS, AND PARKING.

1 PARKING LOT LIGHTING TRENCH DETAIL
NO SCALE



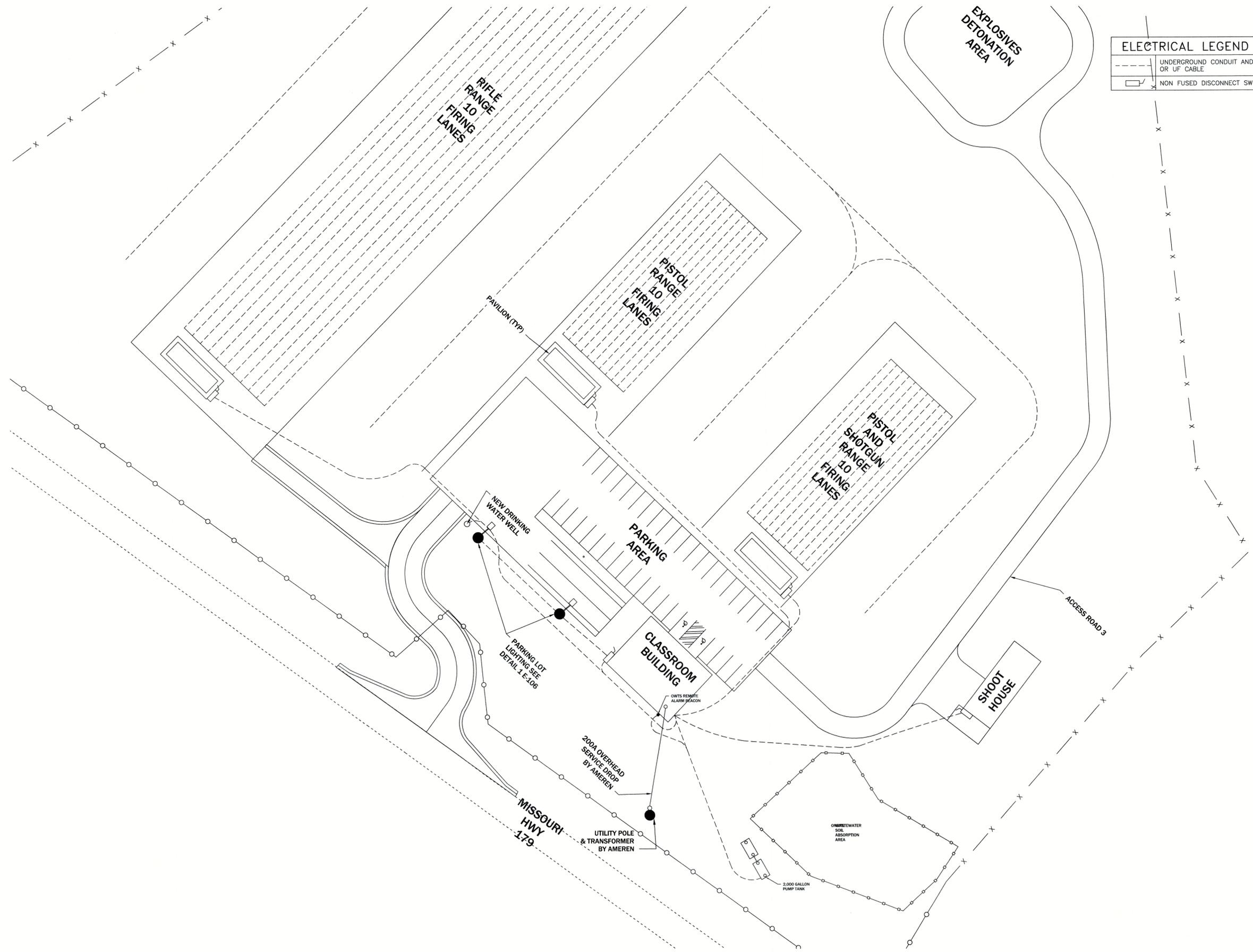
2 UNINSULATED CONDUIT THRU 1-2 HR FIRE RATED GYPSUM WALL ASSEMBLY DETAIL
U.L. SYSTEM #W-1-1085 NO SCALE



3 ELECTRICAL PANEL RISER
NO SCALE

NOTE: SEE SPECIFICATION SECTION 26 5100—INTERIOR LIGHTING FOR OTHER APPROVED MANUFACTURER'S

LIGHTING FIXTURE SCHEDULE									
FIXTURE DATA					LAMP DATA			REMARK	
	TYPE	DESCRIPTION	MANUFACTURER	CATALOG NUMBER	MTG ①	VOLTS VA	LAMP QTY	WATTS TYPE ②	
☐	A	CONTEMPORARY LED ARCHITECTURAL TROFFER	COLUMBIA LIGHTING	LCAT22-35MWG-EU	R	120 18		18W LED	WITH CURVED SHIELD
☐	AX	EMERGENCY LED ARCHITECTURAL TROFFER	COLUMBIA LIGHTING	LCAT22-35MWG-EU-ELL14	R	120 18		18W LED	WITH EMERGENCY BATTERY WITH CURVED SHIELD
—	B	PENDANT LED LINEAR DIRECT	LITECONTROL HUBBELL	6L-P-D-6'-06-SOF-C1-35K-D080-NDM-1C-UNV-FA1	W	120 41		41W LED	LIGHT CENTER LINE AT 8'-0" AFF
—	C	LYON-WALL VANITY	SPI LIGHTING	L29W-120-277V-3500K-SJB-48-A-PT02	W	120 29		29W LED	LOCATE ABOVE MIRROR COORDINATE WITH ARCHITECTURAL DRAWINGS
—	D	LED LENSED STRIP LIGHT	COLUMBIA LIGHTING	LRO-4-35-MLE-U	SC	120 53		53W LED	
⊙	E	DRIVE EDGE-LIT	BEACON HUBBELL	SRT1-35-4K8-5QW-UNV-DB	P	120 35		35W LED	HANG 18" DOWN - ELC PROVIDE 3/4" CONDUIT PAINT SAME AS FIXTURE COLOR
⊙	XA	LED LT DESIGNER COMBOUNIT/LED EXIT	DUAL LITE	LTURWI-	W	120 5	2	10W H	MOUNT ABOVE DOOR
⊙	XB	CU2 SERIES LED EMERG. LIGHT	COMPASS HUBBELL	CU2	W	120 .5	2	1W LED	MOUNT ON WALL AT 7'-6" AFF
▽	XC	CUSO SERIES LED OUTDOOR EMERG.	COMPASS HUBBELL	CUSO4DB-H-ND	W	120 32		32W LED	MOUNT ON WALL AT 8" AFF
NOTE: ①		AC - AIRCRAFT CABLE	G - GROUND	R - RECESSED	ST - STEM				
MOUNTING STYLE		C - COVE	P - POLE	S - SURFACE	W - WALL				
		CH - CHAIN HUNG	PM - PENDANT MOUNT	SC - SURFACE CEILING	U - UNIVERSAL				
NOTE: ②		CF - COMPACT FLUORESCENT	PS - PULSE START	HPS - HIGH PRESSURE SODIUM	T - TUNGSTEN				
LAMP TYPE		FL - FLUORESCENT	MH - METAL HALIDE	IN - INCANDESCENT	XEN - XENON				
		H - HALOGEN	MV - MERCURY VAPOR	LED - LIGHT EMITTING DIODE					



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MANAGEMENT,
DESIGN AND CONSTRUCTION

MISSOURI STATE
HIGHWAY PATROL

NEW OUTDOOR FIRING RANGE

MISSOURI STATE
HIGHWAY PATROL

JEFFERSON CITY, MISSOURI

PROJECT # R1806-01
SITE # 6026
FACILITY # 8136026001

REVISION: _____
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ISSUE DATE: 8/30/2019

CAD DWG FILE: MSHIP SITE ELECTRICAL
DRAWN BY: GRC
CHECKED BY: GRC
DESIGNED BY: GRC

SHEET TITLE:
SITE ELECTRICAL

SHEET NUMBER:

E-105

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8/30/2019



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CAD DWG FILE: MSHP SITE ELECTRICAL
DRAWN BY: GRC
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SHEET TITLE:
RANGE PAVILIONS ELECTRICAL

SHEET NUMBER:

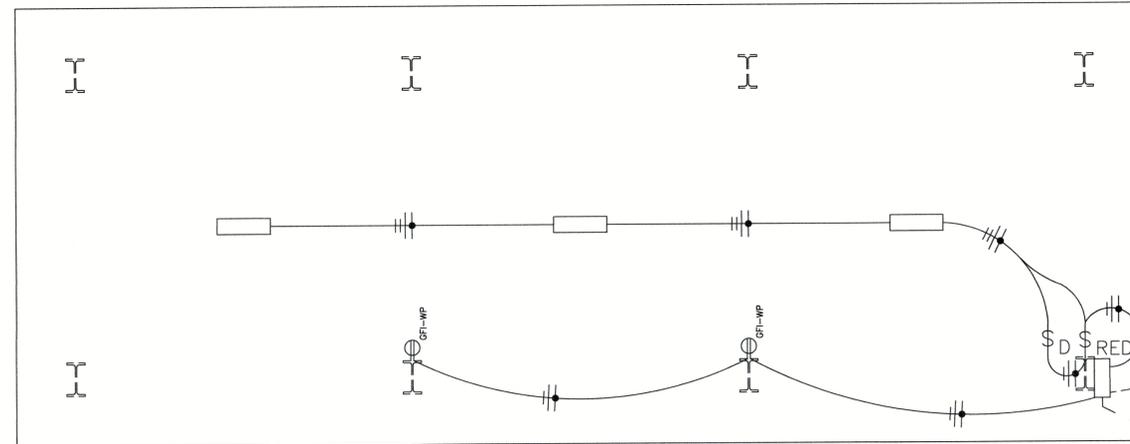
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48 OF 49 SHEETS
8/30/2019

NOTES

(N) INDICATES KEYED NOTES

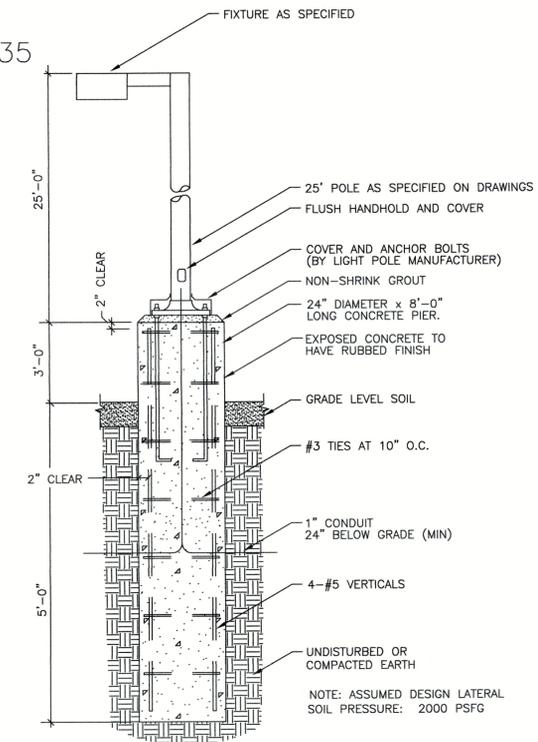
- 1 ALL EXPOSED LINE VOLTAGE WIRING SHALL BE PULLED IN PROPERLY SIZED CONDUIT WITH APPROVED FITTINGS. ALL WIRE IS TO BE COPPER. ALL CONDUIT IS TO BE RUN NEATLY AND PARALLEL TO BUILDING LINES. INSTALL PULL BOXES ON ANY RUNS THAT REQUIRE MORE THAN 360° WORTH OF BENDS. USE OF MC CABLE IN CONCEALED AREAS OF BUILDING IS ALLOWED AND MUST BE SUPPORTED PER NEC REQUIREMENTS.
- 2 ALL LINE VOLTAGE WIRE SHALL BE TYPE THHN OR THWN, #12 COPPER OR LARGER, UNLESS OTHERWISE NOTED. ANY 20A LOADS FED FURTHER THAN 55' SHALL BE INCREASED TO A #10 COPPER CONDUCTOR.
- 3 ALL WORK SHALL BE DONE IN STRICT CONFORMANCE WITH THE LOCAL BUILDING CODES AND REGULATIONS AND CURRENT NEC. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ELECTRICAL PERMITTING FEES AND COORDINATION WITH LOCAL AUTHORITY ON INSTALLATION INSPECTIONS.
- 4 A GREEN INSULATED GROUNDING CONDUCTOR SHALL BE INSTALLED TO ALL ELECTRICAL DEVICES AND SOLIDLY CONNECTED TO THE METAL FRAME OF THE DEVICE.
- 5 ELC (ELECTRICAL CONTRACTOR) SHALL FURNISH AND INSTALL ALL LIGHTING FIXTURES AND LAMPS.
- 6 COVER PLATES IN ALL AREAS SHALL BE STAINLESS STEEL. ALL DEVICES SHALL BE SPECIFICATION GRADE AND WHITE IN COLOR. COORDINATE ALL MOUNTING HEIGHTS SHOWN ARE TO CENTER LINE.
- 7 GUARANTEE ALL WORKMANSHIP AND MATERIALS FOR A MINIMUM OF ONE YEAR FROM FINAL ACCEPTANCE UNLESS OTHERWISE STATED IN CONSTRUCTION SPECIFICATIONS.
- 8 THE SWITCH FOR RED LIGHTS SHALL BE CONNECTED TO THE RED LED CONNECTION FOR ALL LIGHTS. THE DIMMER SWITCH SHALL BE CONNECTED TO THE WHITE LED CONNECTION FOR ALL LIGHTS.



RANGE PAVILIONS LIGHTING

ELECTRICAL LEGEND	
--- --	HOME RUN—SHORT STROKES INDICATE PHASE OR SWITCHED WIRES, LONG STROKE INDICATE NEUTRAL, LONG WITH DOT INDICATE GROUND
□	UNDERGROUND CONDUIT AND WIRE
⊥	NON FUSED DISCONNECT SWITCH
⊥ _{RED}	DAYLIGHT LED LIGHT FIXTURE WITH AUXILIARY RED LED LIGHTING
⊥ _{GF}	DIMMER SWITCH, STANDARD 48" AFF
⊥	SWITCH SPST, STANDARD 48" AFF
⊥	DUPLEX RECEP.— 120V GROUND FAULT TYPE

TO CLASSROOM POWER
PANEL RIFLE #31,
PISTOL #33,
PISTOL/SHOTGUN #35



1 LIGHT POLE PIER DETAIL FOR PARKING LOT FIXTURES
SCALE: NONE



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DESIGNED BY: GRC

SHEET TITLE:
**SHOOT HOUSE
ELECTRICAL**

SHEET NUMBER:

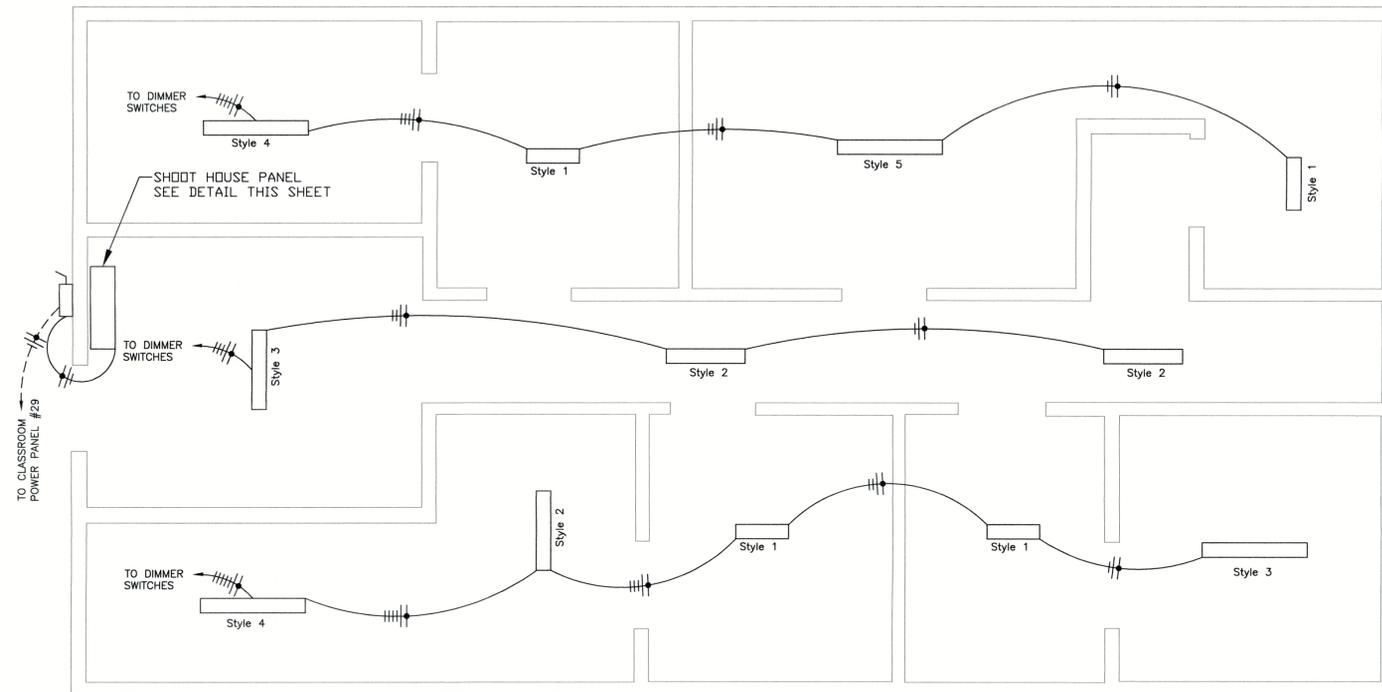
E-107

49 OF 49 SHEETS
8/30/2019

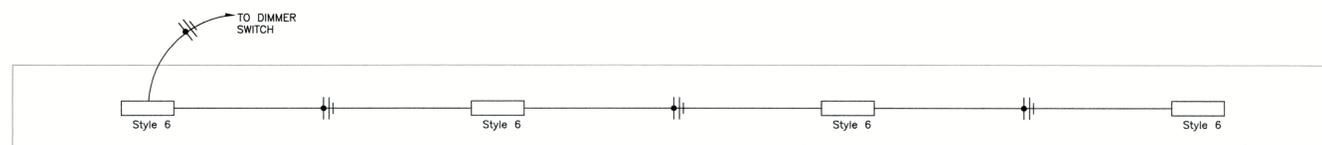
NOTES

(N) INDICATES KEYED NOTES

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- A GREEN INSULATED GROUNDING CONDUCTOR SHALL BE INSTALLED TO ALL ELECTRICAL DEVICES AND SOLIDLY CONNECTED TO THE METAL FRAME OF THE DEVICE.
- ELC (ELECTRICAL CONTRACTOR) SHALL FURNISH AND INSTALL ALL LIGHTING FIXTURES AND LAMPS.
- COVER PLATES IN ALL AREAS SHALL BE STAINLESS STEEL. ALL DEVICES SHALL BE SPECIFICATION GRADE AND WHITE IN COLOR. COORDINATE ALL MOUNTING HEIGHTS SHOWN ARE TO CENTER LINE.
- GUARANTEE ALL WORKMANSHIP AND MATERIALS FOR A MINIMUM OF ONE YEAR FROM FINAL ACCEPTANCE UNLESS OTHERWISE STATED IN CONSTRUCTION SPECIFICATIONS.
- THE MASTER SWITCH SHALL BE CONNECTED TO CONTROL ALL LIGHTS. EACH DIMMER SWITCH CONTROLS ONE LIGHT EXCEPT FOR THE CATWALK WHICH HAS ONLY ONE DIMMER FOR ALL LIGHTS. SEE SPECIFICATION FOR LIGHT STYLE MODEL NUMBERS.

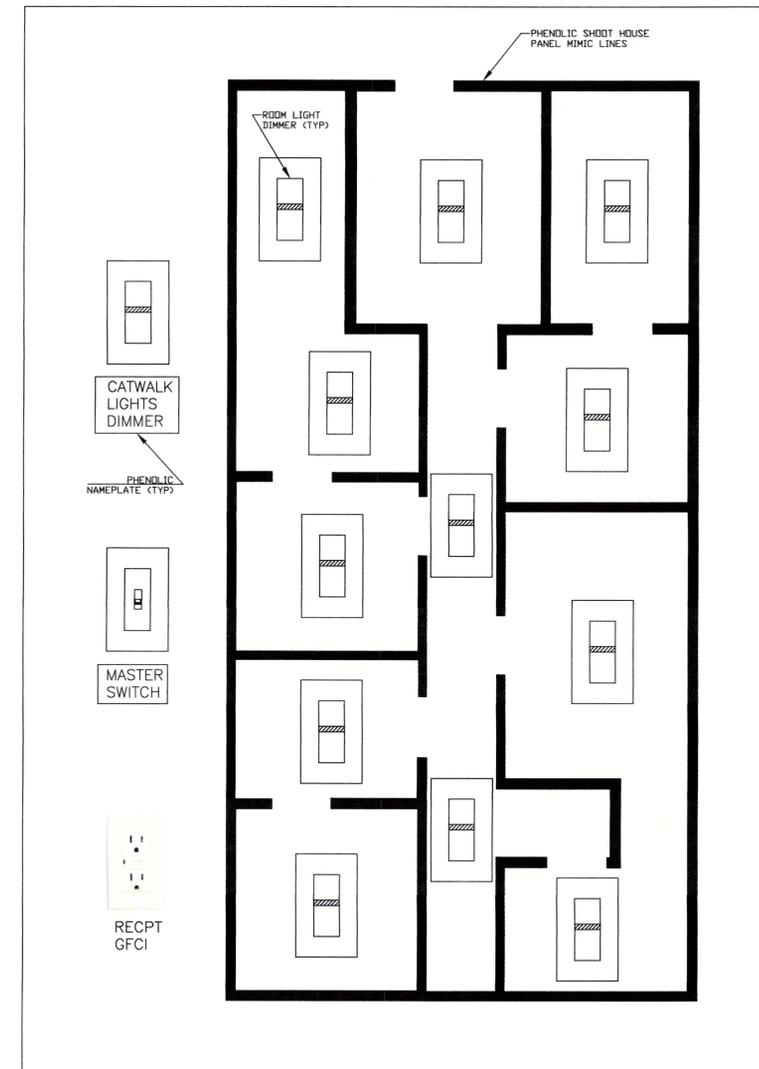


SHOOT HOUSE FLOOR LIGHTING



SHOOT HOUSE PLATFORM LIGHTING

ELECTRICAL LEGEND	
	HOME RUN—SHORT STROKES INDICATE PHASE OR SWITCHED WIRES, LONG STROKE INDICATE NEUTRAL, LONG WITH DOT INDICATE GROUND
	UNDERGROUND CONDUIT AND WIRE
	NON FUSED DISCONNECT SWITCH
	DAYLIGHT LED LIGHT FIXTURE
	DIMMER SWITCH
	DIMMER SWITCH
	MASTER SWITCH, ALL LIGHTS CONTROL
	DUPLEX RECEPT.— 120V GROUND FAULT TYPE



SHOOT HOUSE PANEL DETAIL