AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.

CALL BEFORE YOU DO OVERHEAD

1-702-227-2929

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS. IT'S COSTLY.

Call before you do UnderGround

1-702-455-6000

CLARK COUNTY TRAFFIC OPERATIONS AND

1-702-432-5300

FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you Dig

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

Call 811

1-800-227-2600 AND

CLARK COUNTY TRAFFIC OPERATIONS

1-702-455-6000

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BENCHMARK:

NLV9117NWS
NAVD 88 ELEVATION PUBLISHED 6/30/15
699.482 METERS, 2294.88 FEET
ELEVATION USED FOR THESE PLANS, PRE-REVISION
699.511 METERS, 2294.98 FEET
RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM NO. NLV9117NWS, SET IN THE TOP OF CURB, LOCATED APPROX. 29 FEET SOUTH OF THE SOUTHEAST SOUTH BCR AT THE INTERSECTION OF GRAND TETON DR. AND ALIANTE PKWY.

LEGAL DESCRIPTION:

GOVERNMENT LOTS 5, 7, 10, 12, 14, 18, 19, 21, 24, 25, & 28 THROUGH 37, INCLUSIVE, OF SECTION 18, TOGETHER WITH GOVERNMENT LOT 7 OF SECTION 19, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

BASIS OF BEARINGS:

SOUTH 87°29'39" EAST, BEING THE SOUTH LINE OF GOVERNMENT LOT 19 OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP ON FILE IN THE CLARK COUNTY RECORDER'S OFFICE, IN FILE 104, PAGE 61 OF PARCEL MAPS.

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SOUTHERN NEVADA WATER AUTHORITY — DATE

DPR# 2016-0060

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GENERAL NOTES

A. REFER TO SHEET E-01 FOR SYMBOLS AND LEGEND.
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C. CONTRACTOR SHALL COORDINATE WITH NPCO FOR LOCATION OF CONNECTION AND SERVICE PEDESTAL SHALL BE LOCATED A MINIMUM OF 30' FROM NPCO TRANSFORMER.
D. AREA'S ARE INDICATED WITH FIRST NUMBER OF THE SHEET CALLOUT I.E. E-1.0 IS AREA 1, E-2.0 IS AREA 2 AND SO FORTH TO E-9.0 WHICH IS AREA 9
E. SEE SHEET E-01 FOR POLE AND PEDESTAL DETAILS.
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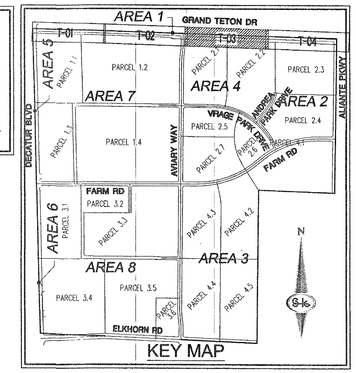

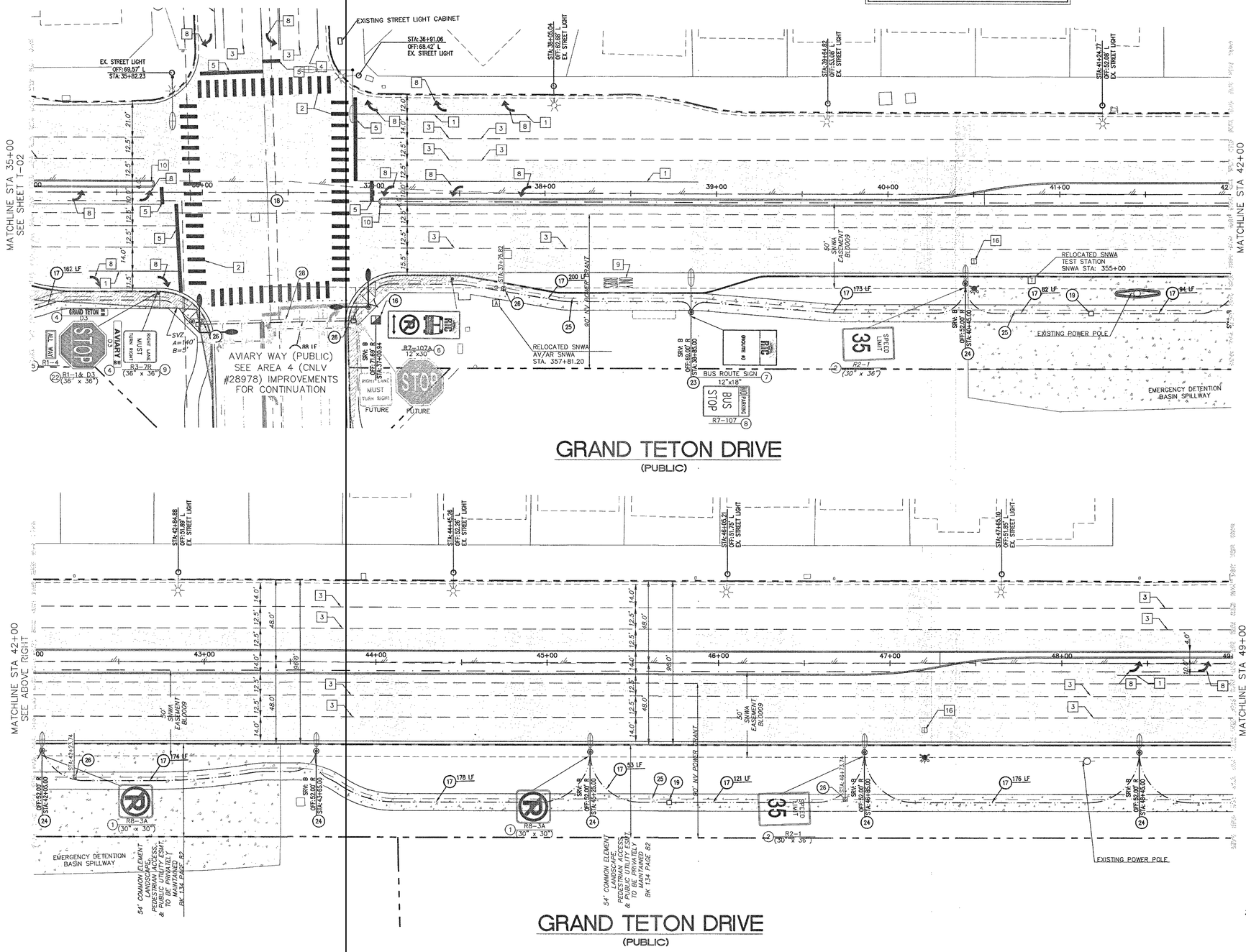

CONSTRUCTION NOTES

1. INSTALL R8-3S "NO PARKING" SIGN
2. INSTALL R2-1 "SPEED LIMIT" SIGN
3. INSTALL 1-36" R-1 STOP SIGN
4. INSTALL 2-12" D3 STREET NAME SIGN
5. INSTALL R1-4 "ALL-WAY" SIGN
6. INSTALL R7-107A SIGN WITH R.T.C. LOGO
7. INSTALL SP-1 BUS ROUTE SIGN PER USD NO. 234.3
8. INSTALL R7-107 "NO PARKING BUS STOP" SIGN
9. INSTALL R3-7R "RIGHT LANE MUST TURN RIGHT" SIGN
10. NOT USED
11. INSTALL R3-2 "NO LEFT TURN" SIGN
12. NOT USED
14. INSTALL R6-1R "ONE WAY" SIGN
15. INSTALL R5-1 "DO NOT ENTER" SIGN
16. INSTALL PAD MOUNT SERVICE PEDISTAL 125 AMP PER CCALISD 331, 332.S1, 335.S1, AND 730
17. INSTALL 2" STREET LIGHT CONDUIT WITH 2 #4 AND 1 #8 THW COPPER CONDUCTORS
18. SEE TRAFFIC SIGNAL PLANS, TS SERIES, FOR INTERSECTION LIGHTING.
19. PROVIDE #3 1/2 PULLBOX.
20. EX. SIGN
21. INSTALL W9-2L "LANE ENDS MERGE LEFT" SIGN
22. INSTALL 1 36" R1-1 FLASHING STOP SIGN
23. INSTALL STREETLIGHT PER STANDARD ON SHEET E-1 "LIGHTING FIXTURE SCHEDULE" WITH 15' MAST ARM AND FOUNDATION LOCATION PER CCALISD 320.
24. INSTALL STREETLIGHT PER STANDARD ON SHEET E-1 "LIGHTING FIXTURE SCHEDULE" WITH 8' MAST ARM AND FOUNDATION LOCATION PER CCALISD 320.
25. INSTALL 4" PVC FIBER CONDUIT A #8 GREEN CONDUCTOR AND 72 STRAND SINGLE MODE FIBER
26. INSTALL P30 PULL BOXES WITH "FIBER OPTIC" INSCRIBED ON LID; TYPE 200 SPACE VAULT SHALL BE USED WHERE TRUNK LINES MEET AT INTERSECTION.
27. CONSTRUCT 5'X25' BUS STOP PASSENGER LOADING AND SHELTER PAD PER CCALISD NO. 234.2
28. ENSURE THAT CONDUIT CROSSING WITH SNWS PIPE MEETS UTILITY SEPARATION GUIDELINE PER SNWA PLATE NO. 03-04-01

SIGN LEGEND

1. R8-3A
2. SPEED LIMIT 35 — R2-1
3. STOP — R1-1
4. GRAND TETON DR — D3
5. ALL WAY — R1-4
6. R7-107A
7. RTC (ROUTE #) — SP-1 BUS ROUTE SIGN
8. NO PARKING BUS STOP — R7-107
9. RIGHT LANE MUST TURN RIGHT — R3-7R
10. K-71 FLEXPOST BOLLARD
11. R3-2
12. BUSES EXEMPT — SP-2
14. ONE WAY — R6-1R
15. DO NOT ENTER — R5-1
21. LANE ENDS MERGE LEFT — W9-2L

STRIPING NOTES

1. INSTALL RAISED PAVEMENT MARKERS (ADDED LEFT/RIGHT TURN LANE) PER USD NO. 246
2. INSTALL TYPE 1 PAVEMENT MARKING (CROSS WALK BAR) PER USD NO. 254A
3. INSTALL RAISED PAVEMENT MARKERS (THROUGH LANES) PER USD NO. 244.1
4. INSTALL TYPE III PAVEMENT MARKING FILM (6-INCH SOLID WHITE LINE)
5. INSTALL TYPE 1 PAVEMENT MARKING FILM (STOP BAR) PER USD NO. 254A
6. INSTALL 24" CHEVRON TAPE AND RAISED PAVEMENT MARKERS PER USD NO. 245
7. NOT USED
8. INSTALL TYPE 1 PAVEMENT MARKING FILM (TURN ARROW) PER USD NO. 246
9. INSTALL TYPE 1 PAVEMENT MARKING FILM (BUSES ONLY) PER USD NO. 234.1
10. INSTALL YELLOW MEDIAN NOSE MARKING AND REFLECTIVE PAINT PER USD NO. 248
11. 8" SOLID WHITE LINE PER CC STD DWG 245
12. FUTURE STRIPING, BY OTHERS
13. EXISTING STRIPING
14. EXISTING STRIPING TO BE REPLACED
15. EXISTING STRIPING TO BE REMOVED
16. INSTALL BLUE REFLECTIVE MARKER

N

30 0 15 30 60
(IN FEET)
HOR. 1 INCH = 30 FT.

MICHAEL HUDGEONS, P.E.
CNLV TRAFFIC ENGINEER — DATE

CLV 731-98

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS

PH WEST HOLDINGS, INC.

VALLEY VISTA

AREA 1 - GRAND TETON DRIVE & RFC FACILITY
SIGNAGE AND STRIPING STA. 35+00 TO 49+00

S18 T-19S R 61E

DATE: 5/07/2018
DRAFTER: OQ/JC
DESIGNER: OQ/JC
CHECKED: DY

PROJECT NO.
SUN1403-000

PROFESSIONAL ENGINEER — STATE OF NEVADA — DERICK D. J. YORO — Exp: 08/30/2020 — CIVIL — No. 16396 — 5/7/18

T-03
SHEET 72 OF 125

CNLV PROJECT NO. 57838
CLV PROJECT NO. 60221

PRO.#:124070 AGREE.#115666 QS:124-07-SWINE,124-18-NWINE

J:\sun1403-000 grand teton replanel flood control (active)\dwg\improv\N 1594-01-1-01_04.dwg 5/7/2018 7:49 AM jane.Crotty

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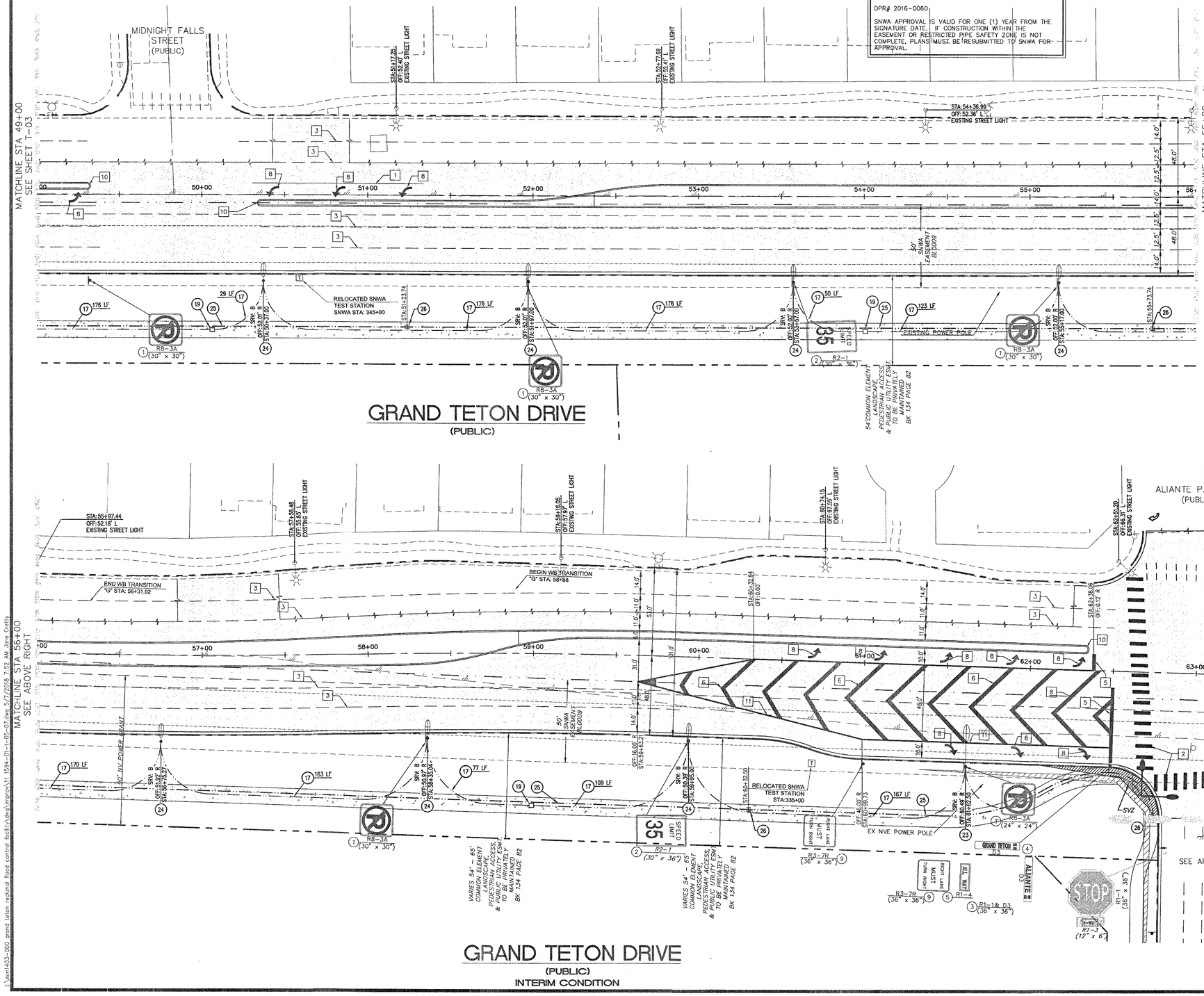
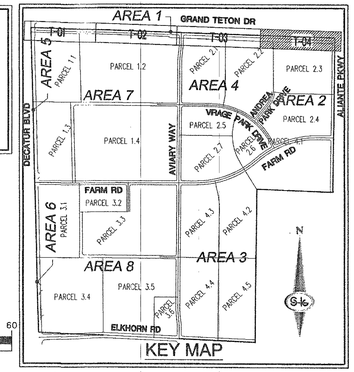


GRAND TETON DRIVE

(PUBLIC)

INTERIM CONDITION



(IN FEET)
HOR. 1 INCH = 30 FT.

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5. INSTALL R1-4 "ALL-WAY" SIGN
6. INSTALL R7-107A SIGN WITH R.T.C. LOGO
7. INSTALL SP-1 BUS ROUTE SIGN PER USD NO. 234.3
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9. INSTALL R3-7R "RIGHT LANE MUST TURN RIGHT" SIGN
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12. NOT USED
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3. STOP R1-1
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5. ALL WAY R1-4
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7. RTC (ROUTE #) SP-1 BUS ROUTE SIGN
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11. R3-2
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13. EXISTING STRIPING
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15. EXISTING STRIPING TO BE REMOVED
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APPROVAL:

MICHAEL HUDGEONS, P.E. DATE
CNLV TRAFFIC ENGINEER

CLV 731-98

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5749 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS

PH WEST HOLDINGS, INC.

VALLEY VISTA

AREA 1 - GRAND TETON DRIVE & RFC FACILITY
SIGNAGE AND STRIPING STA. 49+00 TO 64+00

S18 T19S R61E

DATE: 5/07/2018
DRAFTER: OQ/JC
DESIGNER: OQ/JC
CHECKED: DY

PROJECT NO.
SUN1403-000

REGISTERED PROFESSIONAL ENGINEER
DERICK D.J YORO
06/30/2020
CIVIL
No. 16596
STATE OF NEVADA
5/7/18

T-04
SHEET 73 OF 125

CNLV PROJECT NO. 57838
CLV PROJECT NO. 60221

PROJ#:124070 AGREE:#115666 QS:124-07-SWINE,124-18-NWINE

\\sun1403-000 grand teton regional flood control facility\data\improv\11 1594-01-1-05-07.dwg 5/7/2018 7:52 AM Jens Greby

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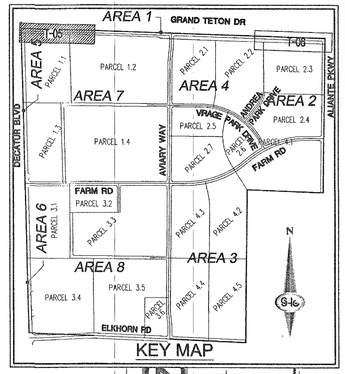
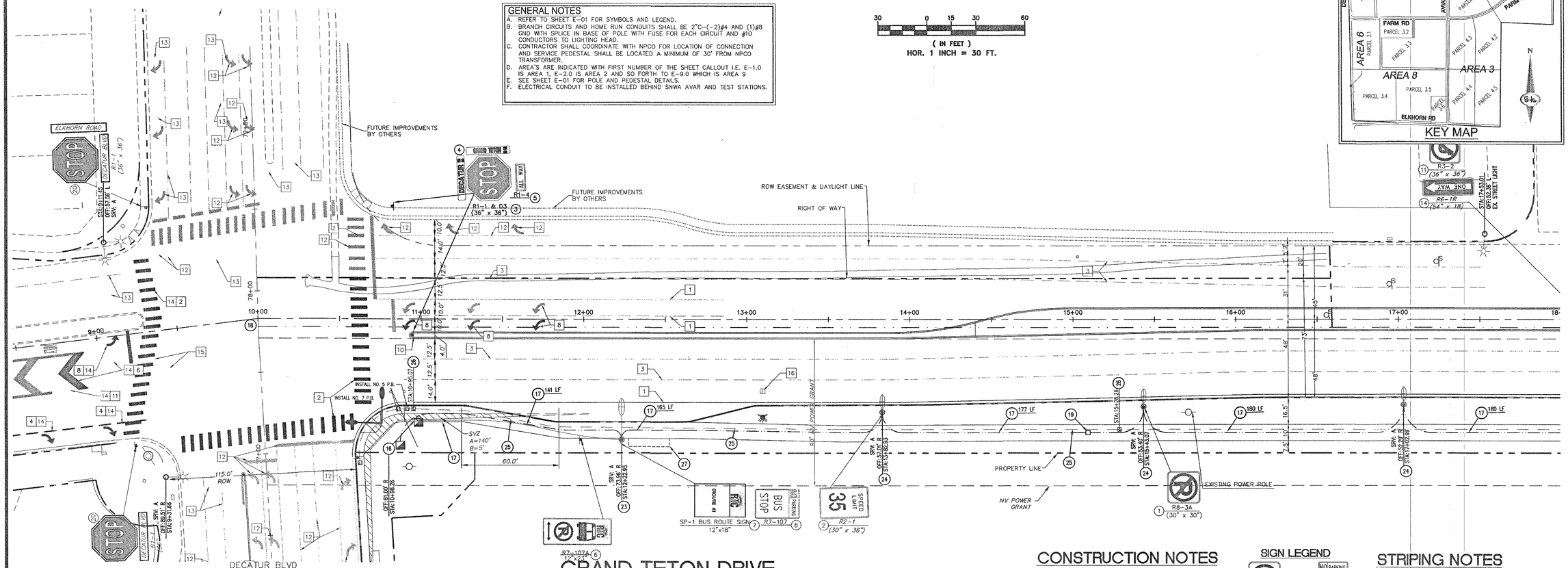
N

S-16

30 0 15 30 60

(IN FEET)
HOR. 1 INCH = 30 FT.





DECATUR BLVD
(PUBLIC)
SEE AREA 5 & 6 IMPROVEMENTS CNLV #56887
FOR CONTINUATION

GRAND TETON DRIVE
(PUBLIC)
ULTIMATE CONDITION
FOR REFERENCE ONLY

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16. INSTALL PAD MOUNT SERVICE PEDISTAL 125 AMP PER CCAUSD 331, 332.S1, 335.S1, AND 730
17. INSTALL 2" STREET LIGHT CONDUIT WITH 2 #4 AND 1 #8 THW COPPER CONDUCTORS
18. SEE TRAFFIC SIGNAL PLANS, TS SERIES, FOR INTERSECTION LIGHTING.
19. PROVIDE #3 1/2 PULLBOX.
20. EX. SIGN
21. INSTALL W9-2L "LANE ENDS MERGE LEFT" SIGN
22. INSTALL 1 36" R1-1 FLASHING STOP SIGN
23. INSTALL STREETLIGHT PER STANDARD ON SHEET E-1 "LIGHTING FIXTURE SCHEDULE" WITH 15' MAST ARM AND FOUNDATION LOCATION PER CCAUSD 320.
24. INSTALL STREETLIGHT PER STANDARD ON SHEET E-1 "LIGHTING FIXTURE SCHEDULE" WITH 8' MAST ARM AND FOUNDATION LOCATION PER CCAUSD 320.
25. INSTALL 4" PVC FIBER CONDUIT A #8 GREEN CONDUCTOR AND 72 STRAND SINGLE MODE FIBER
26. INSTALL F30 PULL BOXES WITH "FIBER OPTIC" INSCRIBED ON LID. TYPE 200 SPACE VAULT SHALL BE USED WHERE TRUNK LINES MEET AT INTERSECTION.
27. CONSTRUCT 5'X25' BUS STOP PASSENGER LOADING AND SHELTER PAD PER CCAUSD NO. 234.2
28. ENSURE THAT CONDUIT CROSSING WITH SNWS PIPE MEETS UTILITY SEPARATION GUIDELINE PER SNWA PLATE NO. 03-04-01

SIGN LEGEND

1. R8-3A — NO PARKING
2. SPEED LIMIT 35 — R2-1
3. STOP — R1-1
4. GRAND TETON DR — D3
5. ALL WAY — R1-4
6. RTC — R7-107A
7. RTC (ROUTE #) — SP-1 BUS ROUTE SIGN
8. NO PARKING BUS STOP — R7-107
9. RIGHT LANE MUST TURN RIGHT — R3-7R
10. K-71 FLEXPOST BOLLARD
11. R3-2
12. BUSES EXEMPT — SP-2
14. ONE WAY — R6-1R
15. DO NOT ENTER — R5-1
21. LANE ENDS MERGE LEFT — W9-2L

STRIPING NOTES

1. INSTALL RAISED PAVEMENT MARKERS (ADDED LEFT/RIGHT TURN LANE) PER USD NO. 246
2. INSTALL TYPE I PAVEMENT MARKING (CROSS WALK BAR) PER USD NO. 254A
3. INSTALL RAISED PAVEMENT MARKERS (THROUGH LANES) PER USD NO. 244.1
4. INSTALL TYPE II PAVEMENT MARKING FILM (6-INCH SOLID WHITE LINE)
5. INSTALL TYPE I PAVEMENT MARKING FILM (STOP BAR) PER USD NO. 254A
6. INSTALL 24" CHEVRON TAPE AND RAISED PAVEMENT MARKERS PER USD NO. 245
7. NOT USED
8. INSTALL TYPE I PAVEMENT MARKING FILM (TURN ARROW) PER USD NO. 246
9. INSTALL TYPE I PAVEMENT MARKING FILM (BUSES ONLY) PER USD NO. 234.1
10. INSTALL YELLOW MEDIAN NOSE MARKING AND REFLECTIVE PAINT PER USD NO. 248
11. 8" SOLID WHITE LINE PER CC STD DWG 245
12. FUTURE STRIPING, BY OTHERS
13. EXISTING STRIPING
14. EXISTING STRIPING TO BE REPLACED
15. EXISTING STRIPING TO BE REMOVED
16. INSTALL BLUE REFLECTIVE MARKER

APPROVAL:

MICHAEL HUDGEONS, P.E. — DATE
CNLV TRAFFIC ENGINEER

CLV 731-98

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS

PH WEST HOLDINGS, INC.

VALLEY VISTA

AREA 1 - GRAND TETON DRIVE & RFC FACILITY
FUTURE SIGNAGE AND STRIPING STA. 8+50 TO 18+00

S 18
T 19S
R 61E

DATE: 5/07/2018
DRAFTER: OQ/JC
DESIGNER: OQ/JC
CHECKED: DY

PROJECT NO.
SUN1403-000

PROFESSIONAL ENGINEER - STATE OF NEVADA
DERICK D.J YORO
Exp: 06/30/2020
CIVIL
No. 16396
5/7/18

T-05
SHEET 74 OF 125

CNLV PROJECT NO. 57838
CLV PROJECT NO. 60221

PROJ.#:124070 AGREE.#115666 QS:124-07-SWINE,124-18-NWINE

J:\sun1403-000 grand teton regional flood control facility\dwg\imperial\10.1594-01-1-01_04.dwg, 5/7/2018 7:57 AM, Jose Cetty

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.

CALL BEFORE YOU DO OVERHEAD

1-702-227-2929

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS. IT'S COSTLY.

Call before you do UnderGround

1-702-455-6000
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you Dig

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

Call 811

OR

1-800-227-2600
AND
CLARK COUNTY TRAFFIC OPERATIONS
1-702-455-6000

DISCLAIMER:

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND OR OVERHEAD UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION. CONTRACTOR TO NOTIFY ENGINEER OF ANY CHANGES OR DISCREPANCIES.

BENCHMARK:

NLV9117NWS
NAVD 88 ELEVATION PUBLISHED 6/30/15
699.482 METERS, 2294.88 FEET
ELEVATION USED FOR THESE PLANS, PRE-REVISION
699.511 METERS, 2294.98 FEET
RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM NO. NLV9117NWS, SET IN THE TOP OF CURB, LOCATED APPROX. 29 FEET SOUTH OF THE SOUTHEAST SOUTH BCR AT THE INTERSECTION OF GRAND TETON DR. AND ALIANTE PKWY.

LEGAL DESCRIPTION:

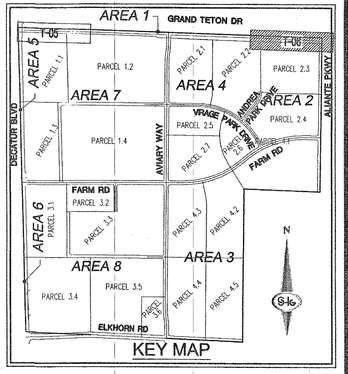
GOVERNMENT LOTS 5, 7, 10, 12, 14, 18, 19, 21, 24, 25, & 28 THROUGH 37, INCLUSIVE, OF SECTION 18, TOGETHER WITH GOVERNMENT LOT 7 OF SECTION 19, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

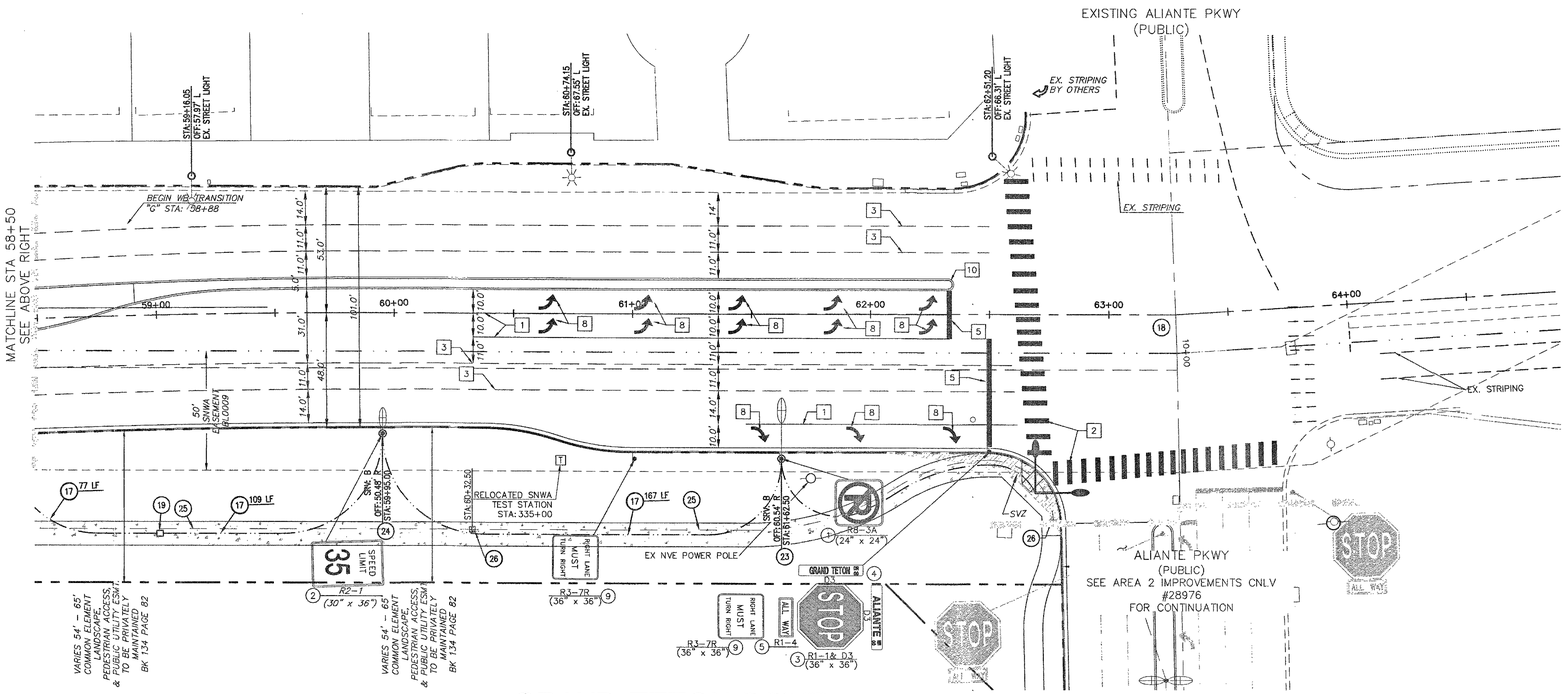
BASIS OF BEARINGS:

SOUTH 87°29'39" EAST, BEING THE SOUTH LINE OF GOVERNMENT LOT 19 OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP ON FILE IN THE CLARK COUNTY RECORDER'S OFFICE, IN FILE 104, PAGE 61 OF PARCEL MAPS.

GENERAL NOTES

A. REFER TO SHEET E-01 FOR SYMBOLS AND LEGEND.
B. BRANCH CIRCUITS AND HOME RUN CONDUITS SHALL BE 2"C-(-2)#4 AND (1)#8 GND WITH SPLICE IN BASE OF POLE WITH FUSE FOR EACH CIRCUIT AND #10 CONDUCTORS TO LIGHTING HEAD.
C. CONTRACTOR SHALL COORDINATE WITH NPCO FOR LOCATION OF CONNECTION AND SERVICE PEDESTAL SHALL BE LOCATED A MINIMUM OF 30' FROM NPCO TRANSFORMER.
D. AREA'S ARE INDICATED WITH FIRST NUMBER OF THE SHEET CALLOUT I.E. E-1.0 IS AREA 1, E-2.0 IS AREA 2 AND SO FORTH TO E-9.0 WHICH IS AREA 9
E. SEE SHEET E-01 FOR POLE AND PEDESTAL DETAILS.
F. ELECTRICAL CONDUIT TO BE INSTALLED BEHIND SNWA AVAR AND TEST STATIONS.





GRAND TETON DRIVE

(PUBLIC)
FOR REFERENCE ONLY

CONSTRUCTION NOTES

1. INSTALL R8-3S "NO PARKING" SIGN
2. INSTALL R2-1 "SPEED LIMIT" SIGN
3. INSTALL 1-36" R-1 STOP SIGN
4. INSTALL 2-12" D3 STREET NAME SIGN
5. INSTALL R1-4 "ALL-WAY" SIGN
6. INSTALL R7-107A SIGN WITH R.T.C. LOGO
7. INSTALL SP-1 BUS ROUTE SIGN PER USD NO. 234.3
8. INSTALL R7-107 "NO PARKING BUS STOP" SIGN
9. INSTALL R3-7R "RIGHT LANE MUST TURN RIGHT" SIGN
10. NOT USED
11. INSTALL R3-2 "NO LEFT TURN" SIGN
12. NOT USED
14. INSTALL R6-1R "ONE WAY" SIGN
15. INSTALL R5-1 "DO NOT ENTER" SIGN
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11. R3-2
12. BUSES EXEMPT SP-2
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21. LANE ENDS MERGE LEFT W9-2L

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SOUTHERN NEVADA WATER AUTHORITY — DATE 9/5/18

DPR# 2018-0060

SNWA APPROVAL IS VALID FOR ONE (1) YEAR FROM THE SIGNATURE DATE. IF CONSTRUCTION WITHIN THE EASEMENT OR RESTRICTED PIPE SAFETY ZONE IS NOT COMPLETE, PLANS MUST BE RESUBMITTED TO SNWA FOR APPROVAL.

STRIPING NOTES

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4. INSTALL TYPE II PAVEMENT MARKING FILM (6-INCH SOLID WHITE LINE)
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14. EXISTING STRIPING TO BE REPLACED
15. EXISTING STRIPING TO BE REMOVED
16. INSTALL BLUE REFLECTIVE MARKER

N

30 0 15 30 60

(IN FEET)
HOR. 1 INCH = 30 FT.

MICHAEL HUDGEONS, P.E. — DATE
CNLV TRAFFIC ENGINEER

CLV 731-98

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS

PH WEST HOLDINGS, INC.

VALLEY VISTA

S-18
R-61E

AREA 1 - GRAND TETON DRIVE & RFC FACILITY
FUTURE SIGNAGE AND STRIPING STA. 51+50 TO 63+27

DATE: 5/07/2018
DRAFTER: OQ/JC
DESIGNER: OQ/JC
CHECKED: DY

PROJECT NO.
SUN1403-000

DERICK D.J YORO
Exp: 06/30/2020
CIVIL
No. 16396
PROFESSIONAL ENGINEER - STATE OF NEVADA
5/7/18

T-06
SHEET 75 OF 125

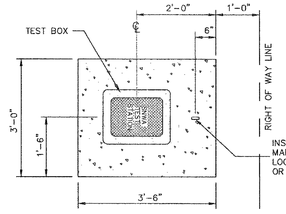
CNLV PROJECT NO. 57838
CLV PROJECT NO. 60221

PROJ.#:124070 AGREE.#115666 QS:124-07-SW/NE,124-18-NW/NE

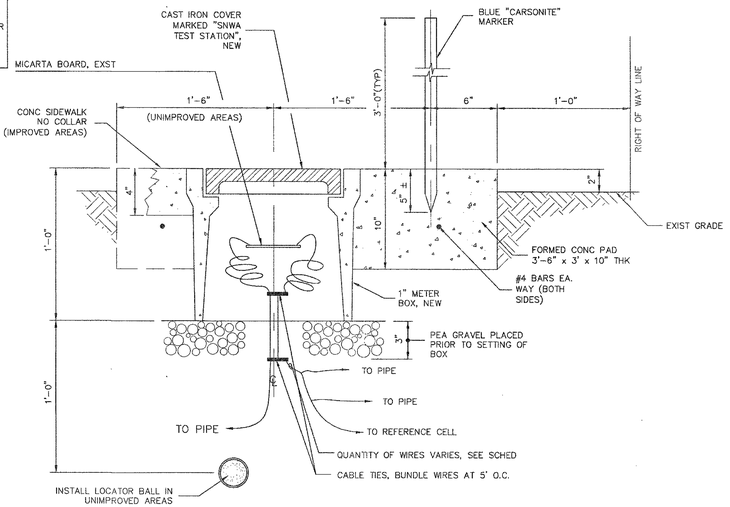
J:\sun1403-000 grand teton regional flood control facility\dwg\maprox\10 1594-01-1-01_04.dwg 5/7/2018 7:57 AM Jane Crotty

SNWA TEST STATION RELOCATION SCHEDULE

ORIGINAL CONTRACT	ORIGIINAL CONTRACT STATION	CURRENT STATION	WIRE QUANTITY, SIZE, COLOR	STREET	OFFSET DIRECTION	OFFSET DISTANCE	GROUNDING MAT, REPLACEMENT	NOTES
170-B	355+00	40+84	TWO #8 BLACK ONE #12 RED ONE #8 BLUE TWO #8 GREEN ONE #10 BLACK	GRAND TETON	SOUTH	50'	YES 12'X8'	FACILITY DESTROYED BY DPR 2004-0015E, NEVER REPLACED
170-B	345+00	50+59	TWO #8 BLACK TWO #8 GREEN ONE #14 RED ONE #8 BLUE	GRAND TETON	SOUTH	48'	YES 12'X8'	FACILITY DESTROYED BY DPR 2004-0015E, NEVER REPLACED
170-B	335+00	60+20	TWO #8 BLACK TWO #8 GREEN ONE #14 RED ONE #8 BLUE	GRAND TETON	SOUTH	60'	YES 12'X8'	FACILITY DESTROYED BY DPR 2004-0015E, NEVER REPLACED



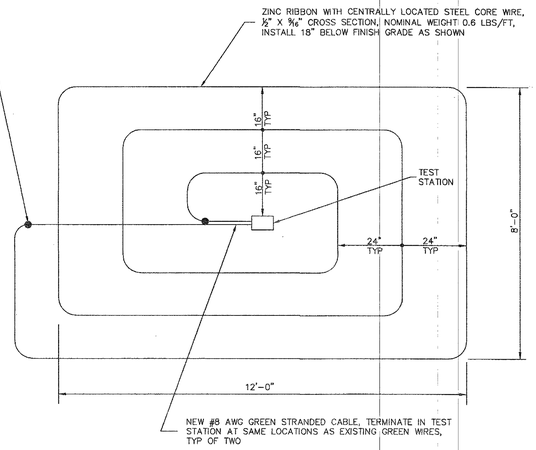
PLAN VIEW



ALL CONCRETE COLLARS TO BE FORMED 10" THICK

TEST BOX DETAIL - TYPICAL (1)

NOT TO SCALE



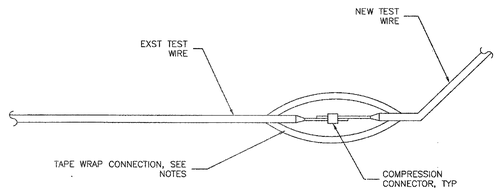
NOTES:
1. INSTALL GROUND MAT UNDER ALL TEST STATIONS WHERE INDICATED IN THE SCHEDULE
2. EMBED GROUND MAT IN 3-INCHES OF CLEAN NATIVE SOIL

TEST STATION GROUND MAT (2)

NOT TO SCALE

SNWA TEST STATION RELOCATION GENERAL NOTES

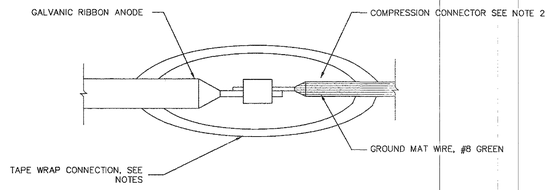
1. TEST STATION INDICATED IN SCHEDULE AS NOT FOUND DOES NOT REQUIRE RELOCATION UNLESS TEST STATION OWNER LOCATES TEST STATION AND VERIFIES TEST WIRES BEFORE GRADING BEGINS.
2. RELOCATE ALL TEST STATIONS AS INDICATED IN THE SCHEDULE. EXISTING WIRES TO BE PRESERVED AND PROTECTED. REPLACE EXISTING TEST STATION WITH NEW TEST STATION BOX, SEE DETAIL 1, THIS DRAWING.
3. EXISTING TEST WIRES DAMAGED BY CONTRACTOR TO BE REPLACED BY EXCAVATING PIPE AND REATTACHING TEST WIRE OR REPLACEMENT OF MAGNESIUM ANODE, REFERENCE ELECTRODE, OR OTHER COMPONENT ASSOCIATED WITH THE DAMAGE WIRE AT THE CONTRACTOR'S SOLE EXPENSE.
4. SALVAGE AND RETAIN TERMINAL BOARDS IN TEST STATIONS, IDENTIFY TEST WIRES BEFORE DISCONNECTING AND RESTORE TO THE SAME TERMINAL IN RELOCATED TEST STATION.
5. WIRES TO BE BURIED 3 FEET MINIMUM.
6. EXTEND WIRES TO NEW TEST STATION LOCATION BY SPLICING WIRES AS SHOWN IN DETAIL 2. THIS DRAWING, MATCH SIZE AND COLOR OF EXISTING WIRE.
7. INFORMATION ON WIRE SIZE BASED ON RECORD DRAWINGS, CONTRACTOR TO FIELD VERIFY.
8. ABANDON EXISTNG GROUNDING MATS WHERE INDICATED ON THE SCHEDULE AND INSTALL NEW GROUNDING MAT AT RELOCATED TEST STATION AS SHOWN IN DETAIL 2, THIS DRAWING. DEPTH OF GROUNDING MAT TO BE BASED ON FINAL GRADE ELEVATION.
9. GREEN WIRES IN TEST STATION ARE FOR GROUNDING MATS. ABANDON EXISTING GREEN WIRES AND PROVIDE NEW WIRES GROUNDING MAT WIRES.
10. TEST STATION BOXES TO BE BROOKS PRODUCTS BOXES TO MATCH EXISTING BOXES. CAST IRON LIDS TO BE LABELED WITH "SNWA TEST STATION"
11. TEST WIRES TO BE STRANDED COPPER WIRES WITH THHN, THWN, OR HMWPE INSULATION TO MATCH EXISTING. PROVIDE WITH INSULATION COLOR AS SPECIFIED AND TO MATCH EXISTING WIRES.
12. IN THE EVENT THAT TEST LEAD AND/OR ANODE LEAD WIRES ARE DAMAGE, NEW TEST LEAD AND/OR ANODE LEAD WIRES SHALL BE REPLACED FROM THE CONNECTION POINT AT THE PIPE AND/OR ANODE TO THE CONNECTION AT THE TEST STATION BOX.
13. ALL TEST LEAD AND ANODE TEST LEAD WIRES SHALL BE PLACED ALONG THE SIDE AND BELOW THE SPRINGLINE OF THE PIPE UNTIL BEING ROUTED INTO THE TEST STATION BOX.
14. ALL TEST LEAD AND ANODE TEST LEAD WIRES SHALL BE ENCASED IN 6 INCHES OF SAND. FOR VERTICAL RETURNS TO THE TEST STATION, ENCASED ALL TEST LEAD AND ANODE TEST LEAD WIRES IN 6 INCH PVC PIPE FILLED WITH SAND.
15. CONTINUOUSLY INSTALL RED PLASTIC MARKING TAPE 6-12 INCHES ABOVE ALL TEST LEAD AND ANODE TEST LEAD WIRES. MARKING TAPE SHALL BE IMPRINTED "CAUTION ELECTRIC LINE BURIED BELOW".
16. ALL GROUND MATS AND GALVANIC ANODES THAT HAVE BEEN EXPOSED DURING CONSTRUCTION ACTIVITIES SHALL BE REPLACED AT NO COST TO SNWA.
17. RETAIN A NACE INTERNATIONAL-CERTIFIED CATHODIC PROTECTION SPECIALIST TO DESIGN AND MONITOR THE CONSTRUCTION OF ALL CATHODIC PROTECTION FACILITIES. NACE SPECIALIST SHALL TEST AND CERTIFY THAT THE CORROSION CONTROL FACILITIES ARE CONSTRUCTED PROPERLY AND ARE FULLY FUNCTIONAL. RESULTS TO BE SUBMITTED IN WRITTING TO SNWA.
18. ALL REPAIRS, REPLACEMENTS, RELOCATIONS AND/OR EXTENSIONS MUST BE DESIGNED AND MONITORED BY A NACE INTERNATIONAL-CERTIFIED CATHODIC PROTECTION SPECIALIST AND WITNESSED AND APPROVED BY SNWA CATHODIC PROTECTION TECHNICIAN PRIOR TO ACCEPTING THE INSTALLATION. CONTRACTOR SHALL PROVIDE ALL MATERIALS FOR ALL REPAIRS, REPLACEMENTS, RELOCATIONS, AND/OR EXTENSIONS. MATERIALS PROVIDED BY CONTRACTOR SHALL BE APPROVED BY SNWA PRIOR TO ACCEPTING THE INSTALLATION.



NOTES:
1. OVERLAP WIRES AND CONNECT USING BURNDY TYPE YC COMPRESSION CONNECTOR SIZED FOR WIRES.
2. FILL VOID AND SMOOTH IRREGULARITIES WITH INSULATING PUTTY.
3. WRAP ENTIRE CONNECTION WITH TWO LAYERS OF SCOTCH 130C SELF VULCANIZING RUBBER TAPE, THEN WRAP WITH TWO LAYERS OF VINYL ELECTRICAL TAPE, SCOTCH 88.

TEST WIRE SPLICE (3)

NOT TO SCALE



WIRE INLINE SPLICE

NOTES:
1. MELT ZINC OFF IRON CORE OF RIBBON WHILE PROTECTING CORE FROM DAMAGE
2. CONNECT WIRE TO IRON CORE USING BURNDY KS OR YC TYPE COMPRESSION CONNECTOR.
3. FILL VOID AND SMOOTH IRREGULARITIES WITH INSULATING PUTTY.
4. WRAP ENTIRE CONNECTION WITH TWO LAYERS OF SCOTCH 130C SELF VULCANIZING RUBBER TAPE, THEN WRAP WITH TWO LAYERS OF VINYL ELECTRICAL TAPE, SCOTCH 88.

GALVANIC RIBBON ANODE SPLICE (4)

NOT TO SCALE

SNWA NOTE

1. SNWA FIBER OPTIC CONDUIT FOLLOWS ALONG THE SNWA PIPELINE.
2. CAUTION: SNWA TEST LEADS ARE SHALLOW.
3. ALL REPAIRS, REPLACEMENTS, RELOCATIONS AND/OR EXTENSIONS MUST BE DESIGNED AND MONITORED BY A NACE INTERNATIONAL-CERTIFIED CATHODIC PROTECTION SPECIALIST AND WITNESSED AND APPROVED BY SNWA CATHODIC PROTECTION TECHNICIAN PRIOR TO ACCEPTING THE INSTALLATION. CONTRACTOR SHALL PROVIDE ALL MATERIALS FOR ALL REPAIRS, REPLACEMENTS, RELOCATIONS, AND/OR EXTENSIONS. MATERIALS PROVIDED BY CONTRACTOR SHALL BE APPROVED BY SNWA PRIOR TO ACCEPTING THE INSTALLATION.

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SOUTHERN NEVADA WATER AUTHORITY — DATE 9/5/18

DPR# 2016-0060

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CLV 731-98

SLATER HANIFAN GROUP
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PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS

PH WEST HOLDINGS, INC.

AREA 1 - GRAND TETON DRIVE & RFC FACILITY

SNWA WATERLINE CATHODIC PROTECTION RELOCATION

S18 T19S R61E

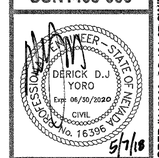
DATE: 5/07/2018

DRAFTER: OQ/JC

DESIGNER: OQ/JC

CHECKED: DY

PROJECT NO. SUN1403-000



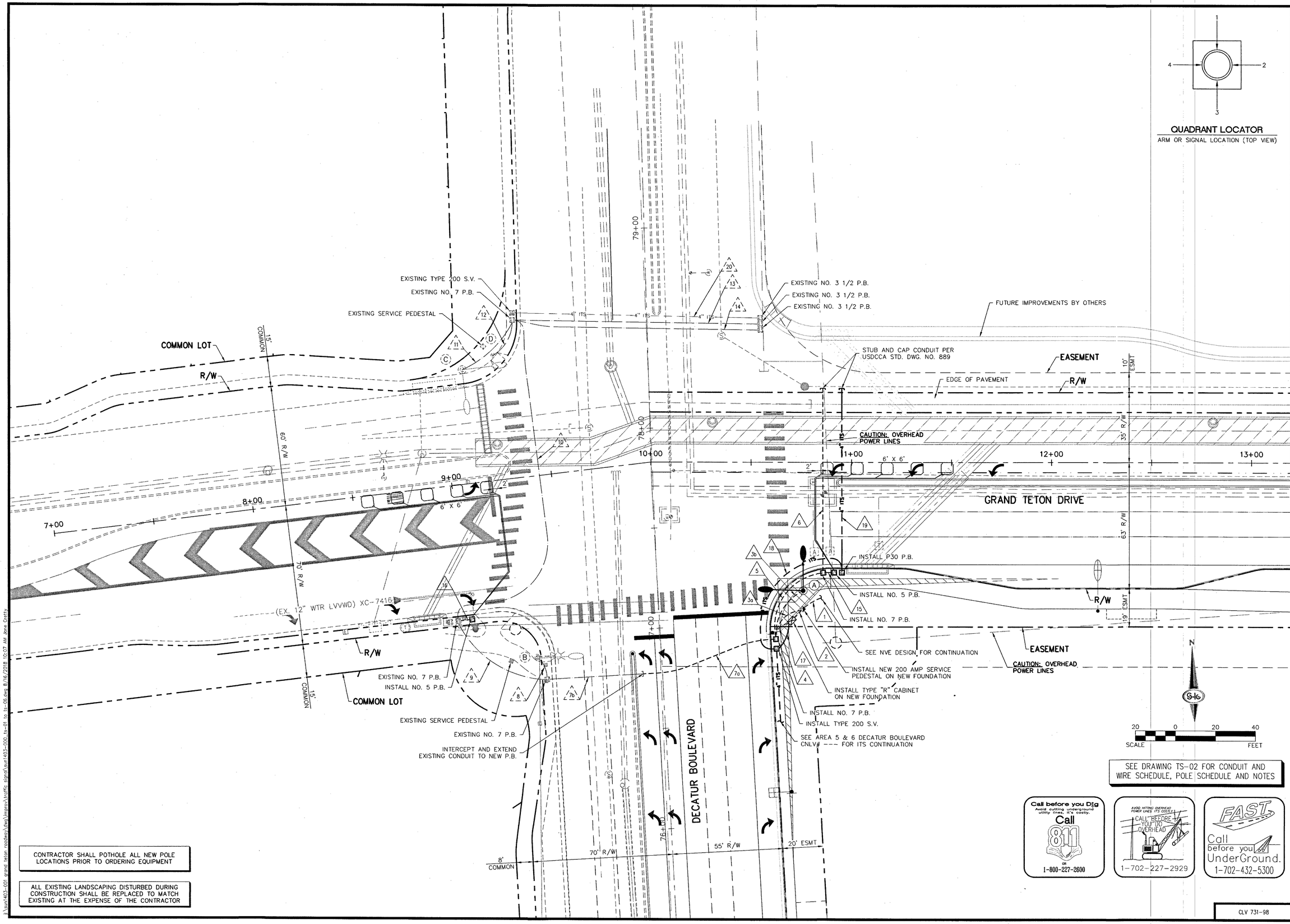
CP-01

SHEET 76 OF 125

CNLV PROJECT NO. 57838
CLV PROJECT NO. 60221

PROJ#:124070 AGREE:#115666 QS:124-07-SWINE,124-18-NWINE

J:\sun1403-000 grand teton resbond fbset control fbsh\dwg\xmtrax\1594-04-ep-tp1-02.dwg 5/7/2018 7:58 AM Jane Cretiv



1
4 2
3

QUADRANT LOCATOR
ARM OR SIGNAL LOCATION (TOP VIEW)

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS, NV

PH WEST HOLDINGS, INC.

VALLEY VISTA

AREA 1 - GRAND TETON DRIVE & RFC FACILITY
TRAFFIC SIGNAL PLAN
GRAND TETON DRIVE AND DECATUR BOULEVARD

S-18
T-19S
R-61E

DATE: ----
DRAFTER: OQ/JC
DESIGNER: OQ/JC
CHECKED: DY
PROJECT NO.
SUN1403-000

PAUL J. VILLALUZ Exp. 6/30/2020 CIVIL No. 15821 STATE OF NEVADA PROFESSIONAL ENGINEER
8-16-18

TS-01
SHEET 77 OF 125

CLV 731-98

CNLV #51805
L-60221

PROJ.#:124070 AGREE.#115666 QS:124-18-SWINE;124-18-NWINE

A:\sun1403-001 grand teton roadway\dwg\Irrigation\traffic signal\sun1403-000_ts-01 to ts-05.dwg 8/16/2018 10:07 AM Jose Cretty

CITY OF NORTH LAS VEGAS GENERAL TRAFFIC SIGNAL NOTES

1. CONTRACTOR SHALL REFERENCE THE LATEST RTC UNIFORM STANDARD SPECIFICATIONS & DRAWINGS FOR CONSTRUCTION. LOCATIONS OF UNDERGROUND UTILITIES SHOWN ON THE DRAWINGS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY FOR UTILITIES OR STRUCTURES NOT SHOW OR NOT IN THE LOCATION SHOWN ON THE DRAWINGS. THE CONTRACTOR'S RESPONSIBILITY REGARDING UTILITIES SHALL BE AS REQUIRES UNDER SECTION 105.06 OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF –SITE IMPROVEMENTS. CLARK COUNTY AREA, NEVADA, LATEST EDITION. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES AT LEAST 2 WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION
   CALL BEFORE YOU DIG 1–800–227–2600
   NORTH LAS VEGAS PUBLIC WORKS 1–702– 633–1200
   NORTH LAS VEGAS TRAFFIC ENGINEER 1–702– 633–1224
   NV ENERGY 1–702– 402–5555
2. ALL CONSTRUCTION SIGNAGE BARRICADING AND TRAFFIC DELINEATION SHALL CONFORM TO NEVADA WORK ZONE TRAFFIC CONTROL HANDBOOK LATEST EDITION AND TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), LATEST EDITION. ALL BARRICADES SHALL HAVE RETRO–REFLECTIVE SHEETING COMPLIANT WITH UNIFORM STANDARD SPECIFICATION 716.
3. CONTRACTOR SHALL INSTALL 1–60A 1 POLE CIRCUIT BREAKER FOR TRAFFIC SIGNAL AND 4–30A 1–POLE CIRCUIT BREAKERS FOR INTERSECTION LIGHTS IN NEW 200 AMP SERVICE PEDESTAL LOCATED ON THE SAME CORNER AS THE TRAFFIC SIGNAL CABINET IN ACCORDANCE WITH CLARK COUNTY UNIFORM STANDARD DRAWING 730. CLARK COUNTY UNIFORM STANDARD SPECIFICATIONS, SPECIAL PROVISIONS, AND AS INDICATED ON THE PLANS. THE LINE SIDE OF METER IS TO BE WIRED WITH NEVADA ENERGY OWNED SERVICE WIRE (NEUTRAL TO BE IDENTIFIED WITH WHITE). THE LOAD SIDE OF THE METER IS TO BE WIRED WITH THREE (3) #6 AWG THW (1 BLACK, 1 WHITE, AND 1 GREEN) FOR TRAFFIC SIGNAL. THE CONTRACTOR SHALL COORDINATE INSTALLATIONS WITH NV ENERGY, CITY OF NORTH LAS VEGAS TRAFFIC OPERATIONS, AND CITY OF NORTH LAS VEGAS CONSTRUCTION SERVICES.
4. INTERSECTION LIGHTS WILL BE FED DIRECTLY FROM 200 AMP SERVICE TO EACH CORNER WITH NO SPLICES (3– #10 THW, BLACK, WHITE, GREEN). EACH INTERSECTION FIXTURE WILL HAVE (3 – # 10 THW BLACK, WHITE, GREEN) RUNNING FROM THE FIXTURE TO A SPLICE POINT IN THE BOTTOM HAND HOLE WITH THE HOT LEG FUSED INTO A SINGLE, IN–LINE WATERPROOF FUSE HOLDER.
5. CONDUIT ROUTING SHOWN ON THE CIVIL PLANS IS SCHEMATIC FOR THE PURPOSE OF CLARITY AND MAY DIFFER FROM ACTUAL INSTALLATION. CONTRACTOR SHALL CHECK THE CONDUIT AND CABLE RUN SCHEDULE FOR CONDUIT, CABLE, AND WIRE SIZE, AND VERIFY ALL EXISTING CONDUIT RUNS ARE USABLE.
6. CONTRACTOR IS RESPONSIBLE FOR OBTAINING SURVEY OF PROPERTY LINES TO ENSURE THAT NEW TRAFFIC SIGNAL STRUCTURES ARE INSTALLED WITHIN PUBLIC RIGHT–OF–WAY OR EASEMENTS.
7. CONTRACTOR SHALL PROVIDE A NAZTEC MODEL 980 ATC SIGNAL CONTROLLER OR APPROVED EQUAL IN ACCORDANCE WITH CLARK COUNTY UNIFORM STANDARDS SPECIFICATIONS, SPECIAL PROVISIONS AND AS INDICATED ON THE PLANS AND AS DIRECTED BY THE CITY OF NORTH LAS VEGAS CITY TRAFFIC ENGINEER. CONTRACTOR TO PROVIDE LICENSE OF APOGEE ACTUATED SIGNAL CONTROLLER SOFTWARE (LATEST VERSION) TO RTC/FAST. MMU SHALL BE AN EDI MODEL 16ELIP OR APPROVED EQUAL. CONTROLLER SHALL BE INSTALLED IN A NEW CONTRACTOR– FURNISHED TYPE VIII "R" CABINET (16 POSITION LOAD BAY WITH EXHAUST FAN AND THERMOSTAT CONTROL) ON A CONTRACTOR–FURNISHED TYPE "J" FOUNDATION PER CLARK COUNTY AREA UNIFORM STANDARD DRAWINGS NO. 803 AND 725. CABINETS SHALL BE ANODIZED ALUMINUM AND INCLUDE INSIDE: MODULES, SWITCHES, OPTICOM CARDS, FLASHERS, LOAD SWITCHES, AND 48 CHANNELS OF DETECTION IN TWO SEPARATE, SHELF–MOUNTED RACKS STACKED ON TOP OF EACH OTHER. ALL LOOP AMPLIFIERS WILL BE EDI LM 602 (CARD) OR APPROVED EQUAL. CABINETS SHALL CONFORM TO THE CITY OF NORTH LAS VEGAS' LATEST SPECIFICATION. CONTRACTOR SHALL PREPARE AS–BUILT DRAWINGS UPON COMPLETION OF THE PROJECT DETAILING ANY CHANGES TO THE CONTROLLER OPERATION. A MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT FOR THE SIGNAL TURN–ON, AND SHALL GIVE 14 DAY ADVANCE NOTICE TO TRAFFIC OPERATIONS
8. THE SIGNAL SHALL BE EQUIPPED WITH EMERGENCY VEHICLE PREEMPTION INCORPORATING FOUR (4) OPTICOM MODEL 722 DIRECTIONAL DETECTORS, ONE (1) 764 CARD AND MODEL 138 CABLE. EMERGENCY VEHICLE PREEMPTION SHALL BE INSTALLED OVER THE FIRST THROUGH LANE IN EACH DIRECTION.
9. THE CONTROLLER, CABINET, AND CABINET COMPONENTS SHALL BE DELIVERED TO NORTH LAS VEGAS TRAFFIC OPERATIONS, 2829 FT SUMTER DRIVE FOR TESTING PRIOR TO INSTALLATION IN THE FIELD. CALL 702–633–1264 OR 702–239–2123 THREE BUSINESS DAYS (72 HOURS) IN ADVANCE. CONTRACTOR SHALL PICK UP CONTROLLER AND CABINET FOLLOWING TESTING.
10. CONTRACTOR SHALL SUPPLY A LAYER 2 FIELD– HARDENED ETHERNET SWITCH FOR EACH TRAFFIC SIGNAL CONTROLLER CABINET TO RTC–FAST PER CLARK COUNTY AREA UNIFORM STANDARD SPECIFICATION (USS) 684.
11. INTERSECTION LUMINAIRES SHALL BE LIGHT EMITTING DIODE (LED) – HOLOPHANE ATB260BLEDE10MVOLTR3 OR APPROVED EQUAL WITH 7 PIN RECEPTACLE AND PHOTOCELL.
12. INSTALL 5 EACH 6'x6' LOOPS CUT PRESENCE LOOP DETECTORS Ø1, Ø3, Ø5 & Ø7. LOOP DETECTORS SHALL BE CENTERED IN THE LANE OR AS CALLED OUT IN PLANS. LOCATE THE FRONT OF THE PRESENCE LOOPS TWO (2) FEET BEYOND THE STOP LINE. ALL NEW LOOP INSTALLATIONS SHALL BE MEGGAR TESTED OR TESTED FOR CONTINUITY PRIOR TO ACTIVATION. LOOP DETECTOR SEALANT USED SHALL BE HOT–MELT, RUBBERIZED ASPHALT PER SECTION 623T.02.04(C) OF THE CLARK COUNTY UNIFORM STANDARD SPECIFICATIONS.
13. INSTALL CCTV CAMERA PER CLARK COUNTY AREA UNIFORM STANDARD DRAWING NO. 766.
14. THE INTERSECTION SHALL BE EQUIPPED WITH ITERIS EDGE II NEXT VIDEO DETECTION SYSTEM WITH ETHERNET AND CARD RACK 175 WATT EDI POWER SUPPLY OR APPROVED EQUAL. THE SYSTEM SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS. CAMERAS WILL BE MOUNTED PER THE MANUFACTURER'S RECOMMENDATION AND PER THE CITY OF NORTH LAS VEGAS' TRAFFIC ENGINEER APPROVAL. "BNC" CONNECTORS ARE THE ONLY ACCEPTABLE TERMINATION OF COAXIAL CABLES.
15. PULL BOXES ARE NO. 7 UNLESS OTHERWISE NOTED. ALL PULL BOXES SHALL BE IN ACCORDANCE WITH CLARK COUNTY UNIFORM STANDARD DRAWINGS 705, 706 AND 707.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GROUNDING THE COMPLETE TRAFFIC SIGNAL ELECTRICAL SYSTEM INCLUDING ALL EXISTING POLES, CABINETS, SERVICE PEDESTALS, PULL BOXES AND ELECTRICAL DEVICES IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND THE CLARK COUNTY UNIFORM STANDARD DRAWINGS. GROUNDING WIRE SHALL BE BONDED TO EXISTING METAL PULL BOX COVERS USING AN EXOTHERMAL WELDING PROCESS ACCEPTABLE TO THE ENGINEER PER CLARK COUNTY UNIFORM STANDARD DRAWING 709. METAL PULL BOX LIDS ARE NOT ALLOWED FOR NEW INSTALLATIONS.
17. ALL EMPTY CONDUITS SHALL HAVE 200 LB RATED PULL STRING INSTALLED AND # 8 AWG GREEN TRACER WIRE. ONE (1) # 8 THW GREEN CONDUCTOR SHALL BE RUN FROM THE CONTROLLER TO ALL POLES AND PULL BOXES AS A BONDING GROUND.
18. ALL IMSA CABLE SHALL BE STRANDED AND CONFORM TO 19–1 OR 20–1 SPECIFICATIONS. TRAFFIC SIGNAL CABLE SHALL BE IMSA 25 CONDUCTOR #14 AWG CABLE (TYPICAL) UNLESS OTHERWISE NOTED. WIRING FROM THE JUNCTION BOX TO EACH THREE (3) SECTION SIGNAL HEAD SHALL BE IMSA 5 CONDUCTOR #14 AWG. WIRING FROM THE JUNCTION BOX TO EACH FOUR (4) SECTION SIGNAL HEAD SHALL BE IMSA 5 CONDUCTOR #14 AWG AND 7 CONDUCTOR #14 FOR EACH FIVE (5) SECTION HEAD.
19. ALL PEDESTRIAN PUSH BUTTON SIGNS SHALL BE R10–3E (9" X 12"). ALL PUSH BUTTONS SHALL BE "POLARA NAVIGATOR" PEDESTRIAN BUTTON (2 WIRE) WITH 1 CENTRAL CONTROL UNIT FOR INTERSECTION OR APPROVED EQUAL, PRESSURE SENSITIVE/LED AND MEET AMERICANS WITH DISABILITY ACT (ADA) GUIDELINES. THE MAXIMUM HORIZONTAL REACH DISTANCE IS 10".
20. CONTRACTOR SHALL INSTALL ILLUMINATED STREET NAME SIGNS (SNS) PER CLARK COUNTY STANDARD DRAWING 818.1 SHEETS 1 TO 3 & 818.S1 (SHEET 3 OF 5 & SHEET 4 OF 5) ON SIGNAL SHAFT AND BLOCK NUMBER SIGNS ON POLES IN ACCORDANCE WITH CITY OF NORTH LAS VEGAS STANDARDS. BLOCK NUMBER SIGNS SHALL BE SUPPORTED ALONG THEIR ENTIRE LENGTH UTILIZING BAND–IT #SX0397 BRACKET OR APPROVED EQUAL. SEE STREET AND BLOCK SIGN DETAIL FOR LEGENDS AND BLOCK NUMBERS. THE CONTRACTOR SHALL VERIFY BLOCK NUMBERS WITH THE CITY OF NORTH LAS VEGAS PRIOR TO FABRICATION. ILLUMINATED STREET NAME SIGNS SHALL BE WIRED WITH A RED "SWITCH LEG" SPLICED AT PHOTOCELL RECEPTACLE CONTROLLING INTERSECTION FIXTURE AND RAN DOWN SIGNAL SHAFT AND SPLICED IN HANDHOLE MAKING THE SIGN ACCESSIBLE FOR MAINTENANCE.
21. ALL VEHICLE AND PEDESTRIAN SIGNAL DISPLAYS (R–Y–G–W–DW) SHALL BE LIGHT EMITTING DIODE (LED) PER CITY OF NORTH LAS VEGAS STANDARDS AND SPECIFICATIONS. PEDESTRIAN INDICATIONS SHALL HAVE COUNTDOWN TIMING DISPLAYS PER MUTCD.
22. TRAFFIC SIGNAL TURN–ON SHALL NOT OCCUR DURING WEEKENDS, FRIDAYS, OR CITY OBSERVED HOLIDAYS. CONTACT CITY OF NORTH LAS VEGAS TRAFFIC OPERATIONS (702–633–1264 OR 702–239–2123) THREE BUSINESS DAYS (72 HOURS) PRIOR TO TURN ON.
23. TRENCH CONSTRUCTION FOR CONDUIT INSTALLATIONS SHALL BE IN ACCORDANCE WITH CLARK COUNTY STANDARD DRAWING 733. EARTH SAW EXCAVATION IS AN ACCEPTABLE ALTERNATIVE TO CONVENTIONAL TRENCHING METHODS.
24. PRIOR TO COMPLETION OF NEW TRAFFIC SIGNAL INSTALLATION, INTERSECTIONS SHALL BE OPERATED UNDER STOP SIGN CONTROL OR UNDER UNIFORMED OFFICER CONTROL. AT THE TIME THE INTERSECTION IS TURNED ON, THE CONTRACTOR SHALL REMOVE ALL STOP SIGNS AND RETURN TO THE CITY OF NORTH LAS VEGAS TRAFFIC OPERATIONS, 2829 FT SUMTER DRIVE OR OTHER SPECIFIED LOCATION. REMOVE SIGN POST AND ANCHOR AND PATCH HOLE IN WITH CONCRETE.
25. EXISTING CONDUCTORS NOT REQUIRED FOR SIGNAL OR LIGHTING OPERATIONS SHALL BE REMOVED BY THE CONTRACTOR PRIOR TO ACCEPTANCE.
26. EXISTING TRAFFIC SIGNAL AND/OR LIGHTING EQUIPMENT REMOVED AND NOT RELOCATED SHALL BE SALVAGED BY THE CONTRACTOR AND DELIVERED TO NORTH LAS VEGAS TRAFFIC ENGINEERING, 2829 FT SUMTER DRIVE, OR OTHER LOCATION BY APPOINTMENT ONLY. PLEASE CONTACT TRAFFIC OPERATIONS AT 702–633–1264.
27. IF REQUIRED TO REMOVE AND SALVAGE EXISTING STREET LIGHT POLE ASSEMBLY, REMOVE FOUNDATION 18–INCHES BELOW GRADE, INTERCEPT EXISTING CONDUIT AND WIRING INTO A 3 1/2 PULL BOX MARKED "STREET LIGHT" WITH NON–CONDUCTIVE LID WHILE MAINTAINING EXISTING STREET LIGHT CIRCUIT.
28. CONTRACTOR SHALL INSURE THAT THE TRAFFIC SIGNAL POLES ARE PLUMB AFTER THE INSTALLATION OF MAST ARMS AND TRAFFIC SIGNAL HEADS.
29. THE CONTRACTOR SHALL BE RESPONSIBLE TO RESTORE ANY DAMAGE OR MODIFICATION TO LANDSCAPE/IRRIGATION TO PRE–CONSTRUCTION CONDITION (MODIFIED LANDSCAPE SHALL BE PAID FOR AS PART OF TRAFFIC SIGNAL LUMP SUM).
30. 240 VOLT STREET LIGHT CONDUITS AND FIBER OPTIC CONDUITS SHALL BE SEPARATE FROM TRAFFIC SIGNAL AND INTERSECTION LIGHTING CONDUITS. EACH SHALL HAVE SEPARATE PULL BOXES.
31. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL UNDERGROUND AND AERIAL UTILITIES AND CONSTRUCTION LIKELY TO BE AFFECTED BY THE WORK. THE LOCATION OF UNDERGROUND UTILITIES, AS SHOWN ON THE PLANS, IS APPROXIMATE ONLY. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPAIRED PROMPTLY IN A MANNER SATISFACTORY TO THE UTILITY OWNER AT THE CONTRACTOR'S EXPENSE.
32. INSTALLATION OF ALL TRAFFIC SIGNAL COMPONENTS SHALL BE SUPERVISED BY A CERTIFIED IMSA LEVEL 2 TRAFFIC SIGNAL ELECTRICIAN AND CLARK COUNTY JOURNEYMAN ELECTRICIAN. THE CONTRACTOR PERFORMING THE WORK SHALL HOLD A VALID STATE OF NEVADA C–2 ELECTRICAL CONTRACTOR'S LICENSE.
33. AS–BUILT DRAWINGS MUST BE PROVIDED TO THE CITY OF NORTH LAS VEGAS' TRAFFIC OPERATIONS DIVISION PRIOR TO TRAFFIC SIGNAL TURN ON.
34. ALL NEW AND EMPTY EXISTING (FIBER / ITS) CONDUIT SHALL HAVE A 72 STRAND FIBER CABLE INSTALLED WITH A #8 GREEN WIRE.
35. NEW AND/ OR RELOCATED SIGNAL HEADS AND TENONS SHALL BE WELDED IN THE FIELD TO ENSURE ACCURATE PLACEMENT.
36. ALL SIGNAGE AND ROAD MARKINGS SHALL BE INSTALLED PRIOR TO TURN–ON OF INTERSECTION.
37. ALL SIGNAGE AND ROAD MARKINGS SHALL BE SELECTED FROM THE CITY OF NORTH LAS VEGAS' (APL) APPROVED PRODUCTS LIST.
38. CONTRACTOR IS RESPONSIBLE FOR THE POST AND PRETEST OF ALL FIBER OPTIC CABLE INSTALLED.

POLE SCHEDULE

POLE	LOCATION STATION (OFFSET)	POLE TYPE	POLE SIGNAL ARM QUAD.	POLE SIGNAL ARM LENGTH	POLE LUM. ARM QUAD.	POLE LUM. ARM LENGTH	SIGNALS (VEH.) TYPE	SIGNALS (VEH.) QTY.	SIGNALS (VEH.) QUAD.	SIGNALS(PED.) TYPE	SIGNALS(PED.) QUAD.	PEDESTRIAN PUSH BUTTON QUAD. (PHASE)	PEDESTRIAN PUSH BUTTON SIGN	REMARKS
(A)	GRAND TETON 10+76 64.1' RT	XX–B	–	–	1 4	15' 15'	–	–	–	–	–	–	–	NEW POLE AND FOUNDATION. INSTALL TYPE "M" FOUNDATION PER USDCCA STD. DWG. NO. 723.
(B)	EXISTING	XX–A(E)	–	–	2	15'(E)	–	–	–	–	–	–	–	EXISTING POLE TO REMAIN IN PLACE.
(C)	EXISTING	XX–B(E)	–	–	2 3	15'(E) 15'(E)	–	–	–	–	–	–	–	EXISTING POLE TO REMAIN IN PLACE.
(D)	EXISTING	1–A(E)	–	–	–	–	–	–	–	–	–	–	–	EXISTING POLE TO REMAIN IN PLACE.

(E) EXISTING, (R) REMOVE AND SALVAGE EXISTING

CONDUIT AND WIRE SCHEDULE

WIRE & CABLE	FROM	TO	VIA CONDUIT 1	2	3a	3b	4	5	6	7a	7b	8	9	10	11	12	13	14	15	16	17	18	19	20
#3/0 THW	TRANSFORMER	SERVICE PEDESTAL	X																					
#3/0 THW	SERVICE PEDESTAL	CONTROLLER		X																				
#8 TRACER WIRE	CONTROLLER	POLE A				X	X																	
#8 TRACER WIRE	CONTROLLER	POLE B							X	X	X	X												
#8 TRACER WIRE	CONTROLLER	POLE C					X						X	X	X									
#8 TRACER WIRE	CONTROLLER	POLE D					X			X	X	X	X	X	X	X								
2–#4 THW & 1–#8 GROUND	SERVICE PEDESTAL	POLE A LUMINAIRE			X	X																		
2–#4 THW & 1–#8 GROUND	SERVICE PEDESTAL	POLE B LUMINAIRE			X				X	X	X	X												
2–#4 THW & 1–#8 GROUND	SERVICE PEDESTAL	POLE C LUMINAIRE			X								X	X	X									
1–LOOP DETECTOR (WB LEFT TURN)	CONTROLLER	NO. 5 PULL BOX					X	X								X	X							
1–LOOP DETECTOR (EB LEFT TURN)	CONTROLLER	NO. 5 PULL BOX					X			X		X												
#8 AWG THW	CONTROLLER	CONDUIT STUB					X	X														X	X	
#8 AWG THW	TYPE 200 S.V.	CONTROLLER																						X
CONDUIT SIZE (E) EXISTING			1–2"	1–2"	1–2"	1–2"	4–3" 2–2"	2–3" 1–2"	2–3" 2–2"	2–3" 2–2"	2–3" 2–2" (E)	1–3" (E)	2–3" (E)	2–3" (E)	1–3" (E)	1–2" (E)	2–3" (E)	2–2" (E)	1–2"	1–2"	1–2"	1–4"	1–4"	1–4" (E)

ONE NO. 8 GREEN GROUNDING WIRE SHALL BE RUN FROM THE CONTROLLER CABINET TO EACH SIGNAL POLE BASE

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS, NV

PH WEST HOLDINGS, INC.

VALLEY VISTA

AREA 1 - GRAND TETON DRIVE & RFC FACILITY
TRAFFIC SIGNAL NOTES & SCHEDULES
GRAND TETON DRIVE AND DECATUR BOULEVARD

S 18
T 19S
R 61E

DATE: ----
DRAFTER: OQ/JC
DESIGNER: OQ/JC
CHECKED: DY
PROJECT NO.
SUN1403-000

PROFESSIONAL ENGINEER STATE OF NEVADA
PAUL J. VILLALUZ
Exp. 6/30/2020
CIVIL
No. 15821

TS-02
SHEET 78 OF 125

CLV 731–98

CNLV #51805
L-00221

PRO.#:124070 AGREE.#115666 QS:124-SW/NE,124-18-NW/NE

J:\sun1403-001 grand teton roadway\dwg\improv\traffic signal\sun1403-000_ts-01 to ts-06.dwg 8/16/2018 10:07 AM Jane Crotty

SEPARATION FROM DRY UTILITIES TO WATER LINES
1' MIN. VERTICAL SEPARATION FOR MAINS AND DRY UTILITIES AND 6" BETWEEN LATERALS AND DRY UTILITIES PER UDACS SECTION 2.04.06
3' MIN. HORIZONTAL SEPARATION BETWEEN MAINS AND DRY UTILITIES PER UDACS SECTION 2.04.02
ANY EXCAVATION AT BACK OF CURB MUST REMAIN OPEN FOR INSPECTION OF COPPER SERVICE LATERALS. ANY COPPER SERVICE LATERAL KINKED, BENT OR OTHERWISE DAMAGED MUST BE REPLACED FROM THE MAIN TO THE ANGLE METER STOP.

QUADRANT LOCATOR
ARM OR SIGNAL LOCATION (TOP VIEW)

AVIARY WAY
GRAND TETON DRIVE
COMMON LOT
VARIES COMMON
R/W
(PRIVATE)
63' R/W
48' R/W
58' R/W
59' 60'
88' 00'
EXISTING TYPE 200 S.V.
EXISTING NO. 7 P.B.
EXISTING CONTROLLER CABINET
EXISTING SERVICE PEDESTAL
INSTALL NO. 5 P.B.
EXISTING P30 P.B.
INTERCEPT AND EXTEND EXISTING CONDUIT TO NEW P.B.
INTERCEPT AND EXTEND EXISTING CONDUITS TO NEW P.B.
6' X 6'
2' X 3'
CATH GRND
INSTALL P30 P.B.
INSTALL NO. 7 P.B.
CAUTION: OVERHEAD POWER LINES
INSTALL NO. 5 P.B.
34+00
35+00
36+00
38+00
39+00
SCALE 20 0 20 40 FEET

SEE DRAWING TS-02 FOR NOTES

SEE DRAWING TS-04 FOR CONDUIT AND WIRE SCHEDULE & POLE SCHEDULE

CONTRACTOR SHALL POTHOLE ALL NEW POLE LOCATIONS PRIOR TO ORDERING EQUIPMENT

ALL EXISTING LANDSCAPING DISTURBED DURING CONSTRUCTION SHALL BE REPLACED TO MATCH EXISTING AT THE EXPENSE OF THE CONTRACTOR

Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call 811 OR 1-800-227-2600

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.
CALL BEFORE YOU DO OVERHEAD
1-702-227-2929

FAST
Call before you UnderGround.
1-702-432-5300

CLV 731-98

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS, NV

PH WEST HOLDINGS, INC.

VALLEY VISTA

S 18 T 19S R 61E

AREA 1 - GRAND TETON DRIVE & RFC FACILITY
TRAFFIC SIGNAL PLAN
GRAND TETON DRIVE AND AVIARY WAY

DATE: ----
DRAFTER: OQ/JC
DESIGNER: OQ/JC
CHECKED: DY
PROJECT NO. SUN1403-000

PROFESSIONAL ENGINEER STATE OF NEVADA PAUL G. VILLALUZ Exp. 6/30/2020 CIVIL No. 15821

TS-03
SHEET 79 OF 125

CNLV #51805
L-60221

PRO.#124070 AGREE.#115666 QS:124-18-SW/NE,124-18-NW/NE

i:\sun1403-001 grand teton roadway\dwg\signal\sun1403-000_ts-05.dwg 8/16/2018 10:07 AM Jose Costy

POLE SCHEDULE

POLE	LOCATION STATION (OFFSET)	POLE TYPE	SIGNAL ARM QUAD.	SIGNAL ARM LENGTH	LUM. ARM QUAD.	LUM. ARM LENGTH	SIGNALS (VEH.) TYPE	SIGNALS (VEH.) QTY.	SIGNALS (VEH.) QUAD.	SIGNALS(PED.) TYPE	SIGNALS(PED.) QUAD.	PEDESTRIAN PUSH BUTTON QUAD. (PHASE)	PEDESTRIAN PUSH BUTTON SIGN	REMARKS
(A)	EXISTING	XX-A(E)	–	–	3 4	15'(E) 15'(E)	–	–	–	–	–	–	–	EXISTING POLE TO REMAIN IN PLACE.
(B)	GRAND TETON 36+97 66.5' RT	XX-B	–	–	1 4	15' 15'	–	–	–	–	–	–	–	NEW POLE AND FOUNDATION. INSTALL TYPE "M" FOUNDATION PER USDCCA STD. DWG. NO. 723.
(C)	GRAND TETON 35+98 81.9' RT	XX	–	–	1 2	15' 15'	–	–	–	–	–	–	–	NEW POLE AND FOUNDATION. INSTALL TYPE "H" FOUNDATION PER USDCCA STD. DWG. NO. 721.
(D)	EXISTING	XX-B(E)	–	–	3	15'(E)	–	–	–	–	–	–	–	EXISTING POLE TO REMAIN IN PLACE.
(E)	GRAND TETON 35+93 75.5' RT	1-A	–	–	–	–	–	–	–	–	–	–	–	NEW POLE AND FOUNDATION. INSTALL TYPE "C" FOUNDATION PER USDCCA STD. DWG. NO. 717.

(E) EXISTING

CONDUIT AND WIRE SCHEDULE

WIRE & CABLE	FROM	TO
(E)	TRANSFORMER	SERVICE PEDESTAL
(E)	SERVICE PEDESTAL	CONTROLLER
#8 TRACER WIRE	CONTROLLER	POLE A
#8 TRACER WIRE	CONTROLLER	POLE B
#8 TRACER WIRE	CONTROLLER	POLE C
#8 TRACER WIRE	CONTROLLER	POLE D
#8 TRACER WIRE	CONTROLLER	POLE E
2-#4 THW & 1-#8 GROUND	SERVICE PEDESTAL	POLE A LUMINAIRE
2-#4 THW & 1-#8 GROUND	SERVICE PEDESTAL	POLE B LUMINAIRE
2-#4 THW & 1-#8 GROUND	SERVICE PEDESTAL	POLE C LUMINAIRE
2-#4 THW & 1-#8 GROUND	SERVICE PEDESTAL	POLE D LUMINAIRE
2-#4 THW & 1-#8 GROUND	SERVICE PEDESTAL	POLE E LUMINAIRE
1-LOOP DETECTOR (WB LEFT TURN)	CONTROLLER	NO. 5 PULL BOX
1-LOOP DETECTOR (EB LEFT TURN)	CONTROLLER	NO. 5 PULL BOX
(E)	DECATUR/ GRAND TETON	CONTROLLER
(E)	CONTROLLER	ALIANTE/ GRAND TETON
#8 TRACER WIRE	P.30 PULL BOX NEC	P.30 PULL BOX SEC
CONDUIT SIZE (E) EXISTING		

VIA CONDUIT

1	2	3	4	5	6a	6b	7	8	9	10	11	12a	12b	13	14	15	16	17	18	19	20	21	22	23	24a	24b	25
(E)	1-2" (E)	2-3" 2-2" (E)	1-3" 1-2" (E)	1-3" (E)	2-3" 2-2" (E)	2-3" 2-2"	1-3"	2-3" 1-2"	2-3" 2-2"	1-3"	2-3" 1-2"	2-3" 2-2"	2-3" 2-2" (E)	1-2" (E)	2-2" (E)	2-3" 2-2" (E)	1-2"	1-2"	1-4" (E)	1-4" (E)	1-4" (E)	(E)	1-4" (E)	1-4" (E)	1-4" (E)	1-4"	1-3"

ONE NO. 8 GREEN GROUNDING WIRE SHALL BE RUN FROM THE CONTROLLER CABINET TO EACH SIGNAL POLE BASE

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS, NV

PH WEST HOLDINGS, INC.

VALLEY VISTA

S 18
T 19S
R 61E

AREA 1 - GRAND TETON DRIVE & RFC FACILITY
TRAFFIC SIGNAL NOTES & SCHEDULES
GRAND TETON DRIVE AND AVIARY WAY

DATE: ----
DRAFTER: OO/JC
DESIGNER: OO/JC
CHECKED: DY

PROJECT NO.
SUN1403-000

PROFESSIONAL ENGINEER STATE OF NEVADA
PAUL VILLALUZ
Exp. 6/30/2020
CIVIL
No. 15821

8-16-18

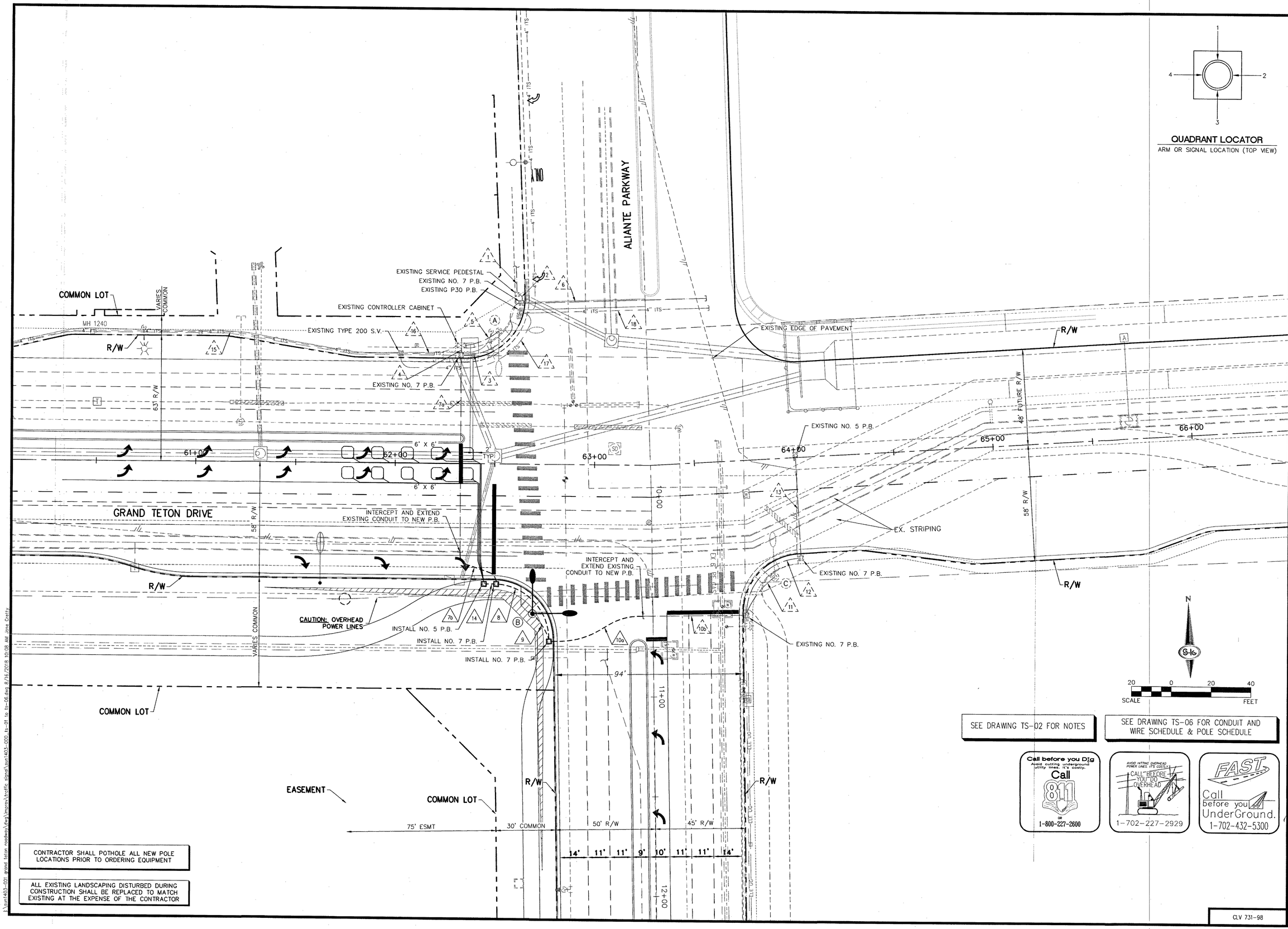
TS-04
SHEET 80 OF 125

CNLV #51805
L-6072.1

CLV 731-98

PRO.#:124070 AGREE.#115666 QS:124-07-SW/NE,124-18-NW/NE

J:\sun1403-001 grand teton roadway\dwg\mono\traffic signal\sun1403-000_ts-01 to ts-06.dwg 8/16/2018 10:07 AM Jose Oratty



1
4 2
3

QUADRANT LOCATOR
ARM OR SIGNAL LOCATION (TOP VIEW)

SEE DRAWING TS-02 FOR NOTES

SEE DRAWING TS-06 FOR CONDUIT AND WIRE SCHEDULE & POLE SCHEDULE

CONTRACTOR SHALL POTHOLE ALL NEW POLE LOCATIONS PRIOR TO ORDERING EQUIPMENT

ALL EXISTING LANDSCAPING DISTURBED DURING CONSTRUCTION SHALL BE REPLACED TO MATCH EXISTING AT THE EXPENSE OF THE CONTRACTOR

Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call 811 or 1-800-227-2600

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
CALL BEFORE YOU DO OVERHEAD
1-702-227-2929

FAST
Call before you UnderGround.
1-702-432-5300

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CITY OF NORTH LAS VEGAS, NV

PH WEST HOLDINGS, INC.
VALLEY VISTA

AREA 1 - GRAND TETON DRIVE & RFC FACILITY
TRAFFIC SIGNAL PLAN
GRAND TETON DRIVE AND ALIANTE PARKWAY

S:18 T:16S R:61E

DATE: ----
DRAFTER: OQ/JC
DESIGNER: OQ/JC
CHECKED: DY
PROJECT NO. SUN1403-000

PROJ.#:124070 AGREE.#115666 QS:124-07-SW/NE,124-18-NW/NE

PROFESSIONAL ENGINEER STATE OF NEVADA PAUL J. VILLALUZ Exp. 6/30/2020 CIVIL No. 15821
11-1-18

TS-05
SHEET 81 OF 125

CLV 731-98
CNLV #51805
L-6022

E:\sun1403-001 grand teton roadway\dwg\micro\traffic signal\sun1403-000_ts-01 to ts-06.dwg 8/16/2018 10:08 AM Jone Crotty

POLE SCHEDULE

POLE	LOCATION STATION (OFFSET)	POLE TYPE	SIGNAL ARM QUAD.	SIGNAL ARM LENGTH	LUM. ARM QUAD.	LUM. ARM LENGTH	SIGNALS (VEH.) TYPE	SIGNALS (VEH.) QTY.	SIGNALS (VEH.) QUAD.	SIGNALS(PED.) TYPE	SIGNALS(PED.) QUAD.	PEDESTRIAN PUSH BUTTON QUAD. (PHASE)	PEDESTRIAN PUSH BUTTON SIGN	REMARKS
(A)	EXISTING	XX-A(E)	–	–	2 3	15'(E) 15'(E)	–	–	–	–	–	–	–	EXISTING POLE TO REMAIN IN PLACE.
(B)	GRAND TETON 62+69 74.8' RT	XX-B	–	–	1 2	15' 15'	–	–	–	–	–	–	–	NEW POLE AND FOUNDATION. INSTALL TYPE "M" FOUNDATION PER USDCCA STD. DWG. NO. 723.
(C)	EXISTING	XX-B(E)	–	–	1	15'(E)	–	–	–	–	–	–	–	EXISTING POLE TO REMAIN IN PLACE.

(E) EXISTING, (R) REMOVE AND SALVAGE EXISTING

CONDUIT AND WIRE SCHEDULE

WIRE & CABLE	FROM	TO	VIA CONDUIT 1	2	3	4	5	6	7a	7b	8	9	10a	10b	11	12	13	14	15	16	17	18
(E)	TRANSFORMER	SERVICE PEDESTAL	X																			
(E)	SERVICE PEDESTAL	CONTROLLER		X	X	X																
#8 TRACER WIRE	CONTROLLER	POLE A					X															
#8 TRACER WIRE	CONTROLLER	POLE B					X		X	X	X	X										
#8 TRACER WIRE	CONTROLLER	POLE C					X		X	X	X	X	X	X	X							
2–#4 THW & 1–#8 GROUND	SERVICE PEDESTAL	POLE A LUMINAIRE		X	X	X																
2–#4 THW & 1–#8 GROUND	SERVICE PEDESTAL	POLE B LUMINAIRE		X	X	X			X	X	X	X										
2–#4 THW & 1–#8 GROUND	SERVICE PEDESTAL	POLE C LUMINAIRE		X	X	X			X	X	X	X	X	X	X							
2–LOOP DETECTORS (EB LEFT TURN)	CONTROLLER	NO. 5 PULL BOX				X			X	X									X			
(E)	AVIARY/ GRAND TETON	CONTROLLER																	X	X	X	X
CONDUIT SIZE (E) EXISTING			(E)	1–3" (E)	2–3" 1–2" (E)	(E)	1–3" (E)	2–3" 2–2" (E)	(E)	2–3" 2–2"	2–3" 1–2"	1–3"	2–3" 2–2"	2–3" 2–2" (E)	1–3" (E)	(E)	2–4" 2–2" (E)	1–2"	1–4" (E)	(E)	1–4" (E)	1–4" (E)

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PROFESSIONAL ENGINEER STATE OF NEVADA
PAUL J. VILLALUZ
Exp. 6/30/2020
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TS-06
SHEET 82 OF 125

CLV 731-98

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L-6022\

k:\sun1403-001 grand teton roadway\dwg\improv\traffic signal\sun1403-000_ts-01 to ts-06.dwg 8/16/2018 10:08 AM John Crotty

GENERAL STRUCTURAL NOTES

GENERAL REQUIREMENTS

DRAWINGS
THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE STRUCTURAL ENGINEERS IN THIS OR SIMILAR LOCALITIES. THEY NECESSARILY ASSUME THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKERS WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, IT IS UNDERSTOOD THAT THE CONTRACTOR WILL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR ALL MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.

MISCELLANEOUS ITEMS
CALCULATION AND DESIGN OF MISCELLANEOUS NON-STRUCTURAL ITEMS, SUCH AS, RAILINGS, NON-STRUCTURAL WALLS AND PREFABRICATED STRUCTURAL ITEMS ARE NOT INCLUDED AND ARE TO BE PROVIDED BY OTHERS UNLESS SPECIFICALLY NOTED ON THESE DRAWINGS.

CONSTRUCTION MEANS AND METHODS
THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DESIGN AND PROVIDE ADEQUATE SHORING, BRACING, FORM-WORK, ETC... AS REQUIRED FOR THE PROTECTION OF LIFE AND PROPERTY (INCLUDING UTILITIES) DURING CONSTRUCTION. CONSTRUCTION MATERIALS SHALL BE PLACED ON THE STRUCTURE SUCH THAT THE DESIGN LOADS AS STATED HEREIN ARE NOT EXCEEDED.

DIMENSIONS, INSERTS AND OPENINGS
THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS, CONDITIONS AND ELEVATIONS WITH CIVIL DRAWINGS PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR SHALL INFORM THE CIVIL ENGINEER IN WRITING OF ANY DISCREPANCIES OR OMISSIONS NOTED ON THE DRAWINGS. ANY SUCH DISCREPANCY, OMISSION, OR VARIATION NOT REPORTED BEFORE START OF CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. WHERE DISCREPANCIES OCCUR IN THESE DRAWINGS, NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS.

CONTRACTOR SHALL ESTABLISH AND VERIFY ALL OPENINGS AND INSERTS WITH APPROPRIATE TRADES, DRAWINGS AND SUBCONTRACTORS PRIOR TO CONSTRUCTION.

STANDARDS
WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE EDITION REFERENCED IN THE GOVERNING BUILDING CODE.

TYPICAL DETAILS AND NOTES
TYPICAL DETAILS AND NOTES SHALL APPLY, THOUGH NOT NECESSARILY INDICATED AT A SPECIFIC LOCATION ON PLANS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT. DETAILS MAY SHOW ONLY ONE SIDE OF CONNECTION OR MAY OMIT INFORMATION FOR CLARITY.

SHOP DRAWINGS
SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL ITEMS. SHOP DRAWINGS ARE REVIEWED ONLY FOR GENERAL COMPLIANCE WITH THE STRUCTURAL DRAWINGS. REVIEW DOES NOT INDICATE THAT THE SHOP DRAWINGS ARE CORRECT OR COMPLETE. RESPONSIBILITY FOR CORRECTNESS SHALL REST WITH THE CONTRACTOR. ANY CHANGES, SUBSTITUTIONS, OR DEVIATIONS FROM CONTRACT DRAWINGS SHALL BE CLOUDED. ANY OF THE AFOREMENTIONED SHALL NOT BE CONSIDERED APPROVED AFTER ENGINEER'S REVIEW UNLESS SPECIFICALLY NOTED ACCORDINGLY. THE SHOP DRAWINGS DO NOT SUPERSEDE OR REPLACE THE ORIGINAL CONTRACT DRAWINGS. ANY ENGINEERING PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW SHALL BEAR THE SEAL OF AN APPROPRIATELY REGISTERED ENGINEER. ENGINEERING SYSTEM SOLUTIONS SHALL NOT BE RESPONSIBLE FOR THE ADEQUACY OF ENGINEERING DESIGNS PERFORMED BY OTHERS. FIVE WORKING DAYS SHALL BE ALLOWED FOR THE ENGINEER'S REVIEW. CONTRACTOR SHALL PROVIDE A COPY OF EACH SUBMITTAL FOR ENGINEERING SYSTEM SOLUTIONS RECORDS.

MOLD
MOLD CONCERNS AND PREVENTION IS OUT OF ENGINEERING SYSTEM SOLUTIONS SCOPE OF SERVICES. ENGINEERING SYSTEM SOLUTIONS SHALL BE HELD HARMLESS, TO THE EXTENT OF THE LAW, FOR ALL MOLD PREVENTION AND MOLD RELATED CONCERNS.

BASIS FOR DESIGN

CODE: . . . . . 2009 IBC (W/ SOUTHERN NEVADA AMENDMENTS)
2008 AASHTO

DEAD LOAD:
STRUCTURE SELF WEIGHT CONCRETE . . . . . 150 PCF
VARYING COVER WITH A SOIL BACKFILL DENSITY . . . . . 130 PCF

SOILS
SOIL BEARING PRESSURE (D+L) . . . . . 2000 PSF
SOIL BEARING PRESSURE (+W or +E) . . . . . 2667 PSF
MINIMUM FOOTING EMBEDMENT DEPTH . . . . . 18 INCHES
ACTIVE EARTH PRESSURE-LEVEL BACKFILL . . . . . 35 PCF
AT REST EARTH PRESSURE-LEVEL BACKFILL . . . . . 56 PCF
PASSIVE EARTH PRESSURE . . . . . 250 PCF
COEFFICIENT OF FRICTION FOR LATERAL SLIDING RESISTANCE 0.30

SEISMIC DESIGN
SITE CLASS . . . . . D
S_{DS}(SHORT PERIOD) 0.486
LATERAL FORCE W/ LEVEL BACKFILL 9.5H²
LATERAL FORCE APPLICATION HEIGHT 0.6H

WIND DESIGN
BASIC WIND SPEED . . . . . 90 MPH
EXPOSURE C
Iw 1.0

GEOTECHNICAL REPORT

1. THE FOUNDATIONS FOR THE ABOVE REFERENCED PROJECT ARE DESIGNED WITH RECOMMENDATIONS FROM:

   FIRM: OWENS GEOTECHNICAL, INC. REPORT # E-06-022 DATED APRIL 26, 2006, (REVISED JULY 14, 2006) W/ ADDENDUMS DATED JULY 29, 2010, FEB 22, 2011, DEC 5, 2011, MARCH 6, 2012 (BY NOVA GEOTECHNICAL AND INSPECTION SERVICES) AND UPDATE LETTER DATED APRIL 3, 2013

   ALL RECOMMENDATIONS LISTED WITHIN THIS REPORT REGARDING SITE PREPARATION, GRADING, COMPACTION TESTS, INSPECTIONS ETC. SHALL BE FOLLOWED WITH STRICT ADHERENCE AND SHALL BE COMPLETED PRIOR TO CONSTRUCTION.

STRUCTURAL STEEL

GENERAL
DESIGN, FABRICATION AND ERECTION OF STRUCTURAL AND MISCELLANEOUS STEEL SHALL CONFORM TO THE SPECIFICATIONS AND STANDARDS OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION, AS CONTAINED IN THE "AISC MANUAL OF STEEL CONSTRUCTION".

MEMBERS
STRUCTURAL STEEL SHALL CONFORM WITH THE FOLLOWING ASTM STANDARDS AND MATERIAL PROPERTIES, U.N.O.

MEMBER	DESIGNATION	GRADE (Fy)
W SHAPE AND STRUCTURAL TEE	ASTM A992 GRADE 50	50 KSI
CHANNELS, TEES AND ANGLES	ASTM A36	36 KSI
BARS AND PLATES	ASTM A36	36 KSI
HSS (SQ. TUBE)	ASTM A500 (GRADE B)	46 KSI
HEADED STUDS	ASTM A108 (TYPE B)	--
OTHER STRUCTURAL STEEL	ASTM A36	36 KSI

FABRICATION
SHOP DRAWINGS SHALL SHOW MEMBER LAYOUT, SIZE, LENGTH, BOLT HOLE SIZES AND LOCATIONS, CONNECTION DETAILS, GRADE AND ERECTION PROCEDURES CONFORMING TO AISC SPECIFICATIONS.

FABRICATORS SHALL BE PRE-QUALIFIED, APPROVED AND RECOGNIZED BY THE BUILDING OFFICIAL AND CONTRACTOR AS COMPETENT TO COMPLETE REQUIRED FABRICATED ITEMS.

WELDING:
WELDING SHALL BE PERFORMED BY WELDERS HOLDING VALID CERTIFICATES AND HAVING CURRENT EXPERIENCE IN THE TYPE OF WELD SHOWN ON THE DRAWINGS. ALL WELDING SHALL USE E70XX LOW HYDROGEN ELECTRODES UNO. SHOP WELDS MAY USE 70KSI WELDABLE WIRE. ALL WELDS INVOLVING REINFORCING BARS SHALL USE E7018 ELECTRODES. ALL WELDING SHALL CONFORM W/ THE LATEST AMERICAN WELDING SOCIETY STANDARDS. NO TACK WELDING OF ASTM A325 OR ASTM A490 BOLTS. ALL WELDS INDICATE SHOP WELDS. DURING CONSTRUCTION SEQUENCING CONTRACTOR TO DETERMINE APPLICABILITY OF FIELD WELDING AT HIS DISCRETION, PROVIDED THAT WELDS MEET DRAWING SPECIFICATIONS AND ARE PERFORMED IN ACCORDANCE W/ APPROVED BUILDING CODES.

WELDING PROCEDURES, ELECTRODES AND WELDER QUALIFICATIONS SHALL CONFORM TO THE "CODE FOR WELDING IN BUILDING CONSTRUCTION", AMERICAN WELDING SOCIETY (AWS) AND THE AISC "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL BUILDINGS".

ALL WELDS SHALL USE A FILLER MATERIAL OF 70KSI

ALL WELDS INVOLVING REINFORCING BARS SHALL FOLLOW AISC SPECIFICATIONS.

ALL CJP WELDS USED SHALL BE MADE WITH A FILLER METAL THAT HAS A MINIMUM CHARPY V-NOTCH TOUGHNESS OF 20 FT-LBS AT MINUS 20°F, AS DETERMINED BY AWS CLASSIFICATION OR MANUFACTURER CERTIFICATION. USING 7018 ROD FULFILLS THIS REQUIREMENT.

FOR ALL WELDS REQUIRING CONTINUOUS INSPECTION FABRICATOR OR ERECTOR SHALL SUBMIT A WELDING PROCEDURE TO THE ENGINEER.

CONCRETE

MATERIAL
MIN 28 DAY STRENGTH:
STRUCTURES . . . . . 4500 PSI
MAX WATER CEMENT RATIO 0.45
CONCRETE SLUMP . . . . . 4 - 6 INCHES
CEMENT TYPE V

ALL CONCRETE SHALL BE REGULAR WEIGHT OF 145 POUNDS PER CUBIC FOOT UNO, USING HARD ROCK AGGREGATES CONFORMING TO ASTM C33.

BATCHING, MIXING, AND TRANSPORTING
CONCRETE MIXES SHALL BE DESIGNED BY A CERTIFIED LABORATORY AND APPROVED BY THE ENGINEER.

PORTLAND CEMENT SHALL CONFORM TO ACI 318, CHAPTER 3.2.

NO MORE THAN 90 MINUTES SHALL ELAPSE BETWEEN CONCRETE BATCHING AND CONCRETE PLACEMENT, UNLESS APPROVED BY THE ENGINEER OR AUTHORIZED TESTING AGENCY.

BATCHING, MIXING, AND TRANSPORTING CONCRETE SHALL BE PER ACI 304R.

WATER SHALL NOT BE ADDED AT THE JOB SITE SUCH THAT THE MAXIMUM W/C RATIO IS EXCEEDED.

ONLY ADMIXTURES PERMITTED BY THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS CLARK COUNTY SHALL BE ALLOWED.

FORM WORK
FORM WORK SHALL BE PER ACI 347R.

PLACING
PLACING OF CONCRETE SHALL BE PER ACI 304R.

PLACING OF CONCRETE BY MEANS OF PUMPING SHALL BE PER ACI 304.2R.

REINFORCING STEEL AND EMBEDDED ITEMS SHALL BE CLEAN AND FREE FROM FOREIGN DEBRIS.

REINFORCING AND OTHER EMBEDDED ITEMS SHALL BE TIED IN PLACE AND CARE SHALL BE TAKEN TO ENSURE THAT EMBEDDED ITEMS ARE NOT DISPLACED WHILE PLACING CONCRETE.

CONTRACTOR SHALL ENSURE THAT PROPER COVER IS MAINTAINED AT ALL REINFORCING DURING PLACEMENT.

CONSOLIDATION
CONSOLIDATION OF FOOTINGS, WALLS, SLABS ON GRADE, BEAMS, COLUMNS, AND ELEVATED SLABS SHALL BE PER ACI 309R.

UNCONFINED FALL OF CONCRETE SHALL NOT EXCEED 5 FEET. WHERE THE CONGESTION OF REINFORCING RESTRICTS THE USE OF A STANDARD HOSE NOZZLE, A REDUCED HOSE NOZZLE MAY BE USED OR AT THE CONTRACTOR'S OPTION PORTS MAY BE BORED INTO THE SIDES OF THE WALL FORMS.

EMBEDDED ITEMS
EMBEDDED ITEMS SHALL BE PLACED PER ACI 318 SECTION 6.3.

CONDUITS AND PIPES SHALL NOT BE EMBEDDED IN STRUCTURAL CONCRETE WITHOUT WRITTEN APPROVAL FROM THE ENGINEER OF RECORD.

EMBEDDED CONDUITS, PIPES, AND SLEEVES SHALL NOT BE LARGER IN DIAMETER THAN 1/3 THE OVERALL THICKNESS OF THE SLAB, BEAM, OR WALL IN WHICH THEY ARE EMBEDDED AND SHALL NOT BE SPACED CLOSER THAN 3 DIAMETERS OR ELEMENT WIDTHS ON CENTER.

NO ALUMINUM EMBEDS SHALL BE IN DIRECT CONTACT WITH CONCRETE

CONCRETE cont.

WEATHER PROTECTION
PROTECT CONCRETE FROM DAMAGE OR REDUCED STRENGTH DUE TO COLD OR HOT WEATHER IN ACCORDANCE W/ ACI 306 AND 305, RESPECTIVELY.

COLD WEATHER CONDITIONS EXIST AS DEFINED BY ACI 306.

WHEN COLD WEATHER EXISTS, FOLLOW ALL COLD WEATHER SPECIFICATIONS AS DEFINED BY ACI 306 AND NOTED BELOW.

STEEL EMBEDDED IN CONCRETE HAVING A CROSS-SECTIONAL AREA GREATER THAN 1 IN^2 INCLUDING REINFORCING SHALL BE HEATED TO 10°F. THE HEATING PROCESS SHALL NOT ALTER THE MECHANICAL OR METALLURGICAL PROPERTIES OF THE METAL. THE CONTRACTOR SHALL SUBMIT THE PLAN FOR HEATING TO THE ENGINEER OF RECORD FOR APPROVAL.

ENSURE THAT ALL EMBEDDED ITEMS ARE FREE OF FROST OR SNOW.

FROZEN SUBGRADE SHALL BE THAWED TO THE MINIMUM FROST DEPTH AS SPECIFIED IN THE BASIS FOR DESIGN.

CONCRETE MIX TEMPERATURE WHILE PLACING SHALL BE 55° F TO 75° F AND MAINTAINED OVER THE NEXT 72 HOURS. THE MAXIMUM ALLOWABLE TEMPERATURE DROP OVER THE NEXT 24 HOURS IS 50°F. CONCRETE TEMPERATURES SHALL BE CHECKED AT LEAST 2 TIMES PER DAY AND NOT CLOSER THAN 8 HOUR INCREMENTS.

WHEN CONCRETE IS PLACED IN COLD WEATHER CONDITIONS, ACCELERATOR ADMIXTURES MAY BE USED WHEN CONCRETE STRENGTH IS INCREASED BY BY 25% (750 PSI MIN) AS SPECIFIED IN CONCRETE SECTION. PRIOR TO REMOVAL OF FORMS AND SHORING, CONCRETE STRENGTH SHALL REACH 1000 PSI COMPRESSIVE STRENGTH UNLESS NOTED OTHERWISE.

A DETAILED REPORT SHALL BE SUBMITTED WITH THE CONCRETE MIX DESIGN AND PROTECTION PROCEDURES PRIOR TO PLACEMENT OF CONCRETE TO THE ENGINEER.

INVERTS AND SLABS
1-1/2" MAX AGGREGATE SIZE.

CONTRACTOR SHALL FOLLOW ACI 302 AGGREGATE SPECIFICATION USING MIN OF #8 AND #4 AGGREGATES TO PROVIDE A WELL GRADED AGGREGATE MIX.

CONCRETE SHALL BE FINISHED ACCORDING TO THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS CLARK COUNTY. INVERT EXPOSED SURFACE SHALL BE ORDINARY BROOM FINISH.

ARCH CULVERT SHOTCRETE

SHOTCRETE PROPORTIONS SHALL BE SELECTED THAT ALLOW SUITABLE PLACEMENT PROCEDURES USING THE DELIVERY EQUIPMENT SELECTED AND SHALL RESULT IN FINISHED IN-PLACE HARDENED SHOTCRETE MEETING THE STRENGTH REQUIREMENTS STATED HERE-IN. COARSE AGGREGATE, IF USED, SHALL NOT EXCEED 3/8 INCH. ANY REBOUND OR ACCUMULATED LOOSE AGGREGATE SHALL BE REMOVED FROM THE SURFACES TO BE COVERED PRIOR TO PLACING THE INITIAL OR ANY SUCCEEDING LAYERS OF SHOTCRETE. REBOUND SHALL NOT BE REUSED AS AGGREGATE.

SHOTCRETE PLACEMENT SHALL BE PLACED ACCORDING TO ACI 506R-90. PRE-CONSTRUCTION TESTING OF SHOTCRETE IS NOT REQUIRED PROVIDED THE CONTRACTOR DEMONSTRATES TO THE BUILDING OFFICIAL, BY MEANS APPROVED BY THE BUILDING OFFICIAL, ACCEPTED SHOTCRETE WORK USING SIMILAR EQUIPMENT UNDER SIMILAR CIRCUMSTANCES WITH THE SAME PERSONNEL.

FINISHING:
ACCORDING TO THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS CLARK COUNTY, ONLY SURFACES EXPOSED TO VIEW AFTER BACKFILL IS PLACED REQUIRE FINISHING (EITHER ORDINARY OR FINE). HOWEVER, IT IS REQUIRED THAT THE EXTERIOR SHOTCRETE SURFACE IS MADE SMOOTH WITH A STEEL TROWEL OR FRESNO TO FACILITATE THE APPLICATION OF WATERPROOFING. THIS FINISH SHALL HAVE NO REQUIREMENTS FOR FLATNESS. HOWEVER, THE SURFACE SHALL BE FREE FROM STONE POCKETS, DEPRESSIONS OR PROJECTIONS IN EXCESS OF 1/4 INCH BEYOND THE SURFACE. INVERT EXPOSED SURFACE SHALL BE INDUSTRY-STANDARD BROOM FINISH.

ADMIXTURES:
ONLY ADMIXTURES PERMITTED BY THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS CLARK COUNTY SHALL BE ALLOWED.

CURING:
CURING ON THE OUTSIDE SURFACE AND INSIDE SURFACE AFTER FORM REMOVAL SHALL BE BY MEANS OF LIQUID MEMBRANE-FORMING COMPOUND MEETING THE REQUIREMENTS OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS CLARK COUNTY. A BULKHEAD SHALL BE PLACED AT THE END OF THE CULVERT TO STOP WIND MOVEMENT THROUGH THE CULVERT IMMEDIATELY AFTER ARCH FORM REMOVAL.

ARCH FORMS SHALL BE LEFT IN PLACE FOR A MINIMUM OF 36 HOURS BEFORE STRIPPING. CONCRETE STRENGTH AT STRIPPING SHALL BE REVIEWED BY EOR.

MISC:
COMPLETED SHOTCRETE WORK SHALL BE CHECKED VISUALLY DURING CONSTRUCTION AND PRIOR TO FINAL APPROVAL OF SHOTCRETE FOR REINFORCING BAR EMBEDMENT, VOIDS, ROCK POCKETS, SAND STREAKS AND SIMILAR DEFICIENCIES. THE SPECIAL INSPECTOR SHALL EXAMINE.

SURFACES OF STEEL FORMS SHALL BE COATED W/ AN ICC APPROVED FORM RELEASE.

SHOTCRETE NOZZLEMAN SHALL BE CERTIFIED PER ACI 506.3R-91. CERTIFIED NOZZLEMAN SHALL BE ABLE TO SHOW COMPLETION OF COMPETENT WORK ON ARCH CULVERT OF SIMILAR SIZE AND SCOPE. COMPARABLE WORK SHALL HAVE BEEN COMPLETED ON AT LEAST 5 PROJECTS WITHIN THE LAST 24 MONTHS.

SHOTCRETE CONTRACTOR SHALL BE ABLE TO SHOW COMPLETION OF COMPETENT WORK ON ARCH CULVERT OF SIMILAR SIZE AND SCOPE. COMPARABLE WORK SHALL HAVE BEEN COMPLETED ON AT LEAST 5 PROJECTS WITHIN THE LAST 24 MONTHS.

SHOTCRETE MAY BE USED IN LIEU OF POURED IN PLACE CONCRETE ON ALL ARCHES, WALLS, MANHOLE BASES (ATTACHED DIRECTLY TO ARCH).

SLABS SHALL BE POURED IN PLACE.

AT CONTRACTORS OPTION CUT OFF WALLS MAY UTILIZE A 3/8" MINUS AGGREGATE IN MIX DESIGN.

ARCH PROFILES SHALL BE SAME GEOMETRY AND MAY NOT DEVIATE.

REINFORCING STEEL

USE OF EPOXY-COATED BARS IS NOT PERMITTED.

GRADE

TYPE	GRADE	ASTM STD
ALL WELDED BARS	60	A706
#4 OR LARGER	60	A615
#3 OR SMALLER	40	A615
WELDED WIRE FABRIC	60	A185

CLEAR COVER
ALL DIMENSIONS NOT NOTED AS "CLR" ARE TO THE CENTER OF THE BAR. MIN COVER FOR NON-PRESTRESSED STEEL (UNO):

STRUCTURAL ELEMENT	COVER	TOLERANCE
FOOTINGS AND SLAB ON GRADE	3"	3/8"
WALLS (#5 OR SMALLER)	1 1/2"	3/8"
WALLS (#6 OR LARGER)	2"	1/2"
ELEVATED SLABS, BEAMS AND COLUMNS	1 1/2"	3/8"

LAP SPLICES
LENGTHS SHALL BE PROVIDED PER THE FOLLOWING TABLE. (UNO TACK WELDING OF REINFORCING BARS NOT ALLOWED).

BAR	REBAR LAP SCHEDULE			
	TOP REINFORCING [a]		BOT REINFORCING	
	LAP	LAP/1.3 [b]	LAP	LAP/1.3 [b]
#3	18"	14"	14"	11"
#4	24"	19"	19"	14"
#5	30"	23"	23"	18"
#6	37"	28"	28"	22"
#7	53"	41"	41"	32"
#8	61"	47"	47"	36"
#9	69"	53"	53"	41"
#10	77"	59"	59"	46"
#11	86"	66"	66"	51"

(a) TOP REINFORCING IS DEFINED AS HORIZONTAL REINFORCING PLACED SUCH THAT MORE THAN 12" OF FRESH CONCRETE IS CAST BELOW.

(b) WHERE HALF OR MORE OF BAR SPLICES ARE STAGGERED AT LEAST ONE LAP LENGTH USE THESE LAP LENGTHS.

MECHANICAL SPLICE COUPLERS
MECHANICAL SPLICE COUPLERS SHALL HAVE CURRENT ICC APPROVAL AND SHALL BE CAPABLE OF DEVELOPING 125% OF THE STRENGTH OF THE BAR.

WELDING
WELDING OF REINFORCING BARS, METAL INSERTS, AND CONNECTIONS SHALL CONFORM TO AWS D1.4. ONLY A706 BAR SHALL BE WELDED.

BENDING
BENDING SHALL BE MADE ONLY AT LOCATIONS SHOWN ON PLANS OR DETAILS. ALL REINFORCING SHALL BE BENT COLD. BARS SHALL NOT BE UN-BENT AND RE-BENT. #6 BAR AND SMALLER MAY BE COLD FIELD BENT. #7 BAR AND LARGER SHALL NOT BE FIELD BENT WITHOUT PRIOR APPROVAL FROM ENGINEER.

PLACE AND DETAIL
ALL BARS SHALL BE DETAILED AND PLACED PER CRSI SPECIFICATIONS AND HANDBOOK. DOWEL ALL VERT REINFORCING TO FOUNDATION. SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE.

DEFERRED SUBMITTALS

DEFERRED ITEMS
PREFABRICATED OR SPECIALTY ITEMS, AND THEIR COMPONENTS, WHICH ARE INDICATED BY THE STRUCTURAL DRAWINGS TO BE DESIGNED BY OTHERS, SHALL BE SUBMITTED TO THE ARCHITECT AND/OR ENGINEER OF RECORD FOR REVIEW AS A DEFERRED SUBMITTAL, PROVIDED THAT SUCH SUBMITTAL IS AUTHORIZED BY THE BUILDING DEPARTMENT. DEFERRED SUBMITTALS REQUIRED TO BE SUBMITTED TO THE STRUCTURAL ENGINEER OF RECORD SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:

- CONCRETE MIX DESIGN
- STRUCTURAL STEEL SHOP DWGS

DOCUMENTATION
ALL DEFERRED SUBMITTALS SHALL INCLUDE CALCULATIONS AND DRAWINGS PREPARED IN ACCORDANCE W/ ALL APPLICABLE BUILDING CODES AND STAMPED BY AN APPROPRIATELY LICENSED PROFESSIONAL ENGINEER. SUBMITTALS SHALL SHOW LOCATION AND MAGNITUDE OF LOADS, SIZE AND CONFIGURATION OF MEMBERS AND COMPATIBILITY W/ THE PRIMARY STRUCTURAL SYSTEM.

REVIEW
DEFERRED SUBMITTAL ITEMS SHALL BE REVIEWED IN ACCORDANCE W/ STANDARD SHOP DRAWING REVIEW PROCEDURES, AS DESCRIBED IN THE GENERAL REQUIREMENT SECTION OF THE GENERAL STRUCTURAL NOTES.

DAMP-PROOFING

THE EXTERIOR SURFACE OF ALL BURIED STRUCTURES SHALL BE DAMP-PROOFED WITH THE TUFF-N-DRI XTS SYSTEM OR EQUIVALENT. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.

POST-INSTALLED ANCHORAGE

INSTALLATION
INSTALL THE ITEMS BELOW PER THE CURRENT ICC REPORT (ESR) AND MFR'S RECOMMENDATIONS

ALTERNATE
ALTERNATE ANCHOR SYSTEMS WITH CURRENT ICC APPROVAL MAY BE USED WITH PRIOR WRITTEN APPROVAL BY ENGINEER

EPOXY-ADHESIVE ANCHORS
EPOXY-ANCHORED BOLTS, THREADED ROD AND REBAR SHALL BE INSTALLED USING ONE OF THE FOLLOWING EPOXY ADHESIVES:

CONCRETE:
- HILTI HIT-RE 500-SD ADHESIVE ANCHOR SYSTEM (ESR-2322)
- SIMPSON SET-XP ADHESIVE ANCHOR SYSTEM (ESR-2508)

SPECIAL INSPECTIONS

SPECIAL INSPECTION INDEPENDENT OF THE CONTRACTOR, ARCHITECT, OR ENGINEER OF RECORD SHALL BE PROVIDED BY OWNER ACCORDING TO IBC/CBC CHAPTER 17. THE SPECIAL INSPECTOR SHALL OBSERVE THE WORK FOR CONFORMANCE W/ THE CONTRACT DOCUMENTS, NOT THE SHOP DWGS. THE SPECIAL INSPECTOR SHALL SEND REPORTS TO THE OWNER, THE BUILDING OFFICIAL, THE ARCHITECT, THE ENGINEER, AND CONTRACTOR. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR FOR CORRECTION. THE SPECIAL INSPECTOR SHALL SUBMIT A FINAL SIGNED REPORT STATING THAT THE SPECIAL INSPECTION WORK WAS, TO THE BEST OF HIS KNOWLEDGE, IN OR NOT IN CONFORMANCE W/ THE PLANS, SPECIFICATIONS AND APPLICABLE WORKMANSHIP PROVISIONS OF THE IBC/CBC.

CONT OR PERIODIC SPECIAL INSPECTION IS REQUIRED FOR THE FOLLOWING WORK:

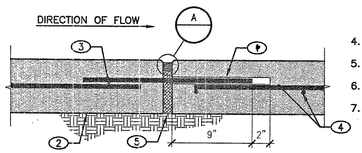
VERIFICATION AND INSPECTION	CONT	PERIODIC
CONCRETE		
INSPECTION OF REINFORCING STEEL, AND/OR PRE STRESS TENDONS AND PLACEMENT		■
INSPECT BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT	■	
VERIFYING USE OF REQUIRED DESIGN MIX		■
SAMPLING FRESH CONCRETE AND PERFORMING SLUMP, AIR CONTENT AND DETERMINING THE TEMPERATURE OF FRESH CONCRETE AT THE TIME OF MAKING SPECIMENS FOR STRENGTH TESTS PER ACI 318	■	
WELDING OF REINFORCING STEEL:		
VERIFICATION OF WELDABILITY OF REINF STEEL OTHER THAN ASTM A 706		■
SHEAR REINFORCEMENT	■	
OTHER REINFORCING STEEL		■
INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.		■
VERIFICATION OF IN-SITU CONCRETE STRENGTH PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS		■
INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED		■
STEEL		
INSPECTION OF WELDING: STRUCTURAL STEEL:		
COMPLETE AND PARTIAL PENETRATION GROOVE WELDS.	■	
SINGLE-PASS FILLET WELDS ≤ 5/16"		■
WELDED STUDS AT STEEL BEAMS		■
POST-INSTALLED ANCHORS (EPOXY, EXPANSION, SCREW)		
AS APPLICABLE THE INSPECTION PROGRAM SHALL VERIFY: ANCHOR TYPE, EMBEDMENT, TIGHTENING TORQUE, DIMENSIONS, HOLE DEPTH, DIA. AND CLEANOUT, EPOXY MIXING AND PLACEMENT PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND CURRENT ICC REPORT (ESR)	DURATION OF INSPECTION SHALL BE IN ACCORDANCE W/ ICC REPORT (ESR)	
ARCH CULVERT BACK FILL		
BACKFILL AROUND THE ARCH CULVERT SHALL BE PROVIDED AT A FREQUENCY AS NECESSARY TO ENSURE THAT PROPER FILL AND COMPACTION IS ACHIEVED	COMPACTION TESTS FOR EACH LIFT SHALL BE TAKEN PER EVERY 2500 SQUARE FEET PLACED AS A MINIMUM	

SHEET INDEX

SHEET NO.	SHEET TITLE
S0.1	GENERAL STRUCTURAL NOTES
S0.2	TYPICAL DETAILS
S0.3	TYPICAL DETAILS
S0.4	TYPICAL DETAILS
S1.1	PLAN VIEW
S1.2	PLAN VIEW
S1.3	PLAN VIEW
S1.4	PLAN VIEW
S1.5	PLAN VIEW
S1.6	PLAN VIEW
S2.1	JUNCTION PLAN VIEW, SECTIONS AND ELEVATIONS
S2.2	JUNCTION SECTIONS AND ELEVATIONS
S2.3	SD-1 JUNCTION PLAN VIEW, SECTIONS AND ELEVATIONS
S2.4	SD-1 JUNCTION SECTION AND ELEVATION
S2.5	SD-1 MANHOLE PLAN VIEW, SECTIONS AND ELEVATIONS
S2.6	HEADWALL PLAN VIEW, SECTIONS AND ELEVATIONS
S2.7	HEADWALL ELEVATION
S2.8	OUTLET STRUCTURE PLAN VIEW AND SECTIONS
S2.9	OUTLET STRUCTURE ELEVATIONS AND SECTIONS
S2.10	SD-2 MANHOLE PLAN VIEW, SECTIONS AND ELEVATIONS
S2.11	SD-2 MANHOLE PLAN VIEW, SECTIONS AND ELEVATIONS
S2.12	SD-2 JUNCTION PLAN VIEW, SECTIONS AND ELEVATIONS
S2.13	HEADWALL PLAN VIEW, SECTION AND ELEVATION
S2.14	SD-2 MANHOLE PLAN VIEW, SECTIONS AND ELEVATIONS
S2.15	SD-2 MANHOLE PLAN VIEW, SECTIONS AND ELEVATIONS
S2.16	SD-2 MANHOLE PLAN VIEW, SECTIONS AND ELEVATIONS
S2.17	SD-2 TRANSITION PLAN VIEW, SECTIONS AND ELEVATIONS
S2.18	SD-2 SECTIONS AND ELEVATIONS
S2.19	(E) RCB CONNECTION PLAN VIEW, SECTIONS AND ELEVATIONS
S3.1	CULVERT SECTIONS
S3.2	ARCH AT MANHOLE SECTIONS
S3.3	ARCH AT RCP LATERAL

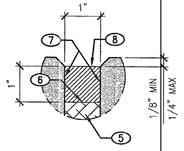
STANDARD ABBREVIATIONS

AB	ANCHOR BOLT
ACI	AMERICAN CONCRETE INSTITUTE
ADDL	ADDITIONAL
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISI	AMERICAN IRON AND STEEL INSTITUTE
AITC	AMERICAN INSTITUTE OF TIMBER CONSTRUCTION
ALT	ALTERNATE
APA	AMERICAN PLYWOOD ASSOCIATION
ARCH	ARCHITECTURAL
ASD	ALLOWABLE STRESS DESIGN
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS



KEYNOTES:

1. 5/8"ø ID PLASTIC SLEEVE AS MANUFACTURED BY SPEED DOWEL OR APPROVED EQUAL
2. SOIL FACE OF WALL
3. 5/8"ø x19" SMOOTH EPOXY COATED DOWELS AT 12" O.C. ALIGN ALL DOWELS TO BE SQUARE W/ JOINT FACE. DOWEL ALIGNMENT TO BE CHECKED BEFORE CONCRETE IS PLACED
4. WALL REINFORCING PER DETAILS
5. PREFORMED SPONGE RUBBER
6. BOND BREAKER TAPE
7. EVA-POX BONDER #1 OR APPROVAL EQUAL APPLIED TO BOTH SURFACES OF THE COMPRESSION SEAL AND BOTH CONCRETE SURFACES. BONDER SHALL FILL THE GROOVES ON THE COMPRESSION SEAL
8. 1" DEEP PHYZITE 380 COMPRESSION SEAL AS MANUFACTURED BY E-POXY ENGINEERED MATERIALS LLC. OR APPROVED EQUAL. THE WIDTH OF THE SEAL SHALL BE 25% GREATER THAN THE WIDTH OF THE JOINT AT THE TIME OF INSTALLATION. MEASURE WIDTH OF JOINT AFTER INITIAL SHRINKAGE AND THERMAL MOVEMENT HAS OCCURRED. ORDER SEALER MATERIAL AT MEASURED WIDTH PLUS 25% AND INSTALL INTO JOINT AS SOON AS POSSIBLE AFTER DELIVERY TO JOB SITE. BRUSH BLAST ALL SURFACES IN DIRECT CONTACT W/ JOINT SEAL. BLOW DEBRIS FROM THE JOINT OPENING AND JOINT SURFACES W/ OIL FREE COMPRESSED AIR. ALL JOINTS IN THE COMPRESSION SEAL SHALL BE HEAT WELDED.

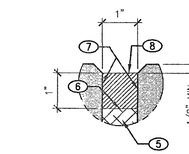


SECTION 'A'

9 EXPANSION JOINT AT CHANNEL WALL
NO SCALE

KEYNOTES:

1. 5/8"ø ID PLASTIC SLEEVE AS MFR BY SPEED DOWEL OR APPROVED EQUAL
2. #4 BENT DOWEL TO LAP AND MATCH SLAB REINF
3. #4 AT 12" O.C. CONT HORIZ
4. 5/8"ø x19" SMOOTH EPOXY COATED DOWELS AT 12" O.C. ALIGN ALL DOWELS TO BE SQUARE W/ JOINT FACE SLAB HORIZ AND VERT. DOWEL ALIGNMENT TO BE CHECKED BEFORE CONCRETE IS PLACED
5. PREFORMED SPONGE RUBBER
6. BOND BREAKER TAPE
7. EVA-POX BONDER #1 OR APPROVAL EQUAL APPLIED TO BOTH SURFACES OF THE COMPRESSION SEAL AND BOTH CONCRETE SURFACES. BONDER SHALL FILL THE GROOVES ON THE COMPRESSION SEAL
8. 1" DEEP PHYZITE 380 COMPRESSION SEAL AS MANUFACTURED BY E-POXY ENGINEERED MATERIALS LLC. OR APPROVED EQUAL. THE WIDTH OF THE SEAL SHALL BE 25% GREATER THAN THE WIDTH OF THE JOINT AT THE TIME OF INSTALLATION. MEASURE WIDTH OF JOINT AFTER INITIAL SHRINKAGE AND THERMAL MOVEMENT HAS OCCURRED. ORDER SEALER MATERIAL AT MEASURED WIDTH PLUS 25% AND INSTALL INTO JOINT AS SOON AS POSSIBLE AFTER DELIVERY TO JOB SITE. BRUSH BLAST ALL SURFACES IN DIRECT CONTACT W/ JOINT SEAL. BLOW DEBRIS FROM THE JOINT OPENING AND JOINT SURFACES W/ OIL FREE COMPRESSED AIR. ALL JOINTS IN THE COMPRESSION SEAL SHALL BE HEAT WELDED.
9. CONSTRUCTION JOINT AT CONTRACTORS OPTION
10. INVERT REINFORCING PER DETAILS
11. 10" CHAMFER

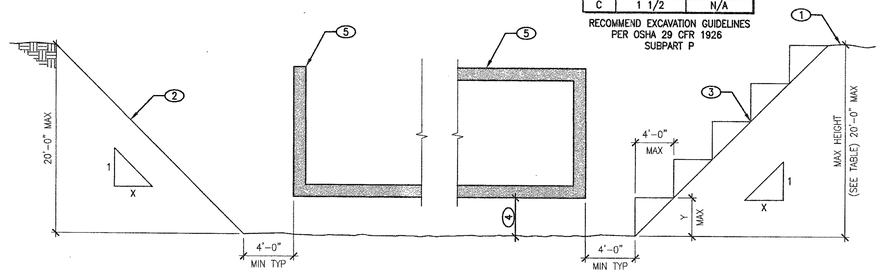


SECTION 'A'

10 EXPANSION JOINT AT CHANNEL BOTTOM
NO SCALE

SOIL TYPE	(X) HORIZONTAL	(Y) MULT BENCH
A	3/4	5'-0"
B	1	4'-0"
C	1 1/2	N/A

RECOMMEND EXCAVATION GUIDELINES PER OSHA 29 CFR 1926 SUBPART P



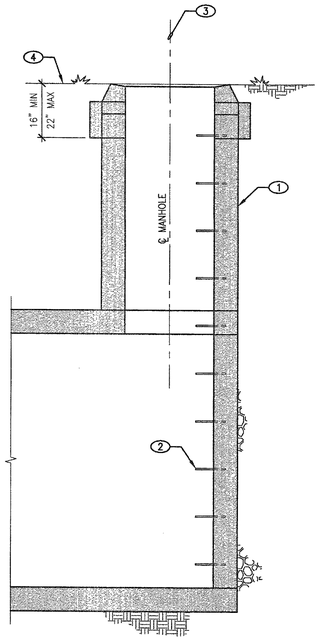
KEYNOTES:

1. FINISHED GRADE
2. SIMPLE SLOPE EXCAVATION
3. MULTIPLE BENCH EXCAVATION
4. OVER EXCAVATE AS REQ'D FOR FILL PLACEMENT. REFER TO GSN
5. RCB OR CHANNEL AS OCCURS

NOTES:

A. COORDINATE EXCAVATION SOIL W/ OSHA 29 CFR 1926 SUBPART P TO DETERMINE SOIL TYPE A, B OR C.
B. CONTRACTOR SHALL CONSULT GEOTECHNICAL REPORT PRIOR TO EXCAVATION
C. THE INFORMATION PRESENTED IS A GUIDELINE TO EXCAVATION BASED ON OSHA 29 CFR 1926 SUBPART P. TO DETERMINE WHERE SHORING IS REQ'D AND FOR FURTHER INFORMATION SEE OSHA 29 CFR 1926. SEE TABLE

3 TYPICAL RCB EXCAVATION REQUIREMENTS
NO SCALE



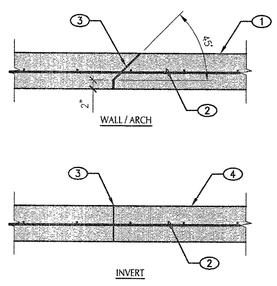
KEYNOTES:

1. MANHOLE ASSEMBLY PER CLARK COUNTY UNIFORM STANDARD DRAWING NO. 403 OR 404
2. MANHOLE STEPS PER CLARK COUNTY UNIFORM STANDARD DRAWING NO. 410
3. REFERENCE CIVIL DRAWINGS FOR MANHOLE STATIONING
4. ROUGH GRADE

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY

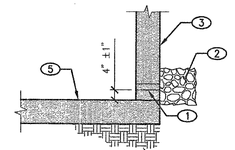
7 TYPICAL SECTION AT MANHOLE
NO SCALE OC1.09



KEYNOTES:

1. CONCRETE WALL OR ARCH
2. REINF PER DETAILS
3. CONSTRUCTION JOINT
4. INVERT

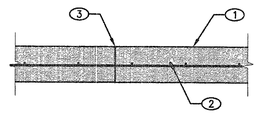
8 CONSTRUCTION JOINT IN ARCH WALL OR INVERT
NO SCALE OC1.06



KEYNOTES:

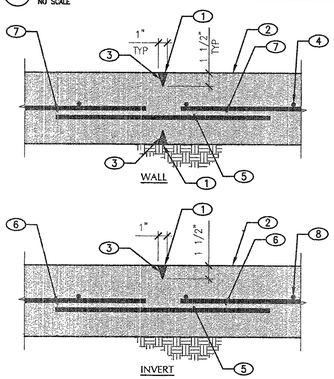
1. 3"ø WEEP HOLE EACH SIDE OF STRUCTURE, LOCATE PER PLANS
2. (2) CUBIC FOOT OF FREE DRAIN MATERIAL WRAPPED IN FILTER FABRIC AT EACH WEEP HOLE.
3. CONCRETE STRUCTURE WALL
4. COMPACT SUBGRADE, SEE GEOTECHNICAL REPORT
5. STRUCTURE INVERT

4 WEEP HOLE DRAIN REQUIREMENTS
NO SCALE



KEYNOTES:

1. CONCRETE WALL OR SLAB
2. REINF PER DETAILS
3. CONSTRUCTION JOINT



KEYNOTES:

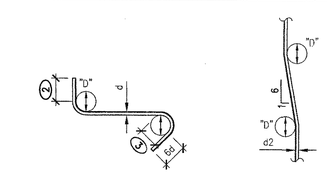
1. SEALANT 2-COMPONENT POLYURETHANE "SIKAFLEX-2C" OR APPROVED EQUAL
2. NON SOIL FACE OF CONCRETE WALL OR TOP OF INVERT
3. FORMED GROOVE
4. VERTICAL BARS PER DETAIL
5. ADD #5x48" LONG DOWEL AT 12" O.C. (CENTERED)
6. LONGITUDINAL BARS, TERMINATE AT JOINT AS SHOWN.
7. HORIZ WALL REINF, TERMINATE AT JOINT AS SHOWN.
8. TRANSVERSE BARS PER DETAIL

NOTES:

A. REINF SHOWN CENTERED. MAY VARY PER DETAILS

5 CONSTRUCTION JOINT IN BOX TOP & BOTTOM SLAB & WALL
NO SCALE

6 CONTROL JOINT AT CHANNEL WALL OR INVERT
NO SCALE



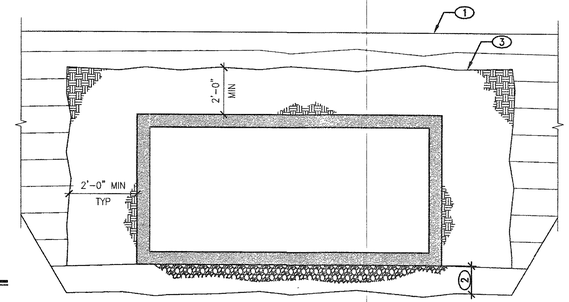
KEYNOTES:

1. D = 6d FOR #3 THRU #8
   D = 8d FOR #9, 10 AND 11
   D = 10d FOR #14 AND #18
2. 6d FOR #5 AND SMALLER
   12d FOR #6 THRU #8
3. MINIMUM FINISHED BEND DIA FOR STIRRUPS AND TIES ONLY
   4"d OF #5 AND SMALLER
   6"d FOR #6 THRU #8
   6"d FOR #6 THRU #8

NOTES:

A. "d" = BAR DIA
B. ALL REINFORCEMENT SHALL BE BENT COLD UNLESS NOTED OTHERWISE ON PLANS OR DETAILS

1 STANDARD REBAR BENDING DETAILS
NO SCALE TD.13



KEYNOTES:

1. FINISHED GRADE
2. SCARIFY 12" MIN AND COMPACT TO 95% OF MAXIMUM DRY DENSITY PER CCRFCD HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL, SECTION 700. SUBGRADE MATERIAL SHALL MEET STRUCTURAL FILL SPECIFICATIONS PER GEOTECHNICAL REPORT.
3. BACKFILL WITHIN 2'-0" OF BOX OR STEM WALLS SHALL CONSIST OF BACKFILL MEETING THE REQUIREMENTS OF THE UNIFORM STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SECTION 207.02.02 AS FOLLOWS:

- GRANULAR BACKFILL SHALL CONSIST OF NATURAL SAND OR A MIXTURE OF SAND WITH GRAVEL, CRUSHED GRAVEL, OR CRUSHED STONE AND CONFORM TO THE FOLLOWING REQUIREMENTS:

SIEVE SIZES	PERCENTAGE PASSING BY MASS
75 MM (3 IN.)	100
4.75 MM (NO. 4)	35-100
1200 µM (NO. 16)	25-100
75 µM (NO. 200)	5-12

TEST	TEST METHOD	REQUIREMENTS
SIEVE ANALYSIS	NEV. T206	ABOVE
LIQUID LIMIT	NEV. T210	35 MAX.
PLASTICITY INDEX	NEV. T212	10 MAX.

- DO NOT USE PEA GRAVEL AS GRANULAR BACKFILL. PEA GRAVEL IS TYPICALLY A BYPRODUCT OF AGGREGATE CRUSHING AND/OR SCREENING OPERATIONS. IT IS UNIFORMLY GRADED, NORMALLY HAVING A NOMINAL SIZE OF 9.5 MM (3/8 IN.). GRANULAR BACKFILL SHALL ALSO CONFORM TO THE FOLLOWING REQUIREMENTS BASED ON USAGE:

TEST:	TEST METHOD	CULVERTS AND STRUCTURES (CONCRETE)
PH VALUE	NEV. T238	5.0 TO 9.5
RESISTIVITY	NEV. T235	1000 OHM.CM MIN.

NOTES:

A. PLACEMENT OF THE FILL AT THE STEM WALLS AND OVER THE BOX MAY BEGIN WHEN THE CONCRETE STRENGTH HAS REACHED 80% OF THE REQ'D COMPRESSIVE STRENGTH PER SECTION 207.03.01. FILL SHALL BE PLACED IN 8" MAXIMUM VERTICAL LIFTS AND COMPACTED TO 95% OF DRY DENSITY. LIFTS SHALL BE PLACED SYMMETRICALLY EACH SIDE ALONG THE FULL LENGTH OF CULVERT WITH A MAXIMUM BACKFILL LIFT HEIGHT DIFFERENTIAL OF 1'-0". MAXIMUM DRY DENSITY SHALL BE DETERMINED PER TEST METHOD NO. NEV. T101
B. NO EQUIPMENT WEIGHING MORE THAN A 3 YARD RUBBER TIRE LOADER (928 CATERPILLAR OR EQUIVALENT) SHALL BE ALLOWED TO PASS OVER THE STRUCTURE UNTIL THE SPECIFIED FILL IS IN PLACE. HEAVY EQUIPMENT SUCH AS SCRAPERS AND CRANES SHALL BE ALLOWED TO PASS OVER THE STRUCTURE ONLY WITH SPECIFIC WRITTEN PERMISSION FROM THE STRUCTURAL ENGINEER.
C. CONTRACTOR SHALL CONSULT GEOTECHNICAL REPORT PRIOR TO COMMENCING BACKFILL

2 RCB BACKFILL REQUIREMENTS (ELEVATION)
NO SCALE

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SEAL: PROFESSIONAL ENGINEER, STATE OF NEVADA, JAMES A. GOLDEN, No. 12181, REGISTERED PROFESSIONAL ENGINEER, CIVIL, STRUCTURAL, Exp. 12/31/19 — 05/10/2018

PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: TYPICAL DETAILS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S0.2

731-93
L-60211

PRO.J#:124070 AGREE.#115666 QS:124-07-SW/NE,124-18-NW/NE

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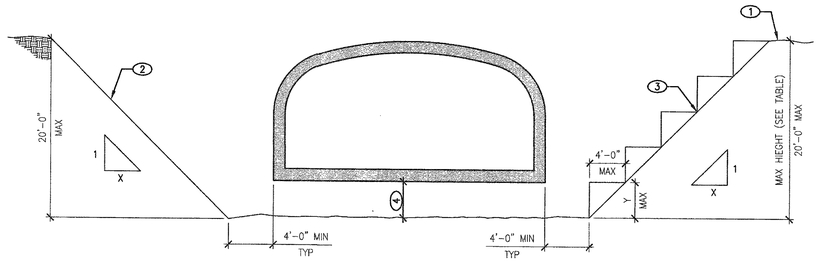


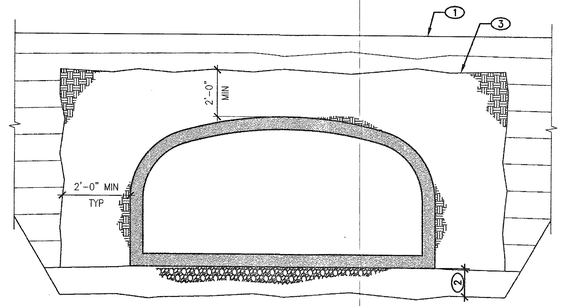
13 TYPICAL ARCH EXCAVATION REQUIREMENTS
NO SCALE

KEYNOTES:
1. FINISHED GRADE
2. SIMPLE SLOPE EXCAVATION
3. MULTIPLE BENCH EXCAVATION
4. OVER EXCAVATE AS REQ'D FOR FILL PLACEMENT
5. COORDINATE EXCAVATION SOIL W/ OSHA 29 CFR 1926 SUBPART P TO DETERMINE SOIL TYPE A, B OR C.
6. THE INFORMATION PRESENTED IS A GUIDELINE TO EXCAVATION BASED ON OSHA 29 CFR 1926 SUBPART P. TO DETERMINE WHERE SHORING IS REQ'D AND FOR FURTHER INFORMATION SEE OSHA 29 CFR 1926

SOIL TYPE	(X) HORIZONTAL	(Y) MULT BENCH
A	3/4	5'-0"
B	1	4'-0"
C	1 1/2	NA

RECOMMEND EXCAVATION GUIDELINES PER OSHA 29 CFR 1926 SUBPART P

OC1.13



KEYNOTES:
1. FINISHED GRADE
2. WHERE THE GEOTECHNICAL REPORT DOES NOT SPECIFY THE SUBBASE PREPARATION BELOW THE ARCH INVERT, THE SUBBASE PREPARATION SHALL CONFORM TO THE FOLLOWING:
   A. NATIVE SOILS SHALL BE FREE OF CLAYS AND SILTS AND MEET A MIN SOIL CLASS OF SM OR SP PER THE UNIFIED CLASSIFICATION SYSTEM
   B. SCARIFY NATIVE SUBBASE SOILS TO 12" MIN DEPTH AND RECOMPACT TO 95% OF MAX DRY DENSITY
   C. PLACE A 6" THICK LAYER OF WELL-GRADED GRANULAR MATERIAL ATOP THE COMPACTED EXISTING SUBBASE. COMPACT TO 95% MAX DRY DENSITY.
3. BACKFILL WITHIN 2'-0" OF BOX OR STEM WALLS SHALL CONSIST OF BACKFILL MEETING THE REQUIREMENTS OF THE UNIFORM STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SECTION 207.02.02 AS FOLLOWS:

- GRANULAR BACKFILL SHALL CONSIST OF NATURAL SAND OR A MIXTURE OF SAND WITH GRAVEL, CRUSHED GRAVEL, OR CRUSHED STONE AND CONFORM TO THE FOLLOWING REQUIREMENTS:

SIEVE SIZES	PERCENTAGE PASSING BY MASS
75 MM (3 IN.)	100
4.75 MM (NO. 4)	35-100
600 µM (NO. 30)	20-100
75 µM (NO. 200)	0-12

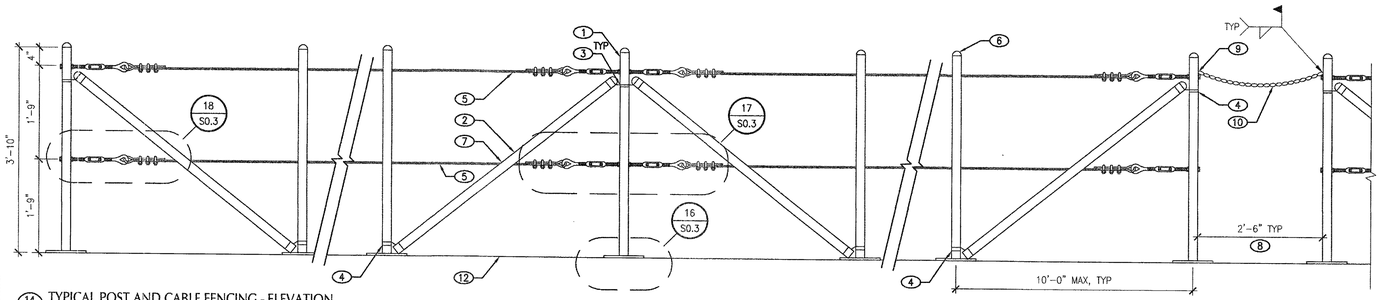
TEST	TEST METHOD	REQUIREMENTS
SIEVE ANALYSIS	NEV. T206	ABOVE
LIQUID LIMIT	NEV. T210	35 MAX.
PLASTICITY INDEX	NEV. T212	10 MAX.

- DO NOT USE PEA GRAVEL AS GRANULAR BACKFILL. PEA GRAVEL IS TYPICALLY A BYPRODUCT OF AGGREGATE CRUSHING AND/OR SCREENING OPERATIONS. IT IS NOT UNIFORMLY GRADED, NORMALLY HAVING A NOMINAL SIZE OF 9.5 MM (3/8 IN.). GRANULAR BACKFILL SHALL ALSO CONFORM TO THE FOLLOWING REQUIREMENTS BASED ON USAGE:

TEST:	TEST METHOD	CULVERTS AND STRUCTURES (CONCRETE)
PH VALUE	NEV. T238	5.0 TO 9.5
RESISTIVITY	NEV. T235	1000 OHM.CM MIN.

NOTES:
A. PLACEMENT OF THE FILL AT THE STEM WALLS AND OVER THE ARCH MAY BEGIN WHEN THE CONCRETE STRENGTH HAS REACHED 2500 psi COMPRESSIVE STRENGTH PER SECTION 207.03.01. FILL SHALL BE PLACED IN 8" MAXIMUM VERTICAL LIFTS AND COMPACTED TO 95% OF DRY DENSITY. LIFTS SHALL BE PLACED SYMMETRICALLY EACH SIDE ALONG THE FULL LENGTH OF CULVERT WITH A MAXIMUM BACKFILL LIFT HEIGHT DIFFERENTIAL OF 1'-0". MAXIMUM DRY DENSITY SHALL BE DETERMINED PER TEST METHOD NO. NEV. T101
B. NO EQUIPMENT WEIGHING MORE THAN A 3 YARD RUBBER TIRE LOADER (928 CATERPILLAR OR EQUIVALENT) SHALL BE ALLOWED TO PASS OVER THE STRUCTURE UNTIL THE SPECIFIED FILL IS IN PLACE. HEAVY EQUIPMENT SUCH AS SCRAPERS AND CRANES SHALL BE ALLOWED TO PASS OVER THE STRUCTURE ONLY WITH SPECIFIC WRITTEN PERMISSION FROM THE STRUCTURAL ENGINEER.
C. CONTRACTOR SHALL CONSULT GEOTECHNICAL REPORT PRIOR TO CONSTRUCTION.

11 ARCH CULVERT BACKFILL REQUIREMENTS (ELEVATION)
NO SCALE
OC1.14

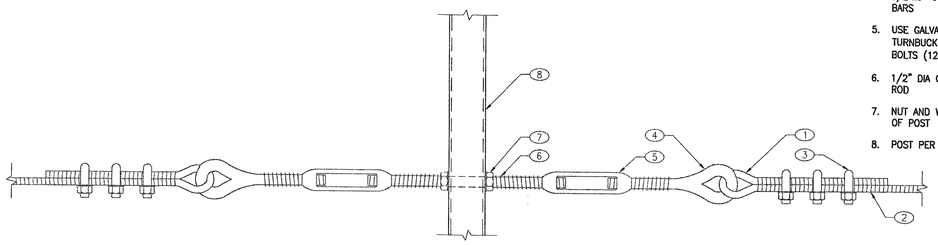


14 TYPICAL POST AND CABLE FENCING - ELEVATION
NO SCALE

KEYNOTES:
1. 2" DIA SCH 80 GALVANIZED POST
2. 2" DIA SCH 80 GALVANIZED BRACE RAIL (TYP)
3. 2" DIA GALVANIZED BRACE BAND
4. GALVANIZED RAIL END (TYP)
5. 3/8" DIA. GALVANIZED AIRCRAFT CABLE
6. POST TOP
7. 3/4"DIA HOLE IN POST AND BRACE RAIL FOR CABLE (TYP)
8. ACCESS OPENING AS REQUIRED. SEE CIVIL FOR LOCATION.
9. REMOVABLE LATCH
10. 3/4" GALVANIZED CHAIN
11. GALVANIZED RAIL END
12. TOP OF WALL

NOTES:
A. CONNECTION TO BE USED AT BRACE POST AT TOP AND BOTTOM CABLE CONNECTIONS.

KEYNOTES:
1. 3/8" STD WIRE ROPE THIMBLE
2. CABLE PER ELEVATION
3. GALVANIZED WIRE ROPE CLIPS (TYP)
4. 1/2"x0'-9" GALVANIZED IRON EYE BARS
5. USE GALVANIZED STD TURNBUCKLES FOR 1/2" DIA. BOLTS (12" TAKE UP)
6. 1/2" DIA GALVANIZED THREADED ROD
7. NUT AND WASHER AT EACH SIDE OF POST
8. POST PER ELEVATION



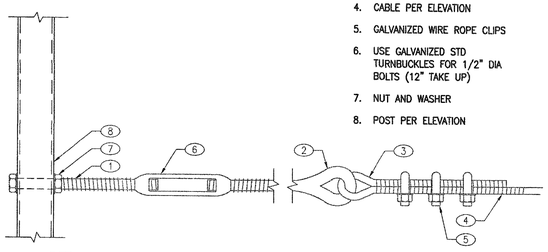
17 DETAIL
NO SCALE

NOTES:
1. USE BASE PLATE CONNETION DETAIL FOR CONNECTION OF POST AND CABLE FENCING TO TOP OF CHANNEL AND COPING WALL.
2. BRACE RAILS SHALL BE PLACED A MAXIMUM OF 200', AT END POSTS, AND WHERE FENCE CHANGES AT AN ANGLE (E.G. CORNERS IN PLAN DIMENSIONS, OR SLOPE CHANGES WHEN MOUNTED ON WALL).
3. HOT DIP GALVANIZE COMPONENTS AFTER FABRICATION.
4. POST/BRACE SHALL BE ASTM A53, GRADE B.
5. PLATES SHALL BE ASTM A36.
6. WELDING E70 ELECTRODE.
7. GALVANIZED BRACE BANDS SIZED FOR 1500 LBS (WORKING LOAD).

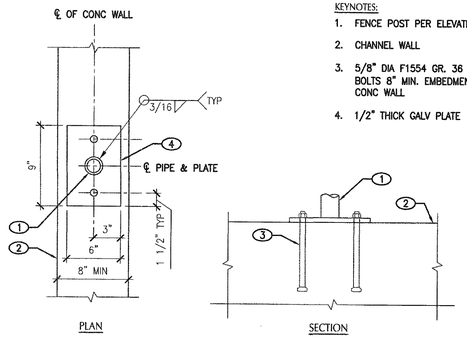
15 POST AND CABLE FENCING NOTES
NO SCALE

NOTES:
A. CONNECTION TO BE USED AT END POST AT TOP AND BOTTOM CABLE CONNECTIONS.

KEYNOTES:
1. 1/2" DIA x 9" GALVANIZED BOLT FOR END BRACE POST
2. 1/2" DIA x 9" GALVANIZED IRON EYES BAR
3. 3/8" STD WIRE ROPE THIMBLE
4. CABLE PER ELEVATION
5. GALVANIZED WIRE ROPE CLIPS
6. USE GALVANIZED STD TURNBUCKLES FOR 1/2" DIA BOLTS (12" TAKE UP)
7. NUT AND WASHER
8. POST PER ELEVATION

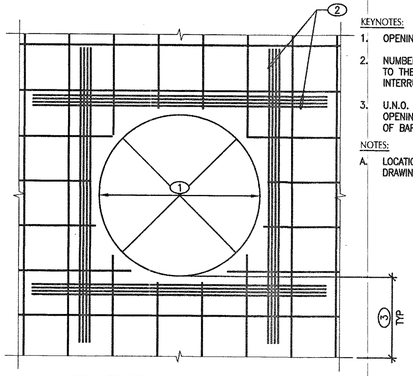


18 DETAIL
NO SCALE



KEYNOTES:
1. FENCE POST PER ELEVATION
2. CHANNEL WALL
3. 5/8" DIA F1554 GR. 36 HEADED BOLTS 8" MIN. EMBEDMENT INTO CONC WALL
4. 1/2" THICK GALV PLATE

16 BASE PLATE CONNECTION DETAIL
NO SCALE



KEYNOTES:
1. OPENING DIAMETER 4'-0" MAX UNO
2. NUMBER OF ADDED BARS EQUAL TO THE NUMBER OF BARS INTERRUPTED BY OPENING.
3. U.N.O. EXTEND BARS PAST EDGE OF OPENING EQUAL TO LAP LENGTH OF BAR PER LAP SCHEDULE

NOTES:
A. LOCATION AS SHOWN PER CIVIL DRAWINGS AS OCCURS

12 TYPICAL REINFORCING AT OPENING IN STORM DRAIN
NO SCALE

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PROFESSIONAL ENGINEER - STATE OF NEVADA
SCOTT GREGORY MEYER
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CIVIL
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05/10/2018

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PROJECT:
GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE:
TYPICAL DETAILS

REV.	DESCRIPTION	DATE
	CCRFCD COMMENTS	11/11/2013
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S0.3
731-99
L-60021

PROJ#:124070 AGREE:#115666 QS:124-07-SWINE,124-18-NWINE

Drawings: \\eslvdsrv\esel\Projects\Structural\2013\STR13.6007_Civil Structures\STR13.6007_Park Highlands Grand Teton Drainage\124070_REVIT\S0.3_STR13.6007.Dwg Last Saved: Thu Jan 26, 2017 - 4:59pm Last Plotted: Wed May 09, 2018 - 9:57am By: wStru
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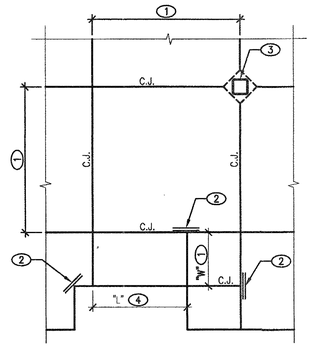
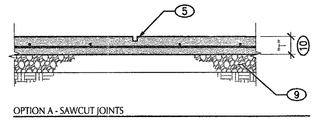
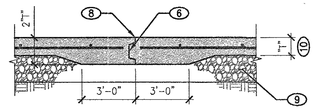
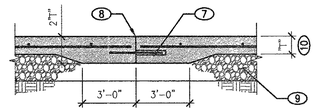




OPTION A - SAWCUT JOINTS



OPTION B - KEYED JOINT



OPTION C - DOWELED JOINT

19 TYPICAL CONTROL JOINT IN CONCRETE SLAB ON GRADE

NO SCALE

TD10039

KEYNOTES:

1. JOINT SPACING PER SCHEDULE
2. PROVIDE (2) #4x48 MID-HEIGHT SLAB BARS ADJACENT TO ALL DISCONTINUOUS JOINT LOCATIONS
3. ALIGN CONTROL JOINTS W/ COLUMN (WHERE OCCURS)
4. WHERE CONTROL JOINT SECTIONS ARE RECTANGULAR, THE LENGTH "L" SHALL NOT EXCEED 1.5 TIMES THE WIDTH "W"
5. SAWCUT JOINT DEPTH EQUAL TO 1/4 SLAB THICKNESS
6. 2x4 CONTINUOUS TAPERED KEY
7. 1/2"Øx12" SMOOTH DOWEL AT 24" O.C. WRAP TO PREVENT BOND TO CONCRETE (CENTER IN SLAB THICKNESS AT JOINT)
8. CONSTRUCTION JOINT
9. COMPACTED SUBGRADE PER GSN
10. SLAB THICKNESS "T" PER TYP SLAB ON GRADE DETAIL

NOTES:

A. C.J. DENOTES CONTROL JOINT

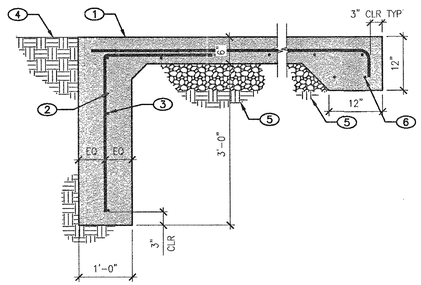
B. USE DOWELED OR KEYED JOINT AT SLOPE TRANSITIONS IN RAMPS AT CONCRETE SLAB ON GRADE OR CONSTRUCTION JOINTS

C. SAWCUTS SHALL BE MADE SOON ENOUGH TO PREVENT SHRINKAGE CRACKING, BUT NOT SO SOON AS TO CAUSE SPALLING

D. ZIP STRIP OR TOOLED JOINT MAY BE USED IN LIEU OF SAW CUT

E. CONTROL JOINTS TO BE SEALED TO PREVENT STANDING WATER IN JOINT

JOINT SPACING SCHEDULE	
SLAB THICKNESS	MAX SPACING
4"	10'
5"	12.5'
6"	15'
7"	17.5'
8"	18'



20 TYPICAL SLAB ON GRADE DETAIL

NO SCALE

KEYNOTES:

1. SLAB ON GRADE W/ #4 AT 18" O.C. EA. WAY, CENTERED IN SLAB THICKNESS
2. #4 HOOKED DOWEL AT 12" O.C.

3. #4 HORIZ AT 12" O.C.
4. FINISHED GRADE PER CIVIL
5. COMPACTED SUBGRADE PER TYPICAL DETAIL
6. (2) #4 AT THICKENED SLAB EDGE

NOTES:

A. PROVIDE CONTROL JOINTS PER TYPICAL DETAIL

B. CUT OFF WALL WHERE REQ'D BY CIVIL PLANS. THICKENED SLAB EDGE TYP WHERE CUT OFF WALL NOT REQ'D.

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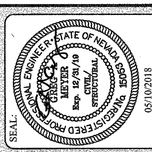

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DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE:

TYPICAL DETAILS

REV.	DESCRIPTION	DATE
	CCREVD COMMENTS	11/11/13
	CCREVD COMMENTS	05/19/14
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S0.4

PROJ#:124070 AGREE.#115666 QS:124-07-SWINE,124-18-AWINE

Drawing: \\es2eng.net\Users\Projects\Structural\2013\13.6000 Civil Structures\13R13.6007_Park Highlands Grand Teton Drainage\ACAD_REVIT\S0.4_13R13.6007.dwg Last Saved: Thu, Jun 06, 2013 - 4:59pm Last Printed: Wed, May 09, 2018 - 9:37am By: erZhu
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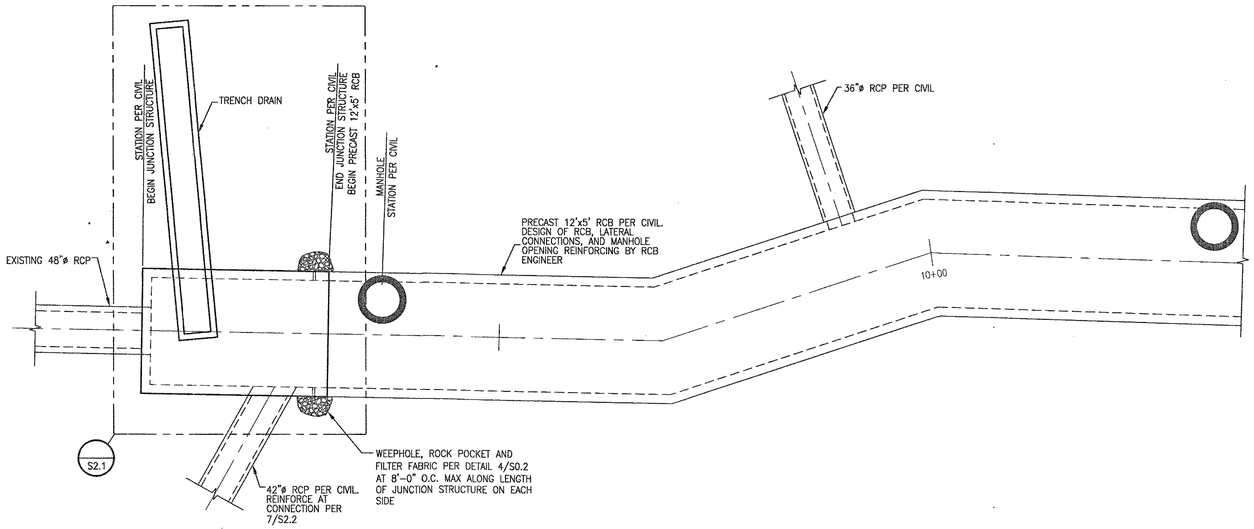
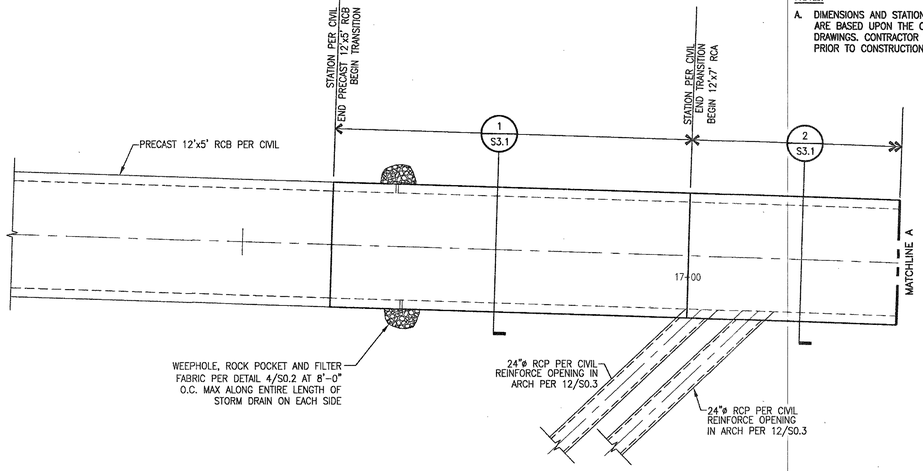
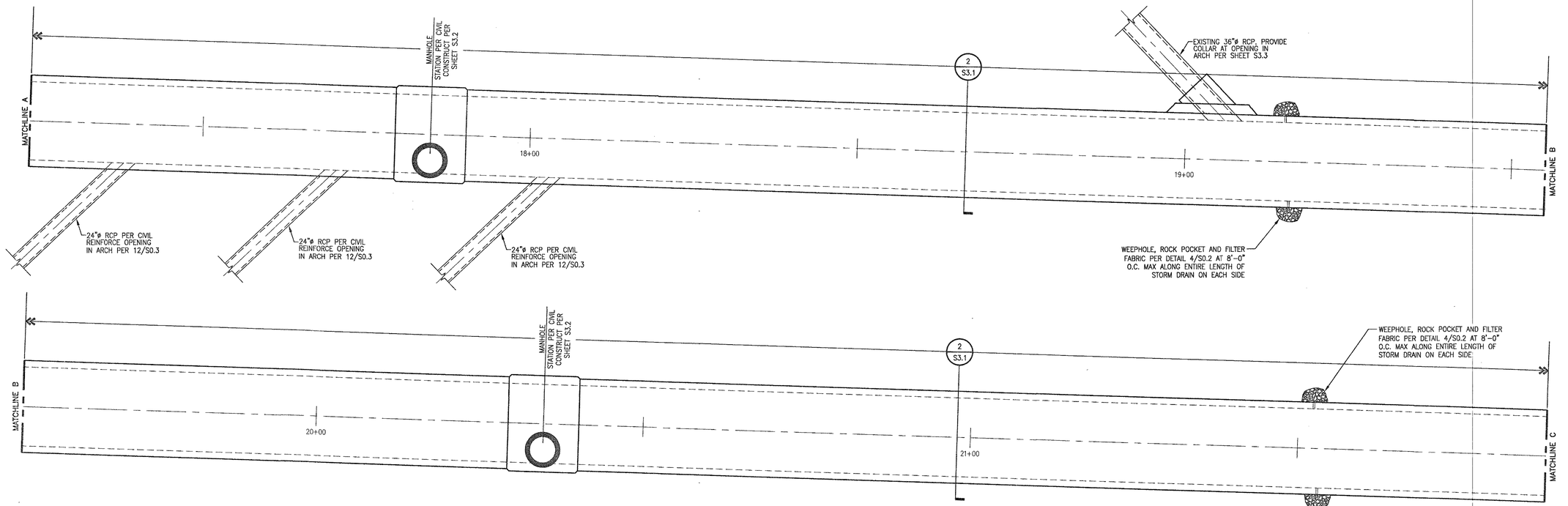






PLAN VIEW AT DRAINAGE STRUCTURE — SCALE: 1/8"=1'-0"

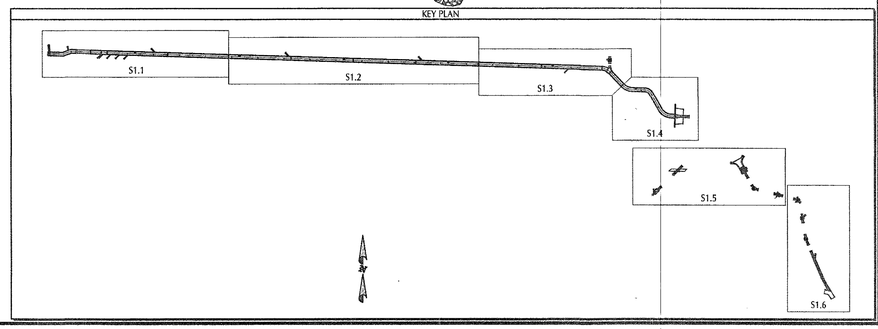
KEYNOTES:

1. REINFORCING AT RCP OPENING PER DETAIL 12/S0.3

NOTES:

A. DIMENSIONS AND STATIONS SHOWN ARE BASED UPON THE CIVIL DRAWINGS. CONTRACTOR TO VERIFY PRIOR TO CONSTRUCTION

KEY PLAN



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PROJECT:
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DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE:
PLAN VIEW

REV:	DESCRIPTION	DATE
	MYLAR SET	05/10/2018
	DESIGN REVISIONS	01/26/2017

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: 731-98 L-60221 **S1.1**

PRO.#:124070 AGREE:#115666 QS:124-07-SWINE,124-18-NWINE

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KEYNOTES:

1. REINFORCING PER DETAIL __/S0.2

NOTES:

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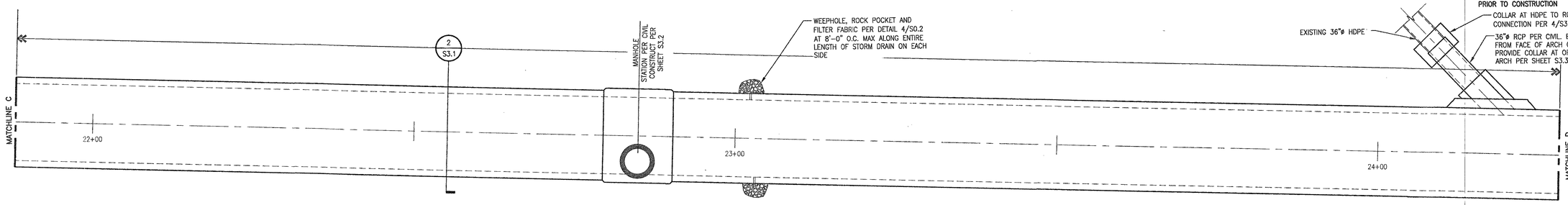
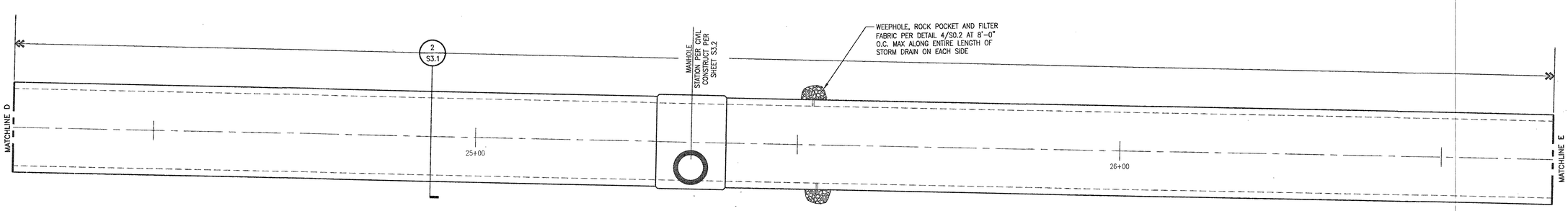
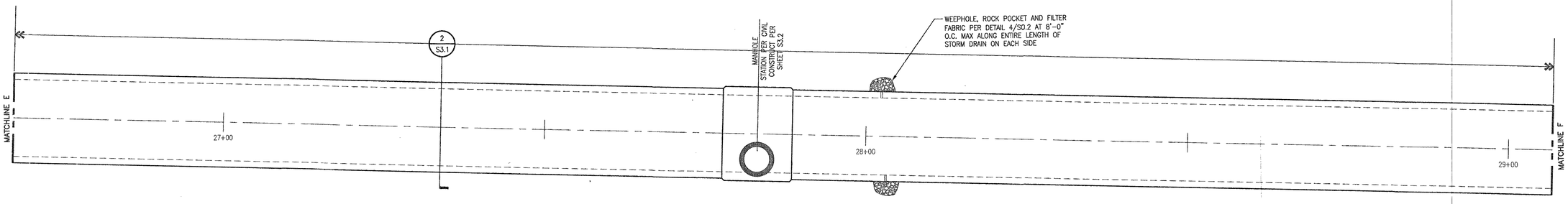
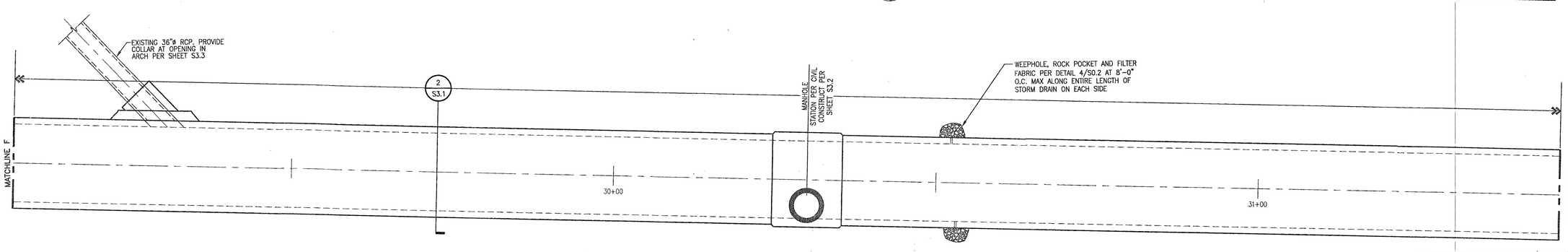




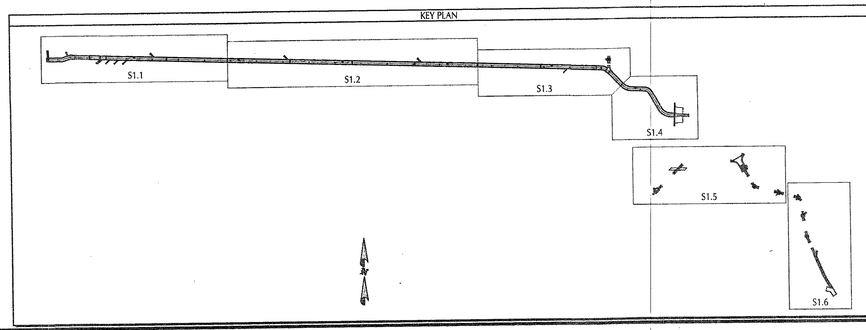




PLAN VIEW AT DRAINAGE STRUCTURE

SCALE: 1/8"=1'-0"

KEY PLAN



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SEAL: PROFESSIONAL ENGINEER STATE OF NEVADA REGISTERED PROFESSIONAL GABRIEL A. MEYER Exp. 12/31/19 CIVIL STRUCTURAL 05/10/2018

PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: PLAN VIEW

REV.	DESCRIPTION	DATE
	DESIGN REVISIONS	01/26/2017
	CCRFCD COMMENTS	11/11/2013
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S1.2

7311-98
L-60221

PROJ#:124070 AGREE:#115666 QS:124-07-SW/NE,124-18-NW/NE

Drawing: \\es2eng.net\Users\Projects\10structural\2013\STR13.6007 Civil Structures\STR13.6007 Tyler Highlands Grand Teton Drainage\ACAD_RVT\S1.1-STR13.6007.dwg Last Saved: Fri Jan 27, 2017 - 11:58am Last Plotted: Wed May 09, 2018 - 8:57am By: wMay
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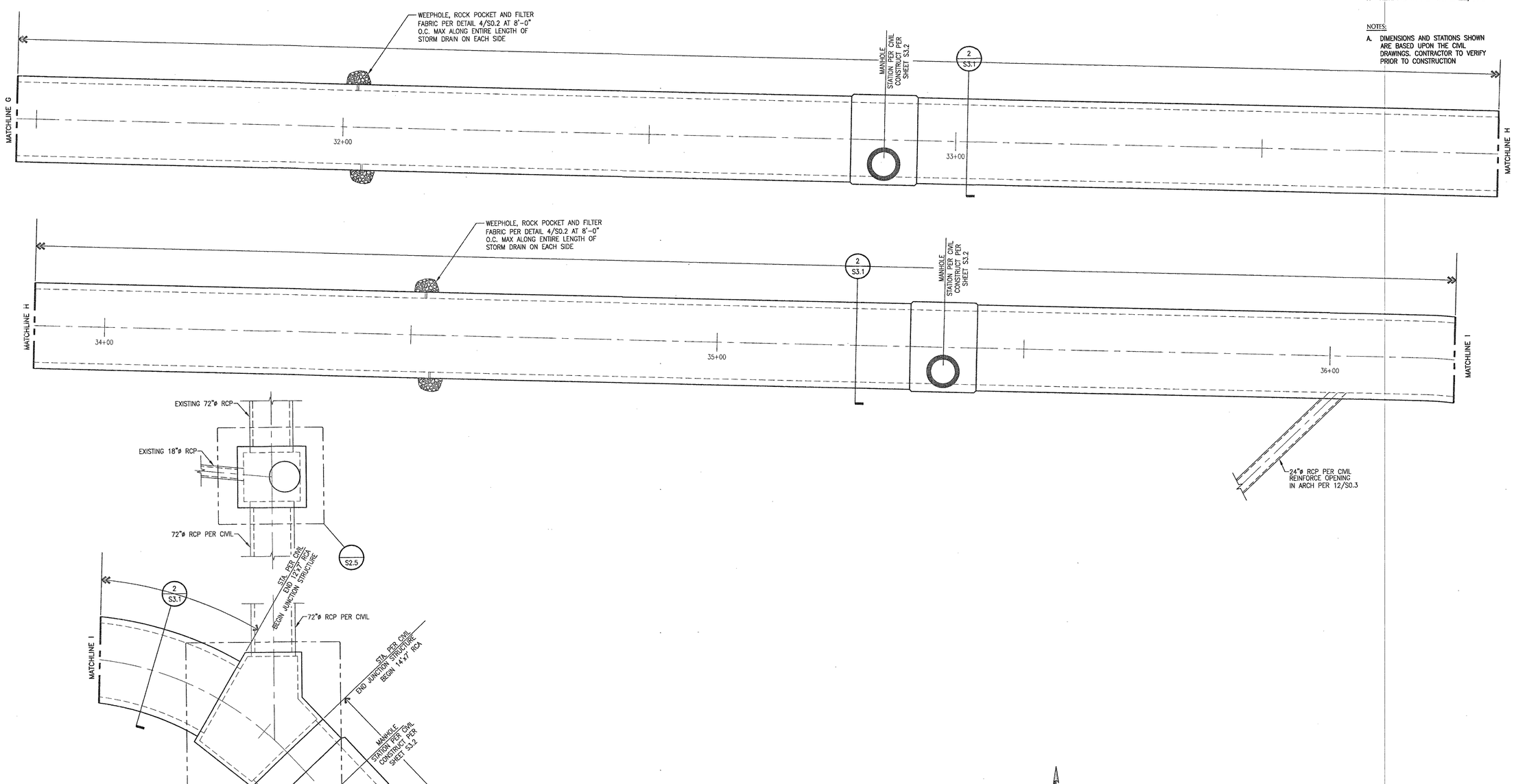
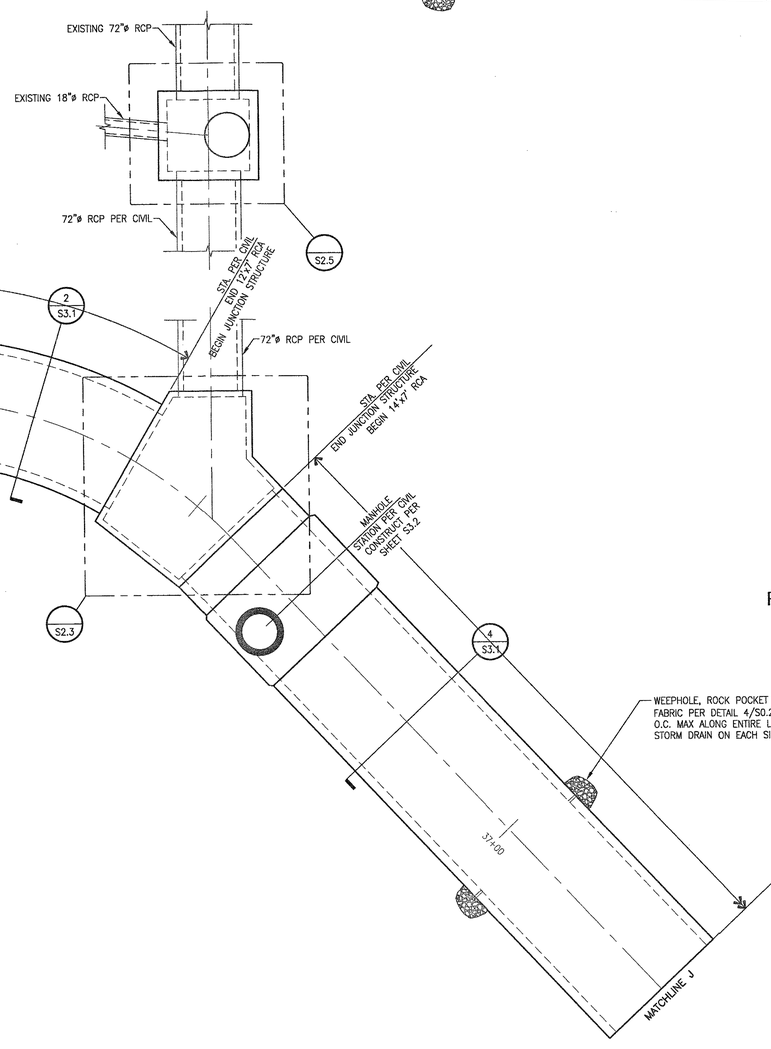




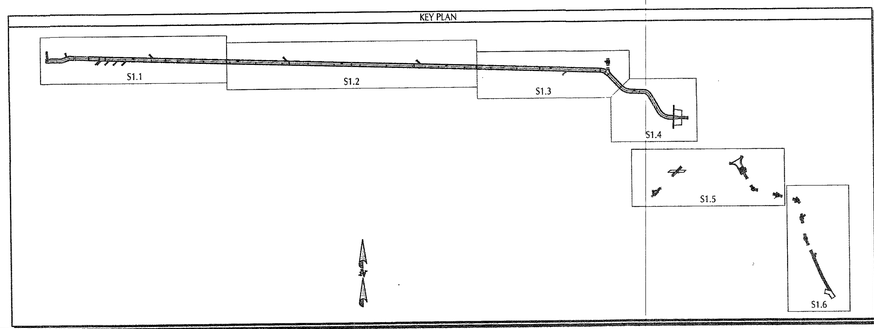
PLAN VIEW AT DRAINAGE STRUCTURE (ES) SCALE: 1/8"=1'-0"

KEYNOTES:

1. REINFORCING PER DETAIL __/S0.2

NOTES:

A. DIMENSIONS AND STATIONS SHOWN ARE BASED UPON THE CIVIL DRAWINGS. CONTRACTOR TO VERIFY PRIOR TO CONSTRUCTION



SEAL: STATE OF NEVADA — PROFESSIONAL ENGINEER — JOSEPH D. MEYER — No. 14781 — STRUCTURAL — REGISTERED PROFESSIONAL ENGINEER — 05/10/2018

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PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: PLAN VIEW

REV.	DESCRIPTION	DATE
	DESIGN REVISIONS	01/26/2017
	DESIGN REVISIONS	03/06/2015
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S1.3

751-99
L-60221

PRO.#:124070 AGREE.#115666 GS:124-07-SWINE,124-18-NWINE

Drawing: L:\Autocad Issues\Projects\Structural\2013\STR13.6000 Civil Structures\STR13.6017_Park Highlands Grand Teton Drainage\ACAD_R\PLT\S1.1_STR13.6007.dwg Last Saved: Fri Jun 22, 2017 - 11:58am Last Plotted: Wed May 09, 2018 - 8:57am By: eMcm
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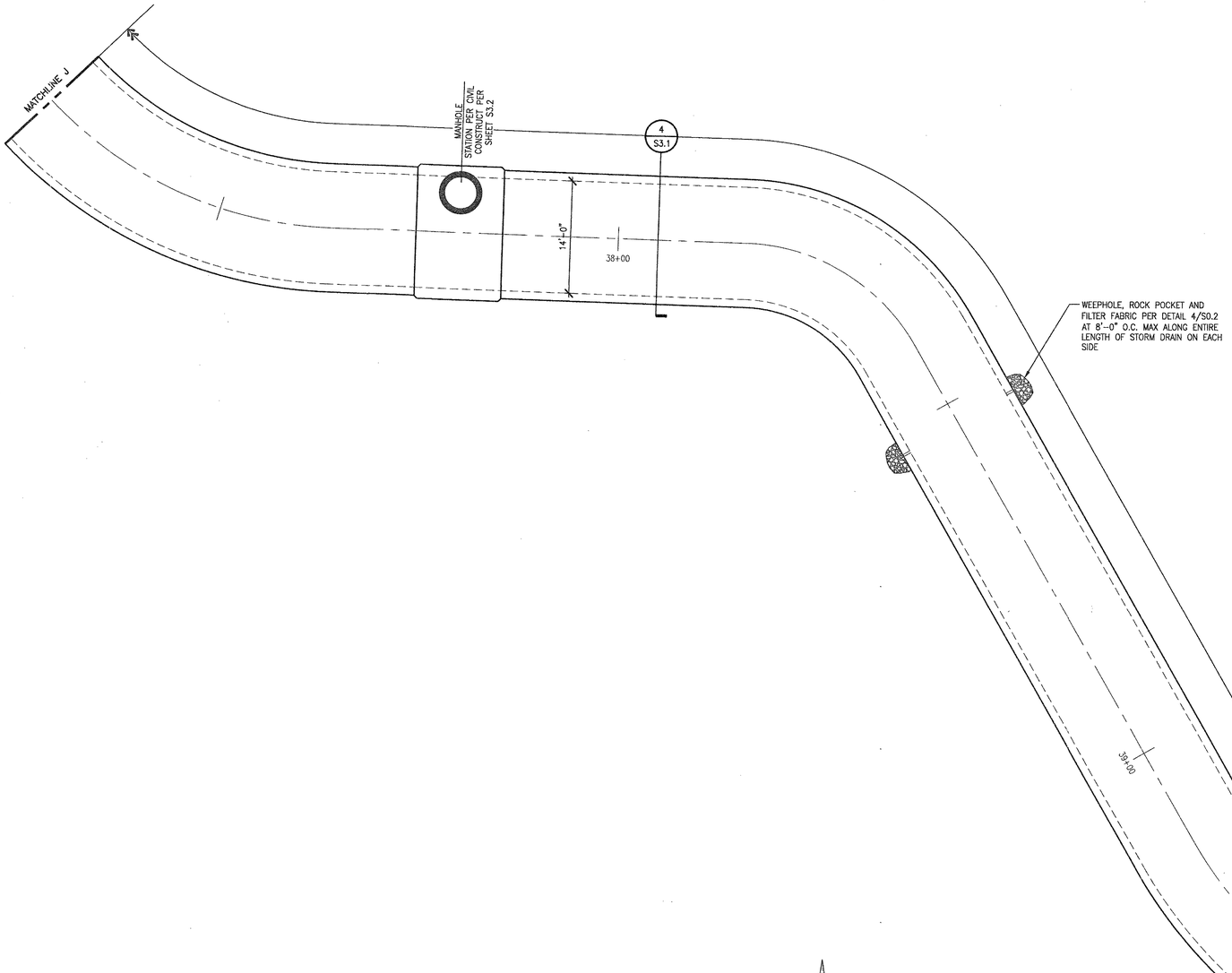
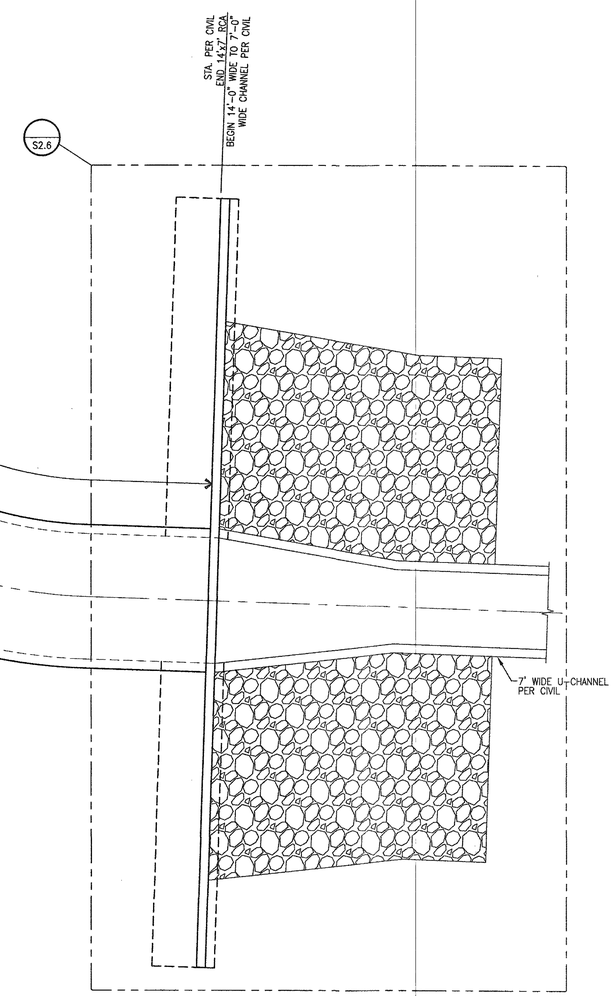
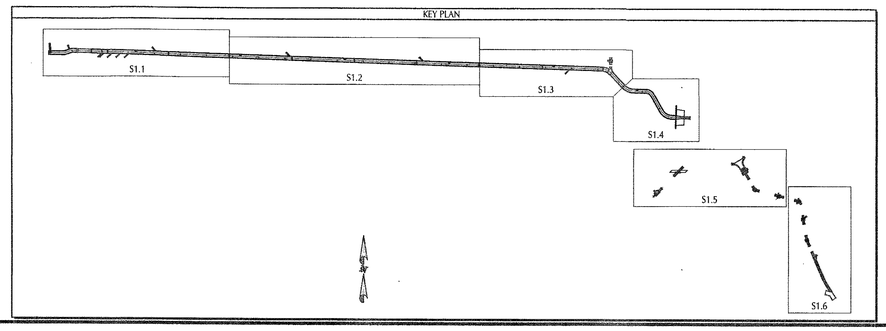


PLAN VIEW AT DRAINAGE STRUCTURE — SCALE: 1/8"=1'-0"





NOTES:

A. DIMENSIONS AND STATIONS SHOWN ARE BASED UPON THE CIVIL DRAWINGS. CONTRACTOR TO VERIFY PRIOR TO CONSTRUCTION

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PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: PLAN VIEW

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018
	DESIGN REVISIONS	03/06/2015

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S1.4

PROJ.#:124070 AGREE.#115686 QS:124-07-SW/NE,124-18-NW/NE

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NOTES:

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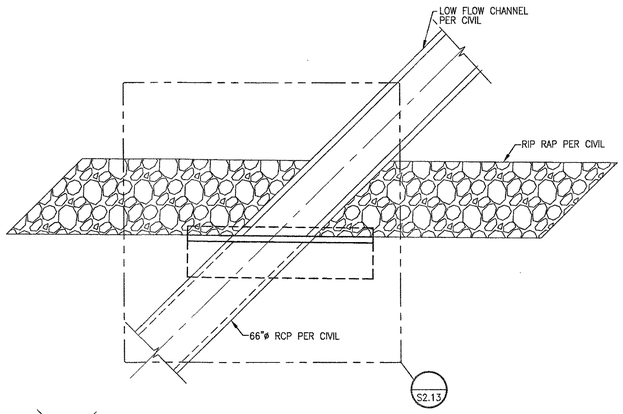
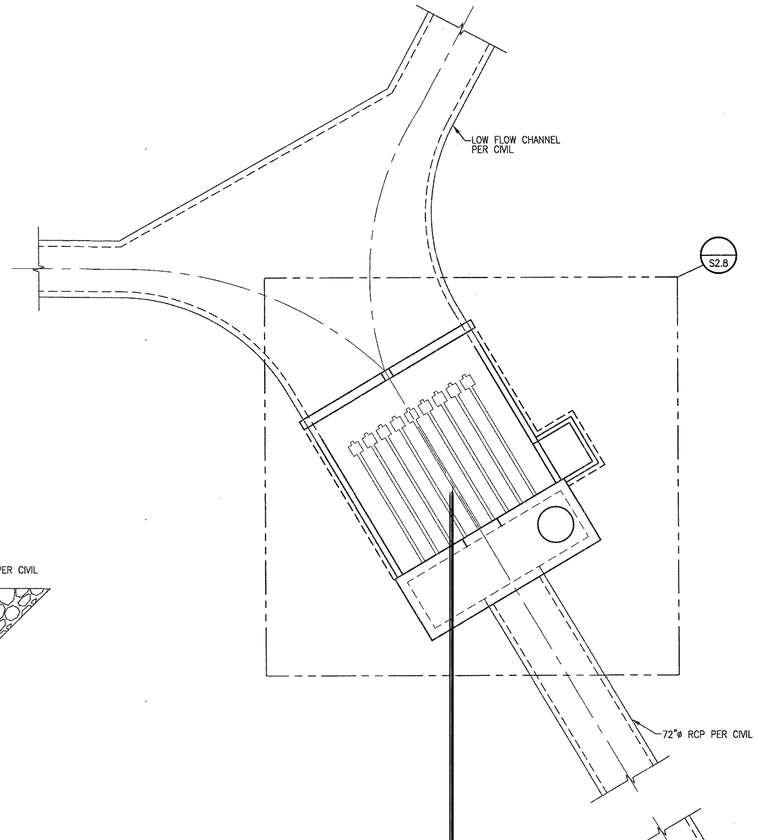
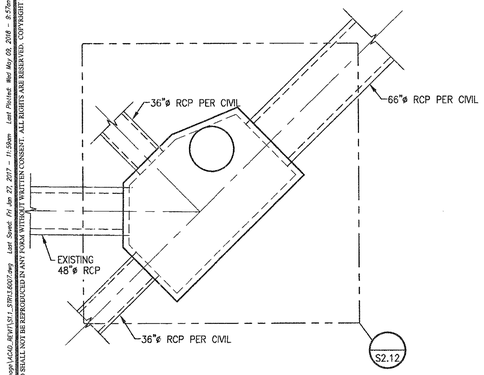
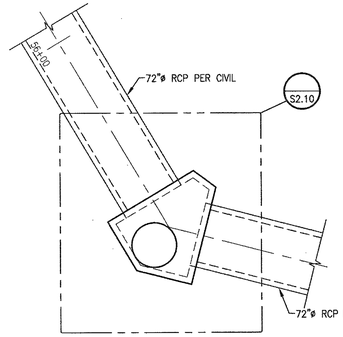
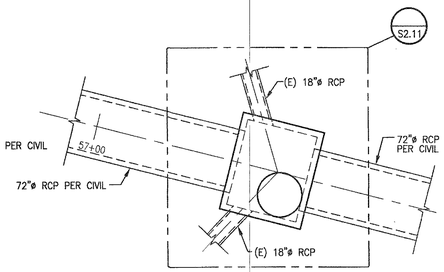


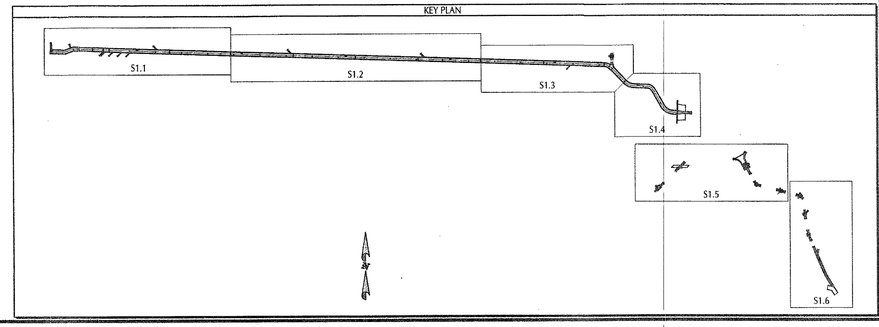








PLAN VIEW AT DRAINAGE STRUCTURES SCALE: 1/8"=1'-0"



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SEAL: STATE OF NEVADA — REGISTERED PROFESSIONAL ENGINEER — GREGORY A. CHRISTENSEN — Date: 12/31/19 — CIVIL — 05/10/2018

PROJECT:
GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE:
PLAN VIEW

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018
	DESIGN REVISIONS	4/8/14
	CCRFCD COMMENTS	11/11/2013

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S1.5

731-99
L-00221

PROJ.#:124070 AGREE.#115666 QS:124-07-SW/NE,124-18-NW/NE

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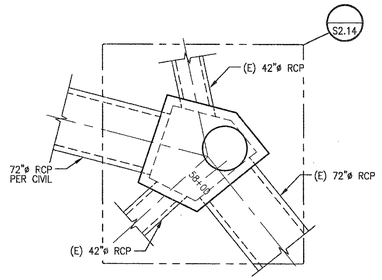
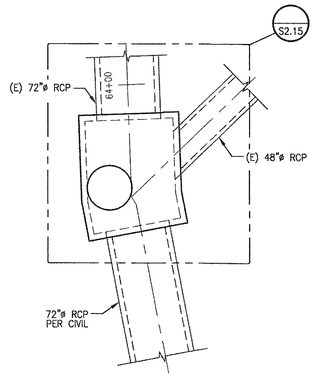
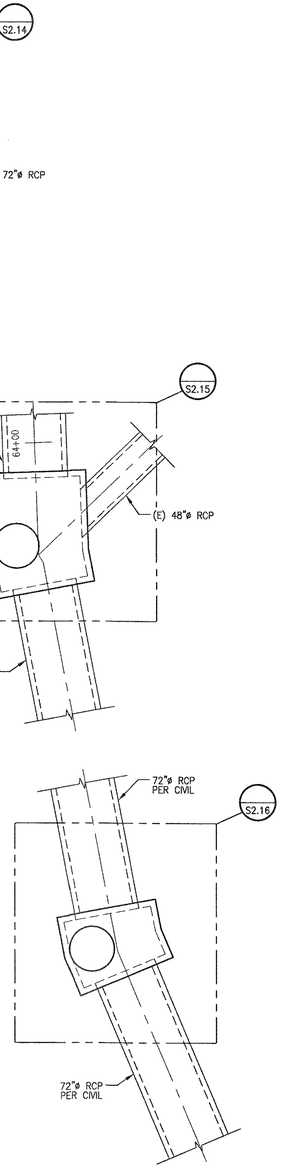
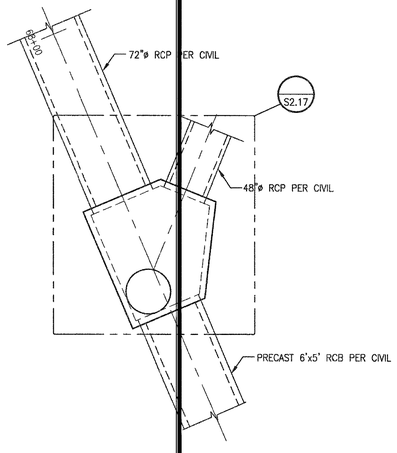


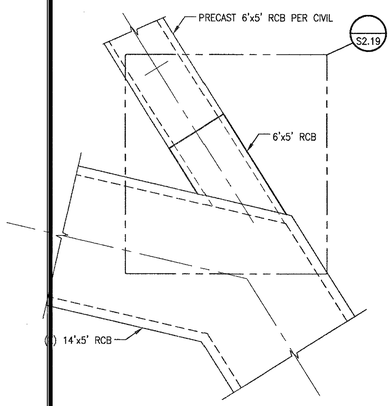




PLAN VIEW AT DRAINAGE STRUCTURES

SCALE: 1/8"=1'-0"

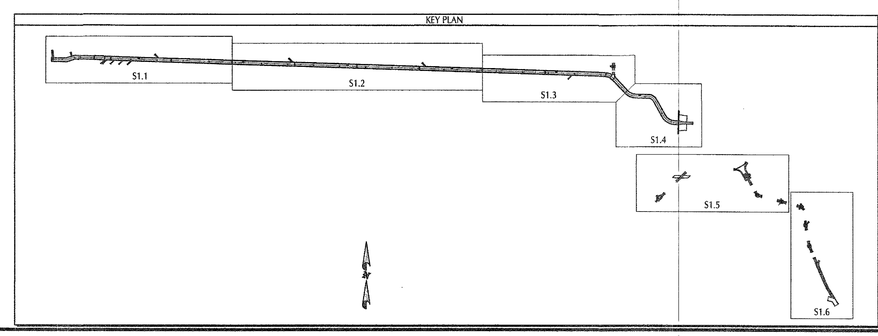




NOTES:

A. DIMENSIONS AND STATIONS SHOWN ARE BASED UPON THE CIVIL DRAWINGS. CONTRACTOR TO VERIFY PRIOR TO CONSTRUCTION

KEY PLAN



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PROJECT:
GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE:
PLAN VIEW

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S1.6

PROJ.#:124070 AGREE.#115666 QS-124-07-SW/NE,124-18-NW/NE

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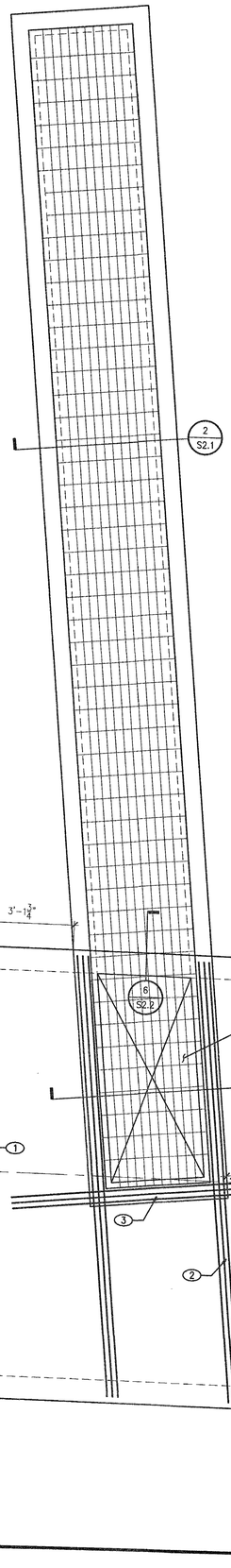
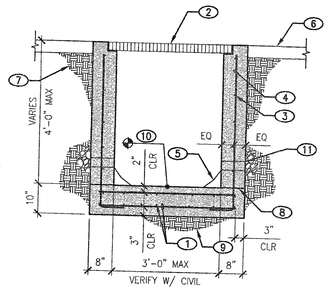




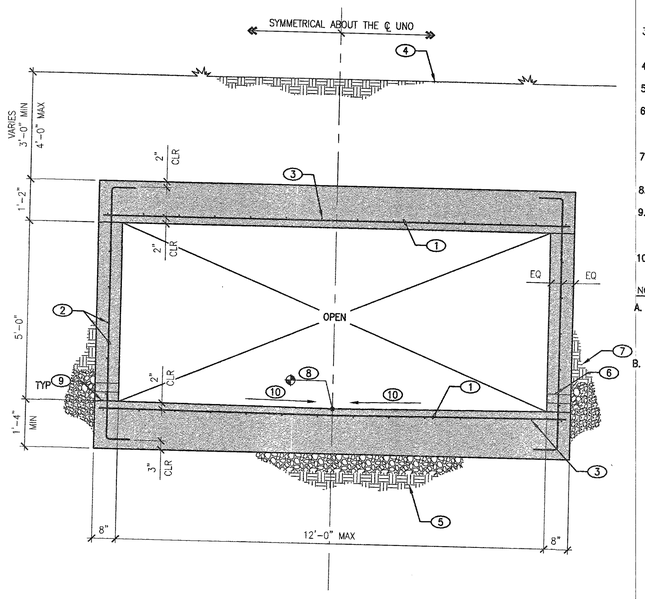
KEYNOTES:

1. #4 AT 18" O.C. EA WAY, TOP & BOTTOM
2. GRATE, FRAME, CONNECTIONS AND ASSOCIATED HARDWARE PER CIVIL DWGS
3. #4 HORIZ AT 12" O.C. W/ STD HOOK INTO END WALLS, LAP PER GSN
4. #4 VERT AT 18" O.C. W/ STD HOOK INTO BASE SLAB
5. SLOPE INVERT FOR DRAINAGE AS REQUIRED
6. FLATWORK PER CIVIL
7. BACKFILL MATERIAL AND PROCEDURE PER GSN
8. CONSTRUCTION JOINT AT CONTRACTORS OPTION. ROUGHEN INTERFACE 1/4" AMPLITUDE
9. PROPERLY PREPARED SUBGRADE PER SOILS REPORT
10. INVERT ELEVATION PER CIVIL
11. WEEP HOLE, FILTER FABRIC, AND ROCK POCKET PER DETAIL 4/S0.2, PLACE EA SIDE OF STRUCTURE AT 8'-0" O.C. MAX

NOTES:

A. DIMENSIONS SHOWN ARE BASED UPON CIVIL DRAWINGS. VERIFY PRIOR TO CONSTRUCTION
B. END WALL CONSTRUCTION SHALL MATCH
C. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL VERIFY STATIONING, ELEVATION, OFFSETS, ETC... W/ CURRENT CIVIL PLANS

2 S2.1 SECTION AT TRENCH DRAIN
NO SCALE



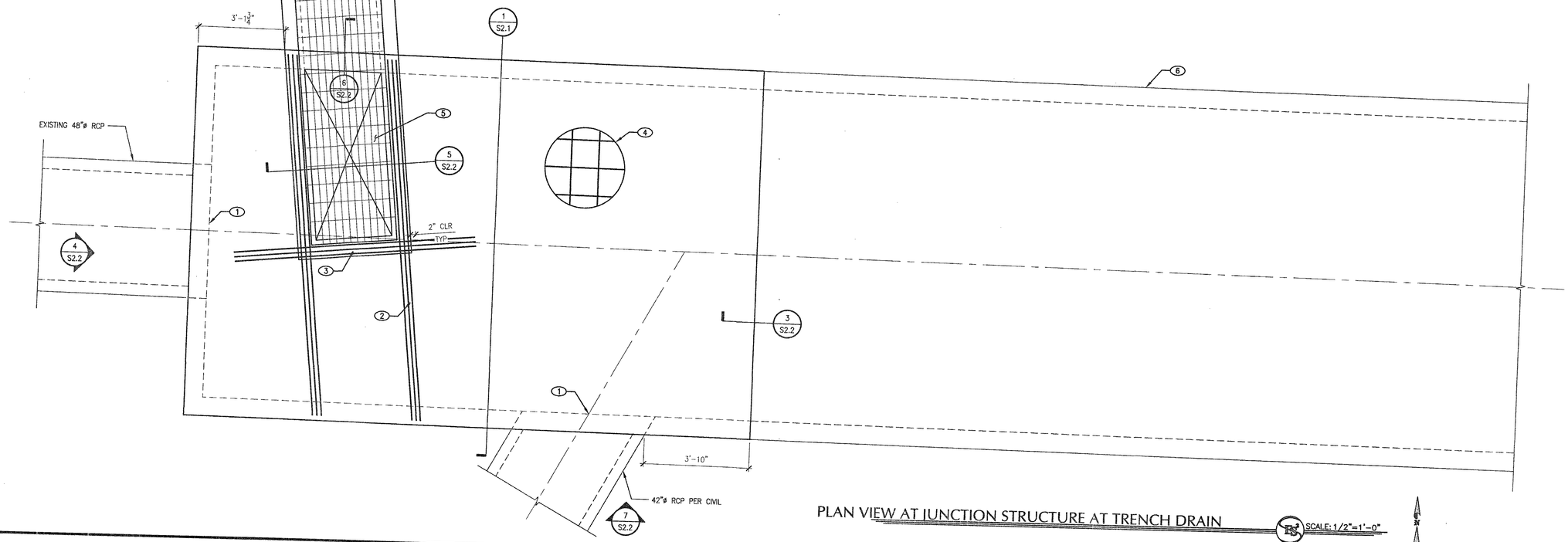
KEYNOTES:

1. #6 AT 6" O.C. TRANSVERSE
2. #4 AT 12" O.C. VERT AND #4 AT 12" O.C. HORIZ W/ STANDARD HOOK ON VERT BARS, T&B
3. #4 AT 18" O.C. LONGITUDINAL LAP LONGITUDINAL BAR 18"
4. FINAL GRADE
5. CONCRETE BOX BEDDING PER GSN
6. WEEP HOLE, FILTER FABRIC, AND ROCK POCKET PER DETAIL 4/S0.2, SEE PLAN FOR SPACING.
7. BACKFILL MATERIAL AND PROCEDURE PER GSN
8. INVERT ELEVATION PER CIVIL
9. CONSTRUCTION JOINT AT CONTRACTOR OPTION. ROUGHENED INTERFACE 1/4" AMPLITUDE
10. 1% CROSS SLOPE AT INVERT, VERIFY WITH CIVIL

NOTES:

A. TRENCH DRAIN AND RCP PENETRATIONS NOT SHOWN FOR CLARITY. REFER TO APPLICABLE DETAILS
B. END WALL CONSTRUCTION SHALL MATCH

1 S2.1 SECTION AT 12'-0"x5'-0" BOX CULVERT
NO SCALE



PLAN VIEW AT JUNCTION STRUCTURE AT TRENCH DRAIN
SCALE: 1/2"=1'-0"

KEYNOTES:

1. END OF RCP TO TERMINATE FLUSH W/ INSIDE FACE OF WALL
2. PLACE (3) ADDITIONAL TRANS. BARS AT EACH SIDE OF TRENCH DRAIN ATTACHMENT. ALIGN BARS W TRENCH DRAIN.
3. PLACE (3) ADDITIONAL LONG. BARS AT END OF TRENCH DRAIN ATTACHMENT. EXTEND 30" MIN PAST END OF OPENING. ALIGN BARS PERP TO TRENCH DRAIN ALIGNMENT.
4. ALIGNMENT OF TYP TRANS AND LONG. REINFORCING.
5. OPENING IN TOP OF STRUCTURE
6. PRECAST 12'x5' RCB PER CIVIL

NOTES:

A. EXACT STATION AND LOCATION PER CIVIL.

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SEAL: STATE OF NEVADA — PROFESSIONAL ENGINEER — GREGORY A. MEYER — No. 9852 — REGISTERED PROFESSIONAL — 05/10/2018

PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: JUNCTION PLAN VIEW, SECTIONS AND ELEVATIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S2.1
731-98
L-60221

PRO.J#:124070 AGREE.#115666 QS:124-07-SWINE,124-18-NWINE

Drawing: \\es2fs\grad1\Users\Projects\Structural\2013\STR13.6000 Civil Structures\STR13.6007_Park Highlands Grand Teton Drainage\ACAD_ARCHITECT\S2.1_STR13.6007.dwg Last Saved By: Jan 28, 1977 - 4:00pm Last Printed: Wed May 09, 2018 - 8:57am By: wilmo
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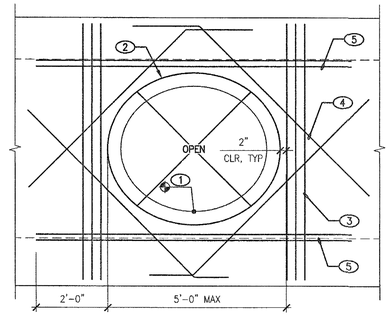
KEYNOTES:

1. RCP INVERT PER CIVIL
2. SKEWED RCP PER PLAN
3. (3) #4 VERT BARS AT EA SIDE OF OPENING. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #4x8'-0" DIAGONAL BARS PLACED AS SHOWN, BEND AS REQUIRED
5. PLACE (2) ADDITIONAL #5 HORIZ BARS ABOVE OPENING AS SHOWN. EXTEND BARS 2'-0" BEYOND EDGE OF OPENING AS SHOWN

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY



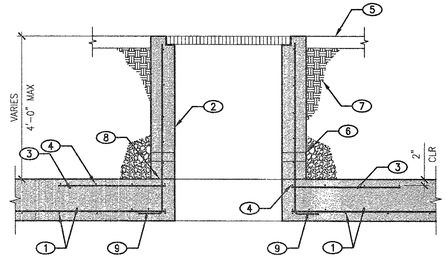
7 / S2.2 ELEVATION AT SKEWED 42"Ø RCP PENETRATION
NO SCALE

NOTES:

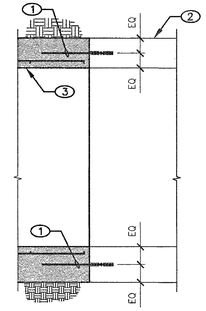
A. FOR ITEMS SHOWN BUT NOT NOTED, REFER TO DETAIL 2/S2.1

KEYNOTES:

1. RCB REINFORCING PER DETAIL
2. TRENCH DRAIN WALL AND REINFORCING PER 2/S2.1
3. #4x36" AT 18" O.C. AT TOP OF RCB LID SLAB
4. #4 AT 12" O.C. TRANSVERSE TOP OF RCB LID SLAB. BARS TO EXTEND FULL WIDTH OF RCB
5. FLAT WORK PER CIVIL
6. WEEP HOLE, FILTER FABRIC, AND ROCK POCKET PER DETAIL 4/S0.2, SPACING PER DETAIL 2/S2.1
7. BACKFILL MATERIAL AND PROCEDURE PER GSN
8. CONSTRUCTION JOINT AT CONTRACTORS OPTION. ROUGHEN INTERFACE 1/4" AMPLITUDE
9. ADDITIONAL REINF PER PLAN



5 / S2.2 SECTION AT TRENCH DRAIN AT RCB
NO SCALE



3 / S5.2 SECTION AT JUNCTION STRUCTURE CONNECTION TO RCB
NO SCALE

KEYNOTES:

1. DRILL AND EPOXY #4x30" DOWELS AT 12" O.C. PROVIDE 6" MIN EMBEDMENT INTO PRECAST RCB
2. PRECAST RCB BY OTHERS
3. JUNCTION STRUCTURE AND REINF PER DETAIL 1/S2.1
4. FINISHED GRADE PER CIVIL

NOTES:

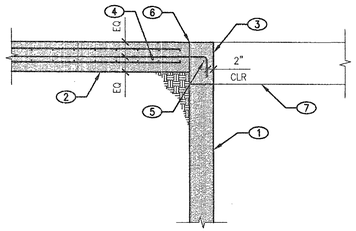
A. EPOXY DOWELS SHOWN SHALL ALSO BE INSTALLED AT WALLS
B. EPOXY INSTALLATION PER MFR RECOMMENDATIONS AND SPECIFICATIONS. SPECIAL INSPECTION REQ'D

KEYNOTES:

1. RCB WALL PER 1/S2.1
2. TRENCH DRAIN INVERT AND REINFORCING PER 2/S2.1
3. END OF DECK OPENING TO BE FLUSH W/ INSIDE FACE OF WALL
4. #4x30" HOOKED DOWEL AT 12" O.C.
5. #4x8'-4" LONG BAR CENTERED AT OPENING
6. TRENCH DRAIN INVERT TO MATCH TOP OF RCB CONNECTION
7. SLAB OPENING PER PLAN

NOTES:

A. TYPICAL RCB REINF NOT SHOWN FOR CLARITY
B. FOR INFORMATION SHOWN BUT NOT NOTED, REFER TO APPLICABLE DETAILS
C. TRENCH DRAIN WALLS BEYOND NOT SHOWN



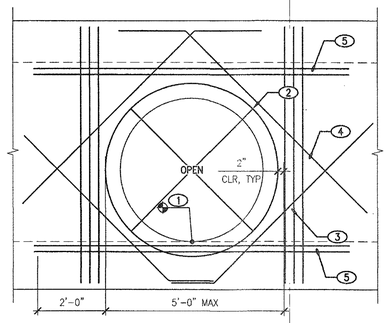
6 / S2.2 SECTION AT TRENCH DRAIN INVERT TO RCB CONNECTION
NO SCALE

KEYNOTES:

1. RCP INVERT ELEVATION PER CIVIL
2. RCP PER PLAN
3. (3) #4 VERT BARS AT EA SIDE OF OPENING. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #4x8'-0" DIAGONAL BARS PLACED AS SHOWN, BEND AS REQUIRED
5. PLACE (2) ADDITIONAL #4 HORIZ BARS ABOVE OPENING AS SHOWN. EXTEND BARS 2'-0" BEYOND EDGE OF OPENING AS SHOWN

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY



4 / S2.2 ELEVATION AT 48"Ø RCP PENETRATION
NO SCALE

SEAL:
REGISTERED PROFESSIONAL ENGINEER
STATE OF NEVADA
GREGORY A. MEYER
No. 12781
CIVIL
STRUCTURAL
05/10/2018

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PROJECT:
GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE:
JUNCTION SECTIONS AND ELEVATIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S2.2
731-98
L-60221

PROJ.#:124070 AGREE.#115666 QS:124-07-SW/NE,124-18-NW/NE

Drawing: T:\working\arl\Users\Projects\Structural\2013\STR13.6007_Fire Mitigation_Grand Teton Drainage\STR13.6007_GTD_SHEETS.dwg Last Saved: Thu Jan 25, 2017 - 4:45pm Last Plotted: Wed May 09, 2018 - 8:47am By: eMcc
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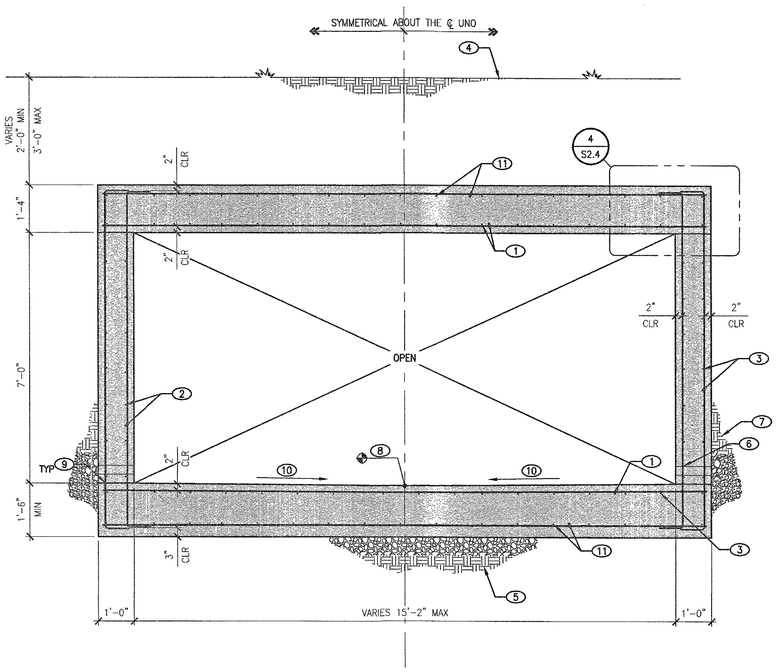
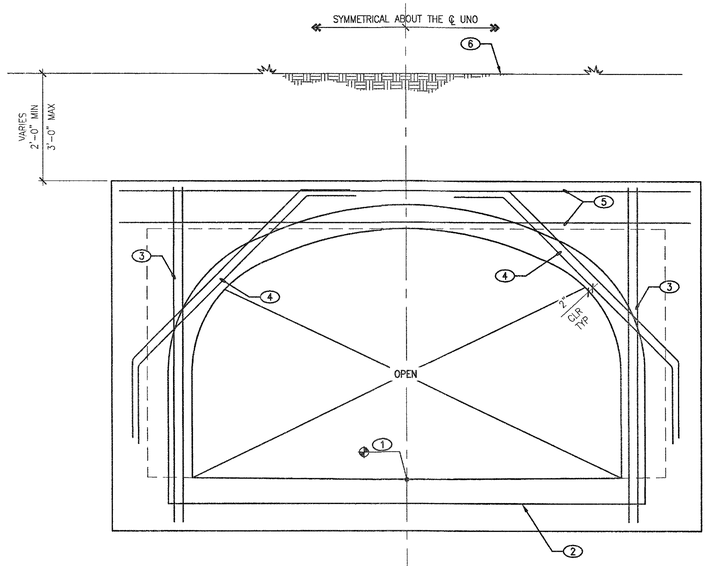


1 S2.3 SECTION AT JUNCTION STRUCTURE
NO SCALE

KEYNOTES:
1. #8 AT 5" O.C. EACH WAY
2. #5 AT 18" O.C. EACH WAY AT INSIDE FACE, ALL BARS TO HAVE STANDARD HOOK AT EACH END
3. #4 AT 18" O.C. EACH WAY AT OUTSIDE FACE, ALL BARS TO HAVE STANDARD HOOK AT EACH END
4. FINAL GRADE
5. CONCRETE BOX BEDDING PER GSN
6. WEEP HOLE, FILTER FABRIC, AND ROCK POCKET PER DETAIL 4/S0.2, SEE PLAN FOR SPACING.
7. BACKFILL MATERIAL AND PROCEDURE PER GSN
8. INVERT ELEVATION PER CIVIL
9. CONSTRUCTION JOINT AT CONTRACTOR OPTION. ROUGHENED NTERFACE 1/4" AMPLITUDE
10. 1% CROSS SLOPE AT INVERT, VERIFY WITH CIVIL
11. #4 AT 18" O.C. EACH WAY

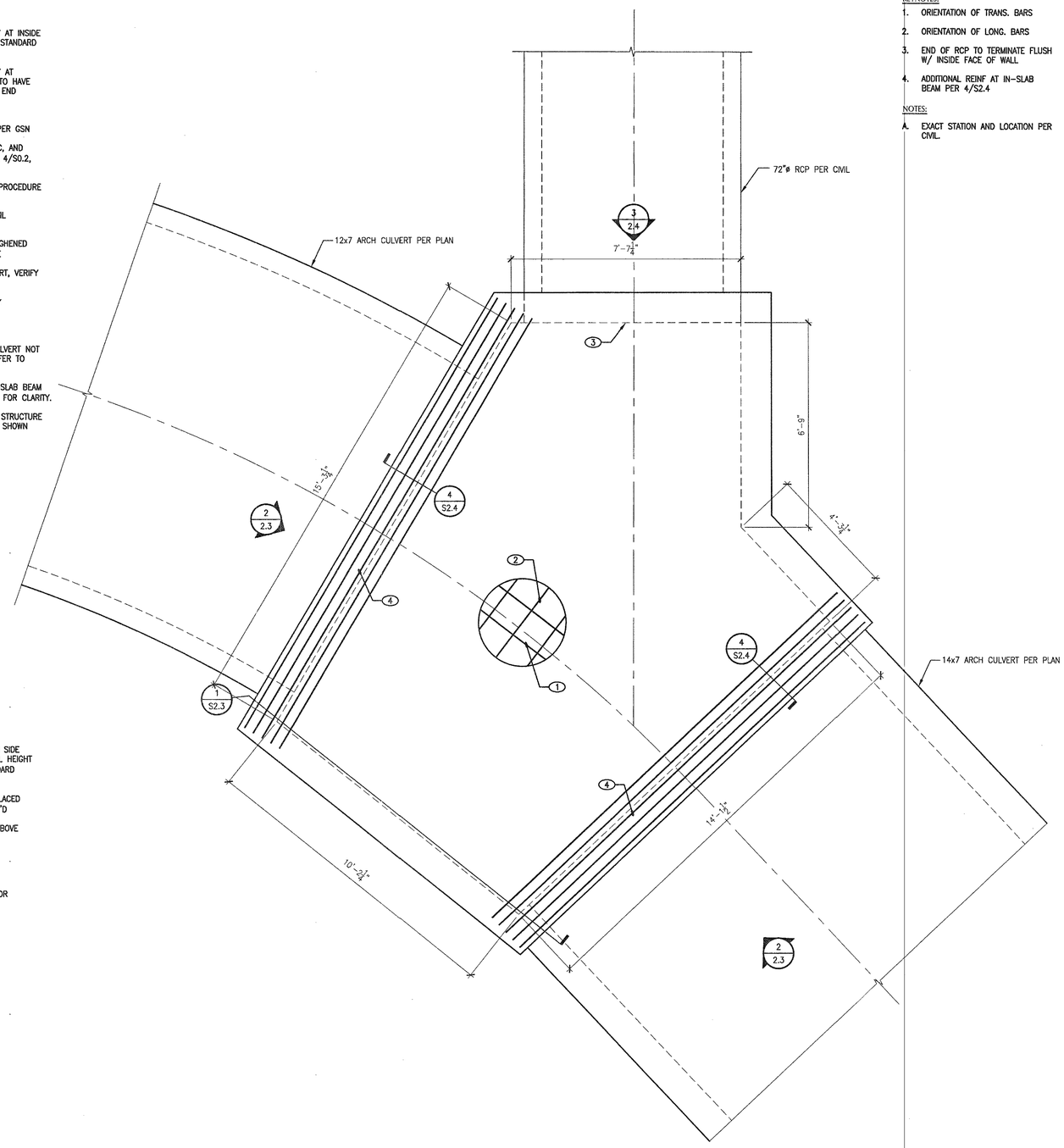
NOTES:
A. MANHOLES AND ARCH CULVERT NOT SHOWN FOR CLARITY. REFER TO APPLICABLE DETAILS
B. ADDITIONAL REINF AT IN-SLAB BEAM PER 4/S2.4 NOT SHOWN FOR CLARITY.
C. ALL WALLS AT JUNCTION STRUCTURE TO BE CONSTRUCTED AS SHOWN



2 S2.3 ELEVATION AT 12'x7' RCA OPENING
NO SCALE

KEYNOTES:
1. RCA INVERT PER CIVIL
2. 12'x7' RCA PER PLAN
3. (2) ADD VERT BARS EACH SIDE OF OPENING. EXTEND FULL HEIGHT AND TERMINATE W/ STANDARD HOOK T&B
4. (2) #5 DIAGONAL BARS PLACED AS SHOWN, BEND AS REQ'D
5. ADDITIONAL HORIZ BARS ABOVE OPENING PER 4/S2.4
6. FINAL GRADE PER CIVIL

NOTES:
A. TYP REINF NOT SHOWN FOR CLARITY



KEYNOTES:
1. ORIENTATION OF TRANS. BARS
2. ORIENTATION OF LONG. BARS
3. END OF RCP TO TERMINATE FLUSH W/ INSIDE FACE OF WALL
4. ADDITIONAL REINF AT IN-SLAB BEAM PER 4/S2.4

NOTES:
A. EXACT STATION AND LOCATION PER CIVIL.

PLAN VIEW AT JUNCTION STRUCTURE AT SD-1 STA. 36+51.91
SCALE: 1/2"=1'-0"

SEAL: REGISTERED PROFESSIONAL ENGINEER STATE OF NEVADA GREGORY S. MEYER Exp. 12/31/19 CIVIL STRUCTURAL MECHANICAL ELECTRICAL — 05/10/2018

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PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: SD-1 JUNCTION PLAN VIEW, SECTIONS AND ELEVATIONS

REV.	DESCRIPTION	DATE
	DESIGN REVISIONS	03/06/2015
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM
DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: 751-98 L-60224 S2.3

PROJ.#:124070 AGREE.#115666 QS:124-07-SW/NE,124-18-NW/NE

Drawing: \\eSDrive.net\Users\Projects\Structural\2013\STR13.6007 GTRC Structures\STR13.6007_Grand Teton Regional Flood Control Facility.rvt Last Saved: Thu Jun 06, 2013 - 4:48pm Last Printed: Wed May 09, 2018 - 9:43am By: eaDrive
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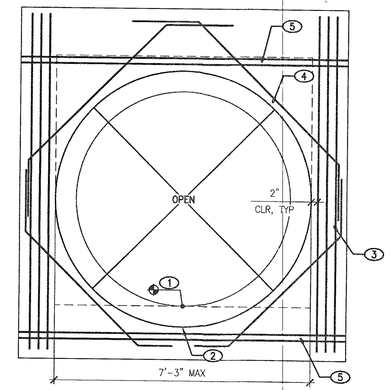
KEYNOTES:

1. RCP INVERT ELEVATION PER CIVIL
2. RCP PER PLAN
3. (3) #5 VERT BARS AT EA SIDE OF OPENING. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x9'-0" DIAGONAL BARS PLACED AS SHOWN, BEND AS REQUIRED
5. PLACE (2) ADDITIONAL #5 HORIZ BAR ABOVE AND BELOW OPENING AS SHOWN. EXTEND BARS 2'-0" BEYOND EDGE OF OPENING AS SHOWN

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY



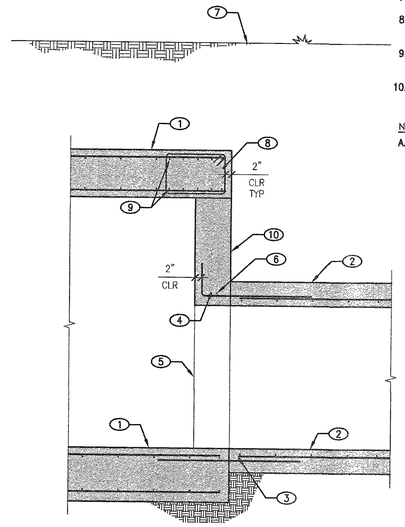
3 / S2.4 ELEVATION AT 72"Ø RCP PENETRATION
NO SCALE

KEYNOTES:

1. JUNCTION STRUCTURE AND REINF PER DETAIL 1/S2.3
2. RCA PER DETAIL 1/S3.1
3. #5x4'-0" AT 12" O.C.
4. #5 x36" DOWEL W/ STANDARD HOOK AT 12" O.C. AROUND PERIMETER OF ARCH
5. WALL BEYOND
6. BAR PER ELEVATION
7. FINISHED GRADE
8. #4 CLOSED STIRRUPS AT 3" O.C. OVER ARCH OPENING
9. (5) #8 BARS AT 2 1/2" O.C. AT T&B OF SLAB
10. END WALL THICKNESS AND REINFORCING TO MATCH SIDEWALLS

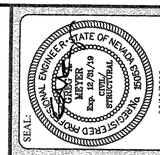
NOTES:

A. NOT ALL TYPICAL REINF SHOWN FOR CLARITY, SEE APPLICABLE SECTIONS



4 / S2.4 SECTION AT RCA TO JUNCTION STRUCTURE CONNECTION
NO SCALE

SEAL:



05/10/2018

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PROJECT:

GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE:

SD-1 JUNCTION SECTION AND ELEVATION

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: 731-98 L-60221 **S2.4**

PRO.#:124070 AGREE.#:15666 QS:124-07-SWINE,124-18-NW/NE

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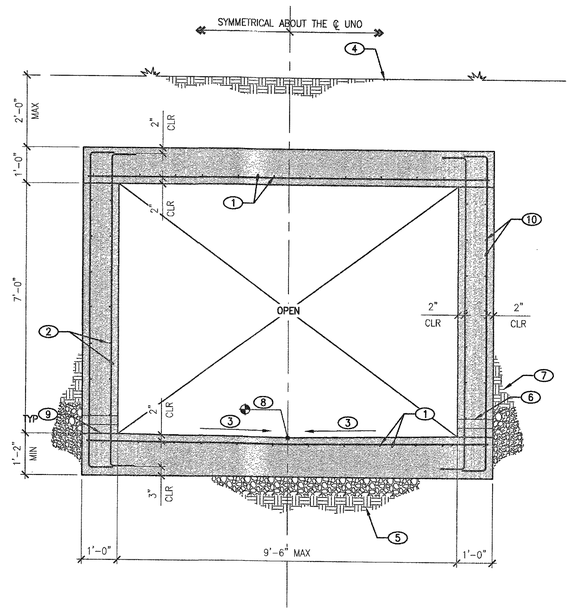
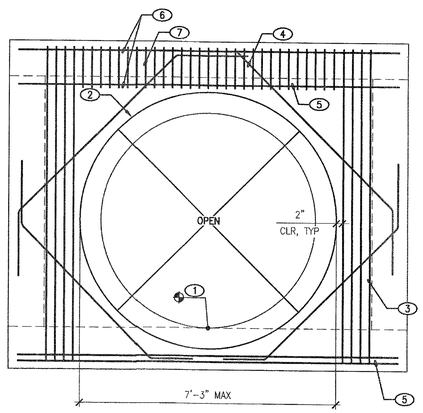


1 S2.5 SECTION AT MANHOLE STRUCTURE
NO SCALE

KEYNOTES:
1. #6 AT 4" O.C. EACH WAY
2. #5 AT 16" O.C. VERT AND #4 AT 16" O.C. HORIZ W/ STANDARD HOOK ON VERT BARS, T&B
3. 1% CROSS SLOPE AT INVERT, VERIFY WITH CIVIL
4. FINAL GRADE
5. CONCRETE BOX BEDDING PER GSN
6. WEEP HOLE, FILTER FABRIC, AND ROCK POCKET PER DETAIL 4/S0.2, SEE PLAN FOR SPACING.
7. BACKFILL MATERIAL AND PROCEDURE PER GSN
8. INVERT ELEVATION PER CIVIL
9. CONSTRUCTION JOINT AT CONTRACTOR OPTION. ROUGHENED INTERFACE 1/4" AMPLITUDE
10. #4 AT 18" O.C. EACH WAY. PROVIDE STD. HOOK AT EACH END. TYPICAL

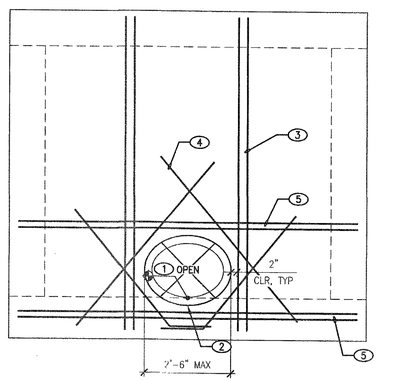
NOTES:
A. MANHOLE AND RCP PENETRATIONS NOT SHOWN FOR CLARITY
B. END WALL CONSTRUCTION SHALL MATCH



2 S2.5 ELEVATION AT 72"Ø RCP PENETRATION
NO SCALE

KEYNOTES:
1. RCP INVERT PER CIVIL
2. RCP PER PLAN
3. (4) #5 VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x10'-0" DIAGONAL BARS PLACED AS SHOWN EF, BEND AS REQUIRED
5. PLACE ADDITIONAL #5 HORIZ BARS ABOVE AND BELOW OPENING AS SHOWN EF. EXTEND BARS TO END OF WALL AND TERMINATE W/ STANDARD HOOK EACH END
6. ADDITIONAL BARS ABOVE OPENING PER PLAN.
7. #3 STIRRUPS AT 3" O.C. OVER OPENING.

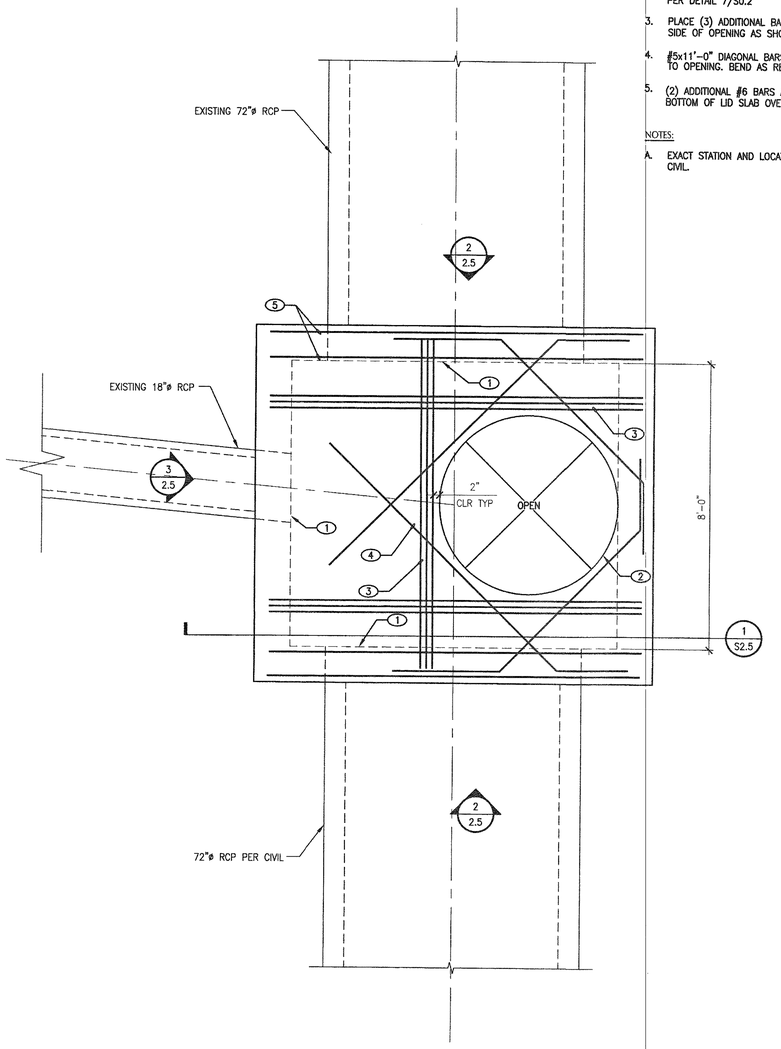
NOTES:
A. TYPICAL REINF NOT SHOWN FOR CLARITY



3 S2.5 ELEVATION AT SKEWED 18"Ø RCP PENETRATION
NO SCALE

KEYNOTES:
1. END OF RCP TO TERMINATE FLUSH W/ INSIDE FACE OF WALL
2. 60"ø MANHOLE OPENING AND RISER PER DETAIL 7/S0.2
3. PLACE (3) ADDITIONAL BARS EACH SIDE OF OPENING AS SHOWN
4. #5x11'-0" DIAGONAL BARS ADJACENT TO OPENING. BEND AS REQ'D.
5. (2) ADDITIONAL #6 BARS AT TOP AND BOTTOM OF LID SLAB OVER OPENING.

NOTES:
A. EXACT STATION AND LOCATION PER CIVIL.



PLAN VIEW AT MANHOLE STRUCTURE AT SD-1 STA. 36+34.46
SCALE: 1/2"=1'-0"

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STATE OF NEVADA — JAMES A. GAVER — Exp. 12/31/18 — CIVIL — REGISTERED PROFESSIONAL ENGINEER — SEAL — 05/10/2018

PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: SD-1 MANHOLE PLAN VIEW, SECTIONS AND ELEVATIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2013

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: 731-98 L-60221 S2.5

PROJ#:124070 AGREE:#115666 QS:124-07-SWINE, 124-18-NWINE

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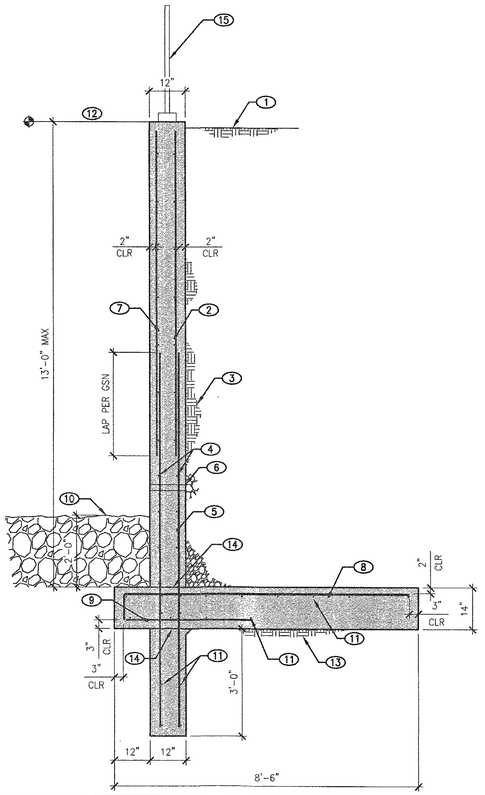


1 S2.6 WING WALL SECTION
NO SCALE

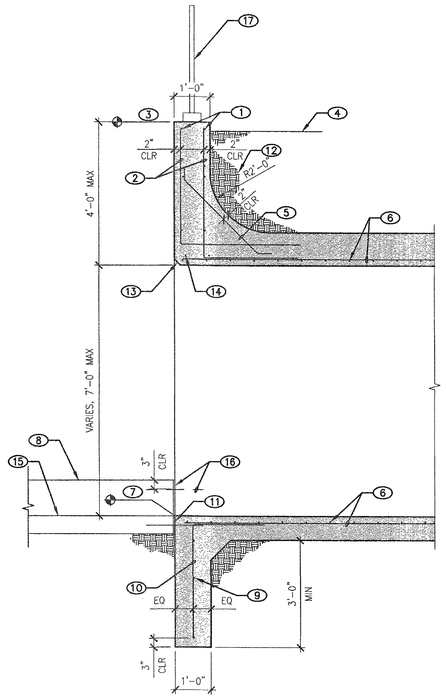
KEYNOTES:

1. FINAL GRADE PER CIVIL
2. #4 VERT AT 12" O.C. LAP LOWER BAR AS SHOWN
3. BACKFILL MATERIAL AND PROCEDURES PER GSN. PROVIDE 12" MIN FREE DRAIN GRANULAR BACKFILL FULL HEIGHT OF WALL
4. #4 HORIZ. AT 16" O.C. AT EACH FACE. LAP 18" MIN.
5. #6x137" VERT AT 6" O.C. AT SOIL FACE OF WALL
6. WEEP HOLE, ROCK POCKET, AND FILTER FABRIC PER TYP DETAIL 4/S0.2. PLACE AT 12'-0" O.C. MAX
7. #4 VERT AT 18" O.C. AT NON-SOIL FACE. EXTEND TO BOTTOM OF KEY AS SHOWN
8. #6 TRANS AT 8" O.C.
9. #4x36" TRANS AT 18" O.C.
10. TOP OF 24" THICK RIP RAP PER CIVIL
11. #4 CONT AT 12" O.C. LAP 18" MIN
12. TOP OF WALL ELEVATION PER CIVIL
13. PROPERLY PREPARED SUBGRADE PER GEOTECHNICAL REPORT
14. CONSTRUCTION JOINT AT CONTRACTORS OPTION. ROUGHEN INTERFACE 1/4" AMPLITUDE
15. FALL PROTECTION FENCING PER TYPICAL DETAILS SHEET S0.3

NOTES:

A. AT CONTRACTORS OPTION VERT REINF PER KEYNOTE 5 MAY BE EXTENDED FULL WALL HEIGHT AND VERT REINF PER KEYNOTE 2 MAY BE ELIMINATED

B. ALL EXTERIOR EDGES OF CONCRETE TO BE CHAMFERED



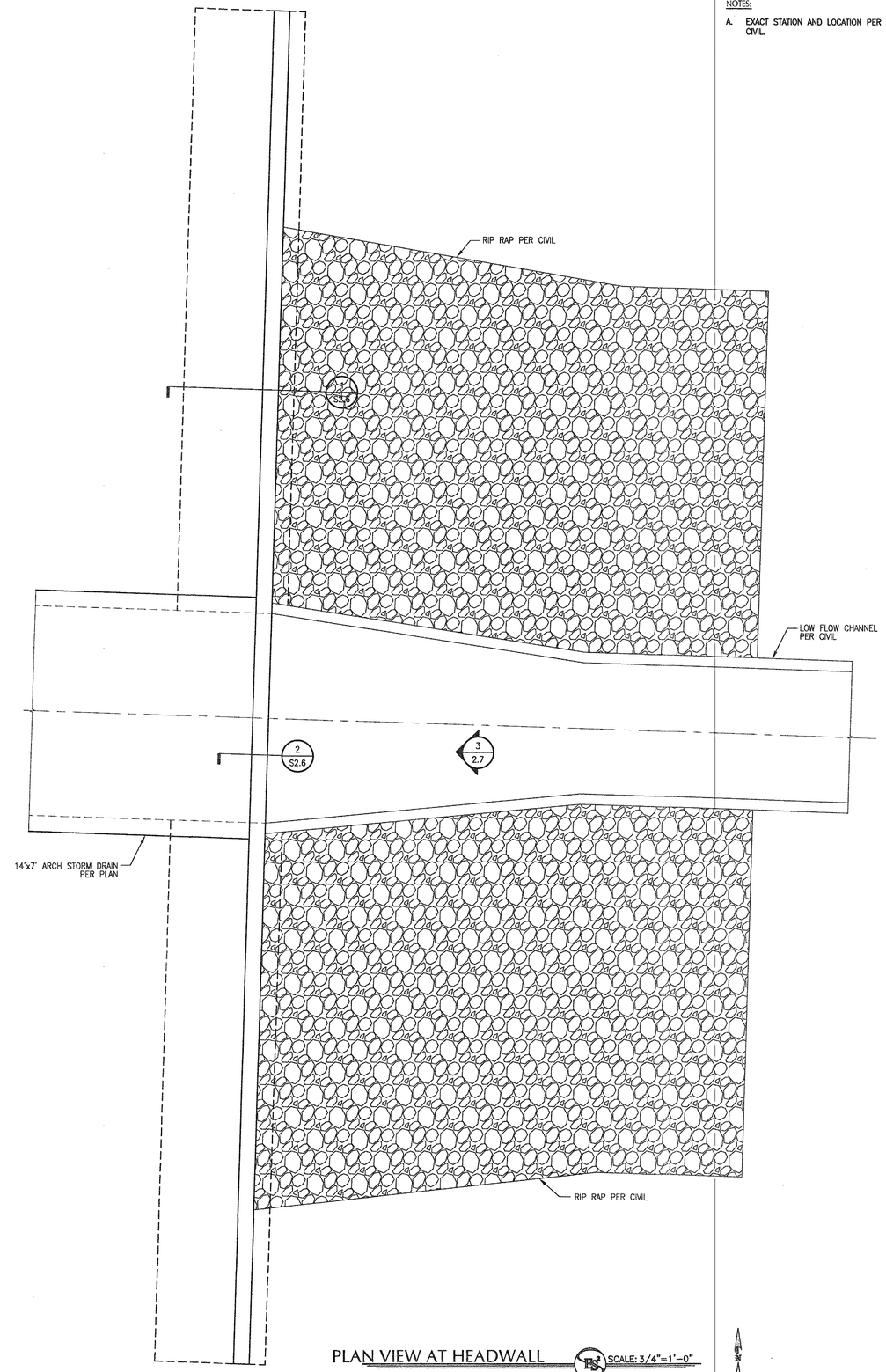
2 S2.6 HEADWALL SECTION AT ARCH STORM DRAIN
NO SCALE

KEYNOTES:

1. #4 HORIZ AT 16" O.C. AT EA FACE
2. #4 VERT DOWEL AT 12" O.C. W/ 36" LONG HOOK AT BASE
3. TOP OF HEADWALL ELEVATION PER CIVIL
4. FINAL GRADE PER CIVIL
5. #4 AT 12" O.C. PLACE RADIALLY AROUND ARCH
6. CULVERT REINFORCING, SEE SECTION
7. INVERT ELEVATION PER CIVIL
8. TOP OF LOW FLOW CHANNEL BEYOND
9. #4 HORIZ AT 12" O.C.
10. #4 AT 12" O.C. 24" / 36"
11. EXPANSION JOINT CONSTRUCTION PER 10/S0.2
12. BACK FILL MATERIAL AND PROCEDURE PER GSN
13. 2" CHAMFER
14. ADDITIONAL BARS PER 3/S2.7
15. LOW FLOW CHANNEL PER CIVIL
16. SLIP DOWEL AND EXPANSION JOINT CONSTRUCTION PER 9/S0.2
17. FALL PROTECTION FENCING PER TYPICAL DETAILS SHEET S0.3

NOTES:

A. BOTTOM OF KEY DEPTH TO MATCH ADJACENT WING WALL KEY DEPTH. MAY EXCEED 36" AT ARCH HEADWALL



PLAN VIEW AT HEADWALL
SCALE: 3/4"=1'-0"

NOTES:

A. EXACT STATION AND LOCATION PER CIVIL.

SEAL: REGISTERED PROFESSIONAL ENGINEER STATE OF NEVADA SCOTT A. MEYER Exp. 12/31/19 CIVIL STRUCTURAL 05/10/2018

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PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: HEADWALL PLAN VIEW, SECTIONS AND ELEVATIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018
	DESIGN REVISIONS	03/06/2015
	CCRFCD COMMENTS	11/11/2013

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: 731-99 L-60221 S2.6

PRO.#:124070 AGREE.#115666 QS:124-07-SW/NE,124-18-NW/NE

Drawing: \\Es2eng\shared\Users\Projects\Structural\2013\STR13.6000 Civil Structures\STR13.6007 Paiute Highlands Flood Water Detention\ACAD_REVIT\S2.6 STR13.6007.dwg Last Opened By: Joe Ali, 2017 - 4:52pm Last Plotted: Wed May 09, 2018 - 4:57pm By: ejeffrey
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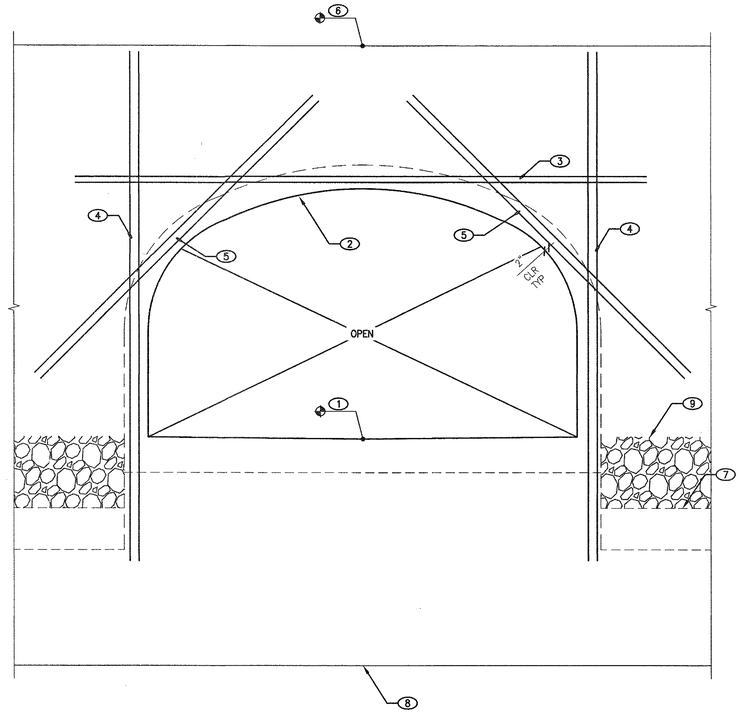

3 S2.7 ELEVATION AT ARCH HEAD WALL
NO SCALE

KEYNOTES:

1. INVERT AT ARCH PER CIVIL
2. ARCH CULVERT PER PLAN
3. (2) #6 HORIZONTAL BARS ABOVE ARCH EF. EXTEND 37" PAST EDGE OF OPENING, TYP
4. PLACE (2) ADDITIONAL VERTICALS EACH SIDE OF OPENING EF BETWEEN TYPICAL VERT REINF. TYP REINF PER DETAIL 1/S2.6
5. (2) #5 DIAGONAL BARS EF
6. TOP OF HEADWALL PER CIVIL
7. TOP OF ADJACENT WING WALL FTG
8. BOTTOM OF KEY
9. RIP RAP PER CIVIL

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY
B. ADJACENT LOW FLOW CHANNEL PER CIVIL NOT SHOWN FOR CLARITY

SEAL: REGISTERED PROFESSIONAL ENGINEER STATE OF NEVADA GREGORY T. CHRISTENSEN No. 12,781 Exp. 12/31/18 CIVIL STRUCTURAL 05/10/2018

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PROJECT:
GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE:
HEADWALL ELEVATION

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: 731-99 L-10221 S2.7

PROJ#:124070 AGREE:#115666 QS:124-07-SWINE,124-18-NWINE

Drawing: \\cs2eng.net\main\Projects\Structural\2013\STR13.6007 Grd Structural\STR13.6007_Plan Highlook Grand Teton Drainage\MOD_45HR1.52 L_STR13.6007.dwg Last Saved Thu Jun 28, 2017 - 4:59pm Last Plotted Wed May 09, 2018 - 8:57am By: wilmu
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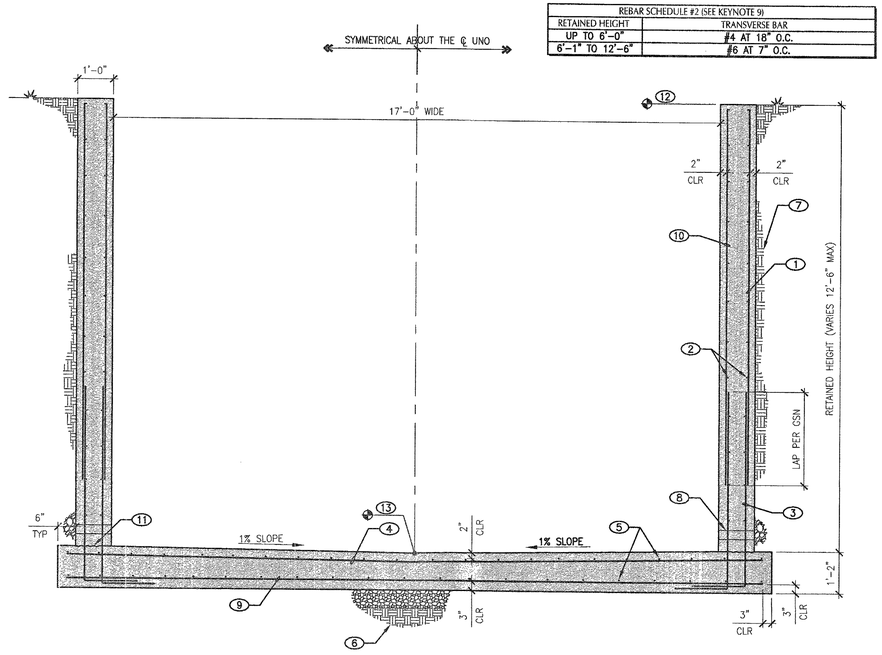
REBAR SCHEDULE #1 (SEE KEYNOTE 3)	
RETAINED HEIGHT	HOOKED VERTICAL DOWEL
UP TO 6'-0"	#4 DOWEL x42" MIN VERT AT 12" O.C. W/ STD HOOK
6'-1" TO 12'-6"	#6 DOWEL x68" MIN VERT AT 7" O.C. W/ STD HOOK

REBAR SCHEDULE #2 (SEE KEYNOTE 9)	
RETAINED HEIGHT	TRANSVERSE BAR
UP TO 6'-0"	#4 AT 18" O.C.
6'-1" TO 12'-6"	#6 AT 7" O.C.



KEYNOTES:

1. #4 VERT AT 12" O.C. AT SOIL FACE. LAP LOWER BAR PER GSN
2. #4 HORIZ AT 16" O.C. EA FACE
3. VERT DOWEL PER REBAR SCHEDULE #1
4. #4 TRANS AT 12" O.C. AT TOP OF INVERT SLAB
5. #5 LONG AT 12" O.C.
6. COMPACTED SUBGRADE PER GSN
7. BACKFILL MATERIAL AND PROCEDURE PER GSN. PROVIDE 12" MIN FREE DRAIN GRANULAR BACKFILL FULL HEIGHT OF WALL
8. WEEP HOLE, ROCK POCKET, AND FILTER FABRIC PER TYP DETAIL 4/S0.2. PROVIDE (1) WEEP HOLE PER SIDE. LOCATE APPROX 36" FROM DROP STRUCTURE
9. TRANS BAR AT BOTTOM OF INVERT SLAB PER REBAR SCHEDULE #2
10. #4 VERT AT 18" O.C. AT NON SOIL FACE. PROVIDE DOWEL TO MATCH AND LAP W/ STD HOOK INTO FTG
11. CONSTRUCTION JOINT AT CONTRACTORS OPTION. ROUGHEN INTERFACE 1/4" AMPLITUDE
12. TOP OF WALL ELEVATION PER CIVIL
13. INVERT ELEVATION PER CIVIL

NOTES:

A. AT CONTRACTOR'S OPTION, VERT REINF PER KEYNOTE 3 MAY BE EXTENDED FULL WALL HEIGHT AND VERT REINF PER KEYNOTE 1 MAY BE ELIMINATED

B. CHAMFER ALL EXTERIOR CONCRETE EDGES

C. TRASH RACK FRAME NOT SHOWN FOR CLARITY, SEE SECTION 4/S2.9

1 S2.8 RECTANGULAR CHANNEL SECTION AT OUTLET STRUCTURE
NO SCALE

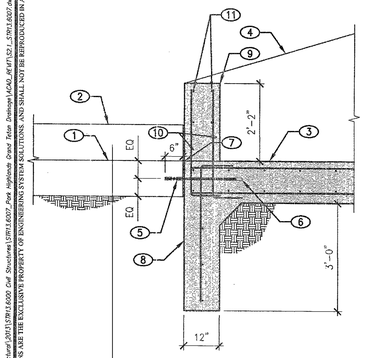
KEYNOTES:

1. LOW FLOW CHANNEL PER CIVIL
2. TOP OF LOW FLOW CHANNEL BEYOND
3. INVERT AND REINF PER 1/S2.8
4. TOP OF CHANNEL WALL BEYOND
5. DRILL AND EPOXY 5/8"ø x24" SMOOTH EPOXY COATED DOWELS AT 12" O.C. W/ 6" EMBED INTO LOW FLOW CHANNEL
6. 5/8"ø ID PLASTIC SLEEVE AS MFR BY SPEED DOWEL OR APPROVED EQUAL. LENGTH AS REQ'D FOR 2" SLIP AT END OF DOWEL
7. EXPANSION JOINT MATERIAL PER 10/S0.2
8. CUTOFF WALL AND REINF PER 10/S0.2
9. WEIR WALL PER PLAN, COORDINATE LOCATION W/ CIVIL
10. #4x21" DOWEL AT 12" O.C. EF, HOOK INTO INVERT AS SHOWN
11. #4 HORIZ EF, AT TOP OF WEIR WALL, AND AT MID-HEIGHT

NOTES:

A. AT SIM NO WEIR WALL PRESENT, SEE PLAN AND CIVIL DRAWINGS FOR LOCATION.

B. VERIFY WEIR HEIGHT W/ CIVIL PLANS



3 S2.8 SECTION AT CONNECTION TO LOW FLOW CHANNEL
NO SCALE

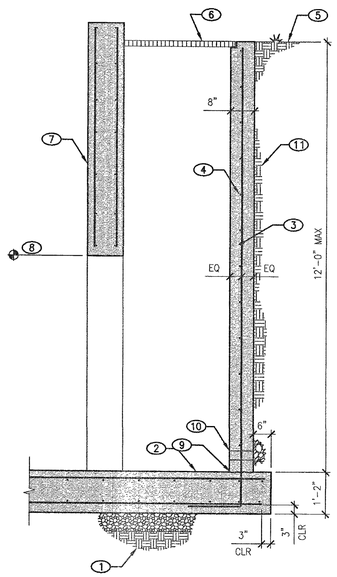
KEYNOTES:

1. PROPERLY PREPARED SUBGRADE PER GEOTECHNICAL REPORT
2. INVERT AND REINF PER 1/S2.8
3. #4 VERT AT 12" O.C. W/ STD HOOK INTO INVERT
4. #4 HORIZ AT 12" O.C. W/ STD HOOK INTO EACH END WALL
5. TOP OF FINISHED GRADE PER CIVIL
6. NEENAH R-6672-M GRATE & FRAME PER CIVIL
7. CHANNEL WALL AND REINF PER 1/S2.8
8. TOP OF ACCESS OPENING PER CIVIL
9. CONSTRUCTION JOINT AT CONTRACTORS OPTION, ROUGHEN INTERFACE 1/4" AMPLITUDE.
10. WEEP HOLE, ROCK POCKET, AND FILTER FABRIC PER TYP DETAIL 4/S0.2. PROVIDE (1) WEEP HOLE PER SIDE
11. BACKFILL MATERIAL AND PROCEDURES PER GEOTECHNICAL REPORT. PROVIDE 12" MIN FREE DRAIN GRANULAR BACKFILL FULL HEIGHT OF WALL

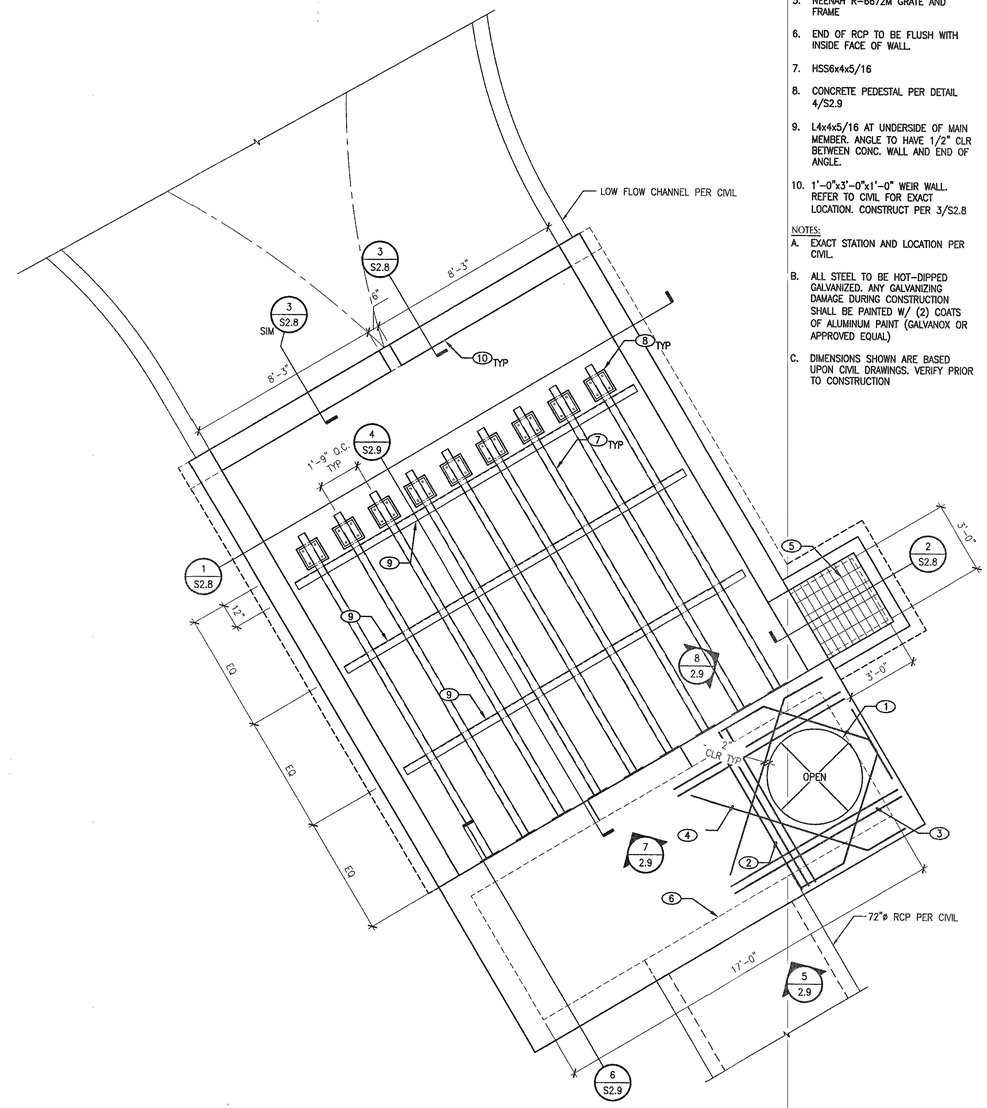
NOTES:

A. ALL WALLS AT MAN ACCESS STRUCTURE TO BE CONSTRUCTED AS SHOWN

B. LADDER PER CIVIL, NOT SHOWN FOR CLARITY



2 S2.8 SECTION AT MAN-ACCESS STRUCTURE
NO SCALE



KEYNOTES:

1. 48"ø MANHOLE OPENING PER 7/S0.2
2. PLACE (3) ADD. TRANS BARS ADJACENT TO OPENING
3. PLACE (2) ADD. LONG. BARS ADJACENT TO OPENING. EXTEND 24" MIN PAST OPENING
4. #4x8'-0" DIAGONAL BARS EACH SIDE OF OPENING. BEND AS REQ'D.
5. NEENAH R-6672M GRATE AND FRAME
6. END OF RCP TO BE FLUSH WITH INSIDE FACE OF WALL.
7. HSS6x4x5/16
8. CONCRETE PEDESTAL PER DETAIL 4/S2.9
9. L4x4x5/16 AT UNDERSIDE OF MAIN MEMBER. ANGLE TO HAVE 1/2" CLR BETWEEN CONC. WALL AND END OF ANGLE.
10. 1'-0"x3'-0"x1'-0" WEIR WALL. REFER TO CIVIL FOR EXACT LOCATION. CONSTRUCT PER 3/S2.8

NOTES:

A. EXACT STATION AND LOCATION PER CIVIL.

B. ALL STEEL TO BE HOT-DIPPED GALVANIZED. ANY GALVANIZING DAMAGE DURING CONSTRUCTION SHALL BE PAINTED W/ (2) COATS OF ALUMINUM PAINT (GALVANOX OR APPROVED EQUAL)

C. DIMENSIONS SHOWN ARE BASED UPON CIVIL DRAWINGS. VERIFY PRIOR TO CONSTRUCTION

PLAN VIEW AT OUTLET STRUCTURE
SCALE: 3/8"=1'-0"

SEAL: STATE OF NEVADA — PROFESSIONAL ENGINEER — GREG MEYER — No. 12781 — STRUCTURAL — REGISTERED PROFESSIONAL ENGINEER — 05/10/2018

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PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: OUTLET STRUCTURE PLAN VIEW & SECTIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018
	DESIGN REVISIONS	4/8/14
	CCRPCD COMMENTS	11/1/2013

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S2.8
731-98
2-60021

PROJ.#:124070 AGREE.#115666 QS:124-07-SW/NE,124-18-NW/NE

Drawing: \\es2eng-server\Projects\Drawings\2013\STR13.6007 Grd Teton\CIVIL\6007 Grd Teton Struct Plans.dwg, ARCH D1 (24.00in x 36.00in), Last Saved: Tue Jan 24, 2017 - 4:58pm Last Printed: Wed May 09, 2018 - 8:27am By: wpalmer
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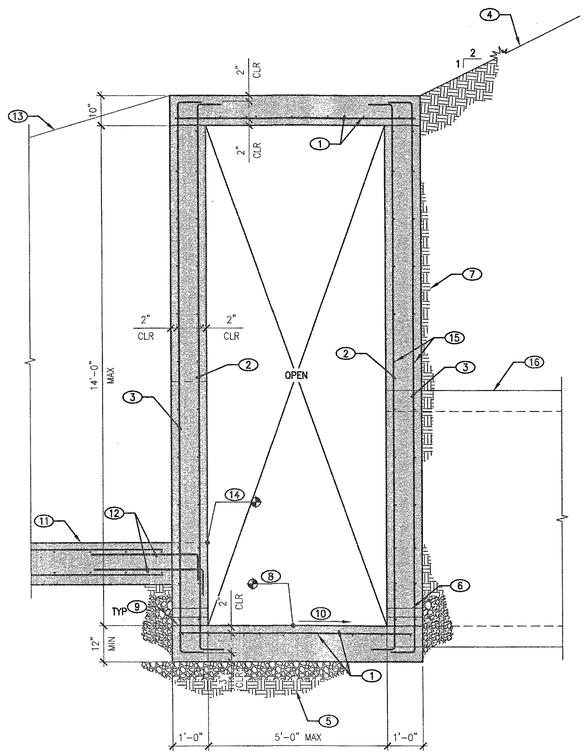


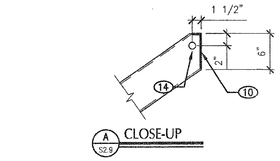
KEYNOTES:

1. #5 AT 12" O.C. EACH WAY
2. #6 VERT AT 10" O.C. W/ STD HOOK T&B
3. #4 VERT AT 18" O.C. AT OUTSIDE FACE
4. FINAL GRADE PER CIVIL, MAX SLOPE AS SHOWN
5. CONCRETE BOX BEDDING PER GSN
6. WEEP HOLE, FILTER FABRIC, AND ROCK POCKET PER DETAIL 4/S0.2. MIN (1) PER SIDE
7. BACKFILL MATERIAL AND PROCEDURE PER GSN
8. INVERT ELEVATION PER CIVIL
9. CONSTRUCTION JOINT AT CONTRACTOR OPTION. ROUGHENED INTERFACE 1/4" AMPLITUDE
10. 0.5% SLOPE AT INVERT, VERIFY WITH CIVIL
11. INVERT AT CHANNEL SECTION PER 1/S2.8
12. #4x36 DOWEL W/ STD HOOK INTO DROP STRUCTURE WALL
13. TOP OF CHANNEL SECTION WALL BEYOND
14. INVERT AT 54"ø OPENING
15. #4 AT 16" O.C. HORIZ, EACH FACE
16. RCP BEYOND

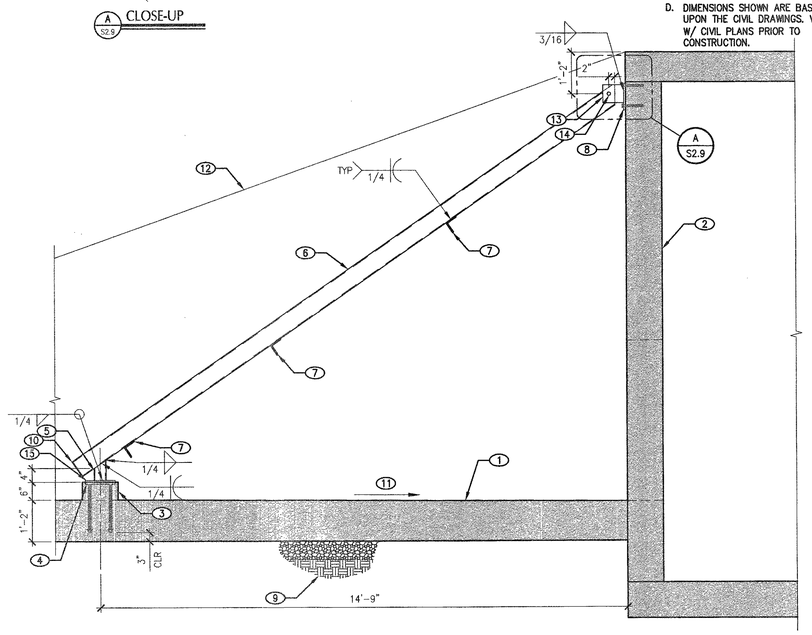
NOTES:

A. MANHOLE AND RCP PENETRATIONS NOT SHOWN FOR CLARITY. REFER TO APPLICABLE DETAILS
B. TRASH RACK FRAMING NOT SHOWN FOR CLARITY
C. DIMENSIONS SHOWN ARE BASED UPON CIVIL DWGS. VERIFY W/ CIVIL PRIOR TO CONSTRUCTION

6 SECTION AT DROP STRUCTURE
S2.9 NO SCALE



A CLOSE-UP
S2.9

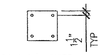


NOTES (CONT):

B. ALL STEEL TO BE HOT-DIPPED GALVANIZED. ANY GALVANIZING DAMAGE DURING CONSTRUCTION SHALL BE PAINTED W/ (2) COATS OF ALUMINUM PAINT (GALVANOX OR APPROVED EQUAL)
C. TYPICAL REINF NOT SHOWN FOR CLARITY, SEE APPLICABLE DETAILS
D. DIMENSIONS SHOWN ARE BASED UPON THE CIVIL DRAWINGS. VERIFY W/ CIVIL PLANS PRIOR TO CONSTRUCTION.

KEYNOTES:

1. INVERT AND REINF AT CHANNEL SECTION PER 1/S2.8
2. DROP STRUCTURE PER 6/S2.9
3. 12"x12" CONCRETE PEDESTAL AT EACH FRAME MEMBER
4. PL 5/8"x10"x0'-10" W/ (4) 3/4"9x17" ANCHOR BOLTS WELDED TO BOTTOM OF EMBED PLATE



5. HSS4x4x1/4 RISER
6. FRAME MEMBER PER PLAN
7. BRACE ANGLE PER PLAN
8. PL 5/8"x9x0'-10" W/ (4) 3/4"ø X6 1/2" SIMPSON TITEN HD (ICC ESR-2713)

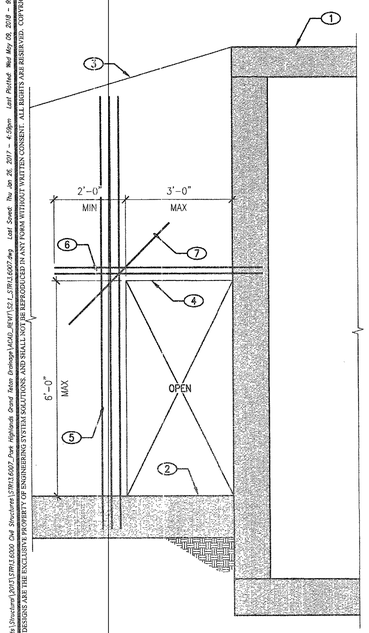
9. PROPERLY PREPARED SUBGRADE PER GEOTECHNICAL REPORT
10. 3/16" STEEL CAP PLATE EACH END, TYP
11. SLOPE PER CIVIL
12. TOP OF CHANNEL WALL BEYOND
13. PL 5/16"x6"x0'-7" EACH SIDE OF HSS. PROVIDE 1 1/8"ø HOLE

14. 1 1/8"ø HOLE FOR 1"ø A325 BOLT. FINGER TIGHTEN ONLY. SPOIL THREADS AFTER INSTALLATION
15. PL 5/8x10x0'-10". DO NOT WELD TO EMBED PLATE

NOTES:

A. POST INSTALLED ANCHORS TO BE INSTALLED PER MANUFACTURER RECOMMENDATIONS AND SPECIFICATIONS. SPECIAL INSPECTION REQ'D

4 SECTION AT TRASH RACK
S2.9 NO SCALE



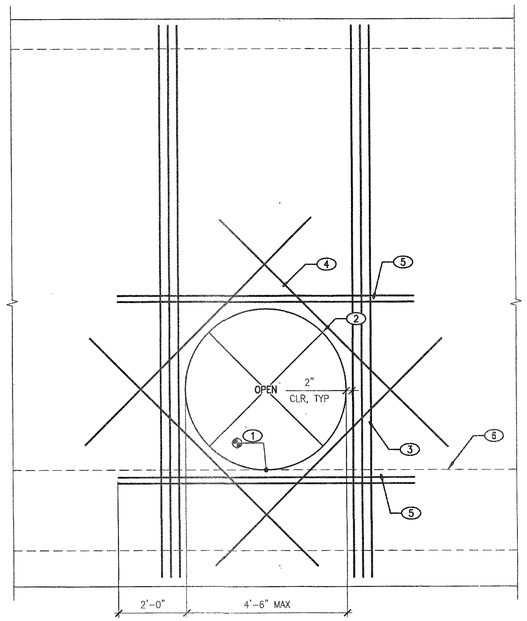
KEYNOTES:

1. DROP STRUCTURE PER 6/S2.9
2. CHANNEL INVERT PER 1/S2.8
3. TOP OF CHANNEL WALL
4. MAN ACCESS OPENING IN CHANNEL WALL
5. (3) ADDITIONAL VERT BARS AT EACH FACE W/ STD HOOK INTO INVERT
6. (2) ADDITIONAL HORIZ BARS ABOVE OPENING AT EACH FACE. EXTEND 24" MIN PAST EDGE OF OPENING. PROVIDE HOOK INTO DROP STRUCTURE WALL
7. #5x4'-0" DIAGONAL BAR AT CORNER AT EACH FACE.

NOTES:

A. TYP REINF NOT SHOWN FOR CLARITY
B. TRASH RACK NOT SHOWN FOR CLARITY

8 ELEVATION AT MAN ACCESS
S2.9 NO SCALE



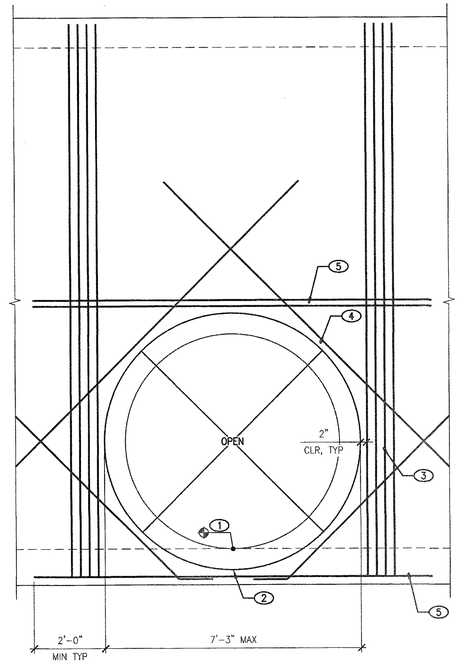
KEYNOTES:

1. INVERT PER CIVIL
2. OPENING PER PLAN
3. (3) ADDITIONAL VERT BARS AT EA SIDE OF OPENING AT EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x9'-0" DIAGONAL BARS PLACED AS SHOWN AT EACH FACE, BEND AS REQUIRED
5. PLACE (2) ADDITIONAL #5 HORIZ BAR ABOVE AND BELOW OPENING AT EACH FACE AS SHOWN. EXTEND BARS 2'-0" BEYOND EDGE OF OPENING AS SHOWN
6. TOP OF INVERT AT CHANNEL SECTION BEYOND.

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY

7 ELEVATION AT 53"Ø PENETRATION
S2.9 NO SCALE



KEYNOTES:

1. RCP INVERT PER CIVIL
2. RCP PER PLAN
3. (4) ADDITIONAL VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF FALL AND TERMINATE W/ STD HOOK T&B
4. #5x11'-0" EF DIAGONAL BARS PLACED AS SHOWN AT EF, BEND AS REQUIRED
5. PLACE (2) ADDITIONAL #5 HORIZ BAR ABOVE AND (1) BELOW OPENING AT EACH FACE AS SHOWN. EXTEND BARS 2'-0" BEYOND EDGE OF OPENING AS SHOWN

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY

5 ELEVATION AT 72"Ø RCP PENETRATION
S2.9 NO SCALE

SEAL: STATE OF NEVADA, REGISTERED PROFESSIONAL ENGINEER, GREGORY A. MEYER, No. 12751, CIVIL, STRUCTURAL, 05/10/2018

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DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: OUTLET STRUCTURE ELEVATIONS & SECTIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018
	DESIGN REVISIONS	03/06/2015
	CCRFCD COMMENTS	11/11/2013

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: 731-98 L-60221 S2.9

PROJ#:124070 AGREE:#115666 QS:124-07-SWINE,124-18-NWINE

Drawing: I:\acbgrad\Users\Projects\Structural\2013\STR13.6000 Old Structures\STR13.6007_Park Highlands Grand Teton Drainage\KOAL_REV#1\S2.1_STR13.6007.dwg Last Saved: Thu Jan 26, 2017 - 4:39pm Last Plotted: Wed May 09, 2018 - 8:57am By: ★Stru
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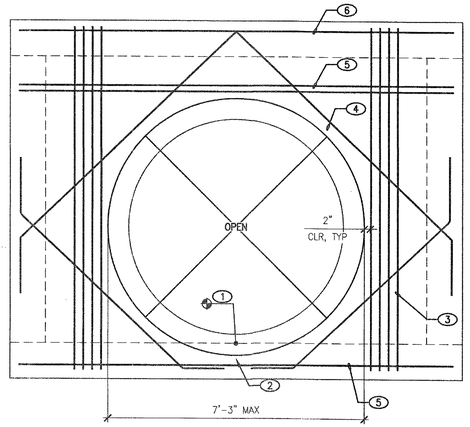


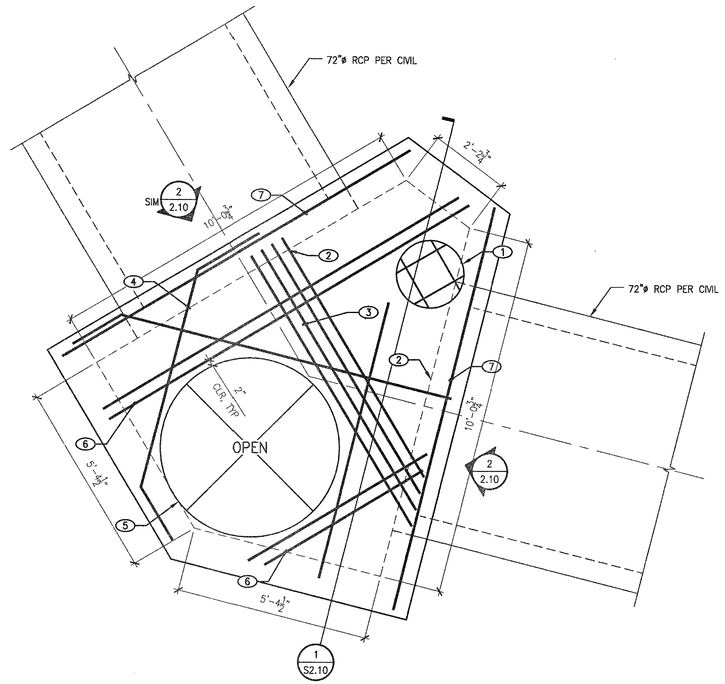
2 / S2.10 ELEVATION AT 72"Ø RCP PENETRATION
NO SCALE

KEYNOTES:

1. RCP INVERT PER CIVIL
2. RCP PER PLAN
3. (4) #5 VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x11'-0" DIAGONAL BARS PLACED AS SHOWN EF, BEND AS REQUIRED
5. PLACE (2) ADDITIONAL #5 HORIZ BAR ABOVE AND (1) BELOW OPENING AS SHOWN EF. TERMINATE W/ STD HOOK EACH END
6. ADDITIONAL BAR ABOVE OPENING PER PLAN

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY



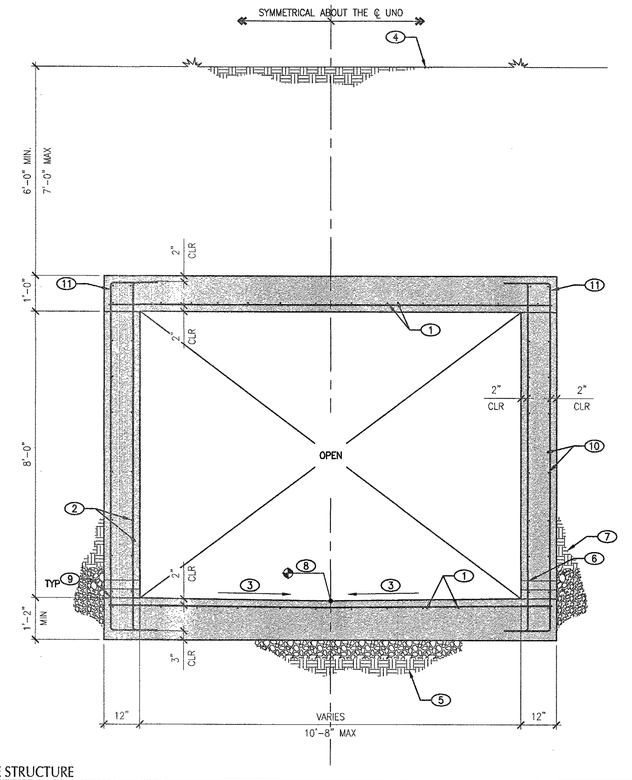
PLAN VIEW AT MANHOLE STRUCTURE AT SD-2 STA. 56+25.00
SCALE: 1/2"=1'-0"

KEYNOTES:

1. ORIENTATION OF TYP REINFORCING BARS
2. END OF RCP TO BE FLUSH W/ INSIDE FACE OF WALL.
3. PLACE (4) ADJACENT BARS EACH SIDE OPENING AS SHOWN.
4. #4x8'-0" DIAGONAL BARS EACH SIDE OF OPENING. BEND AS REQ'D.
5. 60"ø MANHOLE AND RISER PER 7/S0.2
6. (2) ADDITIONAL BARS ADJACENT TO OPENING.
7. #5 BAR AT TOP OF SLAB OVER RCP OPENING

NOTES:

A. EXACT STATION AND LOCATION PER CIVIL.



1 / S2.10 SECTION AT MANHOLE STRUCTURE
NO SCALE

KEYNOTES:

1. #5 AT 8" O.C. EACH WAY, ORIENT AS SHOWN ON PLAN VIEW
2. #5 AT 12" O.C. VERT AND #4 AT 16" O.C. HORIZ W/ STANDARD HOOK ON VERT BARS, T&B
3. 1% CROSS SLOPE AT INVERT, VERIFY WITH CIVIL
4. FINAL GRADE PER CIVIL
5. CONCRETE BOX BEDDING PER GSN
6. WEEP HOLE, FILTER FABRIC, AND ROCK POCKET PER DETAIL 4/S0.2
7. BACKFILL MATERIAL AND PROCEDURE PER GSN
8. INVERT ELEVATION PER CIVIL
9. CONSTRUCTION JOINT AT CONTRACTOR OPTION. ROUGHENED INTERFACE 1/4" AMPLITUDE
10. #4 AT 18" O.C. EACH WAY. PROVIDE STD HOOK AT EACH END. TYPICAL
11. ADDITIONAL BARS ABOVE RCP OPENING PER PLAN

NOTES:

A. MANHOLES AND RCP PENETRATIONS NOT SHOWN FOR CLARITY. REFER TO APPLICABLE DETAILS
B. END WALL REINFORCING SHALL MATCH

SEAL: REGISTERED PROFESSIONAL ENGINEER, STATE OF NEVADA, GREGORY T. MEYER, No. 9870, CIVIL, STRUCTURAL — 05/10/2018

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PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: SD-2 MANHOLE PLAN VIEW, SECTIONS AND ELEVATIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM
DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: 6-60231 731-99 S2.10

PROJ.#:124070 AGREE:#115666 QS:124-07-SW/NE,124-18-NW/NE

Drawings | Landscape/Lawn (Projects | Structural | 2013 | STR13.6007 Cell Structures | STR13.6007_Park Highlands Gravel Pond Drainage | ACAD_REVIT | S2.1_STR13.6007.dwg Last Saved By: Jon 25, 2017 - 4:09pm Last Plotted: Wed May 09, 2018 - 9:57am By: wadley
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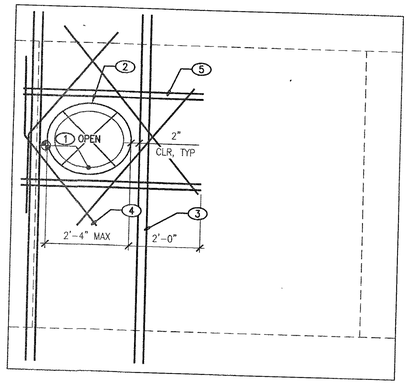
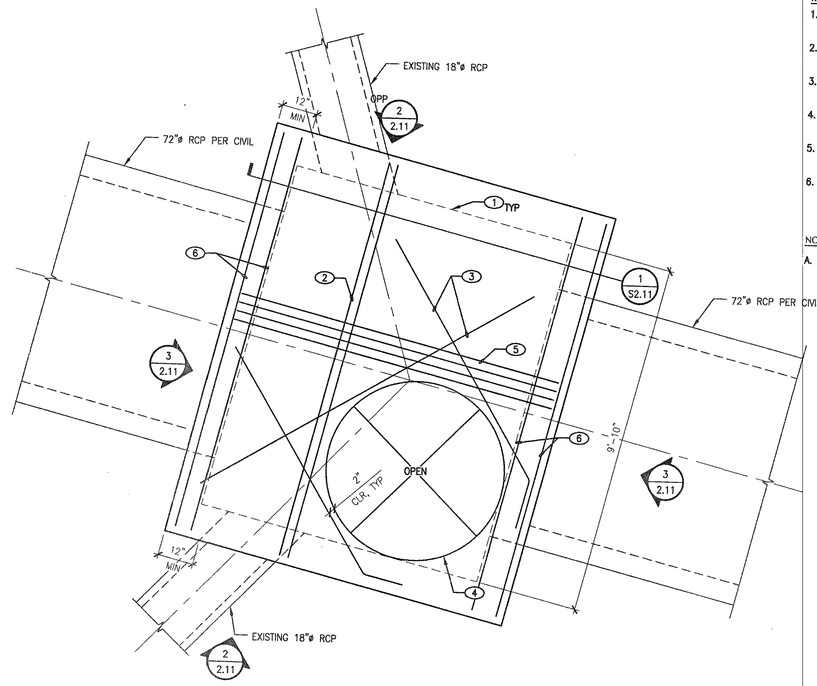


KEYNOTES:

1. RCP INVERT PER CIVIL
2. SKEWED RCP PER PLAN
3. (2) #5 VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x6'-0" DIAGONAL BARS PLACED AS SHOWN EF, BEND AS REQUIRED
5. PLACE (2) ADDITIONAL #4 HORIZ BAR ABOVE AND BELOW OPENING AS SHOWN EF. EXTEND BARS 2'-0" BEYOND EDGE OF OPENING OR TO END OF WALL. TERMINATE W/ STANDARD HOOK EACH END

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY



PLAN VIEW AT MANHOLE STRUCTURE AT SD-2 STA. 57+21.60

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

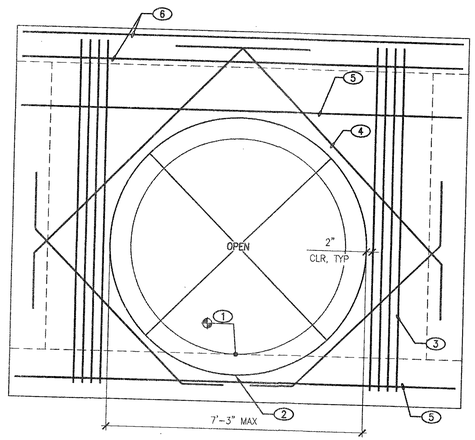
KEYNOTES:

1. END OF RCP TO TERMINATE FLUSH W/ INSIDE FACE OF WALL
2. PLACE (2) ADD. BARS ADJACENT TO OPENING.
3. #4 DIAGONAL BARS EACH SIDE OF OPENING. BEND AS REQ'D.
4. 60"ø MANHOLE AND RISER PER 7/S0.2
5. (4) #5 TRANS BARS ADJACENT TO OPENING
6. (2) #5 BARS AT TOP AND BOTTOM OF LID SLAB OVER RCP OPENINGS

NOTES:

A. EXACT STATION AND LOCATION PER CIVIL.

2 S2.11 ELEVATION AT SKEWED 18"Ø RCP PENETRATION
NO SCALE



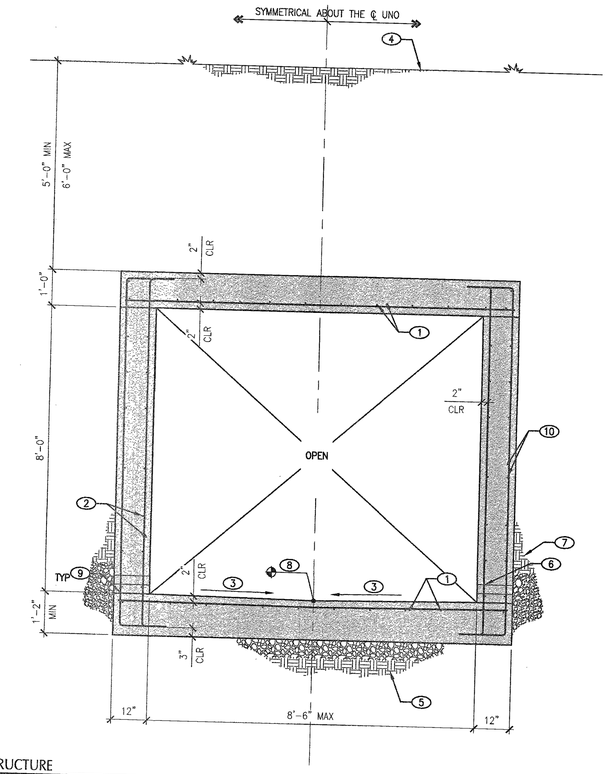
KEYNOTES:

1. RCP INVERT PER CIVIL
2. RCP PER PLAN
3. (4) #5 VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x11'-0" DIAGONAL BARS PLACED AS SHOWN EF, BEND AS REQUIRED
5. PLACE ADDITIONAL #5 HORIZ BAR ABOVE AND (1) BELOW OPENING AS SHOWN EF. TERMINATE W/ STD HOOK EACH END
6. ADDITONAL BARS IN LID SLAB PER PLAN

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY

2 S2.11 ELEVATION AT 72"Ø RCP PENETRATION
NO SCALE



1 S2.11 SECTION AT MANHOLE STRUCTURE
NO SCALE

KEYNOTES:

1. #5 AT 8" O.C. EACH WAY
2. #5 AT 12" O.C. VERT AND #4 AT 16" O.C. HORIZ W/ STANDARD HOOK ON VERT BARS, T&B
3. 1% CROSS SLOPE AT INVERT, VERIFY WITH CIVIL
4. FINAL GRADE PER CIVIL
5. CONCRETE BOX BEDDING PER GSN
6. WEEP HOLE, FILTER FABRIC, AND ROCK POCKET PER DETAIL 4/S0.2 EACH SIDE
7. BACKFILL MATERIAL AND PROCEDURE PER GSN
8. INVERT ELEVATION PER CIVIL
9. CONSTRUCTION JOINT AT CONTRACTOR OPTION. ROUGHENED INTERFACE 1/4" AMPLITUDE
10. #4 AT 18" O.C. EACH WAY. PROVIDE STD HOOK AT EACH END. TYPICAL

NOTES:

A. MANHOLES AND RCP PENETRATIONS NOT SHOWN FOR CLARITY. REFER TO APPLICABLE DETAILS

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PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: SD-2 MANHOLE PLAN VIEW, SECTIONS AND ELEVATIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S2.11

PROJ#:124070 AGREE.#115666 QS:124-07-SW/NE,124-18-NW/NE

731-98
L-60221

Drawing: I:\Active-staff\Grant Projects\Structural\2013\STR13.6007_Civil Structural\2013\STR13.6007_Park Highlands Grand Teton Drainage\ACAD_R2013\S2.1_STR13.6007.dwg Last Saved: Thu Jan 26, 2017 - 4:58pm Last Plotted: Wed Mar 06, 2018 - 8:27am By: eaDieu
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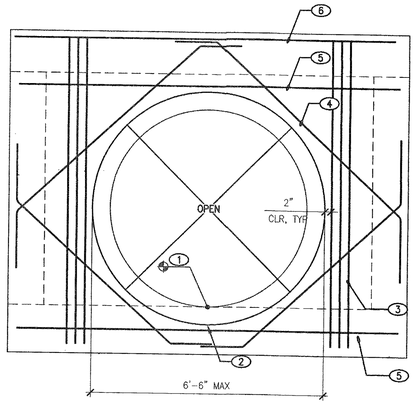


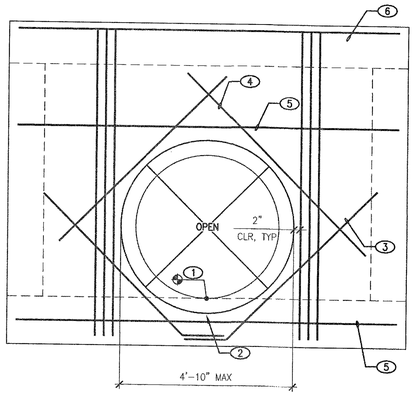
KEYNOTES:

1. RCP INVERT PER CIVIL
2. RCP PER PLAN
3. (3) #5 VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x10'-0" DIAGONAL BARS PLACED AS SHOWN EF, BEND AS REQUIRED
5. PLACE (2) ADDITIONAL #4 HORIZ BAR ABOVE AND BELOW OPENING AS SHOWN EF. EXTEND BARS AND TERMINATE W/ HOOK INTO WALL
6. BARS AT TOP OF SLAB OVER OPENING PER PLAN

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY

2 S2.12 ELEVATION AT 66"Ø RCP PENETRATION
NO SCALE



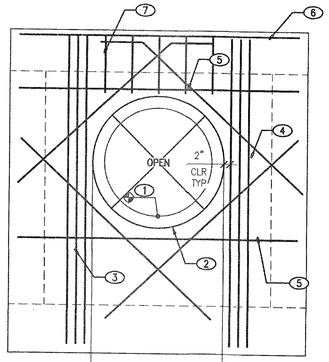
KEYNOTES:

1. RCP INVERT PER CIVIL
2. RCP PER PLAN
3. (3) #5 VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x10'-0" DIAGONAL BARS PLACED AS SHOWN EF, BEND AS REQUIRED
5. PLACE (2) ADDITIONAL #4 HORIZ BAR ABOVE AND BELOW OPENING AS SHOWN EF. EXTEND BARS AND TERMINATE W/ HOOK INTO WALL
6. BAR AT TOP OF SLAB OVER OPENING PER PLAN

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY

3 S2.12 ELEVATION AT 48"Ø RCP PENETRATION
NO SCALE



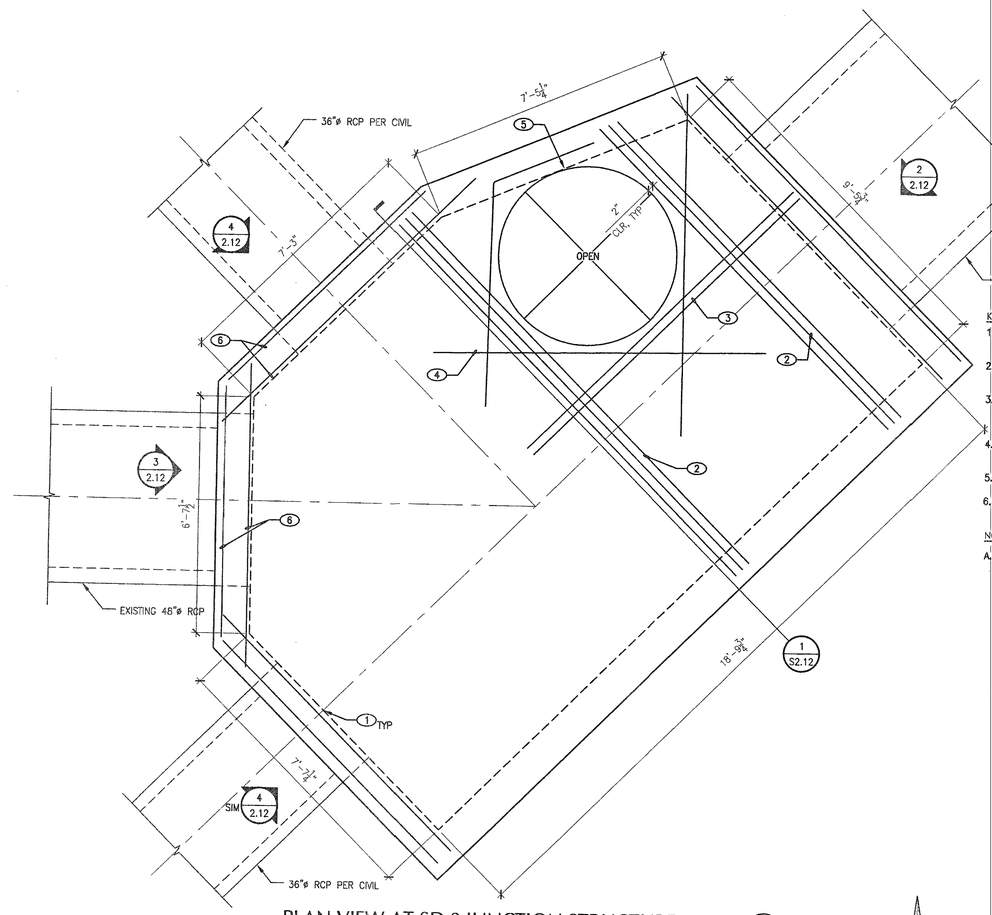
KEYNOTES:

1. RCP INVERT PER CIVIL
2. RCP PER PLAN
3. (3) #5 VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x9'-0" DIAGONAL BARS PLACED AS SHOWN EF, BEND AS REQUIRED
5. PLACE ADDITIONAL #4 HORIZ BAR ABOVE AND BELOW OPENING AS SHOWN EF. EXTEND BARS AND TERMINATE W/ HOOK INTO WALL
6. BAR AT TOP OF SLAB OVER OPENING PER PLAN
7. #4 STIRRUP AT 9" O.C. OVER OPENING. PLACE FIRST STIRRUP 4 1/2" FROM OUTSIDE FACE OF RCP OPENING

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY

4 S2.12 ELEVATION AT 36"Ø RCP PENETRATION
NO SCALE



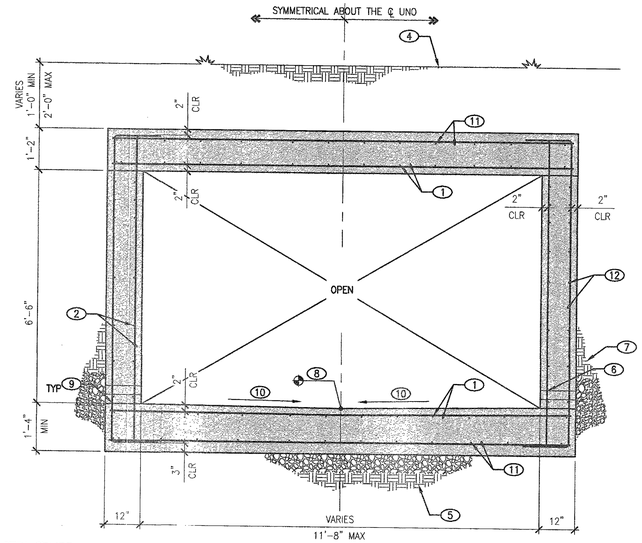
PLAN VIEW AT SD-2 JUNCTION STRUCTURE
SCALE: 1/2"=1'-0"

KEYNOTES:

1. END OF RCP TO TERMINATE FLUSH W/ INSIDE FACE OF WALL
2. PLACE (3) ADD. TRANS. BARS EACH SIDE OF OPENING.
3. PLACE (2) ADD. LONG. BARS ADJACENT TO OPENING. EXTEND 24" MIN PAST OPENING.
4. #4 DIAGONAL BAR EACH SIDE OF OPENING. BEND AS REQ'D.
5. 60"ø MANHOLE AND RISER PER 7/S0.2
6. (2) #5 BARS AT TOP OF SLAB OVER OPENING

NOTES:

A. EXACT STATION AND LOCATION PER CIVIL



1 S2.12 SECTION AT JUNCTION STRUCTURE
NO SCALE

KEYNOTES:

1. #8 AT 5" O.C. EACH WAY
2. #5 AT 16" O.C. VERT AND #4 AT 10" O.C. HORIZ W/ STANDARD HOOK ON VERT BARS, T&B
3. #4 AT 18" O.C., EACH WAY
4. FINAL GRADE PER CIVIL
5. CONCRETE BOX BEDDING PER GSN
6. WEEP HOLE, FILTER FABRIC, AND ROCK POCKET PER DETAIL 4/S0.2, EACH SIDE
7. BACKFILL MATERIAL AND PROCEDURE PER GSN
8. INVERT ELEVATION PER CIVIL
9. CONSTRUCTION JOINT AT CONTRACTOR OPTION. ROUGHENED INTERFACE 1/4" AMPLITUDE
10. 1% CROSS SLOPE AT INVERT, VERIFY WITH CIVIL
11. #4 BAR AT 18" O.C. EACH WAY
12. #4 AT 18" O.C. EACH WAY. PROVIDE STD HOOK AT EACH END. TYPICAL

NOTES:

A. MANHOLES AND RCP PENETRATIONS NOT SHOWN FOR CLARITY. REFER TO APPLICABLE DETAILS

731-98
L-60221

SEAL: PROFESSIONAL ENGINEER STATE OF NEVADA JAMES G. WEYER No. 12151 REGISTERED CIVIL STRUCTURAL Exp. 12/31/19 05/10/2018

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PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: SD-2 JUNCTION PLAN VIEW, SECTIONS AND ELEVATIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S2.12

PROJ#:124070 AGREE:#115666 QS:124-07-SW/NE,124-18-NW/NE

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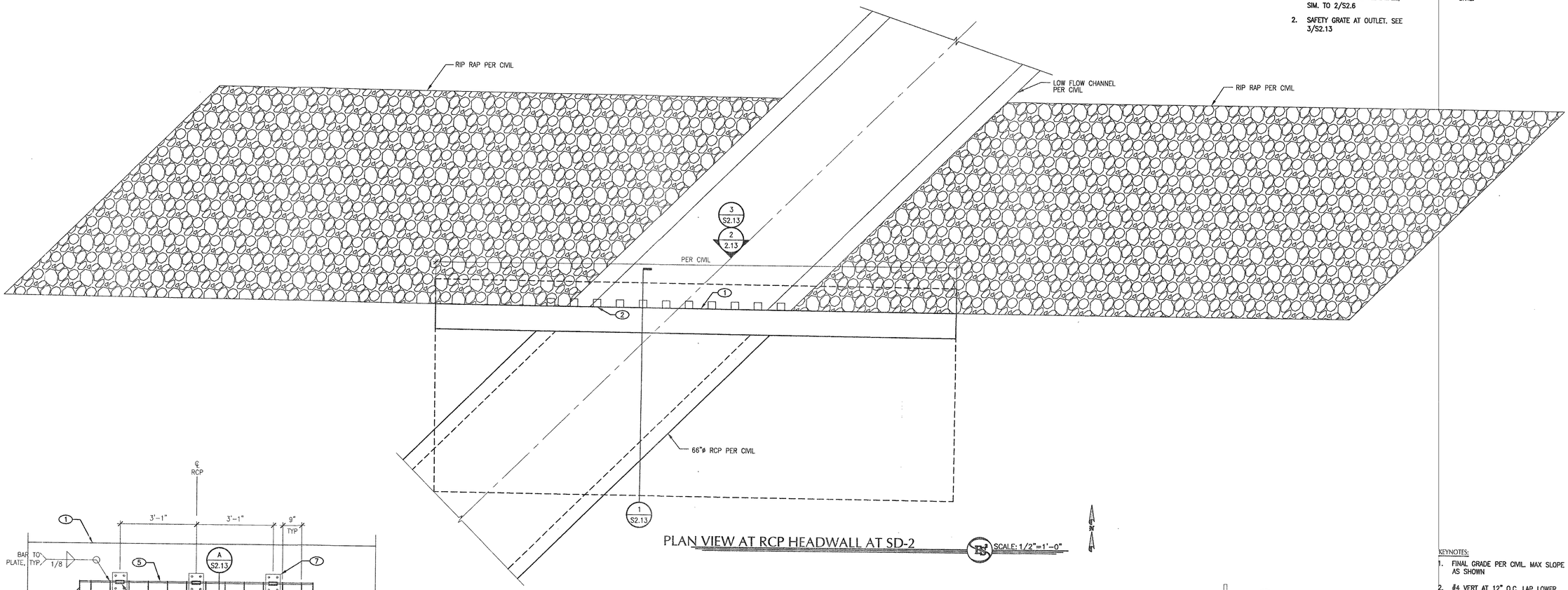
KEYNOTES:

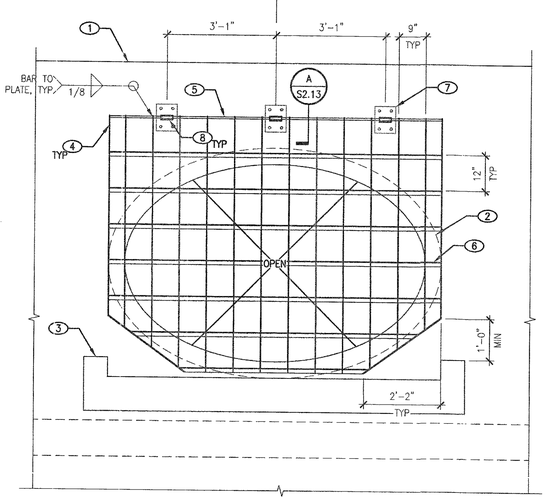
1. SLIP DOWEL CONNECTION AT LOW FLOW CHANNEL TO HEADWALL, SIM. TO 2/S2.6
2. SAFETY GRATE AT OUTLET. SEE 3/S2.13

NOTES:

A. EXACT STATION AND LOCATION PER CIVIL.

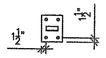


PLAN VIEW AT RCP HEADWALL AT SD-2 — SCALE: 1/2"=1'-0"



KEYNOTES:

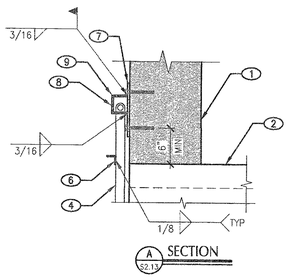
1. HEADWALL PER DETAIL 1/S2.13
2. SKEWED RCP PER PLAN
3. LOW FLOW CHANNEL PER CIVIL
4. 3/16x1 1/2" VERTICAL FLAT BAR AT SPACING SHOWN. PROVIDE HOLE AT TOP FOR ROUND BAR PER KEYNOTE 5. TOP OF BAR TO HAVE 3/4" RADIUS TO ALLOW BAR TO SWING
5. CONT 1"ø ROUND BAR
6. L1 1/2x1 1/2x3/16 HORIZ AT SPACING SHOWN
7. PL 3/8x7x0'-9" W/ (4) 1/2"ø SIMPSON TITEN HD ANCHORS (ICC ESR-2713). 4" EMBED



8. L2 1/2 x2 1/2 x1/4 x0'-4"
9. PL1/4x2 1/2x0'-4" COVER. INSTALL AFTER SAFETY GRATING HAS BEEN PLACED IN BRACKET ANGLES

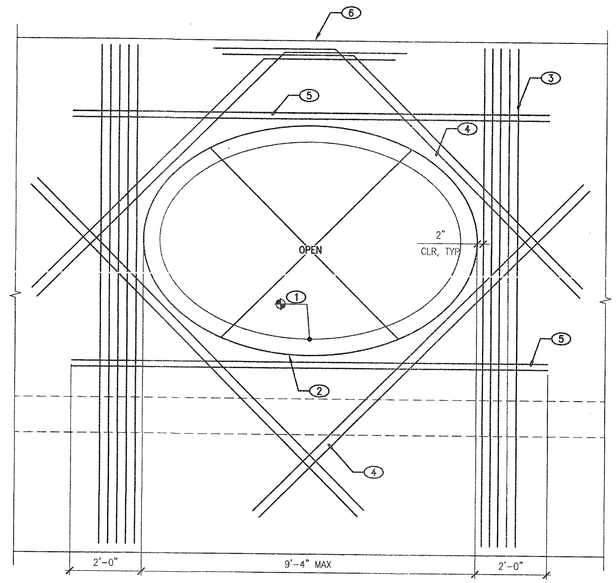
NOTES:

A. WALL REINF NOT SHOWN FOR CLARITY
B. ALL EXPOSED STEEL TO BE HOT-DIPPED GALVANIZED. ANY GALVANIZING DAMAGE DURING CONSTRUCTION SHALL BE PAINTED W/ (2) COATS OF ALUMINUM PAINT (GALVANOX OR APPROVED EQUAL)
C. POST-INSTALLED ANCHORS INSTALLATION PER MFR RECOMMENDATIONS AND SPECIFICATIONS. SPECIAL INSPECTION REQ'D.
D. BOTTOM OF GRATING TO BE 1" CLR FROM TOP OF LOW FLOW CHANNEL INVERT.



A S2.13 SECTION

3 S2.13 ELEVATION AT SAFETY GRATE — NO SCALE



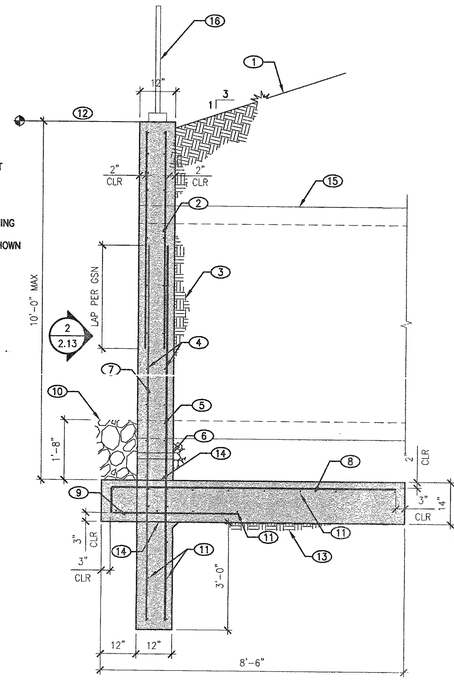
2 S2.13 ELEVATION AT SKEWED 66"Ø RCP PENETRATION — NO SCALE

KEYNOTES:

1. RCP INVERT PER CIVIL
2. SKEWED RCP PER PLAN
3. (5) ADDITIONAL VERT BARS AT EA SIDE OF OPENING AT EACH FACE. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. (2) #5x13'-0" DIAGONAL BARS AT EACH FACE PLACED AS SHOWN, BEND AS REQUIRED
5. PLACE (2) ADDITIONAL #5 HORIZ BARS AT EACH FACE ABOVE OPENING AS SHOWN. EXTEND BARS 2'-0" BEYOND EDGE OF OPENING AS SHOWN
6. TOP OF HEADWALL PER CIVIL

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY
B. LOWFLOW CHANNEL NOT SHOWN FOR CLARITY
C. SAFETY GRATE NOT SHOWN FOR CLARITY. SEE 3/S2.13



1 S2.13 WING WALL SECTION — NO SCALE

KEYNOTES:

1. FINAL GRADE PER CIVIL. MAX SLOPE AS SHOWN
2. #4 VERT AT 12" O.C. LAP LOWER BAR AS SHOWN
3. BACKFILL MATERIAL AND PROCEDURES PER GSN. PROVIDE 12" MIN FREE DRAIN GRANULAR BACKFILL FULL HEIGHT OF WALL
4. #4 HORIZ. AT 16" O.C. AT EACH FACE. LAP 18" MIN.
5. #6x113" VERT AT 8" O.C. AT SOIL FACE OF WALL
6. WEEP HOLE, ROCK POCKET, AND FILTER FABRIC PER TYP DETAIL 4/S0.2. PLACE AT 12'-0" O.C. MAX
7. #4 VERT AT 18" O.C. AT NON-SOIL FACE. EXTEND TO BOTTOM OF KEY AS SHOWN
8. #6 TRANS AT 8" O.C.
9. #4x36" TRANS AT 18" O.C.
10. TOP OF 20" THICK RIP RAP PER CIVIL
11. #4 CONT AT 12" O.C. LAP 18" MIN
12. TOP OF WALL ELEVATION PER CIVIL
13. PROPERLY PREPARED SUBGRADE PER GEOTECHNICAL REPORT
14. CONSTRUCTION JOINT AT CONTRACTORS OPTION. ROUGHEN INTERFACE 1/4" AMPLITUDE
15. 66"ø RCP. SEE 2/S2.13 FOR OPENING
16. FALL PROTECTION FENCING PER TYPICAL DETAILS SHEET S0.3

NOTES:

A. AT CONTRACTORS OPTION VERT REINF PER KEYNOTES 5 AND 7 MAY BE EXTENDED FULL WALL HEIGHT AND VERT REINF PER KEYNOTES 2 & 13 MAY BE ELIMINATED
B. ALL EXTERIOR EDGES OF CONCRETE TO BE CHAMFERED
C. ADJACENT LOW FLOW CHANNEL PER CIVIL NOT SHOWN FOR CLARITY. CONNECT HEADWALL TO LOW FLOW CHANNEL SIM TO 2/S2.6
D. SAFETY GRATE NOT SHOWN FOR CLARITY. SEE 3/S2.13

731-98
L-60224

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DATE	DESCRIPTION	REV.
11/11/2013	CCRFCD COMMENTS	
05/10/2018	MYLAR SET	

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: **S2.13**

PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: **HEADWALL PLAN VIEW, SECTION AND ELEVATION**

PROJ#:124070 AGREE:#115666 QS:124-07-SWINE,124-18-NWINE

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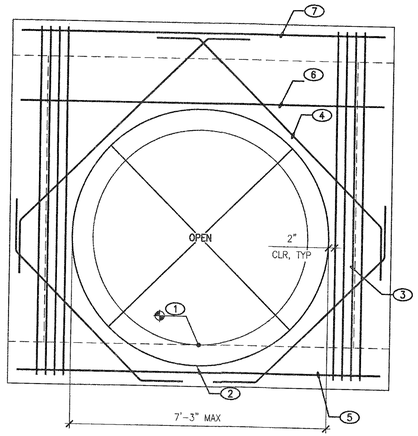


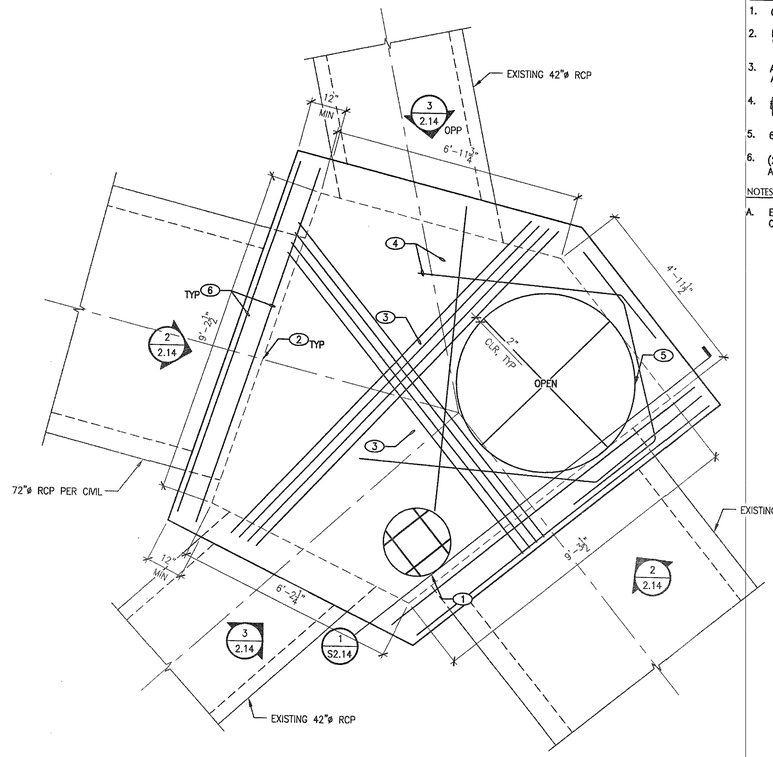
2 S2.14 ELEVATION AT 72"Ø RCP PENETRATION
NO SCALE

KEYNOTES:

1. RCP INVERT PER CIVIL
2. RCP PER PLAN
3. (4) #5 VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x11'-0" DIAGONAL BARS PLACED AS SHOWN, BEND AS REQUIRED
5. PLACE (2) ADDITIONAL #5 HORIZ BAR ABOVE AND BELOW OPENING AS SHOWN EF. TERMINATE W/ STD HOOK EACH END
6. (2) #6 HORIZ BARS SIDE BY SIDE ABOVE OPENING
7. ADDITIONAL BARS AT TOP OF LID OVER OPENING PER PLAN

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY



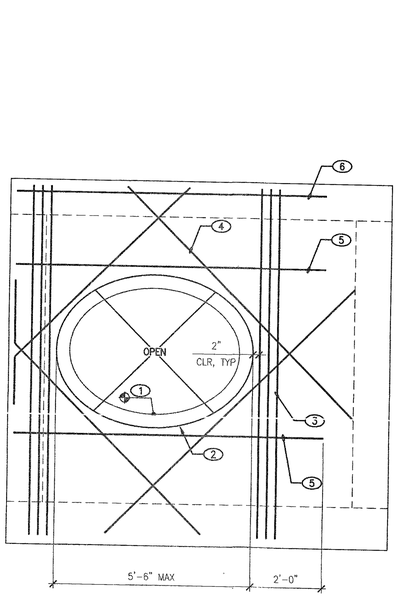
PLAN VIEW AT MANHOLE STRUCTURE AT SD-2 STA 57+99.30
SCALE: 1/2"=1'-0"

KEYNOTES:

1. ORIENTATION OF MAIN REINF. BARS
2. END OF RCP TO TERMINATE FLUSH W/ INSIDE FACE OF WALL
3. ADD (4) ADD. BARS AT OPENING AS SHOWN.
4. #4x8'-0" DIAGONAL BARS ADJACENT TO OPENING. BEND AS REQ'D
5. 60"ø MANHOLE AND RISER PER 7/S0.2
6. (2) #6 BARS AT TOP OF LID SLAB ABOVE OPENING

NOTES:

A. EXACT STATION AND LOCATION PER CIVIL.



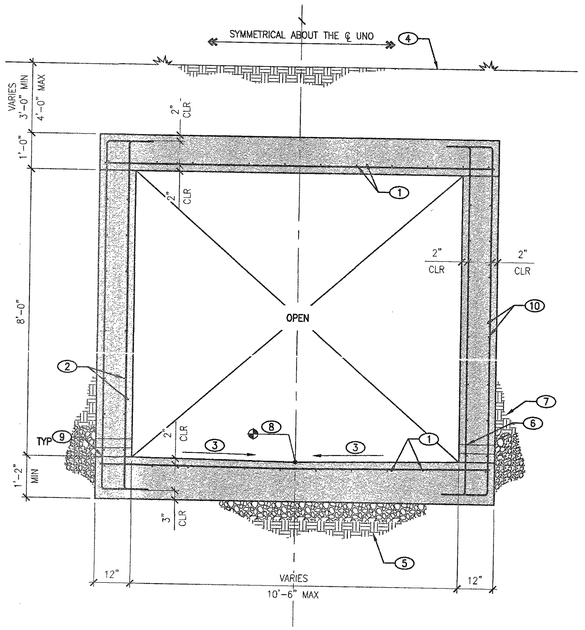
3 S2.14 ELEVATION AT SKEWED 42"Ø RCP PENETRATION
NO SCALE

KEYNOTES:

1. RCP INVERT PER CIVIL
2. SKEWED RCP PER PLAN
3. (3) #5 VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x7'-0" DIAGONAL BARS PLACED AS SHOWN EF, BEND AS REQUIRED
5. PLACE ADDITIONAL #5 HORIZ BAR ABOVE AND BELOW OPENING AS SHOWN EF. EXTEND BARS 2'-0" BEYOND EDGE OF OPENING AS SHOWN OR TO END OF WALL, TERMINATE W/ HOOK AT WALL
6. ADDITIONAL BARS AT TOP OF LID OVER OPENING PER PLAN

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY



1 S2.14 SECTION AT MANHOLE STRUCTURE
NO SCALE

KEYNOTES:

1. #6 AT 6" O.C. EACH WAY. ORIENT BARS AS SHOWN ON PLAN VIEW
2. #5 AT 10" O.C. VERT AND #4 AT 12" O.C. HORIZ W/ STANDARD HOOK ON VERT BARS, T&B
3. 1% CROSS SLOPE AT INVERT, VERIFY WITH CIVIL
4. FINAL GRADE PER CIVIL
5. CONCRETE BOX BEDDING PER GSN
6. WEEP HOLE, FILTER FABRIC, AND ROCK POCKET PER DETAIL 4/S0.2 EACH SIDE
7. BACKFILL MATERIAL AND PROCEDURE PER GSN
8. INVERT ELEVATION PER CIVIL
9. CONSTRUCTION JOINT AT CONTRACTOR OPTION. ROUGHENED INTERFACE 1/4" AMPLITUDE
10. #4 AT 18" O.C. EACH WAY. PROVIDE STD HOOK EACH END, TYP

NOTES:

A. MANHOLES AND RCP PENETRATIONS NOT SHOWN FOR CLARITY. REFER TO APPLICABLE DETAILS

731-98
L-60721

SEAL: STATE OF NEVADA — PROFESSIONAL ENGINEER — GREG A. MEITER — No. 9049 — CIVIL STRUCTURAL — REGISTERED PROFESSIONAL ENGINEER — 05/10/2018

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PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: SD-2 MANHOLE PLAN VIEW, SECTIONS AND ELEVATIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	5/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S2.14

PROJ.#:124070 AGREE.#115666 QS:124-07-SW/NE,124-18-NW/NE

Drawing: \\es2eng.net\Home\Projects\Structural\2013\STR13.6000 Civil Structural\STR13.6007 Bids Highlands Grand Teton Drainage\ CAD\ S2.14.DGN - Last Saved: Thu Jun 29, 2017 - 4:58pm Last Plotted: Wed May 09, 2018 - 8:37am By: wRhow
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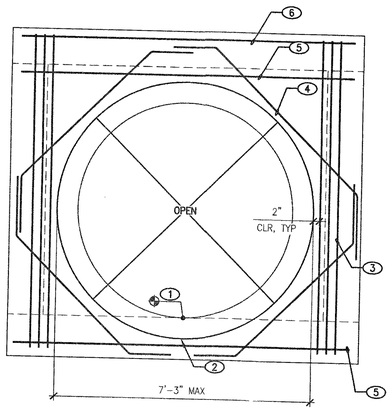


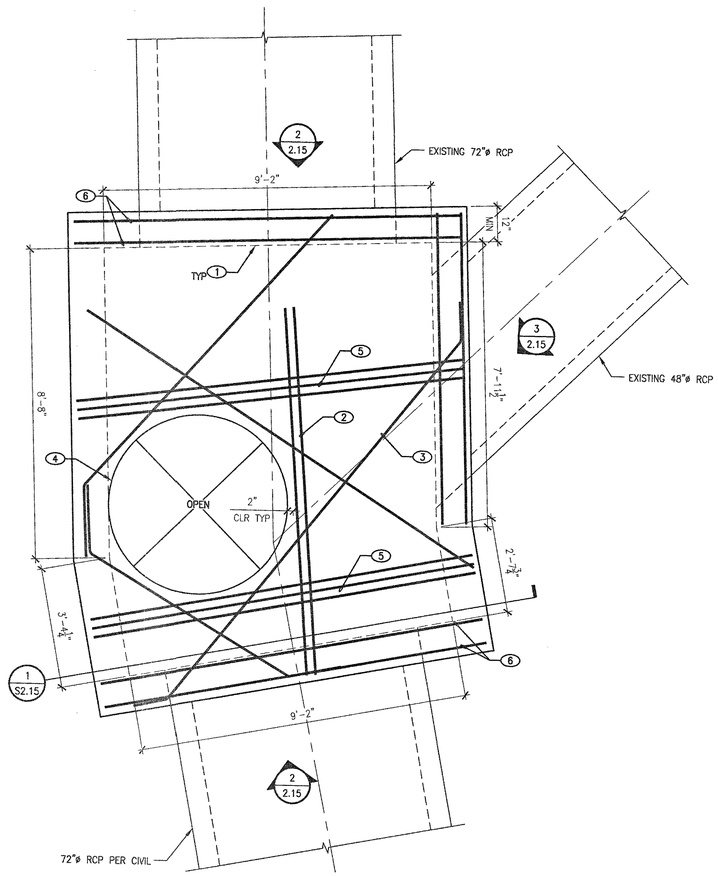
2 ELEVATION AT 72"Ø RCP PENETRATION
S2.15 NO SCALE

KEYNOTES:

1. RCP INVERT PER CIVIL
2. RCP PER PLAN
3. (3) #5 VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x9'-0" DIAGONAL BARS PLACED AS SHOWN EF, BEND AS REQUIRED
5. PLACE ADDITIONAL #5 HORIZ BAR ABOVE AND BELOW OPENING AS SHOWN EF. TERMINATE W/ STD HOOK EACH END
6. BAR AT TOP OF LID ABOVE OPENING PER PLAN

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY



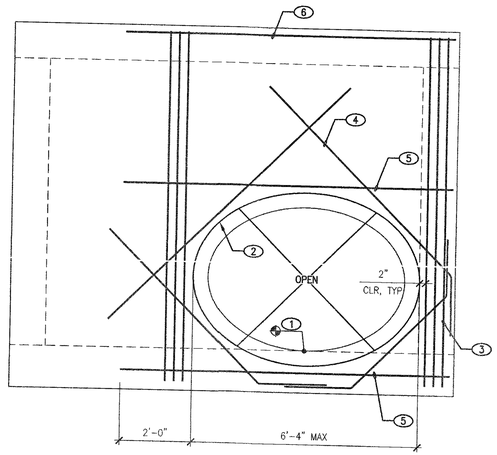
PLAN VIEW AT MANHOLE STRUCTURE AT SD-2 STA 64+13.44
S2.15 SCALE: 1/2"=1'-0"

KEYNOTES:

1. END OF RCP TO TERMINATE FLUSH W/ INSIDE FACE OF WALL
2. PLACE (2) ADDITIONAL BARS ADJACENT TO OPENING AS SHOWN
3. #4 DIAGONAL BAR EACH SIDE OF OPENING. BEND AS REQ'D.
4. 60"ø MANHOLE AND RISER PER 7/S0.2
5. PLACE (3) ADDITIONAL TRANS BARS EACH SIDE OF OPENING
6. (2) #5 BARS AT TOP OF SLAB OVER OPENING

NOTES:

A. EXACT STATION AND LOCATION PER CIVIL.



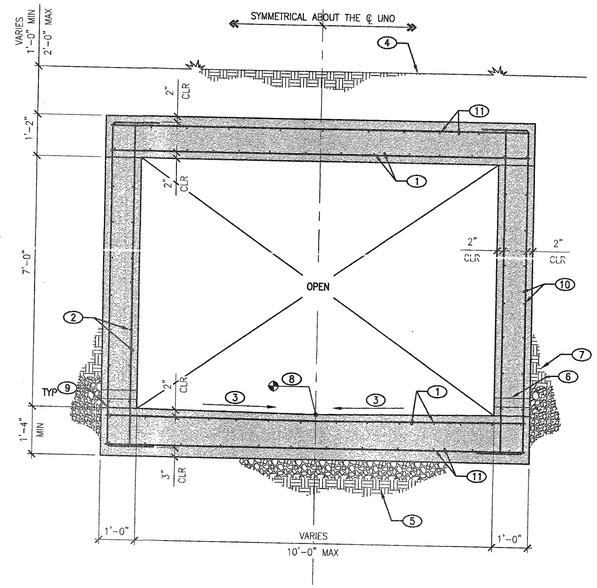
3 ELEVATION AT SKEWED 48"Ø RCP PENETRATION
S2.15 NO SCALE

KEYNOTES:

1. RCP INVERT PER CIVIL
2. SKEWED RCP PER PLAN
3. (3) #5 VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x9'-0" DIAGONAL BARS PLACED AS SHOWN EF, BEND AS REQUIRED
5. PLACE ADDITIONAL #5 HORIZ BAR ABOVE AND BELOW OPENING AS SHOWN EF. EXTEND BARS 2'-0" BEYOND EDGE OF OPENING AS SHOWN OR TO END OF WALL, TERMINATE W/ HOOK AT WALL
6. BAR AT TOP OF LID ABOVE OPENING PER PLAN

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY



1 SECTION AT MANHOLE STRUCTURE
S2.15 NO SCALE

KEYNOTES:

1. #8 AT 6" O.C. EACH WAY
2. #5 AT 18" O.C. VERT AND #4 AT 16" O.C. HORIZ AT INSIDE FACE W/ STANDARD HOOK ON VERT BARS, T&B
3. 1% CROSS SLOPE AT INVERT, VERIFY WITH CIVIL
4. FINAL GRADE PER CIVIL
5. CONCRETE BOX BEDDING PER GSN
6. WEEP HOLE, FILTER FABRIC, AND ROCK POCKET PER DETAIL 4/S0.2 EACH SIDE
7. BACKFILL MATERIAL AND PROCEDURE PER GSN
8. INVERT ELEVATION PER CIVIL
9. CONSTRUCTION JOINT AT CONTRACTOR OPTION. ROUGHENED INTERFACE 1/4" AMPLITUDE
10. #4 AT 18" O.C. EACH WAY AT OUTSIDE FACE, ALL BARS TO TERMINATE W/ STD HOOK EACH END
11. #4 AT 18" O.C., EACH WAY

NOTES:

A. MANHOLES AND RCP PENETRATIONS NOT SHOWN FOR CLARITY. REFER TO APPLICABLE DETAILS
B. END WALL CONSTRUCTION SHALL MATCH

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L-60221

SEAL: STATE OF NEVADA — REGISTERED PROFESSIONAL ENGINEER — GREGORY T. MEYER — No. 12070 — STRUCTURAL — 05/10/2018

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PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: SD-2 MANHOLE PLAN VIEW, SECTIONS AND ELEVATIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S2.15

PRO.#:124070 AGREE.#115666 QS:124-07-SWINE,124-16-NWINE

Drawings \\es2eng.net\team\Projects\Structural\2013\STR13.6000 Civil Structures\STR13.6007_Park Highlands Grand Teton Drainage*.dwg, #S4T1.S2.1, STR13.6007.dwg Last Saved By: gtc Apr 26, 2018 - 9:48am Last Plotted: Wed May 09, 2018 - 9:48am By: gtc
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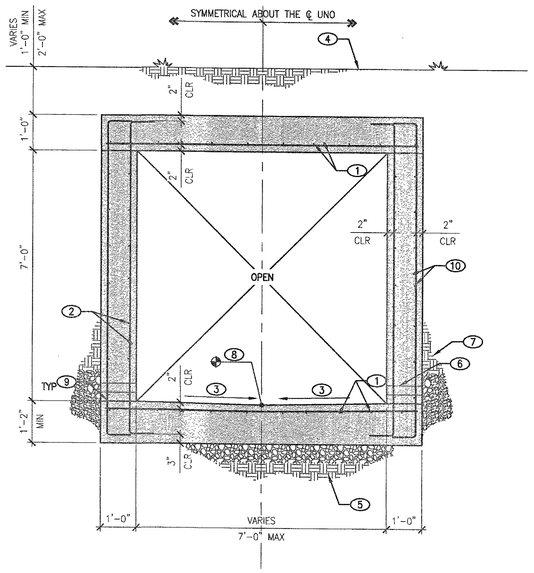


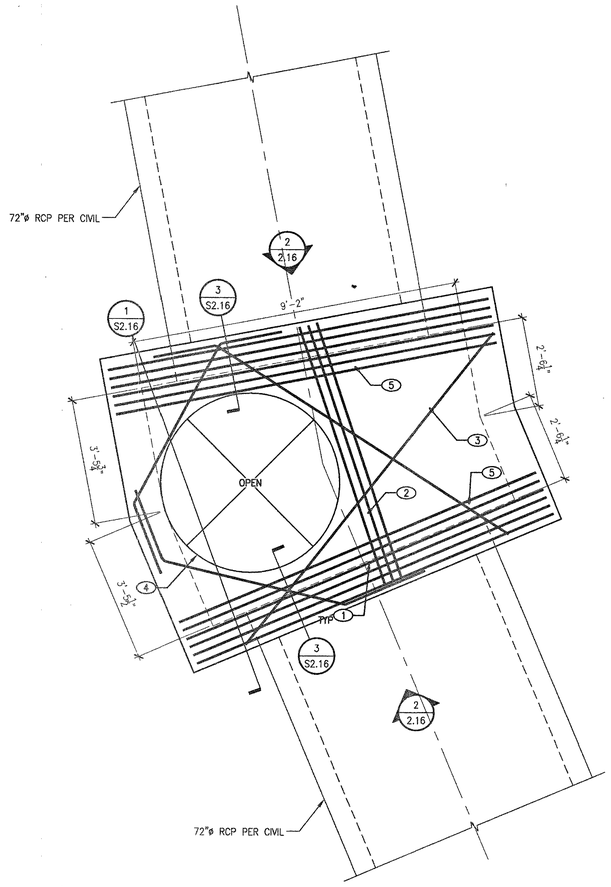
1 S2.16 SECTION AT MANHOLE STRUCTURE
NO SCALE

KEYNOTES:

1. #6 AT 6" O.C. EACH WAY
2. #5 AT 16" O.C. VERT AND #4 AT 12" O.C. HORIZ W/ STANDARD HOOK ON VERT BARS, T&B
3. 1% CROSS SLOPE AT INVERT, VERIFY WITH CIVIL
4. FINAL GRADE PER CIVIL
5. CONCRETE BOX BEDDING PER GSN
6. WEEP HOLE, FILTER FABRIC, AND ROCK POCKET PER DETAIL 4/S0.2 EACH SIDE
7. BACKFILL MATERIAL AND PROCEDURE PER GSN
8. INVERT ELEVATION PER CIVIL
9. CONSTRUCTION JOINT AT CONTRACTOR OPTION. ROUGHENED INTERFACE 1/4" AMPLITUDE
10. #4 AT 18" O.C. EACH WAY AT OUTSIDE FACE, ALL BARS TO TERMINATE W/ STD HOOK EACH END

NOTES:

A. MANHOLES AND RCP PENETRATIONS NOT SHOWN FOR CLARITY. REFER TO APPLICABLE DETAILS
B. ADDITIONAL REINF. AT IN-SLAB BEAM NOT SHOWN FOR CLARITY REFER TO 3/S2.16



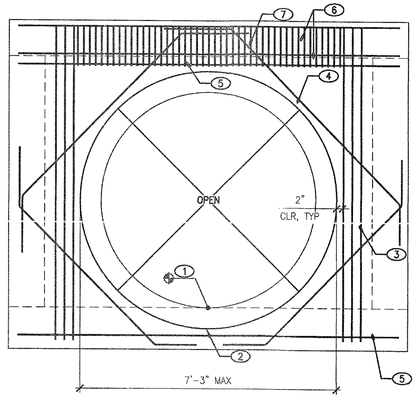
PLAN VIEW AT MANHOLE STRUCTURE AT SD-2 STA 65+47.97
SCALE: 1/2"=1'-0"

KEYNOTES:

1. END OF RCP TO TERMINATE FLUSH W/ INSIDE FACE OF WALL
2. PLACE (3) ADD. BARS ADJACENT TO OPENING AS SHOWN
3. #4 DIAGONAL BAR EACH SIDE OF OPENING. BEND AS REQ'D.
4. 60"ø MANHOLE AND RISER PER 7/S0.2
5. IN SLAB BEAM REINF PER 3/S2.16

NOTES:

A. EXACT STATION AND LOCATION PER CIVIL.



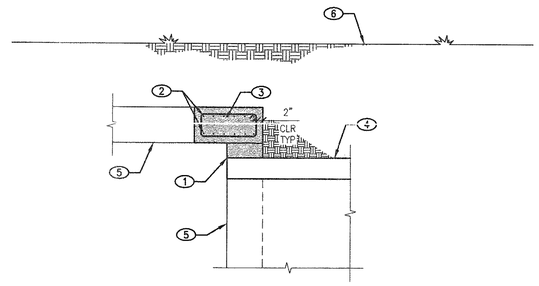
2 S2.16 ELEVATION AT 72"Ø RCP PENETRATION
NO SCALE

KEYNOTES:

1. RCP INVERT PER CIVIL
2. RCP PER PLAN
3. (3) #5 VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x9'-0" DIAGONAL BARS PLACED AS SHOWN EF, BEND AS REQUIRED
5. PLACE ADDITIONAL #5 HORIZ BAR ABOVE AND BELOW OPENING AS SHOWN EF. TERMINATE W/ STD
6. BARS ABOVE OPENING PER PLAN AND DETAIL 3/S2.16
7. STIRRUPS ABOVE OPENING PER 3/S2.16

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY



3 S2.16 SECTION AT IN-SLAB BEAM OVER RCP
NO SCALE

KEYNOTES:

1. MANHOLE STRUCTURE WALL PER 1/S2.16
2. (6) #6 BARS T&B
3. #4 CLOSED STIRRUP TIES AT 2" O.C. OVER RCP OPENING
4. RCP PER PLAN
5. STRUCTURE BEYOND PER PLAN
6. FINAL GRADE PER CIVIL

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY

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PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: SD-2 MANHOLE PLAN VIEW, SECTIONS AND ELEVATIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S2.16

PROJ.#:124070 AGREE.#115666 QS:124-07-SW/NE,124-18-NW/NE

Drawing: L:\es2engineering\Projects\Structural\2013\STR13.6007 Grand Teton Regional Flood Control Facility\CAD\Structural\STR13.6007.dwg Last Saved: Thu Jun 26, 2014 - 4:08pm Last Plotted: Wed Nov 09, 2016 - 8:58am By: eshaw
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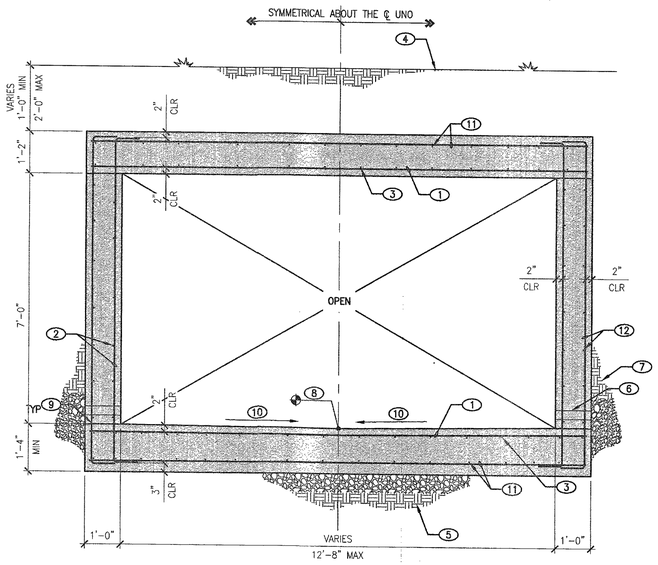


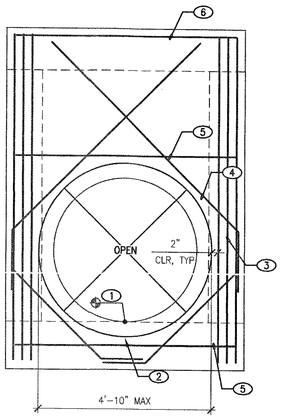
1 S2.17 SECTION AT TRANSITION STRUCTURE
NO SCALE

KEYNOTES:

1. #8 AT 4" O.C. TRANSVERSE
2. #5 AT 18" O.C. VERT AND #4 AT 16" O.C. HORIZ W/ STANDARD HOOK ON VERT BARS, T&B
3. #6 AT 4" O.C. LONGITUDINAL,
4. FINAL GRADE PER CIVIL
5. CONCRETE BOX BEDDING PER GSN
6. WEEP HOLE, FILTER FABRIC, AND ROCK POCKET PER DETAIL 4/S0.2
7. BACKFILL MATERIAL AND PROCEDURE PER GSN
8. INVERT ELEVATION PER CIVIL
9. CONSTRUCTION JOINT AT CONTRACTOR OPTION. ROUGHENED INTERFACE 1/4" AMPLITUDE
10. 1% CROSS SLOPE AT INVERT, VERIFY WITH CIVIL
11. #4 AT 18" O.C., EACH WAY
12. #4 AT 18" O.C. EACH WAY W/ STD HOOK EACH END

NOTES:

A. MANHOLES AND RCP PENETRATIONS NOT SHOWN FOR CLARITY. REFER TO APPLICABLE DETAILS



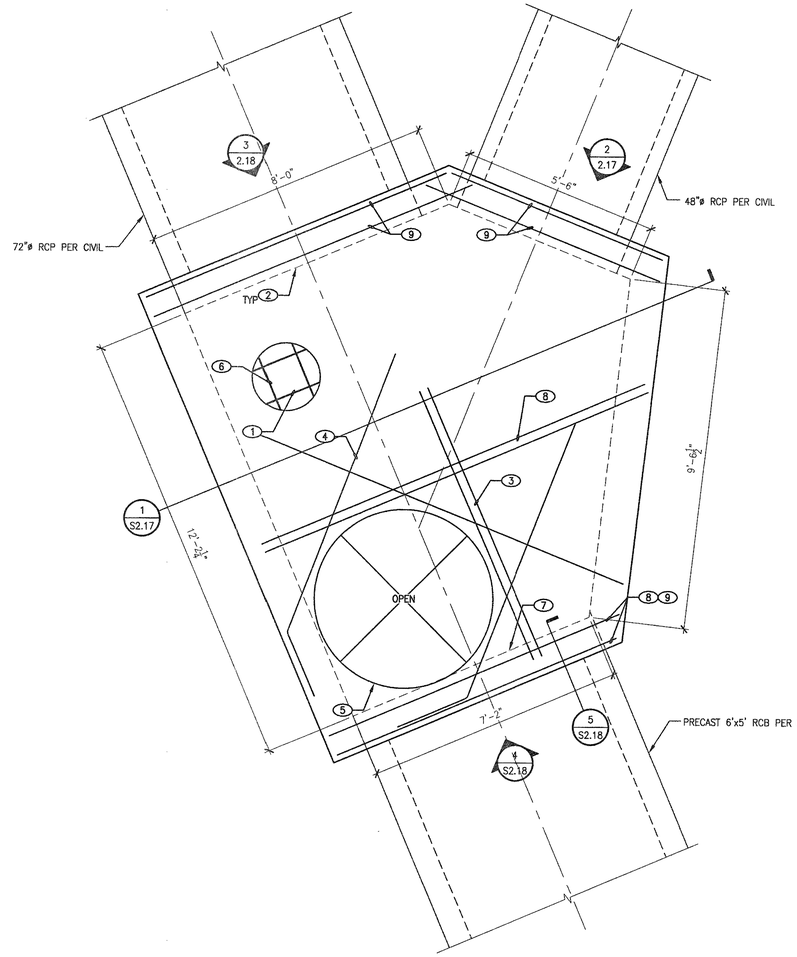
2 S2.17 ELEVATION AT 48"Ø RCP PENETRATION
NO SCALE

KEYNOTES:

1. RCP INVERT PER CIVIL
2. RCP PER PLAN
3. (3) #5 VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x9'-0" DIAGONAL BARS PLACED AS SHOWN EF, BEND AS REQUIRED
5. PLACE ADDITIONAL #5 HORIZ BAR ABOVE AND BELOW OPENING AS SHOWN EF. TERMINATE W/ HOOK AT END WALL
6. ADDITIONAL BAR AT TOP OF LID ABOVE OPENING PER PLAN

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY



PLAN VIEW AT TRANSITION STRUCTURE AT SD-2 STA 68+29.80
SCALE: 1/2"=1'-0"

KEYNOTES:

1. ORIENTATION OF TRANSVERSE BARS
2. END OF RCP TO TERMINATE FLUSH W/ INSIDE FACE OF WALL
3. PLACE (2) ADDITIONAL BARS ADJACENT TO OPENING AS SHOWN
4. #6 DIAGONAL BAR EACH SIDE OF OPENING. BEND AS REQ'D.
5. 60"ø MANHOLE AND RISER PER 7/S0.2
6. ORIENTATION OF LONGITUDINAL BARS
7. END OF RCB TO TERMINATE FLUSH W/ INSIDE FACE OF WALL
8. (2) ADDITIONAL TRANSVERSE BARS ADJACENT TO OPENING.
9. (2) #5 BARS ABOVE OPENING AT TOP OF SLAB

NOTES:

A. EXACT STATION AND LOCATION PER CIVIL.

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PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: SD-2 TRANSITION PLAN VIEW, SECTIONS AND ELEVATIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S2.17

731-98
L-60221

PROJ.#:124070 AGREE#:115666 QS:124-07-SW/NE,124-18-NW/NE

Drawing: \\es2eng.net\Users\Projects\Structural\2013\STR13.6007 Civil Structures\STR13.6007_Para Highlands Grand Teton Drainage ACAD_R19\S17-STR13.6007.dwg Last Saved By: Thu Jan 25, 2017 - 4:13pm Last Plotted: Wed May 09, 2018 - 9:58am By: eMew
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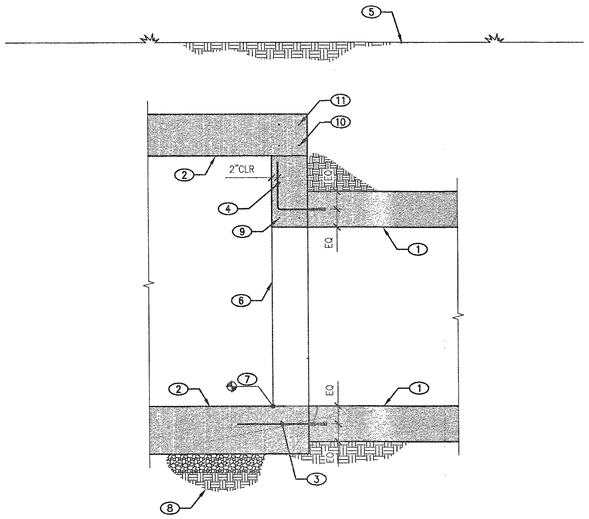
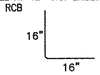


KEYNOTES:

1. PRECAST 6'x5' RCB PER CIVIL
2. TRANSITION STRUCTURE PER PLAN
3. DRILL AND EPOXY #4x30" DOWEL AT 12" O.C. EMBED 6" INTO RCB
4. DRILL AND EPOXY #4 HOOKED DOWEL AT 12" O.C. EMBED 6" INTO RCB

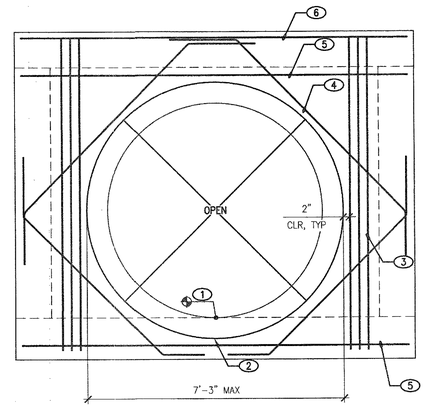


5. FINAL GRADE PER CIVIL
6. TRANSITION STRUCTURE WALL BEYOND
7. INVERT ELEVATION PER CIVIL
8. PROPERLY PREPARED SUBGRADE PER GEOTECHNICAL REPORT
9. BARS ABOVE OPENING PER 4/S2.18
10. ADDITIONAL TRANS BARS ADJACENT TO MH OPENING PER PLAN
11. ADDITIONAL BARS AT TOP OF SLAB PER PLAN

NOTES:

A. TYPICAL REINF AT TRANSITION STRUCTURE NOT SHOWN FOR CLARITY, SEE 1/S2.17
B. EPOXY INSTALLATION PER MFR RECOMMENDATIONS AND SPECIFICATIONS, SPECIAL INSPECTION REQ'D
C. EPOXY DOWELS PER KEYNOTE 4 SHALL BE USED AT WALL CONNECTION
D. MANHOLE OPENING NOT SHOWN FOR CLARITY

5 S2.18 SECTON AT PRECAST RCB CONNECTION
NO SCALE



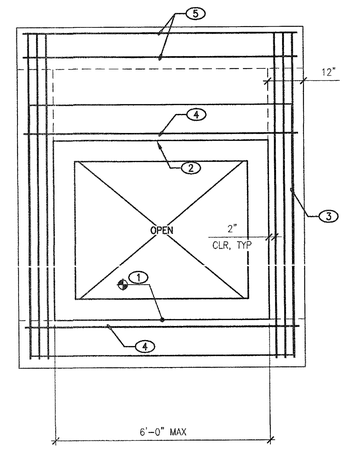
KEYNOTES:

1. RCP INVERT PER CIVIL
2. RCP PER PLAN
3. (3) #5 VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. #5x9'-0" DIAGONAL BARS PLACED AS SHOWN EF, BEND AS REQUIRED
5. PLACE ADDITIONAL #5 HORIZ BAR ABOVE AND BELOW OPENING AS SHOWN EF. TERMINATE W/ STD HOOK EACH END
6. ADDITIONAL BARS AT TOP OF SLAB ABOVE OPENING PER PLAN

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY

3 S2.18 ELEVATION AT 72"Ø RCP PENETRATION
NO SCALE



KEYNOTES:

1. RCB INVERT PER CIVIL
2. RCB PER PLAN
3. (3) #5 VERT BARS AT EA SIDE OF OPENING EF. EXTEND FULL-HT OF WALL AND TERMINATE W/ STD HOOK T&B
4. PLACE ADDITIONAL #5 HORIZ BAR ABOVE AND BELOW OPENING AS SHOWN EF. TERMINATE W/ STD HOOK EACH END
5. ADDITIONAL BAR AT TOP OF SLAB PER PLAN

NOTES:

A. TYPICAL REINF NOT SHOWN FOR CLARITY

4 S2.18 ELEVATION AT PRECAST 6'x5' RCB PENETRATION
NO SCALE

731-98
L-6022

SEAL: PROFESSIONAL ENGINEER STATE OF NEVADA GREGG T. MEYER Exp. 12/31/19 No. 15069 05/10/2018

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PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: SD-2 SECTIONS AND ELEVATIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S2.18

PROJ#:124070 AGREE#:115666 OS:124-07-SWINE,124-18-NWINE

Drawing: L:\acdwg.net\Users\Projects\Structural\2013\STR13.6007_Grand Teton Drainage\ACAD_REVIT\S2.18_STR13.6007.dwg Last Saved By: Jan 28, 2017 - 4:59pm Last Plotted: Wed May 09, 2018 - 8:38am By: eMcnv
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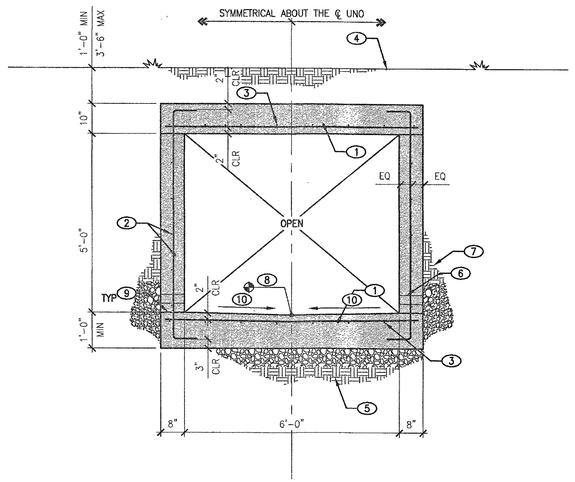
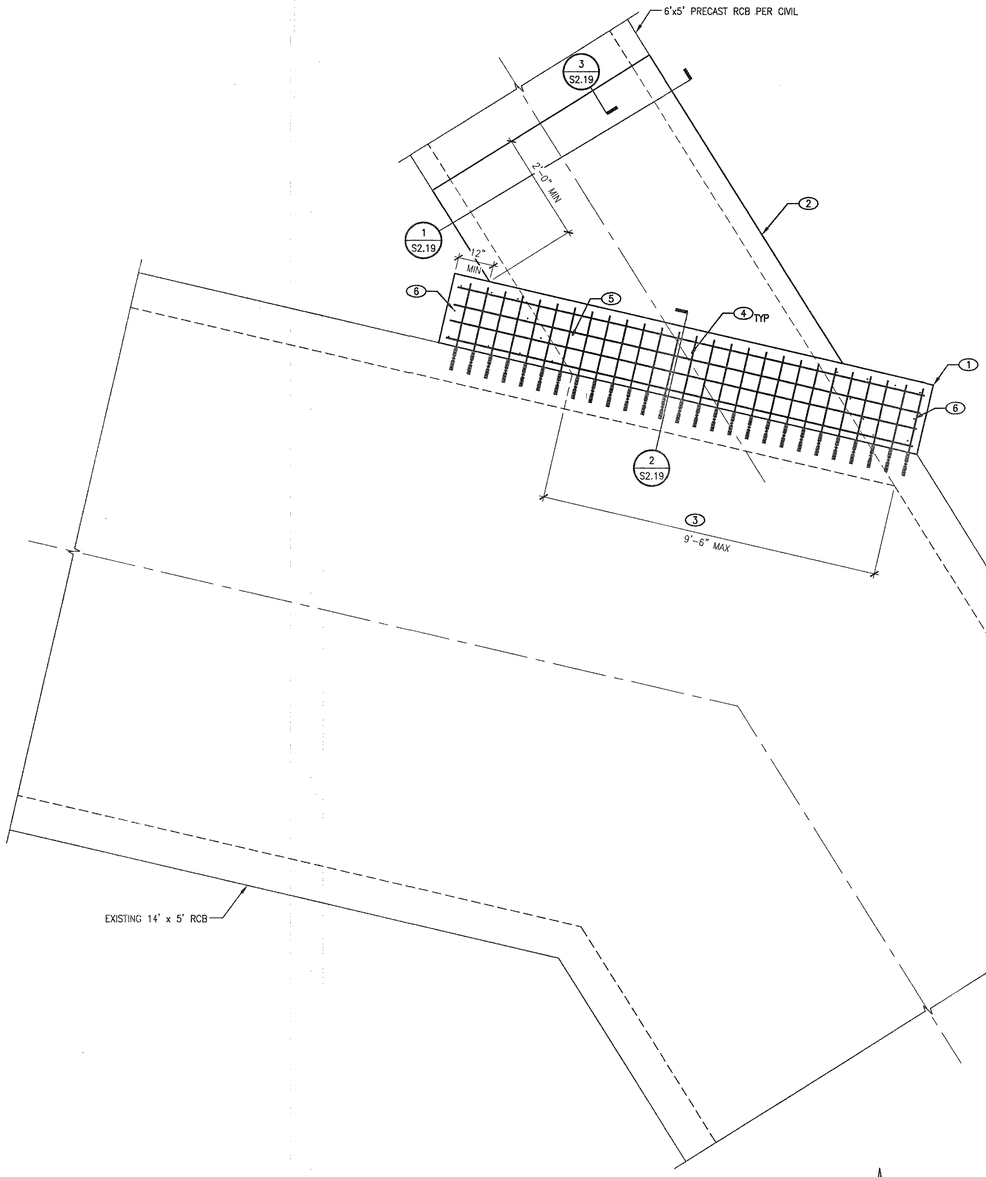


KEYNOTES:

1. #6 AT 4" O.C. TRANSVERSE
2. #5 AT 18" O.C. VERT AND #4 AT 12" O.C. HORIZ W/ STANDARD HOOK ON VERT BARS, T&B
3. #5 AT 6" O.C. LONGITUDINAL LAP LONGITUDINAL BAR PER GSN
4. FINAL GRADE
5. CONCRETE BOX BEDDING PER GSN
6. WEEP HOLE, FILTER FABRIC, AND ROCK POCKET PER DETAIL 4/S0.2,
7. BACKFILL MATERIAL AND PROCEDURE PER GSN
8. INVERT ELEVATION PER CIVIL
9. CONSTRUCTION JOINT AT CONTRACTOR OPTION. ROUGHENED INTERFACE 1/4" AMPLITUDE
10. 1% CROSS SLOPE AT INVERT, VERIFY WITH CIVIL

1 S2.19 SECTION AT 6'-0"x5'-0" RCB
NO SCALE



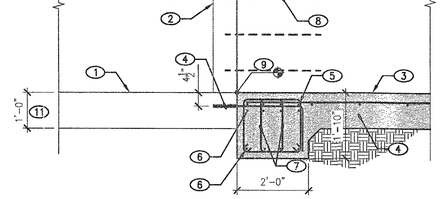
KEYNOTES:

1. COLLAR PATCH AND REINF PER DETAIL
2. 6'x5' RCB PER DETAILS
3. LIMITS OF SAWCUT OPENING. ALL REBAR EXPOSED DURING DEMOLITION TO BE COATED W/ EPOXY
4. EPOXY DOWELS PER SECTION
5. REINF AT COLLAR PER DETAIL
6. REINF AT END COLUMN PER 4/S2.19

NOTES:

A. EXACT STATION AND LOCATION PER CIVIL.

PLAN VIEW AT CONNECTION TO EXISTING 14'x5' RCB
SCALE: 1/2"=1'-0"



KEYNOTES:

1. (E) 14'x5' RCB PER PLAN
2. SAWCUT OPENING AT (E) RCB SIDEWALL, SEE ELEVATION
3. 6'x5' RCB AND REINF PER 1/S2.19
4. DRILL AND EPOXY #8 HOOKED DOWEL AT 5" O.C. AT (E) RCB. EMBED 8" MIN. USE SIMPSON SET-XP (ICC ESR-2508)

5. (4) #8 BARS, EVENLY SPACED
6. (4) #6 BARS, EVENLY SPACED.
7. #4 CLOSED STIRRUPS AT 9" O.C.

8. EPOXY DOWELS AT WALL PER DETAIL 4/S2.19
9. INVERT ELEVATION PER CIVIL
10. FINISHED GRADE PER CIVIL
11. CONTRACTOR TO VERIFY (E) RCB LID THICKNESS, NOTIFY ENGINEER IF FOUND TO VARY FROM THAT SHOWN

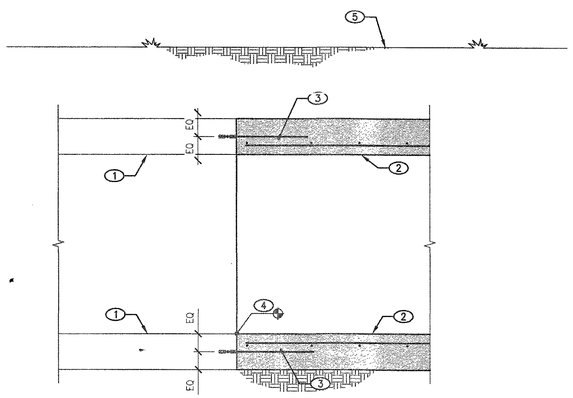
KEYNOTES (CONT.):

12. EPOXY DOWELS AT WALL PER DETAIL 4/S2.19

NOTES:

A. EPOXY INSTALLATION PER MFR RECOMMENDATIONS AND SPECIFICATIONS, SPECIAL INSPECTION REQ'D

2 S2.19 SECTION AT CONNECTION TO EXISTING 14'-0"x5'-0" RCB
NO SCALE



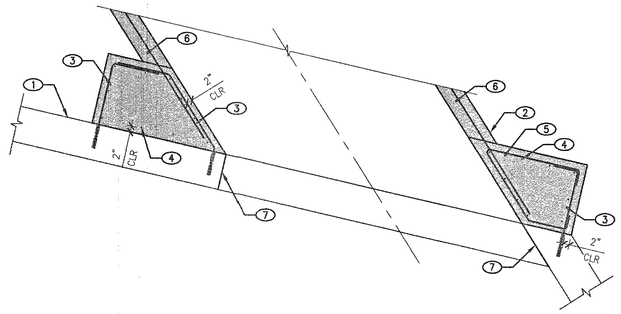
KEYNOTES:

1. 6'x5' RCB PER CIVIL
2. RCB AND REINF PER 1/S2.19
3. #4x30 DOWEL AT 12" O.C. DRILL AND EPOXY INTO PRECAST RCB, EMBED 6" MIN
4. INVERT ELEVATION PER CIVIL
5. FINISHED GRADE PER CIVIL

NOTES:

A. EPOXY INSTALLATION PER MFR RECOMMENDATIONS AND SPECIFICATIONS, SPECIAL INSPECTION REQ'D
B. EPOXY DOWELS PER KEYNOTE 3 TO BE INSTALLED IN WALLS ALSO

3 S2.19 SECTION AT CONNECTION TO PRECAST RCB
NO SCALE



NOTES:

A. EPOXY INSTALLATION PER MFR RECOMMENDATIONS AND SPECIFICATIONS, SPECIAL INSPECTION REQ'D
B. TYPICAL REINF NOT SHOWN FOR CLARITY, REFER TO APPLICABLE DETAILS

KEYNOTES:

1. WALL AT (E) 14'x5' RCB
2. WALL AT 6'x5' RCB PER 1/S2.19
3. DRILL AND EPOXY #4 BENT DOWELS AT 12" O.C. INTO WALL OF (E) 14'x5' RCB, EMBED 4" MIN
4. #6 VERT AT 12" O.C. MAX AROUND PERIMETER OF COLUMN, EXTEND 18" INTO BEAM T&B AND TERMINATE W/ STD HOOK
5. #4 TIE AT 12" O.C.
6. HORIZ BAR PER 1/S2.19. EXTEND INTO COLUMN AS SHOWN
7. FACE OF THE SAWCUT. ANY REBAR EXPOSED DURING DEMOLITION SHALL BE COATED W/ EPOXY

4 S2.19 SECTION AT WALL COLUMNS
NO SCALE

731-98
L-60221

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PROJECT:
GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE:
(E) RCB CONNECTION PLAN VIEW, SECTIONS AND ELEVATIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018

DRAWN: GTC
CHECKED: SG/GAM
DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S2.19

PROJ#:124070 AGREE#:115666 QS:124-07-SWINE,124-18-NWINE

Drawing: I:\es2eng.net\Projects\Structural\2013\STR13.6007_Five Highlands Grand Teton Drainage\ACAD_DETAILS\S2.19_STR13.6007.dwg Last Saved Thu Jan 26, 2017 – 4:58pm Last Plotted Wed May 09, 2018 – 8:40am By: e42mv
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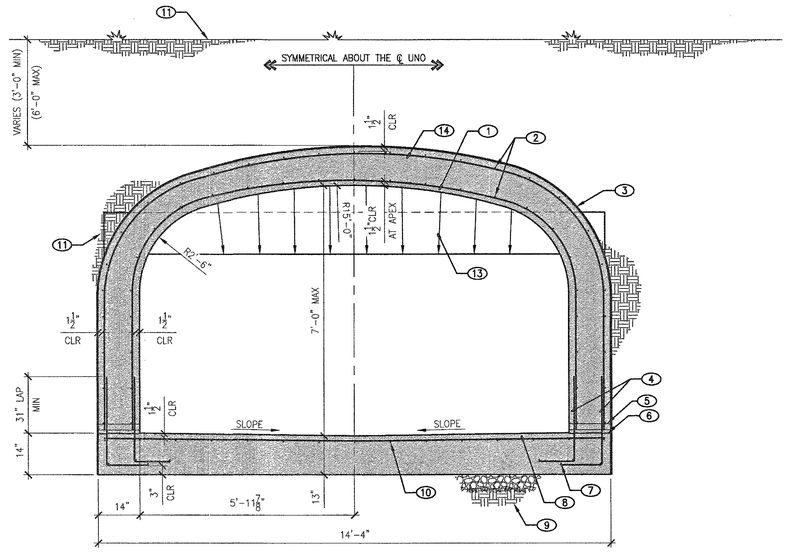
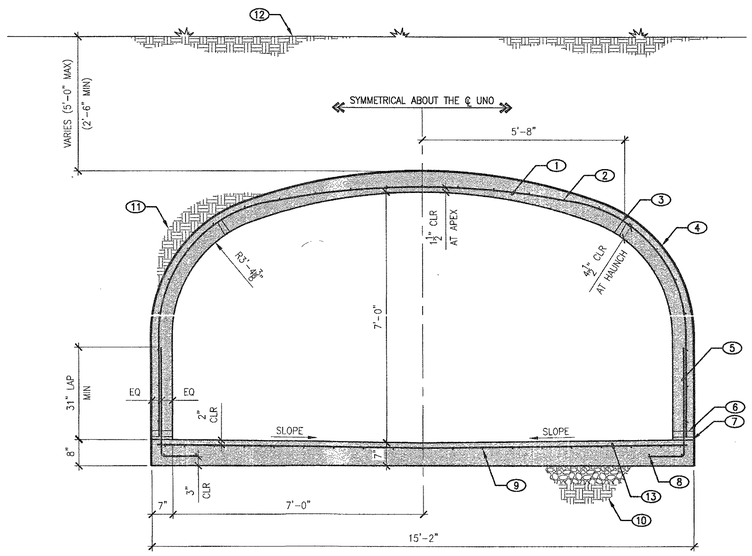
NOT USED



1 S3.1 ARCH TO RCB TRANSITION STRUCTURE SECTION
NO SCALE

KEYNOTES:

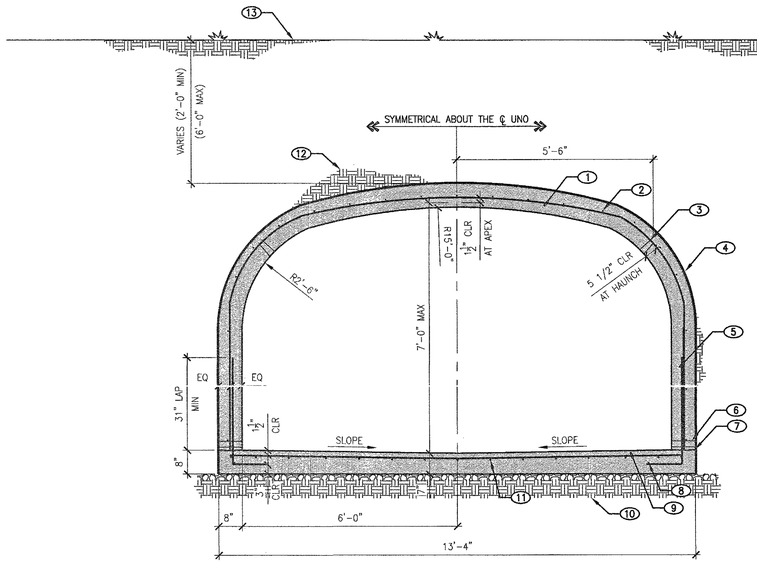
1. #5 AT 5" O.C. TRANSVERSE INSIDE
2. #4 AT 12" O.C. LONGITUDINAL LAP 18" MIN
3. WATER PROOF MEMBRANE COVER ARCH AND WALL ONLY
4. #5 DOWEL AT 10" O.C. W/ 12" HOOK AT BASE
5. WEEP HOLE PER PLAN
6. ROUGHEN CONSTRUCTION JOINT PER GSN
7. (2) #5 CONT LONGITUDINAL LAP 18" MIN
8. #5 AT 5" O.C. TRANSVERSE
9. BEDDING PER GSN
10. #5 AT 10" O.C. LONGITUDINAL CONT LAP 18" MIN
11. BACKFILL PER GSN
12. FINAL GRADE
13. WARP CONCRETE ARCH GEOMETRY THROUGH TRANSITION TO ALIGN W/ BOX GEOMETRY
14. #5 TRANSVERSE AT 10" O.C.



3 S3.1 SECTION AT FLOODWALL
NO SCALE OC3.08

KEYNOTES:

1. #4 AT 6" O.C. TRANSVERSE
2. #4 AT 16" O.C. LONGITUDINAL LAP 18" MIN
3. REBAR CHAIR POINT
4. WATER PROOF MEMBRANE COVER ARCH AND WALL ONLY
5. #4 DOWEL AT 12" O.C. W/ 12" HOOK AT BASE
6. 2"ø WEEP HOLE PER PLAN
7. ROUGHEN CONSTRUCTION JOINT PER GSN
8. (2) #5 CONT LONGITUDINAL LAP 18" MIN
9. #4 AT 12" O.C. LONGITUDINAL CONT LAP 18" MIN
10. BEDDING BELOW ARCH CULVERT SHALL CONSIST OF A 2" THICK LAYER OF CRUSHED ROCK UNDERLAIN BY A 6" LAYER OF TYPE II MATERIAL. BEDDING SHALL EXTEND 6" MIN BEYOND EDGE OF ARCH
11. BACKFILL PER GSN
12. FINAL GRADE
13. #4 AT 8" O.C. TRANSVERSE



2 S3.1 12'x7' STORM DRAIN SECTION
NO SCALE

KEYNOTES:

1. #4 AT 6" O.C. TRANSVERSE
2. #4 AT 12" O.C. LONGITUDINAL LAP 18" MIN
3. REBAR CHAIR POINT
4. WATER PROOF MEMBRANE COVER ARCH AND WALL ONLY
5. #4 DOWEL AT 12" O.C. W/ 12" HOOK AT BASE
6. WEEP HOLE PER PLAN
7. ROUGHEN CONSTRUCTION JOINT, PER GSN
8. (2) #5 CONT LONGITUDINAL LAP 18" MIN
9. #5 AT 6" O.C. TRANSVERSE
10. BEDDING BELOW ARCH CULVERT SHALL CONSIST OF A 2" THICK LAYER OF CRUSHED ROCK UNDERLAIN BY A 6" LAYER OF TYPE II MATERIAL. BEDDING SHALL EXTEND 6" MIN BEYOND EDGE OF ARCH
11. #5 AT 10" O.C. CONT LONGITUDINAL LAP 18" MIN
12. BACKFILL PER GSN
13. FINAL GRADE

4 S3.1 14'x7' STORM DRAIN SECTION
NO SCALE

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GREG T. CHRISTENSEN
No. 12170
CIVIL
05/10/2018

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PROJECT:
GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

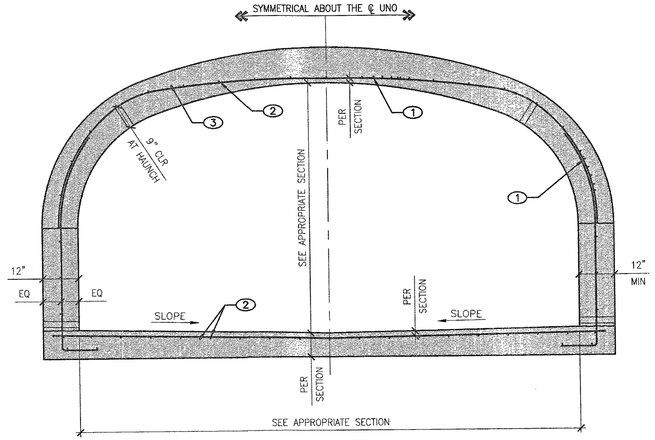
SHEET TITLE:
CULVERT SECTIONS

REV.	DESCRIPTION	DATE
	MYLAR SET	05/10/2018
	DESIGN REVISIONS	03/06/2015
	CCRFCD COMMENTS	05/19/14
	CCRFCD COMMENTS	11/11/13

DRAWN: GTC
CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S3.1

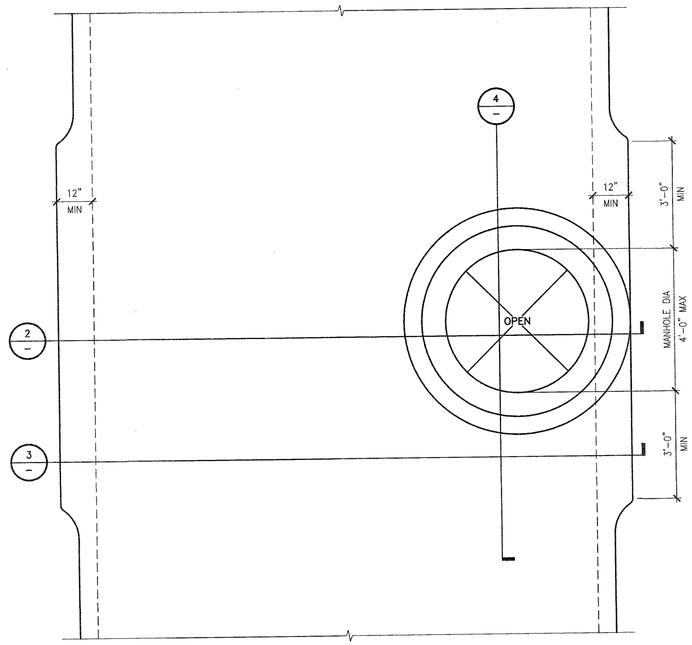
PROJ#:124070 AGREE#:115666 QS:124-07-SWINE,124-18-NWINE



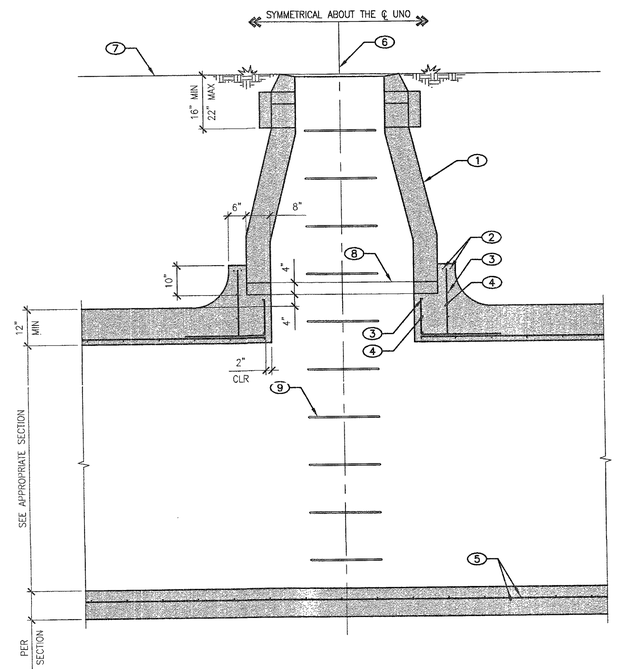
KEYNOTES:

1. (5) #5x10'-0" LONG AT 3" O.C. LONGITUDINAL EA SIDE OF OPENING
2. REINF PER CULVERT SECTION
3. TRANS REINF=TYP REINF PER SECTION PLUS INTERUPTED TRANS BARS AT MAN HOLE OPENING EQ SPACED OVER 3'-0" ON EA SIDE OF CULVERT

   EXAMPLE: #4 AT 6" O.C. TRANS TYP IN A 48" HOLE 8 BARS INTERUPTED TOTAL BARS OVER 3'-0" (8+36"/6)= (14) #4 AT 2 1/2" O.C. SPACING #4 AT 2 1/2" OVER 3'-0"



1 S3.2 TYPICAL PLAN AT MANHOLE
NO SCALE



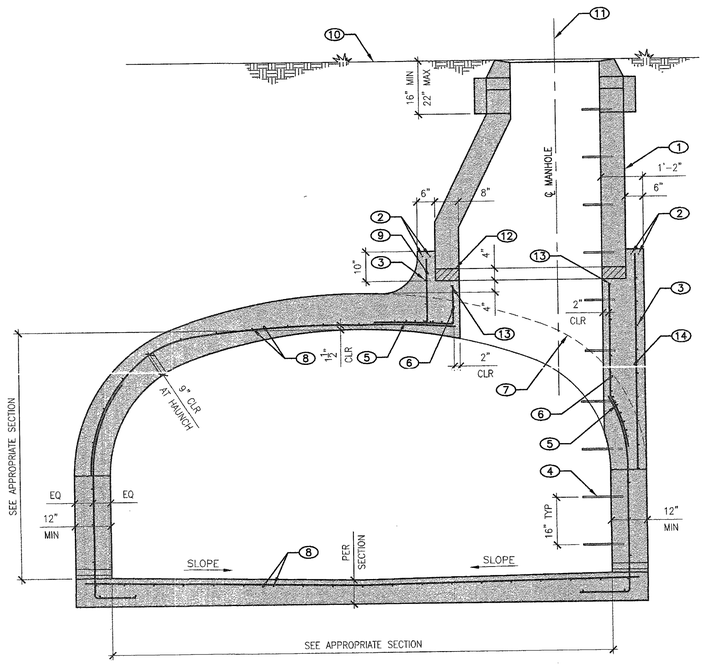
3 S3.2 TYPICAL SECTION AT THICKENED ARCH AT MANHOLE
NO SCALE

KEYNOTES:

1. TYPE I OR IA MANHOLE ASSEMBLY PER CLARK COUNTY UNIFORM STANDARD DRAWING NO. 403 OR 404 USE OF TYPE I OR IA SHALL BE DETERMINED BASED ON THE FINAL COVER REQUIRED
2. (2) #4 CONT AT TOP OF WALL
3. #4 AT 8" O.C. HORIZONTAL
4. #4 AT 8" O.C. VARIES 18" VARIES
5. REINF PER CULVERT SECTION
6. REFERENCE CIVIL DRAWINGS FOR MANHOLE STATIONING
7. FINISHED GRADE
8. STYROFOAM FILL BETWEEN CULVERT AND MANHOLE ASSEMBLY
9. MANHOLE STEPS PER CLARK COUNTY UNIFORM STANDARD DRAWING NO. 410

NOTES:

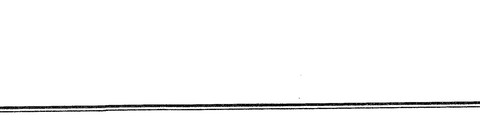
A. FOR ITEMS SHOWN BUT NOT NOTED SEE DETAILS 1,2, AND 3 THIS SHEET



2 S3.2 TYPICAL SECTION AT MANHOLE
NO SCALE

KEYNOTES:

1. TYPE I OR IA MANHOLE ASSEMBLY PER CLARK COUNTY UNIFORM STANDARD DRAWING NO. 403 OR 404 USE OF TYPE I OR IA SHALL BE DETERMINED BASED ON THE FINAL COVER REQUIRED
2. (2) #4 CONT AT TOP OF WALL
3. #4 AT 8" O.C.
4. MANHOLE STEPS PER CLARK COUNTY UNIFORM STANDARD DRAWING NO. 410
5. (5) #5x10'-0" LONG AT 3" O.C. LONGITUDINAL EA SIDE OF OPENING
6. #4 AT 8" O.C. VARIES 18" VARIES
7. ARCH BEYOND
8. REINF PER CULVERT SECTION
9. #4 AT 8" O.C. VARIES 18" VARIES
10. FINISHED GRADE
11. REFERENCE CIVIL DRAWINGS FOR MANHOLE STATIONING
12. STYROFOAM FILL BETWEEN CULVERT AND MANHOLE ASSEMBLY
13. #4 AT 8" O.C.
14. #4 AT 8" O.C. VERT



4 S3.2 TYPICAL SECTION AT MANHOLE
NO SCALE

731-98
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PROJECT: GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE: ARCH AT MANHOLE SECTIONS

DATE	DESCRIPTION	REV.
5/10/2018	MYLAR SET	

DRAWN: GTC | CHECKED: SG/GAM

DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S3.2

PROJ.#:124070 AGREE#:115666 OS:124-07-SW/NE,124-18-NW/NE

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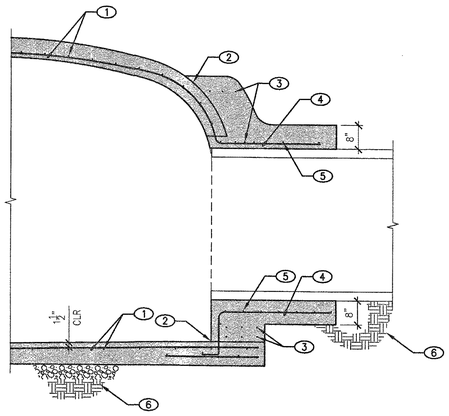


KEYNOTES:

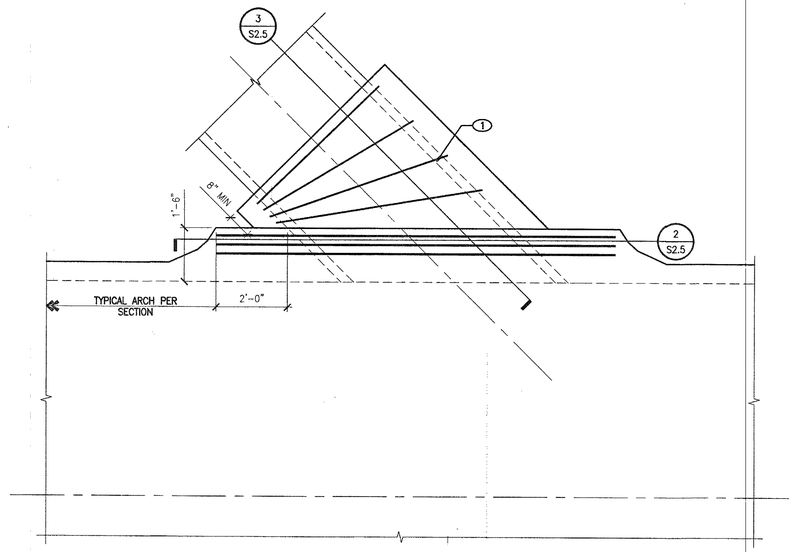
1. TYPICAL REINF PER SECTION
2. CONSTRUCTION JOINT AT CONTRACTORS OPTION
3. (3) #5 EXTENDING THE LENGTH OF THE THICKENED SECTION
4. TYPICAL REINF BENT AROUND RCP TYPICAL REINF MAY BE BENT ONE TIME ONLY
5. #4 AT 18" O.C. MAX TRANS SPLAYED AROUND LATERAL
6. BEDDING PER GSN

NOTES

A. SECTIONS A AND B ARE PROVIDED FOR CLARIFICATION. REINF AND THICKNESS ARE THE SAME FOR BOTH SECTIONS AND BOTH ARE COMPATIBLE WITH LATERAL DETAILS

B. INVERT ELEVATIONS AND ANGLES ARE PER THE CIVIL DRAWINGS ANGLES VARY AT EACH LATERAL

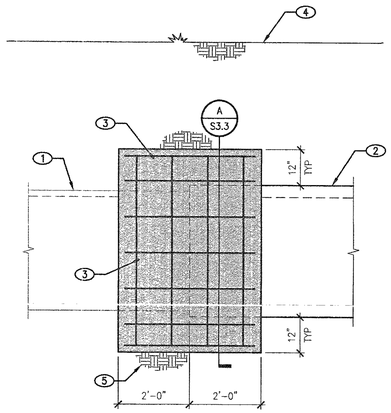
3 S3.3 RCP AT ARCH
NO SCALE

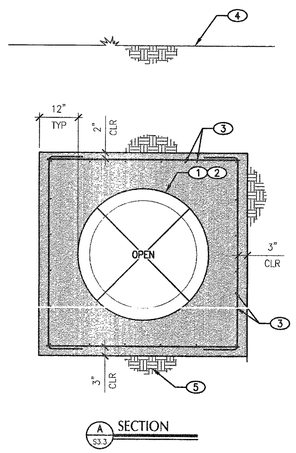


KEYNOTES:

1. #4 AT 18" O.C. MAX TRANS SPLAYED AROUND LATERAL

1 S3.3 RCP AT ARCH (PLAN)
NO SCALE



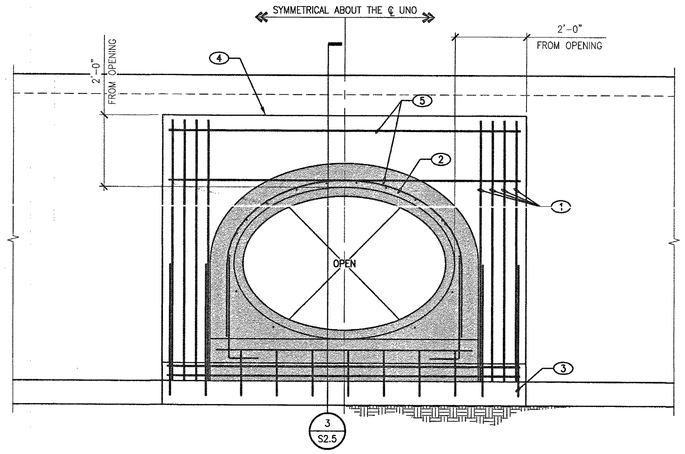


A S3.3 SECTION

KEYNOTES:

1. (E) HDPE PER PLAN
2. RCP PER PLAN
3. #4 AT 12" O.C. EA WAY. PROVIDE STD HOOK T&B OF VERT BARS
4. FINISHED GRADE PER CIVIL
5. PROPERLY PREPARED SUBGRADE PER GSN

4 S3.3 COLLAR AT HDPE TO RCP CONNECTION
NO SCALE



KEYNOTES:

1. (4) #5 AT 5" O.C. EA FACE
2. #4 AT 18" O.C. W/DOWEL TO LAP AND MATCH
3. DOWELS PER TYPICAL REINF.
4. EXTENT OF THICKENED SECTION
5. HORIZONTAL BAR PER 3/S2.5

NOTES

A. FOR ITEMS SHOWN BUT NOT NOTED SEE DETAIL 3 ON THIS PAGE

2 S3.3 RCP OPENING ELEVATION
NO SCALE

731-98
L-60221

SEAL:
STATE OF NEVADA
PROFESSIONAL ENGINEER
GREGORY T. MEYER
No. 9870
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STRUCTURAL
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05/10/2018

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GRAND TETON REGIONAL FLOOD CONTROL FACILITY
DRAINAGE STRUCTURES
NORTH LAS VEGAS, NV

SHEET TITLE:
ARCH AT RCP LATERAL

REV.	DESCRIPTION	DATE
	CCRFCD COMMENTS	11/11/2013
	MYLAR SET	05/10/2018

DRAWN: GTC
CHECKED: SG/GAM
DATE: JULY 22, 2013
PROJECT NUMBER: STR13.6007
SHEET NUMBER: S3.3

PROJ.#:124070 AGREE#:115666 QS:124-07-SW/NE,124-18-NW/NE

Drawing: L:\Archive\Work\Projects\Construct\2013\STR13.6007 GSF Structures\STR13.6007.dwg Layout: Arch at RCP Lateral (ARCH_RCP_LAT) - STR13.6007.dwg Last Saved By: sg Last Plotted: Wed May 02, 2018 - 8:52am By: wilma
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DISCLAIMER:

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND OR OVERHEAD UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION. CONTRACTOR TO NOTIFY ENGINEER OF ANY CHANGES OR DISCREPANCIES.

BENCHMARK:

NLV9117NWS
NAVD 88 ELEVATION PUBLISHED 6/30/15
699.482 METERS, 2294.88 FEET
ELEVATION USED FOR THESE PLANS, PRE-REVISION
699.511 METERS, 2294.98 FEET
RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM NO. NLV9117NWS, SET IN THE TOP OF CURB, LOCATED APPROX. 29 FEET SOUTH OF THE SOUTHEAST SOUTH BCR AT THE INTERSECTION OF GRAND TETON DR. AND ALIANTE PKWY.

LEGAL DESCRIPTION:

GOVERNMENT LOTS 5, 7, 10, 12, 14, 18, 19, 21, 24, 25, & 28 THROUGH 37, INCLUSIVE, OF SECTION 18, TOGETHER WITH GOVERNMENT LOT 7 OF SECTION 19, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

BASIS OF BEARINGS:

SOUTH 87°29'39" EAST, BEING THE SOUTH LINE OF GOVERNMENT LOT 19 OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP ON FILE IN THE CLARK COUNTY RECORDER'S OFFICE, IN FILE 104, PAGE 6: OF PARCEL MAPS.

SNWA CONSTRUCTION NOTES:

CONTRACTOR SHALL FIELD LOCATE AND PROTECT ALL SNWA/SNWS APPURTENANCES INCLUDING, BUT NOT LIMITED TO, AV/AR, ACCESS MANWAYS AND CATHODIC PROTECTION SYSTEMS. ALL ABOVE GROUND STRUCTURES AND AT GRADE STRUCTURES MUST BE ADJUSTED TO NEW GRADE AT CONTRACTOR'S EXPENSE. CATHODIC PROTECTION TEST STATIONS, RECTIFIERS, AND AV/AR'S MUST BE RELOCATED TO THE SIDEWALK PER SNWA STANDARDS AND AT THE CONTRACTOR'S EXPENSE. CONTRACTOR TO NOTIFY SOUTHERN NEVADA WATER AUTHORITY, DEVELOPMENT PLAN REVIEW, AT (702) 691-5372 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION ACTIVITY.

SOUTHERN NEVADA WATER AUTHORITY — DATE 9/5/18

DPR# 2018-0060

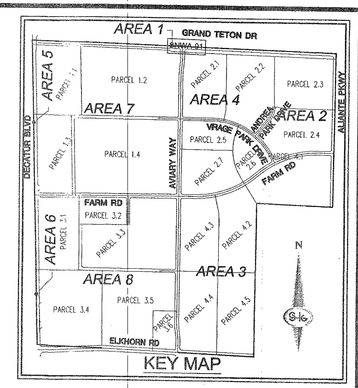
SNWA APPROVAL IS VALID FOR ONE (1) YEAR FROM THE SIGNATURE DATE. IF CONSTRUCTION WITHIN THE EASEMENT OR RESTRICTED PIPE SAFETY ZONE IS NOT COMPLETE, PLANS MUST BE RESUBMITTED TO SNWA FOR APPROVAL.

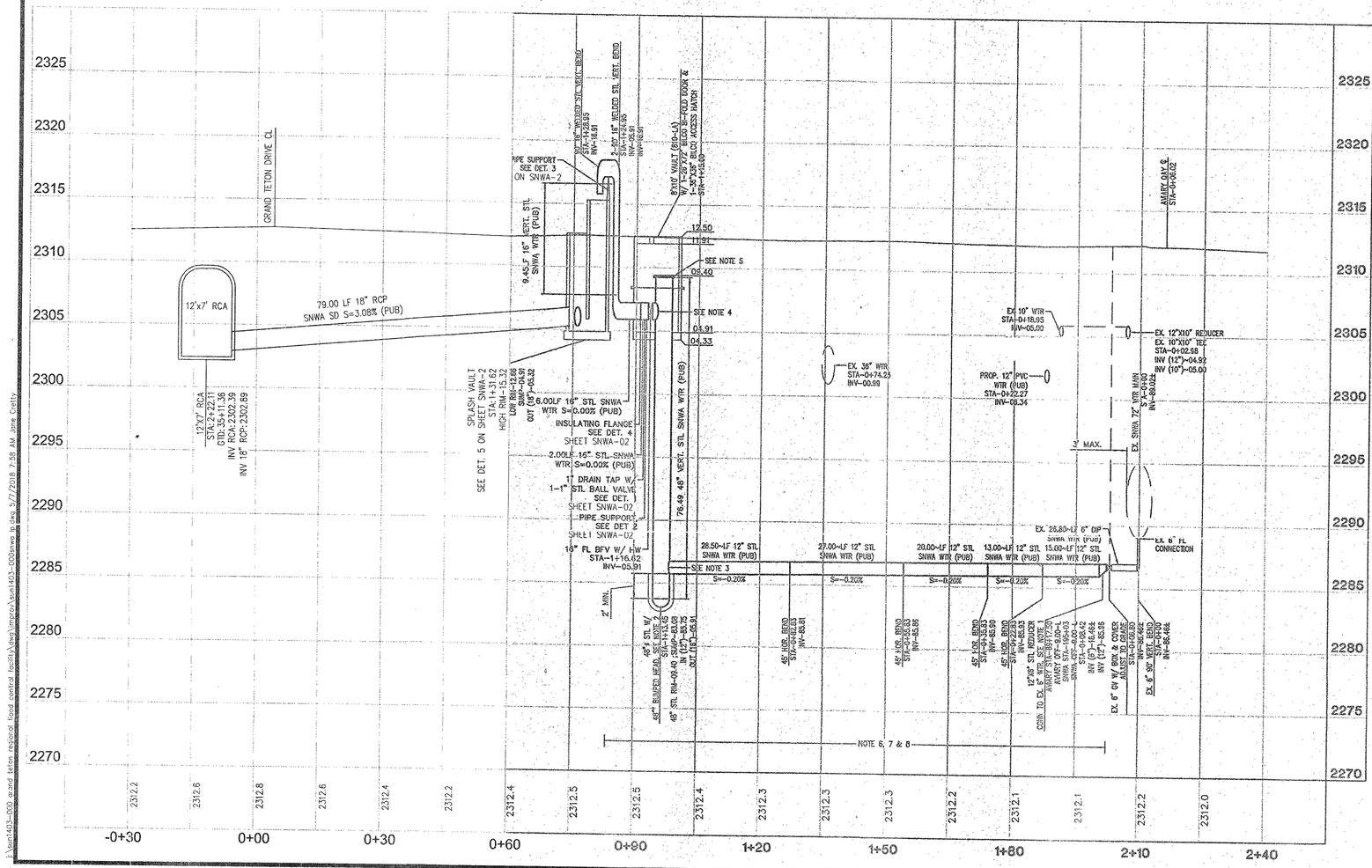
SNWA NOTES:

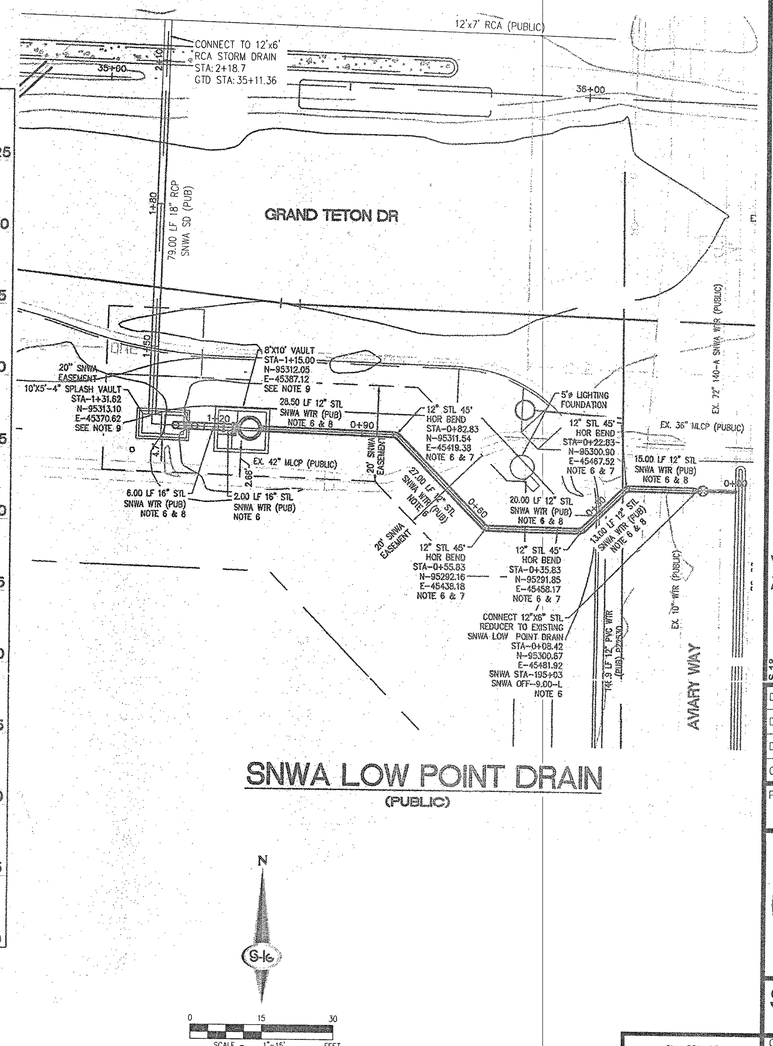
1. CONTRACTOR TO REMOVE EXISTING PIPE, FITTINGS, & DRAIN MANHOLE.
2. CONCRETE ENCASE BUMPED HEAD, MIN. 1 FT. ALL AROUND.
3. INSTALL 48"X12" STEEL WELDED FLANGED TEE.
4. INSTALL A 48"X16" STEEL WELDED TEE. INSTALL INSULATING FLANGE PER DETAIL 4 SHEET WTR-DET-02.
5. INSTALL 48" BLIND FLANGE.
6. RESTRAIN ALL JOINTS.
7. INSTALL PIPE LOCATOR BALL AT ALL HORIZONTAL BENDS PER UDACS PLATE NO. 27.
8. INSTALL TEAR TAPE ALONG DRAIN LINE AT APPROPRIATE DEPTHS.
9. CONTRACTOR SHALL NOTIFY CITY OF NORTH LAS VEGAS UTILITIES DEPARTMENT 48 HOURS IN ADVANCE PRIOR TO WORKING WITHIN TWENTY (20) FEET OF EXISTING WATERLINES. EXISTING WATERLINES ARE WITHIN THE AREA AND WILL HAVE MINIMAL COVER. HANDHELD CONSTRUCTION EQUIPMENT MUST BE USED WITHIN THIS AREA, UNLESS APPROVED BY CITY OF NORTH LAS VEGAS UTILITIES DEPARTMENT. EXTREME CARE AND CAUTION MUST BE USED DURING EXCAVATION TO ENSURE EXISTING WATERLINES ARE NOT DAMAGED. BACKFILL SHALL BE PLACED IN THREE INCH LIFTS AND A HAND HELD COMPACTOR SHALL BE USED. CONSTRUCTION OF VAULTS SHALL BE PERFORMED IN 20' SEGMENTS. 20' SECTION SHALL BE BACKFILLED AND COMPACTED BEFORE ANOTHER 20' SECTION IS EXCAVATED.
10. THE CONTRACTOR SHALL NOTIFY THE CNLV UTILITIES DEPARTMENT, AT 633-1285, A MINIMUM OF 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL NOTIFY RICH ARNOLD CNLV UTILITIES DEPARTMENT, AT 632-1288, A MINIMUM OF 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITY AND FOR SCHEDULING INSPECTIONS AND APPROVALS.

SNWA NOTES:

11. CAUTION SNWA FIBER OPTICS CONDUIT RUNS ALONG THE WEST SIDE OF THE SNWA 72" LATERAL AT VARIOUS DEPTHS.







SNWA LOW POINT DRAIN
(PUBLIC)

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5399 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS

PH WEST HOLDINGS, INC.

VALLEY VISTA

AREA 1 - GRAND TETON DRIVE & RFC FACILITY

SNWA PLAN & PROFILE LOW POINT DRAIN

S-18 T-19S R-61E

DATE: 5/07/2018
DRAFTER: OQ/JC
DESIGNER: OQ/JC
CHECKED: DY
PROJECT NO. SUN1403-000

PROFESSIONAL ENGINEER - STATE OF NEVADA
DERICK D.J. YORO
Exp: 06/30/2020
CIVIL
No. 16396
5/7/18

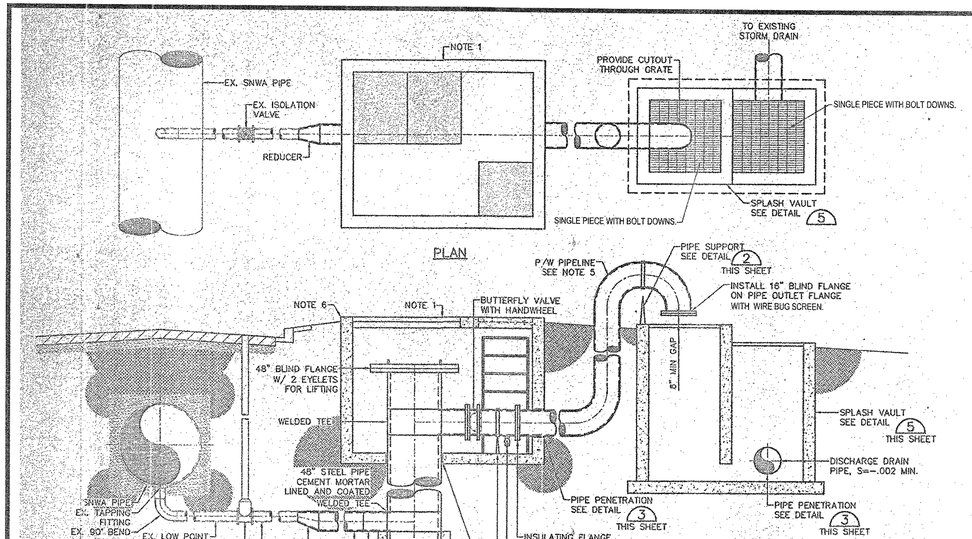
SNWA-01
SHEET 115 OF 125

CLV 731-98

CNLV PROJECT NO. 57838
L-60220

PRO.#:124070 AGREE#:115666 QS:124-07-SW/NE,124-18-NW/NE

J:\sun1403-000 grand teton regional flood control facility\dwg\improv\sun1403-000snwa lp.dwg 5/7/2018 7:58 AM Jane Crotty

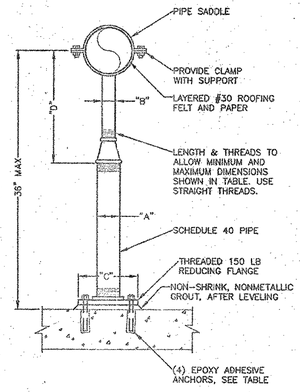


NOTES:

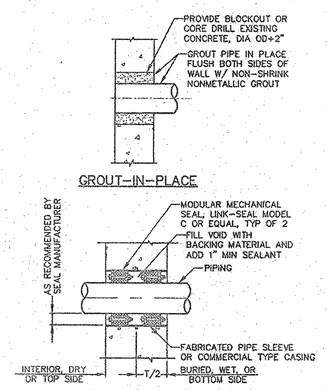
1. 8'X10' UTILITY VAULT (810-LA) W/ 1-BILCO 36"X72" BI-FOLD DOOR WITH DRAIN TO SUMP IN FLOOR AND 1-BILCO 36"X36" SQUARE ACCESS HATCH. ATTACH BOLT ON LADDER UNDER 36"X36" HATCH. HATCHES SHALL BE WARRANTED FOR 2 YEARS AFTER ACCEPTANCE. SUBMIT WARRANTY TO SNWA FOR APPROVAL.
2. INSTALL TEMPORARY PIPING DURING TESTING.
3. DRAIN VALVE PIPING AND APPURTENANCES SHALL MEET THE PRESSURE CLASS OF THE ADJACENT PIPE.
4. PROVIDE DISSIMILAR METALS PROTECTION, EITHER SIDE OF VALVE. SEE (4) THIS SHEET.
5. ALL SPLASH VAULT PIPING AND FITTINGS TO BE 16" STEEL MLCP AND MUST BE RESTRAINED.
6. SHOP DRAWING SUBMITTAL MUST INCLUDE A VENDOR STATEMENT THAT HE HAS EXAMINED THE DIMENSIONS, PROPOSES APPROPRIATELY SIZED UNITS TO FIT THESE DIMENSIONS AND WILL PROVIDE AN UNCONDITIONAL TWO YEAR FREE REPLACEMENT WARRANTY. THE WARRANTY WILL COMMENCE AFTER FINAL COMPLETION.

FLOOR PIPE SUPPORT SCHEDULE
DIMENSIONS IN INCHES

PIPE SIZE	"A"	"B"	"C"	"D" MINIMUM	"D" MAXIMUM	ANCHORS DIA	ANCHORS EMBED
18	4	3	11	17 1/2	22 1/2	3/4	6 5/8
18	6	3 1/2	13 1/2	19 1/2	24	3/4	6 5/8
20	6	3 1/2	13 1/2	21	25 1/2	3/4	6 5/8
24	6	4	13 1/2	23 1/2	28 1/2	3/4	6 5/8
30	6	4	13 1/2	27	31 1/2	3/4	6 5/8
32	6	4	13 1/2	28 1/2	32 1/2	3/4	6 5/8
36	6	4	13 1/2	30 1/2	34 1/2	3/4	6 5/8



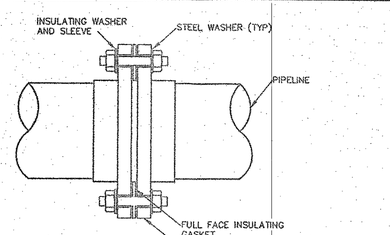
PIPE SUPPORT (2)
NOT TO SCALE



NOTES:

1. BOLT HEADS ON ACCESSIBLE SIDE OF PENETRATION
2. WHEN USED AS FLOOR PENETRATION IN WET AREA, PROVIDE CASTINGS/ SLEEVES WITH TOP 3 INCHES ABOVE FINISH FLOOR
3. PROVIDE DOUBLE ROW OF SEALS FOR PIPES 16" DIAMETER AND LARGER IF CONCRETE THICKNESS PERMITS
4. ONE SEAL FOR WALLS LESS THAN 8" THICK, TWO FOR WALLS 8" THICK AND LARGER
5. PIPE SLEEVES SHALL BE SCHEDULE 40, HOT-DIP GALVANIZED.
6. MODULAR MECHANICAL SEALS: LINK-SEAL, OR EQUAL. USE TYPE 316 SS BOLTS.
7. CONTRACTOR REQUIRED TO ENSURE THAT APPROPRIATE BOLTED FLEXIBLE SLEEVE UNITS ARE INSTALLED. CONTRACTOR IS REQUIRED TO MEASURE THE FINAL WIDTH OF THE ANNULUS AT A MINIMUM OF 12 POSITIONS AROUND THE CIRCUMFERENCE OF THE SLEEVE AND PROVIDE THESE DIMENSIONS TO THE VENDOR FOR INCLUSION IN THE SHOP DRAWING SUBMITTAL.

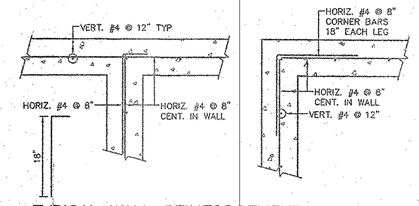
PIPE PENETRATION (3)
NOT TO SCALE



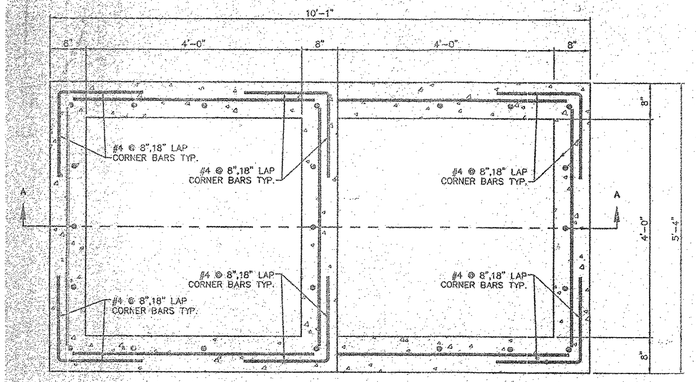
NOTES:

1. ABOVE GRADE INSULATING FLANGE INSTALLATION SHOWN
2. FOR BURIED INSULATING FLANGE INSTALLATION, DO NOT INSTALL INSULATING WASHER ON PROTECTED SIDE OF INSULATING FLANGE.
3. COAT BURIED INSULATING FLANGES WITH COLD APPLIED COAL TAR MASTIC AFTER ASSEMBLING JOINT AND WRAP WITH A BUTYL RUBBER ADHESIVE, POLYETHYLENE BACKED TAPE.

INSULATING FLANGE (4)
NOT TO SCALE



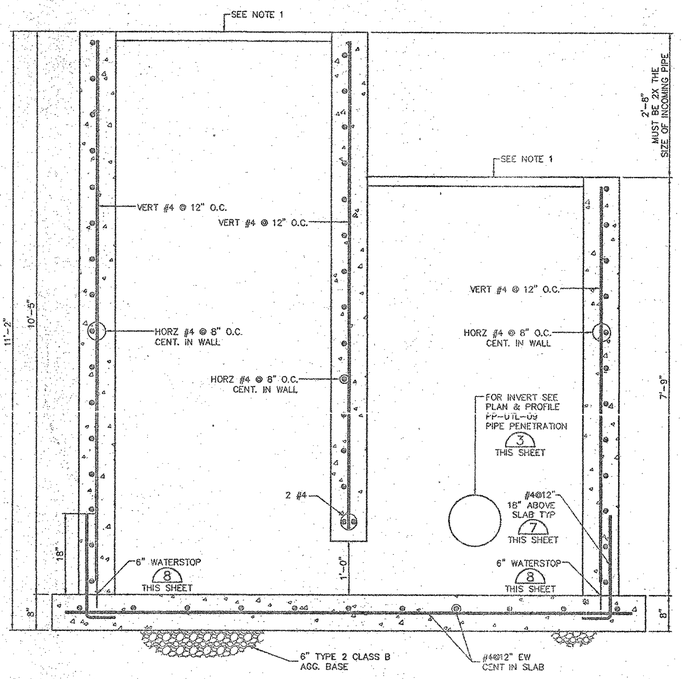
TYPICAL WALL REINFORCEMENT AT CORNERS AND INTERSECTIONS (6)
SCALE: 3/4" = 1'-0"



TOP VIEW

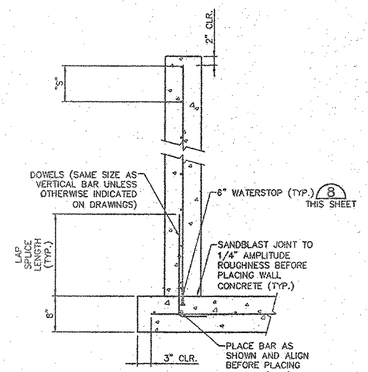
NOTES:

1. ALUMINUM GRATING SHALL BE 19-SPACE, 1¼"X1/8" BAR, U=237/D=0.384; C=4.76/D=0.307, OHIO GRATING, OR EQUAL. EMBED ALUMINUM FRAME IN CONC. IN STRICT ACCORDANCE WITH MFR. INSTALLATION REGARDING DISSIMILAR MATERIALS. SINGLE PIECE EACH WITH BOLT DOWNS.
2. ALL AREA UNDER STRUCTURE WILL BE COMPACTED TO 95% COMPACTION AND TESTED PER APPLICABLE JURISDICTION CODES. A COPY OF THE TEST RESULTS MUST BE SUBMITTED TO SNWA.
3. ALL REBAR SHALL TO BE ASTM A615 GRADE 60 STEEL. STEEL SPECS MUST BE SUBMITTED TO SNWA. REINFORCING STEEL: ALL REINFORCING STEEL SHALL BE ASTM A615 GRADE 60. DIMENSIONS RELATING TO BAR SPACING ARE CENTER TO CENTER. BENDING DIMENSIONS ARE FROM OUT TO OUT OF BARS.
4. DESIGN SPECIFICATIONS AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES", 17TH EDITION, 2002.
5. CONSTRUCTION SPECIFICATIONS: STATE OF NEVADA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION 2001", EXCEPT AS NOTED BELOW AND IN THE SPECIAL PROVISIONS FOR THE CONTRACT.
6. CONCRETE: CONCRETE SHALL BE CLASS D MODIFIED (MAJOR) WITH F'C=4,500 PSI AT 28 DAYS. ONLY TYPE V CEMENT SHALL BE USED, NO FLY ASH.
7. EXCAVATION AND BACKFILL: SEE NDOT STANDARD PLAN R-1.1.3 (206,207) "STRUCTURE EXCAVATION AND BACKFILL (METHOD OF MEASUREMENT)" FOR GENERAL NOTES AND INFORMATION NOT SHOWN.



SECTION A-A

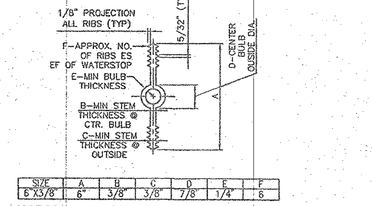
SPLASH VAULT (5)
SCALE: 3/4" = 1'-0"



NOTES:

1. "S" = BAR SPACING INDICATED ON THE DRAWINGS.

HORIZONTAL WALLS WITH WATERSTOPS (7)
SCALE: 3/4" = 1'-0"



SIZE	A	B	C	D	E	F
6 X 3/8	6"	3/8"	3/8"	7/8"	1/4"	6

NOTES:

1. MATERIAL QUALITY PER SPECIFICATIONS.
2. DIMENSION REQUIREMENTS INDICATED SHOULD BE GIVEN TO SUPPLIERS PRIOR TO PLACING ORDERS.
3. NON-ROUND CENTER BULBS SHALL HAVE A MIN. OUTSIDE DIMENSION OF "D".
4. SUBMIT WATERSTOP SPECIFICATIONS TO SNWA FOR REVIEW AND APPROVAL.

WATERSTOP DETAIL (8)
SCALE: NTS

Southern Nevada Water Authority — Date 9/5/18

Project DPR # 2016-0060

SNWA approval is valid one (1) year from the signature date. If construction within the easement or restricted pipe safety zone is not complete, plans must be resubmitted to SNWA for approval.

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP

CITY OF NORTH LAS VEGAS

PH WEST HOLDINGS, INC.

VALLEY VISTA

S18 T19S R61E

AREA 1 - GRAND TETON DRIVE & RFC FACILITY

SNWA LOW POINT DRAIN DETAIL SHEET

DATE: 5/07/2018
DRAFTER: OQ/JC
DESIGNER: OQ/JC
CHECKED: DY
PROJECT NO. SUN1403-000

FREDERICK D. J. YORO — Exp: 06/30/2020 — CIVIL — No. 16386 — STATE OF NEVADA — PROFESSIONAL ENGINEER — 9/7/18

SNWA-02
SHEET 116 OF 125

CLV 731-98

CNLV PROJECT NO. 57838
L-60221

PROJ#:124070 AGREE#:115666 QS:124-07-SWINE,124-18-NWINE

J:\sun1403-000 grand teton regional flood control facility\dwg\engrcv\sun1403-000engrcv.dwg 5/7/2018 7:58 AM Jane Crotty

LEGEND, GENERAL NOTES

LEGEND: (NOT ALL SYMBOLS ARE USED)

EXT	DEMO	NEW	DEFINITION
			PANELBOARD SURFACE MOUNTED
			PANELBOARD FLUSH MOUNTED
			SWITCHBOARD
TC	TC	TC	TERMINAL CABINET
T	T	T	TRANSFORMER
P	P	P	PULLBOX
			MOTOR STARTER
			COMBINATION MOTOR STARTER
			COMBINATION MOTOR STARTER VENDOR FURNISHED
F	F	F	DISCONNECT SWITCH "F" INDICATES FUSIBLE
			DISCONNECT SWITCH VENDOR FURNISHED
			CONTACTOR
			CONTACTOR VENDOR FURNISHED
TTB	TTB	TTB	TELEPHONE TERMINAL BOARD 4 X 8 X 3/4" FIRE TREATED PLYWOOD
TTC	TTC	TTC	TELEPHONE TERMINAL CABINET
A	A	A	FLUORESCENT FIXTURE - LETTER DENOTES TYPE (LOWER CASE LETTER DENOTES SWITCHING), NUMBER DENOTES CIRCUIT
A	A	A	WALL MOUNTED FIXTURE (FLUORESCENT SHOWN) - LETTER DENOTES TYPE
A	A	A	HID OR INCANDESCENT FIXTURE - LETTER DENOTES TYPE
A		A	FLUORESCENT STRIP FIXTURE - LETTER DENOTES TYPE
A		A	TRACK LIGHTING - LETTER DENOTES TYPE
A	A	A	EMERGENCY LIGHTING UNIT - LETTER DENOTES TYPE
A	A	A	EXIT FIXTURE - SHADED AREA DENOTES LIGHTED FACE, ARROWS DENOTE DIRECTION - LETTER DENOTES TYPE
A		A	EMERGENCY OR NIGHT LIGHT CONNECTED FIXTURE (FLUORESCENT SHOWN) - LETTER DENOTES TYPE
A	A	A	POLE MOUNTED AREA LIGHT - LETTER DENOTES TYPE
			SPORTS FIELD POLE ASSEMBLY
			SINGLE RECEPTACLE 18" AFF UNLESS NOTED OTHERWISE
			DUPLEX RECEPTACLE 18" AFF UNLESS NOTED OTHERWISE
			FLOOR MOUNTED DUPLEX RECEPTACLE
			QUADRUPLEX RECEPTACLE 18" AFF UNO
			ISOLATED GROUND TYPE (ORANGE) DUPLEX RECEPTACLE AT 18" AFF UNO.
			ISOLATED GROUND TYPE (ORANGE) QUADRUPLEX RECEPTACLE AT 18" AFF UNO.
C	C	C	COUNTER HEIGHT RECEPTACLE (VERIFY HEIGHT)
			GFI DUPLEX RECEPTACLE 18" AFF UNLESS NOTED OTHERWISE
			SWITCHED DUPLEX RECEPTACLE 18" AFF UNLESS NOTED OTHERWISE
2	2	2	ELECTRIC SHEET NOTE DESIGNATION
AHU 2	AHU 2	AHU 2	MECHANICAL EQUIPMENT CROSS REFERENCE
2	2	2	SPECIAL PURPOSE RECEPTACLE - NUMBER REFERS TO RECEPTACLE SCHEDULE
C	C	C	CLOCK OUTLET
24	24	24	MULTIOUTLET ASSEMBLY - ARROW HEADS INDICATE EXTENT, NUMBERS INDICATE SPACING IN INCHES
S	S	S	SINGLE POLE SWITCH 48" AFF UNO
S_3	S_3	S_3	THREE WAY SWITCH 48" AFF UNO
S_4	S_4	S_4	FOUR WAY SWITCH 48" AFF UNO
S_K	S_K	S_K	KEY OPERATED SWITCH
S_D	S_D	S_D	DIMMER OPERATED SWITCH
S_P	S_P	S_P	SWITCH WITH PILOT LIGHT
S_M	S_M	S_M	MOTION SENSING SWITCH
			CONTROL STATION
			TELEPHONE OUTLET 18" AFF UNO
			PAY TELEPHONE OUTLET 48" AFF UNO
			FLOOR MOUNTED TELEPHONE OUTLET
			COMPUTER OUTLET OR SPECIAL PURPOSE COMMUNICATIONS
R	R	R	RADIO OUTLET
PC	PC	PC	PHOTOELECTRIC CELL
TC	TC	TC	TIME CLOCK
			BRANCH CIRCUIT CONSISTING OF 2#12 IN MINIMUM SIZE CONDUIT NOT INCLUDING GROUND WIRE
			HOME RUN TO PANELBOARD OR DEVICE - NUMBER OF ARROW HEADS INDICATES NUMBER OF CIRCUITS
			BRANCH CIRCUIT - SHORT SLASHES INDICATE NUMBER OF PHASE OR SWITCH LEGS, LONG SLASHES INDICATE NUMBER OF NEUTRALS, LONG SLASH W/ A DOT INDICATES A SEPARATE ISOLATED GROUND WIRE.
			CONDUIT IN SLAB OR UNDERGROUND

EXT	DEMO	NEW	DEFINITION
			CONDUIT SEALING FITTING (USED FOR CLARITY ONLY)
			INTERRUPTER SWITCH
			FUSE
			CIRCUIT BREAKER
			DRAWOUT CIRCUIT BREAKER
M	M	M	METERING
KWH D	KWH D	KWH D	KILOWATT HOUR DEMAND METER
			TRANSFORMER
			MOTOR OUTLET
G	G	G	GENERATOR
			GROUND ROD
SV	SV	SV	SOLENOID VALVE
S	S	S	SPEAKER
M	M	M	MOTION DETECTOR
TV	TV	TV	CCTV SURVEILLANCE CAMERA OUTLET
TV	TV	TV	TELEVISION ANTENNA OUTLET
F	F	F	PULL STATION
FS	FS	FS	FLOW SWITCH
TS	TS	TS	TAMPER SWITCH
H	H	H	HORN
S	S	S	HORN / STROBE
S	S	S	STROBE
FACP	FACP	FACP	FIRE ALARM CONTROL PANEL
FAA	FAA	FAA	FIRE ALARM ANNUNCIATOR
DH	DH	DH	DOOR HOLDER
S X	S X	S X	SMOKE DETECTOR LETTER (X) INDICATES TYPE. D DUCT MOUNT I IONIZATION P PHOTOELECTRIC
H X	H X	H X	HEAT DETECTOR LETTER (X) INDICATES TYPE. R RATE OF RISE F FIXED TEMPERATURE
F	F	F	FIREMAN PHONE
SD	SD	SD	SMOKE /FIRE DAMPER
FS	FS	FS	CONTROL DEVICE. LETTERS INDICATE TYPE: FLS = FLOAT SWITCH, FS = FLOW SWITCH FTS = FOOT SWITCH, LS = LIMIT SWITCH PE = PNEUMATIC SWITCH, PS = PRESSURE SWITCH TS = TEMPERATURE SWITCH
T	T	T	THERMOSTAT
J	J	J	JUNCTION BOX (USED FOR CLARITY ONLY)
A	A	A	AMMETER
AS	AS	AS	AMMETER SWITCH
V	V	V	VOLTMETER
VS	VS	VS	VOLTMETER SWITCH
#	#	#	RELAY OR CONTROL DEVICE. NUMBER REPRESENTS STANDARD DEVICE FUNCTION
ST	ST	ST	SHUNT TRIP
GFI	GFI	GFI	GROUND FAULT INTERRUPTER

ABBREVIATIONS:

AFF	ABOVE FINISHED FLOOR	J-BOX	JUNCTION BOX
AFG	ABOVE FINISHED GRADE	KVA	KILOVOLT AMPS
AL	ALUMINUM	KW	KILOWATT
BKR	BREAKER	LTG	LIGHTING
C	CONDUIT	NTS	NOT TO SCALE
CKT	CIRCUIT	PNL	PANEL
C.O.	CONDUIT ONLY	PWR	POWER
CU	COPPER	TYP	TYPICAL
DWG	DRAWING	UNO	UNLESS NOTED OTHERWISE
ELEC	ELECTRICAL	V	VOLTS
(E)	EXISTING	VA	VOLT AMPS
GFI	GROUND FAULT INTERRUPT	WP	WEATHER PROOF
GND	GROUND	XFMR	TRANSFORMER

GENERAL NOTES:

1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOOK THROUGH ALL DRAWINGS ASSOCIATED WITH THIS PROJECT. WORK ASSOCIATED WITH THE ELECTRICAL CONTRACTOR'S TRADE MAY BE SHOWN ON OTHER DRAWINGS. ANY ADDITIONAL COST RESULTING FROM THE FAILURE TO INCLUDE THESE ITEMS SHOWN ON THE OTHER DRAWINGS WILL BE INCURRED BY CONTRACTOR.
2. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO ESTABLISH A STANDARD OF QUALITY. THE ENGINEER RESERVES THE RIGHT TO ALLOW OTHER METHODS AND MATERIALS NOT REFLECTED HEREIN. THE CONTRACTOR SHALL BE RESPONSIBLE TO REQUEST THE ENGINEER WAIVE THE STANDARDS TO ALLOW ALTERNATE MEANS AND METHODS PRIOR TO BEGINNING THE PROJECT. CONTRACT DOCUMENT REVISIONS TO ACCOMMODATE INSTALLED CONDITIONS, WITHOUT PRIOR APPROVAL, WILL RESULT IN ADDITIONAL DESIGN CHARGES TO THE CONTRACTOR.
3. ELECTRICAL WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE NECA INSTALLATION STANDARDS TO THE SATISFACTION OF THE ARCHITECT AND ENGINEER.
4. ALL WORK, MATERIALS AND EQUIPMENT SHALL CONFORM TO THE CURRENTLY ADOPTED EDITION OF ALL APPLICABLE NATIONAL, STATE AND CITY CODES AND ORDINANCES.
5. ALL ELECTRICAL SYSTEM COMPONENTS SHALL BE LISTED OR LABELED BY UL OR OTHER RECOGNIZED TESTING FACILITY AS ALLOWED BY AUTHORITY HAVING JURISDICTION.
6. WHERE AN APPARENT DISCREPANCY EXISTS BETWEEN THE REQUIREMENTS OF THE GENERAL NOTES AND INFORMATION PORTRAYED IN THE ELECTRICAL DRAWINGS, THE CONTRACTOR SHALL INCLUDE IN THE BID THE COST OF THE GREATER QUALITY OR QUANTITY.
7. CONTRACTOR SHALL VISIT JOB SITE PRIOR TO BID AND VERIFY EXISTING CONDITIONS.
8. CONTRACTOR SHALL INCLUDE IN BASE BID ALL COSTS REQUIRED FOR PERMITS AND INSPECTIONS.
9. CONTRACTOR SHALL VERIFY, WITH OWNER'S REPRESENTATIVE PRIOR TO SUBMITTING BID, ALLOWABLE WORKING HOURS, EMPLOYEE PARKING AREAS, MATERIAL DELIVERY, STORAGE REQUIREMENTS, DEMOLITION AND REMOVAL OF CONSTRUCTION DEBRIS, AS WELL AS DAILY CLEAN UP REQUIREMENTS. INCLUDE ALL COSTS IN BID FOR DUST BARRIERS, DUMPSTERS ETC. AS REQUIRED FOR THE DURATION OF THE PROJECT. PERFORM ALL WORK AS DIRECTED BY OWNER'S REPRESENTATIVE AND ARCHITECT.
10. ALL ELECTRICAL SYSTEMS SHALL BE TESTED FOR PROPER OPERATION. IF TESTS SHOW THAT WORK IS DEFECTIVE, CONTRACTOR SHALL MAKE ALL NECESSARY CORRECTIONS AT NO ADDITIONAL COST TO OWNER.
11. CONTRACTOR SHALL GUARANTEE ALL WORK AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP WHICH MAY OCCUR UNDER NORMAL USE FOR A PERIOD OF ONE YEAR AFTER OWNER'S ACCEPTANCE. ALL DEFECTS SHALL BE PROMPTLY CORRECTED BY CONTRACTOR WITHOUT ADDITIONAL COST TO OWNER.
12. PROVIDE AS-BUILT DRAWINGS TO ARCHITECT. DRAWINGS SHALL INCLUDE ACCURATE CONDUIT AND DEVICE LOCATIONS DIMENSIONED FROM PERMANENT LANDMARKS SUCH AS SEWER OR VAULT COVERS.
13. ANY VARIANCE OR EXCEPTIONS TO THE DRAWINGS AND SPECIFICATIONS MUST BE REQUESTED AND APPROVED IN WRITING BY THE ENGINEER. WHERE UNAUTHORIZED CHANGES ARE FOUND, THE CONTRACTOR SHALL REMOVE THE INSTALLED WORK AND INSTALL ITS AS SHOWN ON THE DRAWINGS AT NO ADDITIONAL COST THE THE OWNER.
14. PRIOR TO INSTALLATION, CONTRACTOR SHALL REVIEW THE COMPLETE SET OF CONSTRUCTION DOCUMENTS FOR CONFLICTS WITH OTHER TRADES. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE ALL WORK WITH OTHER TRADES TO AVOID CONFLICT DURING INSTALLATION.
15. CONTRACTOR SHALL BE RESPONSIBLE TO PROPERLY CUT AND PATCH EXISTING CONSTRUCTION AS REQUIRED TO INSTALL NEW ELECTRICAL WORK. ALL PATCHING SHALL BE OF THE SAME MATERIALS, WORKMANSHIP AND FINISH AS THE EXISTING WORK AND SHALL ACCURATELY MATCH ALL SURROUNDING WORK TO THE SATISFACTION OF THE OWNER.
16. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER, ARCHITECT AND ENGINEER AS REQUIRED FOR SHUT-DOWNS OR TIE-INS RELATING TO THESE SYSTEMS. REQUESTS FOR SHUTDOWNS SHALL BE SUBMITTED IN WRITING AT LEAST ONE WEEK IN ADVANCE FOR APPROVAL BY THE OWNER.
17. THE ELECTRICAL CONTRACTOR ASSUMES ALL RESPONSIBILITY AND LIABILITY FOR ANY "VALUE ENGINEERING" OF THE MATERIALS, SPECIFICATIONS AND DESIGN OF THIS PROJECT, INCLUDING ANY AND ALL COST FOR ANY REVISIONS TO THE CONTRACT DOCUMENTS REQUIRED AS A RESULT IF THE "VALUE ENGINEERING".
18. IN AREA WHERE THERE WILL BE OPEN EXCAVATION OR THE GROUND ELEVATION IS LESS THAN THREE (3) FEET FROM THE TOP OF THE SNWA TRANSMISSION MAIN, NO EXCAVATION EQUIPMENT, OTHER THAN HAND HELD EQUIPMENT WILL BE ALLOWED WITHIN TEN (10) FEET OF THE PIPELINE IN THESE AREAS. THE CONTRACTOR IS TO PLACE CONCRETE BARRIER; I.E. JERSEY RAIL, TO IDENTIFY AND PROTECT THE NO EQUIPMENT ZONE.

SHEET INDEX

NUMBER	TITLE	100% CD 08/15/2017
E000	LEGEND, GENERAL NOTES	●
E002	SPECIFICATIONS AND TESTING	●
E200	POWER PLAN - OVERALL	●
E201	POWER PLAN - AREA 1 - GRAND TETON AND AVIARY	●
E202	POWER PLAN - AREA 2 - SURGE TANK SITE PLAN	●
E500	SINGLE LINE	●
E501	SINGLE LINE	●
E600	SCHEDULES	●

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Southern Nevada Water Authority — Date: 9/5/18

DPR# 2016-0060

SNWA approval is valid for one (1) year from the signature date. if construction within the easement or restricted pipe safety zone is not complete, plans must be resubmitted to SNWA for approval.

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS

PH WEST HOLDINGS, INC.

VALLEY VISTA

LEGEND, GENERAL NOTES

S 18 T 19S R 61E

DATE: 08/15/2017
DRAFTER: TJK
DESIGNER: TJK
CHECKED: TJK
PROJECT NO. SUN1403-000

tjk consulting engineers, inc.
8728 Spanish Ridge Avenue
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PROFESSIONAL ENGINEER STATE OF NEVADA — THOMAS M. ANDERSON — EXP. 12-31-18 — ELECTRICAL — No. 13946 — 8/15/18

TJK # 17075

CLV 731-98

E000
SHEET 1 OF 125

CNLV PROJECT NO. 57838
L-60221

PRO.#:124070 AGREE#:11566 QS:124-07-SWINE,124-18-NWINE

NEW 5KV CABLE INSTALLATION - SEQUENCE OF INSTALLATION:

1. PROCURE ALL ITEMS NECESSARY FOR NEW 5KV CABLE INSTALLATION.
   a. 125KW PRIME EMERGENCY GENERATOR.
   b. 125KW STANDBY EMERGENCY GENERATOR.
   c. 200A, 460V NON-FUSED SAFETY SWITCH, NEMA 3R.
   d. 200A, 460V DOUBLE-THROW SAFETY SWITCH WITH CAMLOCK CONNECTORS, NEMA 3R
   e. CONDUIT.
   f. CONDUCTORS.
   g. FUEL TANK.
2. ELECTRICAL CONTRACTOR PROCURES, INSTALL, TEST TEMPORARY EMERGENCY POWER GENERATORS, DOUBLE-THROW SAFETY SWITCH, DIESEL STORAGE TANK, DIESEL FUEL SUPPLY.
   a. ELECTRICAL CONTRACTOR PREPARES CABLING FOR TEMPORARY POWER FEED FROM GENERATORS FOR CONNECTION AT PANEL 'S1' TO INCLUDE CAMLOCK CONNECTORS AND VERIFIES GENERATORS PHASE ROTATION.
3. ELECTRICAL CONTRACTOR TO NOTIFY SNWA TO COORDINATE SERVICE SWITCHOVER AT SURGE TANKS SITE PANEL 'S1'.
   a. SNWA DOCUMENT AND CONFIRM THEIR LOCK-OUT, TAG-OUT PROCEDURE.
   b. ELECTRICAL CONTRACTOR TO DOCUMENT AND CONFIRM THEIR LOCK-OUT, TAG-OUT PROCEDURE.
   c. SNWA NOTIFIES ELECTRICAL CONTRACTOR TO SCHEDULE SERVICE INTERRUPTION TO PANEL 'S1'.
   d. SNWA OPENS FEEDER SWITCH TO TRANSFORMER EE-1-T1 AT RESERVOIR EE-1-MCC-1, PERFORMS LOCK-OUT, TAG-OUT.
   e. SNWA DISCONNECTS FEEDER AT FEEDER SWITCH. (FOR FUTURE SYSTEM TEST)
   f. SNWA AT FEEDER SWITCH NOTIFIES SNWA AT SURGE TANKS LOCATION THAT POWER IS OFF, LOCK-OUT, TAG-OUT IS IN PLACE.
   g. SNWA DISCONNECTS PANEL 'S1' FEEDER AT LINE SIDE TERMINALS OF PANEL 'S1' MAIN BREAKER.
   h. SNWA CONNECTS FEEDERS FORM TRANSFORMER TO "NORMAL"TERMINALS OF DOUBLE-THROW SWITCH, THIS WILL BE A PERMANENT CONNECTION.
   i. SNWA MAKES NEW PERMANENT CONNECTION FROM "OUTPUT" OF DOUBLE-THROE SWITCH TO THE LINE SIDE OF 'S1'MAIN BREAKER.
   j. SNWA CONNECTS TEMPORARY POWER FEEDERS TO LINE SIDE OF PANEL 'S1' MAIN BREAKER.
   k. TEMPORARY POWER 'PRIME' GENERATOR IS STARTED TO RESTORE POWER TO PANEL 'S1'.
4. ELECTRICAL CONTRACTOR TO DISCONNECT, REMOVE AND DISPOSE OF EXISTING SPLICE AT SNWA VAULTS FROM EV-4, EV-5 AND EV-6.
   a. MAKE NOTE OF CURRENT SPLICE LOCATIONS IN SNWA VAULTS TO MATCH FOR NEW SPLICES. (SEE ITEM 17)
5. 5KV FEEDER REMOVED BETWEEN SNWA VAULTS EV-4 AND EV-5.
6. 5KV FEEDER REMOVED BETWEEN SNWA EV-5 AND EV-6 (ELECTRICAL CONTRACTOR TO DISPOSE OF CABLES).
7. AT THE INTERSECTION OF GRAND TETON DRIVE AND VALLEY DRIVE, EXCAVATE AND EXPOSE EXISTING TWO (2) CELL DUCT BANKS AT SNWA VAULT EV-5; 100 FEET NORTH AND 100 FEET EAST.
8. AT APPROXIMATELY 65 FEET NORTH OF VAULT EV-5 AND APPROXIMATELY 65 FEET EAST OF VAULT EV-5 PERFORM SAW CUT AND CONCRETE REMOVAL OF THE EXISTING DUCT BANK AND REMOVE DUCT BANK BACK TO VAULT EV-5. EXPOSE EXISTING CONDUITS FOR EXTENSION TO NEW VAULT.
9. DEMOLISH AND REMOVE VAULT EV-5.
10. INSTALL NEW SNWA VAULT EV-5A.
11. EXTEND EXISTING (2) CELL DUCT BANK FROM SNWA VAULT EV-6 TO NEW VAULT EV-5A.
12. CONSTRUCT NEW TWO (2) CELL DUCT BANK TO EXTEND FROM A POINT APPROXIMATELY 65 FEET NORTH OF EXISTING VAULT EV-5, FROM SNWA VAULT EV-4, TO NEW VAULT EV-5A PER PLANS.
13. CLEAR DUCT BANKS CELLS BETWEEN VAULT EV-4 AND EV5A AND BETWEEN VAULT EV-5A AND EV-6 BY RUNNING MANDREL THROUGH ALL CONDUITS.
14. INSTALL 5KV CABLE BETWEEN VAULTS EV-5A AND EV-4, PULLING FROM EV-5A TO EV-4.
15. INSTALL 5KV CABLE BETWEEN VAULTS EV-5A AND EV-6, PULLING FROM EV-5A TO EV-6.
16. HI-POT TEST EACH CABLE PRIOR TO SPLICE. SUBMIT TEST RESULTS FOR REVIEW.
17. SPLICE 5KV CABLE AT VAULTS EV-4, EV-5A AND EV-6 AT SAME HEIGHT AS PREVIOUS SPLICE.
18. PERFORM FULL SYSTEM TEST AT RATED SYSTEM VOLTAGE FROM FEEDER SWITCH TO SURGE TANK (BETWEEN VAULTS EV-1 TO EV-14). SUBMIT TEST RESULTS FOR REVIEW.
19. NOTIFY SNWA THAT SYSTEM IS READY FOR SWITCHOVER.
   a. TEMPORARY POWER 'PRIME' GENERATOR POWER IS REMOVED.
   b. SNWA DISCONNECTS TEMPORARY POWER FEEDERS AT LINE SIDE OF PANEL 'S1' MAIN BREAKER.
   c. SNWA RECONNECTS PANEL 'S1' FEEDER AT LINE SIDE TERMINALS OF PANEL 'S1' MAIN BREAKER.
   d. SNWA AT SURGE TANK NOTIFIES SNWA AT FEEDER SWITCH LOCATION THAT 'S1' IS READY FOR RE-ENERGIZING, LOCK-OUT, TAG-OUT IS REMOVED.
   e. SNWA RECONNECTS EXISTING CABLING AT FEEDER SWITCH.
   f. SNWA AND ELECTRICAL CONTRACTOR REMOVES LOCK-OUT,TAG-OUT DEVICES AND CLOSES FEEDER SWITCH TO TRANSFORMER EE-1-T1 AT RESERVOIR EE-1-MCC-1.
20. UPON APPROVAL FROM SNWA, CONTRACTOR REMOVES TEMPORARY EMERGENCY POWER GENERATORS, DOUBLE-THROW SAFETY SWITCH, DIESEL STORAGE TANK, DIESEL FUEL SUPPLY AND RETURNS SITE TO ORIGINAL CONDITIONS.

SNWA CONSTRUCTION NOTES:

Contractor shall field locate and protect all SNWA/SNWS appurtenances including, but not limited to: AV/AR, access manways and cathodic protection Systems. All above ground structures and at grade structures must be adjusted to new grade at contractor's expense. Cathodic protection test stations, rectifiers, and AV/AR's must be relocated to the sidewalk per SNWA Standards and at the Contractor's expense. Contractor to notify Southern Nevada Water Authority, Development Plan Review, at (702) 691-5372 at least 48 hours PRIOR to construction activity.

Alphonso Roberts 5/5/18
Southern Nevada Water Authority — Date

DPR# 2016-0060

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ELECTRICAL SPECIFICATIONS
SECTION 16000
PROJECT NUMBER TJK #17075

PART 1 - GENERAL REQUIREMENTS

1.1 DESCRIPTION

A. SCOPE: THE ELECTRICAL WORK CONSISTS OF FURNISHING EVERYTHING NECESSARY FOR AND INCIDENTAL TO THE EXECUTION AND COMPLETION OF ALL ELECTRICAL WORK INDICATED ON THE DRAWINGS AND SPECIFIED BELOW INCLUDING BUT NOT LIMITED TO:
   1. CONCRETE DUCT BANK.
   2. PRE-CAST CONCRETE ELECTRICAL VAULT.
   3. MEDIUM VOLTAGE CABLE.
   4. MEDIUM VOLTAGE CABLE SPLICE KITS.

B. MAKE ALL FIELD CONNECTIONS AND TERMINATIONS TO ALL PANELS AND TO ALL VENDOR-FURNISHED PACKAGED EQUIPMENT. THE REQUIREMENTS OF THIS SECTION SHALL APPLY TO ALL ELECTRICAL ITEMS INDICATED IN THE VARIOUS SECTIONS OF DIVISION 16 UNLESS OTHERWISE INDICATED.

C. PROVIDE ALL MATERIALS AND INCIDENTALS REQUIRED TO COMPLETE THE ELECTRICAL WORK. TYPICAL MATERIALS WHICH MAY BE INCIDENTALS ARE TERMINAL LUGS NOT FURNISHED WITH VENDOR-SUPPLIED EQUIPMENT AND CABLE SPLICES.

D. ALL CONCRETE WORK REQUIRED FOR ENCASEMENT, INSTALLATION, OR CONSTRUCTION OF DUCT BANKS SHALL BE 3,000-PSI CONCRETE. THE FOLLOWING EXCEPTIONS AND SUPPLEMENTARY REQUIREMENTS SHALL APPLY:
   1. CONSOLIDATION OF ENCASEMENT CONCRETE AROUND DUCT BANKS SHALL BE BY HAND PADDLING, AND NO MECHANICAL VIBRATION SHALL BE PERMITTED.
   2. A WORKABILITY ADMIXTURE SHALL BE USED IN ENCASEMENT CONCRETE, WHICH SHALL BE A HYDROXYLATED CARBOXYLIC ACID TYPE IN LIQUID FORM. ADMIXTURES CONTAINING CALCIUM CHLORIDE SHALL NOT BE USED.
   3. CONCRETE FOR ENCASEMENT OF CONDUIT OR DUCT BANKS SHALL CONTAIN AN INTEGRAL RED-OXIDE COLORING PIGMENT IN THE PROPORTION OF 8 POUNDS PER CUBIC YARD OF CONCRETE.

1.2 CODES AND STANDARDS

A. GOVERNMENT STANDARDS

NEMA WC 71, ICEA S-96-659	NONSHIELDED CABLES RATED 2001-5000 VOLTS.
NEMA WC 74, ICEA S-93-639	5-46kV SHIELDED POWER CABLE.
29 CFR 1910	OCCUPATIONAL SAFETY AND HEALTH STANDARDS.
29 CFR 1926	SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION.

B. COMMERCIAL STANDARDS

ASTM B 3	SOFT OR ANNEALED COPPER WIRE.
ASTM B 8	CONCENTRIC-LAY-STRANDED COPPER CONDUCTORS, HARD, MEDIUM-HARD, OR SOFT.
UL 467	GROUNDING AND BONDING EQUIPMENT.
UL1072	MEDIUM-VOLTAGE POWER CABLES.

C. ALL WORK SHALL BE IN ACCORDANCE WITH NEC AND LOCAL GOVERNING CODES

D. ALL EQUIPMENT FURNISHED BY THE CONTRACTOR SHALL BE LISTED BY AND SHALL BEAR THE LABEL OF UNDERWRITERS' LABORATORIES, INCORPORATED, (UL) OR OF AN INDEPENDENT TESTING LABORATORY ACCEPTABLE TO THE LOCAL CODE-ENFORCEMENT AGENCY HAVING JURISDICTION.

E. THE CONSTRUCTION AND INSTALLATION OF ALL ELECTRICAL EQUIPMENT AND MATERIALS SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE OSHA SAFETY AND HEALTH STANDARDS (29CFR1910 AND 29CFR1926, AS APPLICABLE), STATE BUILDING STANDARDS, AND APPLICABLE LOCAL CODES AND REGULATIONS.

1.3 SUBSTITUTIONS

1.4 PERMITS AND INSPECTIONS

A. PERMITS SHALL BE OBTAINED AND INSPECTION FEES SHALL BE PAID FOR BY ELECTRICAL CONTRACTOR.

1.5 SUBMITTALS

A. SHOP DRAWINGS AND CATALOG DATA: SUBMIT SHOP DRAWINGS AND CATALOG DATA SUBMITTALS IN ACCORDANCE WITH SECTION 01300 - CONTRACTOR SUBMITTALS.

B. SUBMIT COMPLETE MATERIAL LISTS FOR THE WORK OF THIS SECTION. SUCH LIST SHALL STATE MANUFACTURER AND BRAND NAME OF EACH ITEM OR CLASS OF MATERIAL. SUBMIT SHOP DRAWINGS FOR ALL GROUNDING WORK NOT SPECIFICALLY INDICATED.

C. SHOP DRAWINGS ARE REQUIRED FOR MATERIALS AND EQUIPMENT LISTED IN OTHER SECTIONS. SHOP DRAWINGS SHALL PROVIDE SUFFICIENT INFORMATION TO EVALUATE THE SUITABILITY OF THE PROPOSED MATERIAL OR EQUIPMENT FOR THE INTENDED USE, AND FOR COMPLIANCE WITH THESE SPECIFICATIONS. THE FOLLOWING SHALL BE INCLUDED:
   1. FRONT, SIDE, REAR ELEVATIONS AND TOP VIEWS WITH DIMENSIONAL DATA.
   2. LOCATION OF CONDUIT ENTRANCES AND ACCESS PLATES.
   3. COMPONENT DATA.
   4. CONNECTION DIAGRAMS, TERMINAL NUMBERS, WIRE NUMBERS, INTERNAL WIRING DIAGRAMS, CONDUCTOR SIZE, AND CABLE NUMBERS.
   5. METHOD OF ANCHORING, SEISMIC REQUIREMENT, WEIGHT.
   6. TYPES OF MATERIALS AND FINISH.

D. TESTS:CONTRACTOR SHALL PERFORM ALL TEST REQUIRED BY THE CONSTRUCTION MANAGER OR OTHER AUTHORITIES HAVING JURISDICTIONS. ALL SUCH TEST SHALL BE PERFORMED IN THE PRESENCE OF THE CONSTRUCTION MANAGER. FURNISH ALL NECESSARY TESTING EQUIPMENT AND PAY ALL COSTS OF TEST, INCLUDING ALL REPLACEMENT PARTS AND LABOR NECESSARY DUE TO DAMAGE RESULTING FROM DAMAGED EQUIPMENT OR FROM TEST AND CORRECTION OF FAULTY INSTALLATION. THE FOLLOWING TESTING SHALL BE ACCOMPLISHED:
   1. TESTING FOR THE GROUND RESISTANCE VALUE UNDER "GROUNDING," BELOW.
   2. INSULATION RESISTANCE TESTS UNDER "WIRE AND CABLE," BELOW.
   3. OPERATIONAL TESTING OF ALL EQUIPMENT FURNISHED AND/OR CONNECTED IN OTHER SECTIONS OF DIVISION 16, INCLUDING FURNISHING OF SUPPORT LABOR FOR TESTING.

E. STANDARD TEST REPORTS FOR MASS-PRODUCED EQUIPMENT SHALL BE SUBMITTED ALONG WITH THE SHOP DRAWING FOR SUCH EQUIPMENT. TEST REPORTS ON TESTING SPECIFICALLY REQUIRED FOR INDIVIDUAL PIECES OF EQUIPMENT SHALL BE SUBMITTED FOR REVIEW PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.

F. ANY TEST FAILURE SHALL BE CORRECTED IN ACCORDANCE WITH THE INDUSTRY PRACTICES AND IN A MANNER SATISFACTORY TO THE CONSTRUCTION MANAGER.

1.6 DEMOLITION AND RELATED WORK

A. THE CONTRACTOR SHALL PERFORM ALL ELECTRICAL DEMOLITION WORK AS INDICATED.
   1. ELECTRICAL EQUIPMENT AND COMPONENTS, TERMINAL AND RELAY CABINETS, MCCs, SHALL BE RETURNED TO THE OWNER IN AN ORDERLY FASHION TO A DESIGNATED LOCATION ON THE SITE.
   2. WIRE, CONDUIT, JUNCTION BOXES, FITTINGS, SUPPORTS AND MISCELLANEOUS HARDWARE REMOVED AS PART OF THE DEMOLITION WORK SHALL NOT BE REUSED AND SHALL BE RETURNED TO THE AUTHORITY FOR THEIR SALVAGE USE.
   3. WIRES AND/OR CONDUITS WHICH NEED TO BE EXTENDED SHALL BE TERMINATED IN A NEW TERMINAL BOX WITH TERMINAL STRIPS. TERMINAL BOX SHALL BE PROPERLY SIZED BY THE CONTRACTOR. IN OUTDOOR INSTALLATION, THE TERMINAL BOX SHALL BE NEMA 4X.

B. INSTALLATION OF TEMPORARY EQUIPMENT
   1. TO FACILITATE CONTINUOUS OPERATION OF EXISTING EQUIPMENT, PROVIDE TEMPORARY EQUIPMENT INDICATED. SUBMIT INSTALLATION AND CONNECTION DETAILS FOR REVIEW AND ACCEPTANCE. ALL COST ASSOCIATED WITH THESE TEMPORARY INSTALLATIONS SHALL BE PART OF THE ORIGINAL BID DOCUMENTS, AND WITHOUT ADDITIONAL COST TO THE AUTHORITY.
   2. ALL CABLES, CONDUITS, AND FITTINGS USED IN TEMPORARY CONNECTIONS SHALL NOT BE REUSED TO INSTALL PERMANENT CONNECTIONS. RETURN THE SALVAGE ITEMS TO THE AUTHORITY.

C. PLANT MONITORING POWER AND CONTROL SHUTDOWNS
   1. CONTINUANCE OF SURGE TANKS OPERATION DURING THIS VAULT RELOCATION PROCESS IS IMPORTANT. THEREFORE, CONTRACTOR SHALL CAREFULLY EXAMINE ALL WORK TO BE DONE IN, ON, OR ADJACENT TO EXISTING EQUIPMENT. WORK SHALL BE SCHEDULED, SUBJECT TO AUTHORITY'S APPROVAL, TO MINIMIZE REQUIRED PLANT SHUTDOWN TIME. SUBMIT A WRITTEN REQUEST, INCLUDING SEQUENCE AND DURATION OF ACTIVITIES TO BE PERFORMED DURING PLANT SHUTDOWN.
   2. PERFORM ALL SWITCHING AND SAFETY TAGGING REQUIRED FOR PLANT SHUTDOWN OR TO ISOLATE EXISTING EQUIPMENT. IN NO CASE SHALL THE CONTRACTOR BEGIN ANY WORK IN, ON, OR ADJACENT TO EXISTING EQUIPMENT WITHOUT WRITTEN AUTHORIZATION.

PART 2 - PRODUCTS

2.1 GENERAL

A. ALL EQUIPMENT AND MATERIALS SHALL BE NEW, SHALL BE LISTED BY UL, AND SHALL BEAR THE UL LABEL. WHERE UL REQUIREMENTS APPLY. ALL EQUIPMENT AND MATERIALS SHALL BE THE PRODUCTS OF EXPERIENCED AND REPUTABLE MANUFACTURERS IN THE INDUSTRY. SIMILAR ITEMS IN THE PROJECT SHALL BE PRODUCTS OF THE SAME MANUFACTURER. ALL EQUIPMENT AND MATERIALS SHALL BE OF INDUSTRIAL GRADE AND STANDARD OF CONSTRUCTION; SHALL BE OF STURDY DESIGN AND MANUFACTURE/ AND SHALL BE CAPABLE OF RELIABLE, TROUBLE-FREE SERVICE.

2.2 GROUNDING

A. GENERAL: ALL COMPONENTS OF THE GROUNDING ELECTRODE SYSTEM SHALL BE MANUFACTURED IN ACCORDANCE WITH UL 467 AND SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF NATIONAL ELECTRICAL CODE ARTICLE 250.

B. GROUNDING CABLE SHALL BE COPPER. BARE COPPER WIRE SHALL BE ANNEALED, NO. 8 AWG MINIMUM, IF NOT CALLED OUT IN THE DRAWINGS.

C. GROUND RODS SHALL CONFORM TO UL 467 AND SHALL BE 3/4-INCH DIAMETER COPPER-CLAD STEEL, SECTIONAL TYPE, JOINED BY THREADED COPPER ALLOY COUPLINGS.
   1. GROUNDING CONNECTORS SHALL BE HIGH-STRENGTH COPPER ALLOY SUITABLE FOR DIRECT BURIAL.
   2. WIRE CONNECTIONS SHALL BE EXOTHERMIC WELD BY CADWELD OF ERICO PRODUCTS, OR BURNDY HYGROUND SYSTEM USING IRREVERSIBLE COMPRESSION-TYPE CONNECTORS.
   3. MANUFACTURERS OF GROUNDING MATERIALS SHALL BE COPPERWELD, BLACKBURN, BURNDY OR EQUAL.

2.3 UNDERGROUND DUCTS AND MANHOLES

A. GENERAL: WHERE AN UNDERGROUND DISTRIBUTION SYSTEM IS REQUIRED, IT SHALL BE COMPRISED OF MULTIPLE RUNS OF SINGLE BORE NONMETALLIC DUCTS, CONCRETE ENCASED, WITH STEEL REINFORCING BARS, WITH UNDERGROUND MANHOLES AND PULLBOXES. WHEN NONMETALLIC DUCTS ARE REQUIRED, THEY SHALL BE RIGID SCHEDULE 40 PVC FOR CONCRETE ENCASEMENT.

2.4 RACEWAYS

A. GENERAL: RACEWAY SHALL BE MANUFACTURED IN ACCORDANCE WITH UL AND NEMA STANDARDS AND SHALL BEAR UL LABEL AS APPLICABLE.

B. RACEWAY
   1. RIGID SCHEDULE 40 PVC (FRE) CONDUITS SHALL BE USED FOR CONCRETE ENCASED DUCT ON EARTH. UNDERGRAUND 90° BENDS SHOULD BE PVC COATED RIGID.

C. MEDIUM VOLTAGE CABLES: MEDIUM VOLTAGE CABLES SHALL BE RATED AT 5000 VOLTS NOMINAL AND SHALL MEET THE FOLLOWING REQUIREMENTS:
   1. MATERIALS: SINGLE CONDUCTOR SHALL BE UNCOATED COPPER, CLASS B STRANDED, CONFORMING TO ASTM B 3 AND B 8
   2. INSULATION SHALL BE ETHYLENE-PROPYLENE RUBBER (EPR) CONFORMING TO ICEA S-68-516 AND S-19-81. INSULATION LEVEL SHALL BE 133 PERCENT. INSULATION SHALL BE SUITABLE FOR USE IN WET AND DRY LOCATIONS AT CONDUCTOR OPERATING TEMPERATURES NOT EXCEEDING 90° C FOR NORMAL OPERATION, 130° C FOR OVERLOAD CONDITIONS, AND 250° C FOR SHORT-CIRCUIT CONDITIONS.
   3. THE CONDUCTOR SHALL BE COVERED WITH A LAYER OF EXTRUDED SEMICONDUCTING TAPE UNDER THE CABLE INSULATION. INSULATION SHALL BE COVERED WITH SEMICONDUCTING NONMETALLIC TAPE AND OVER WHICH IT SHALL BE UNCOATED COPPER SHIELDING TAPE HELICALLY APPLIED.
   4. EXTERIOR JACKET SHALL BE HYPALON AND SHALL MEET THE REQUIREMENTS OF UL 1072 FOR SUNLIGHT RESISTANCE.
   5. MEDIUM VOLTAGE CABLE SHALL BE UL LISTED AS TYPE MV-105 AND SHALL BE SO THIS LABEL IN ACCORDANCE WITH UL STANDARDS.
   6. MANUFACTURERS SHALL BE BICC/GENERAL, KERITE, OR OKONITE OR EQUAL.

D. CABLE TERMINATIONS: CABLE TERMINATIONS SHALL BE IN ACCORDANCE WITH THE FOLLOWING:
   1. EXPOXY RESIN SPLICING KITS SHALL BE 3M SCOTCHCOAT 82 SERIES, BURNDY HY SEAL, OR EQUAL.
   2. STRESS CONE MATERIAL FOR MAKEUP OF MEDIUM VOLTAGE SHIELDED CABLE SHALL BE BY 3M OR RAYCHEM. NO SUBSTITUTIONS.

PART 3 - EXECUTION

3.1 GROUNDING

A. GENERAL: GROUNDING CABLE SHALL BE SIZED IN ACCORDANCE WITH CODE REQUIREMENTS WHEN SIZES ARE NOT INDICATED ON THE DRAWINGS. THE LOCATION OF GROUND RODS SHALL BE AS INDICATED. THE LENGTH OF RODS FORMING AN INDIVIDUAL GROUND ARRAY SHALL BE EQUAL IN LENGTH AND SHALL BE OF THE QUANTITY REQUIRED TO OBTAIN A GROUND RESISTANCE OF NO MORE THAN 5 OHMS.

B. EQUIPMENT GROUND: GROUND CONTINUITY THROUGHOUT THE FACILITY SHALL BE MAINTAINED BY INSTALLING AN ELECTRICALLY-CONTINUOUS METALLIC RACEWAY SYSTEM, OR A NON-METALLIC RACEWAY WITH A GROUNDING CONDUCTOR WHEN NON-METALLIC RACEWAY IS PERMITTED IN THE CONTRACT DOCUMENTS.
   1. METALLIC RACEWAY SHALL BE INSTALLED WITH DOUBLE LOCK NUTS OR HUBS AT ENCLOSURES. NONMETALLIC RACEWAY CONTAINING DC CONDUCTORS OPERATING AT MORE THAN 50 VOLTS TO GROUND, OR ANY AC CONDUCTORS, SHALL CONTAIN A COPPER GROUNDING CONDUCTOR EITHER BARE, OR GREEN IF INSULATED. SUCH CONDUCTOR SHALL BE BONDED TO TERMINAL AND INTERMEDIATE METALLIC ENCLOSURES.
   2. METAL EQUIPMENT PLATFORMS WHICH SUPPORT ANY ELECTRICAL EQUIPMENT SHALL BE BONDED TO THE NEAREST GROUND BUS OR TO THE NEAREST SWITCHGEAR GROUND BUS. THIS GROUNDING REQUIREMENTS IS IN ADDITION TO THE RACEWAY GROUNDING REQUIRED IN THE PRECEDING PARAGRAPH HEREIN.

C. GROUNDING ELECTRODE SYSTEM: INSTALL THE GROUNDING ELECTRODE SYSTEM WITH ALL REQUIRED COMPONENTS IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE ARTICLE 250.
   1. CONNECTION TO GROUND ELECTRODES AND GROUND CONDUCTORS SHALL BE EXOTHERMIC WELDED WHERE CONCEALED AND SHALL BE BOLTED PRESSURE-TYPE WHERE EXPOSED. BOLTED CONNECTORS SHALL BE ASSEMBLED WRENCH-TIGHT.
   2. INSULATED GROUNDING BUSHINGS SHALL BE EMPLOYED FOR ALL GROUNDING CONNECTIONS TO STEEL CONDUITS IN SWITCHBOARDS, IN MOTOR CONTROL CENTERS, IN PULLBOXES, AND ELSEWHERE WHERE CONDUITS DO NOT TERMINATE AT A HUB OR A SHEET METAL ENCLOSURE. WHERE INSULATED BUSHINGS ARE REQUIRED, THEY SHALL BE INSTALLED IN ADDITION TO DOUBLE LOCK-NUTS.
   3. COPPER BONDING JUMPERS SHALL BE USED TO OBTAIN A CONTINUOUS METALLIC GROUND.

D. SHIELD GROUNDING
   1. SHIELDED POWER CABLE SHALL HAVE ITS SHIELD GROUNDED AT EACH TERMINATION IN A MANNER RECOMMENDED BY THE CABLE MANUFACTURER.
   2. SHIELDED INSTRUMENTATION CABLE SHALL BE GROUNDED AT ONE END ONLY; THIS SHALL BE AT THE MCB OR OTHERWISE AT THE "RECEIVING" END OF THE SIGNAL CARRIED BY THE CABLE, UNLESS SHOP DRAWINGS INDICATE THAT THE SHIELD SHALL BE GROUNDED AT BOTH ENDS.
   3. TERMINATION OF EACH SHIELD DRAIN WIRE SHALL BE ON ITS OWN TERMINAL SCREW. ALL OF THESE TERMINAL SCREWS IN ONE RACK SHALL BE JUMPERED WITH NO. 16 SOLID TINNED BARE COPPER WIRE; CONNECTION TO GROUND SHALL BE ACCOMPLISHED WITH A NO. 12 GREEN INSULATED CONDUCTOR TO THE MAIN GROUND BUS.

3.2 UNDERGROUND DUCTS AND MANHOLES

A. THE UNDERGROUND CONCRETE ENCASED DUCT BANK SHALL BE INSTALLED IN ACCORDANCE WITH THE CRITERIA BELOW:
   1. DUCT BANK SHALL BE ASSEMBLED USING HIGH IMPACT NONMETALLIC SPACERS AND SADDLES TO PROVIDE CONDUITS WITH VERTICAL AND HORIZONTAL SEPARATION. PLASTIC SPACERS SHALL BE SET EVERY 5 FEET.
   2. THE DUCT SHALL BE LAID ON A GRADE LINE OF AT LEAST 4 INCHES PER 100 FEET, SLOPING TOWARDS MANHOLES. DUCT SHALL BE INSTALLED AND MANHOLE DEPTHS ADJUSTED SO THAT THE TOP OF THE CONCRETE ENVELOPE IS A MINIMUM OF 108 INCHES BELOW GRADE.
   3. CHANGES IN DIRECTION OF THE DUCT ENVELOPE BY MORE THAN 10 DEGREES HORIZONTALLY OR VERTICALLY SHALL BE ACCOMPLISHED USING STANDARD CONDUIT RADII EXCEPT IN SPECIAL CASES WHERE CABLE BENDING RADII MAYBE EXCEEDED.
   4. COUPLINGS SHALL BE STAGGERED AT LEAST 6 INCHES VERTICALLY. BOTTOM OF TRENCH SHALL BE OF SELECT BACKFILL OR SAND. THE DUCT ARRAY SHALL BE ANCHORED EVERY 4 FEET TO PREVENT MOVEMENT DURING PLACEMENT OF THE CONCRETE ENVELOPE.
   5. EACH BORE OF THE COMPLETED DUCT BANK SHALL BE CLEANED BY DRAWING THROUGH IT A STANDARD FLEXIBLE MANDREL ONE FOOT LONG AND 1/4-INCH SMALLER THAN THE NOMINAL SIZE OF THE DUCT THROUGH WHICH THE MANDREL WILL BE DRAWN. AFTER PASSING OF THE MANDREL, DRAW A WIRE BRUSH AND SWAB THROUGH.
   6. A RACEWAY IN THE DUCT ENVELOPE, WHICH DOES NOT REQUIRE CONDUCTORS SHALL HAVE A 1/8-INCH POLYPROPYLENE PULL CORD INSTALLED THROUGHOUT THE ENTIRE LENGTH OF THE RACEWAY.
   7. DUCTS SHALL BE ENCASED WITH 3000 PSI RED CONCRETE WITH MINIMUM 6" COVER ALL AROUND WITH #4 REBAR REINFORCING SPACED AT 24-INCH O.C. THROUGHOUT THE ENTIRE LENGTH AND SHALL HAVE A 4/0 BARE COPPER GROUND CONDUCTOR EMBEDDED OVER THE FULL LENGTH.

B. DUCT ENTRANCES SHALL BE GROUTED SMOOTH; DUCT FOR PRIMARY AND SECONDARY CABLES SHALL BE TERMINATED WITH FLUSH END BELLS. SECTIONS OF PRE-FABRICATED MANHOLES SHALL BE ASSEMBLED WITH WATERPROOF MASTIC AND SHALL BE SET ON A 12-INCH BED OF GRAVEL AS RECOMMENDED BY THE MANUFACTURER OR AS REQUIRED BY FIELD CONDITIONS.

C. DUCT BANK MARKERS SHALL BE INSTALLED EVERY 200 FEET ALONG RUN OF DUCT BANK, AT CHANGES IN HORIZONTAL DIRECTION OF DUCT BANK, AND AT ENDS OF DUCT BANK. CONCRETE MARKERS, 6 BY 6 INCHES SQUARE AND ONE FOOT LONG, SHALL BE SET 2 INCHES ABOVE FINISH GRADE. THE LETTER "D" AND ARROW SHEET IN THE CONCRETE SHALL BE FACING IN THE DIRECTION OF THE DUCT BANK.

D. EACH DUCT BANK SHALL CONTAIN A NO. 4/0 BARE STRANDED COPPER GROUND WIRE, CONTINUOUS THROUGHOUT THE ENTIRE DUCT BANK. END OF GROUND WIRES SHALL BE TERMINATED AT SWITCH GEAR OR MCC GROUND BUS, OR TRANSFORMER GROUND LUGS.

E. DUCT BANK PENETRATION THROUGH WALLS OF MANHOLES OR PULLBOXES, AND ON BUILDING WALLS BELOW GRADE SHALL BE WATERTIGHT.

F. TRENCHES CONTAINING DUCT BANKS SHALL BE FILLED WITH SELECT BACKFILL WITH NO LARGE ROCKS WHICH COULD DAMAGE THE DUCT.

G. CABLES RATED 2,00 VOLTS AND ABOVE SHALL BE FIREPROOFED FOR THEIR ENTIRE EXPOSED LENGTH IN MANHOLES AND HANDHOLES, USING 1-1/2-INCH ARC-PROOFING TAPE ANCHORED BY OVERWRAPPING WITH GLASS CLOTH TAPE SUCH AS 3M CO NO. 27, SCOTCH, PLYMOUTH. OR EQUAL.

H. CABLE ASSEMBLY AND TESTING: CABLE ASSEMBLY AND TESTING SHALL COMPLY WITH APPLICABLE REQUIREMENTS ICEA PUBLICATION NO. S-68-516 AND OTHER RELEVANT ICEA PUBLICATIONS. FACTORY TEST RESULTS SHALL BE SUBMITTED IN ACCORDANCE WITH SECTION -1300 - CONTRACTOR SUBMITTALS. PRIOR TO SHIPMENT OF CABLE. THE FOLLOWING TEST SHALL BE THE MINIMUM REQUIREMENTS:
   1. HIGH POTENTIAL DC TEST SHALL BE PERFORMED ON ALL CABLES OPERATING AT MORE THAN 2, 000 VOLTS TO GROUND.
   2. INSULATION RESISTANCE SHALL BE OBTAINED AND SHALL NOT BE LESS THAN THE VALUE RECOMMENDED BY ICEA.
   3. ALL FIELD TESTING MENTIONED ABOVE SHALL BE DONE AFTER CABLES ARE INSTALLED IN THE RACEWAYS.
   4. FIELD TEST SHALL BE PERFORMED BY CERTIFIED TEST ORGANIZATION ACCEPTABLE TO THE CONSTRUCTION MANAGER. TEST RESULTS SHALL BE SUBMITTED FOR REVIEW AND ACCEPTANCE.
   5. CABLES FAILING IN THE SAID TEST SHALL BE REPLACED WITH A NEW CABLE OR REPAIRED. SUCH KIND OF REPAIR METHODS SHALL BE AS RECOMMENDED BY THE CABLE MANUFACTURER AND SHALL BE PERFORMED BY PERSONS CERTIFIED BY THE INDUSTRY.

PART 4 - TESTING

4.1 THE REQUIREMENT

A. THE CONTRACTOR SHALL INSPECT, TEST, COMMISSION, AND DEMONSTRATE THAT THE ELECTRICAL WORK PERFORMED UNDER THIS CONTRACT MEETS THE REQUIREMENTS OF THE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS THE CONTRACT DOCUMENTS.

B. THE WORK OF THIS SECTION INCLUDES FURNISHING THE LABOR, EQUIPMENT AND POWER REQUIRED TO SUPPORT THE TESTING IN OTHER DIVISIONS OF THESE SPECIFICATIONS. ELECTRICAL TESTING HEREIN, AND FUNCTIONAL TESTING OF ALL POWER AND CONTROLS SHALL BE COMPLETED BEFORE COMMENCEMENT OF THE 7-DAY TEST. TEST PROCEDURES SHALL BE BASED ON THE REQUIREMENTS OF THESE SPECIFICATIONS, NETA ACCEPTANCE TESTING SPECIFICATIONS FOR ELECTRICAL POWER DISTRIBUTION EQUIPMENT AND SYSTEMS, ISA TEST PROCEDURES, AND THE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. THIS TESTING INCLUDES, BUT IS NOT LIMITED TO, INSPECTION OF THE EQUIPMENT, TESTING INDIVIDUAL COMPONENTS OR PIECES OF EQUIPMENT AND SYSTEM TESTING.

4.2 TESTING

A. THE FOLLOWING TEST REQUIREMENTS ARE INTENDED TO SUPPLEMENT TEST AND ACCEPTANCE CRITERIA THAT MAY BE STATED ELSEWHERE. ALL TESTING PROCEDURES DEFINED IN THIS SECTION OR CALLED FOR ELSEWHERE IN THIS CONTRACT SHALL BE SU

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BENCHMARK:

NLV9117NWS
NAVD 88 ELEVATION PUBLISHED 6/30/15
699.482 METERS, 2294.88 FEET
ELEVATION USED FOR THESE PLANS, PRE-REVISION
699.511 METERS, 2294.98 FEET
RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM NO. NLV9117NWS, SET IN THE TOP OF CURB, LOCATED APPROX. 29 FEET SOUTH OF THE SOUTHEAST SOUTH BCR AT THE INTERSECTION OF GRAND TETON DR. AND ALIANTE PKWY.

LEGAL DESCRIPTION:

GOVERNMENT LOTS 5, 7, 10, 12, 14, 18, 19, 21, 24, 25, & 28 THROUGH 37, INCLUSIVE, OF SECTION 18, TOGETHER WITH GOVERNMENT LOT 7 OF SECTION 19, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

BASIS OF BEARINGS:

SOUTH 87°29'39" EAST, BEING THE SOUTH LINE OF GOVERNMENT LOT 19 OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP ON FILE IN THE CLARK COUNTY RECORDER'S OFFICE, IN FILE 104, PAGE 61 OF PARCEL MAPS.

NOTE:

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"SNWA FIBER OPTIC CONDUIT RUNS ALONG THE WEST/SOUTH SIDE OF THE SNWA LATERAL"

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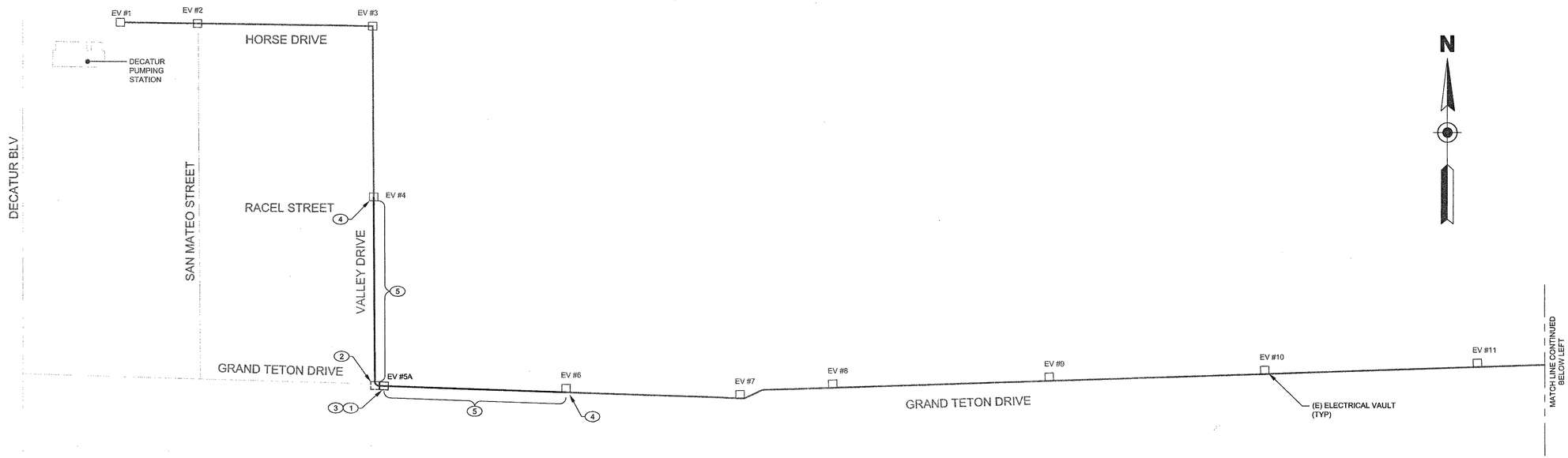
Alphonse Rydell Jr. 9/5/18
Southern Nevada Water Authority — Date

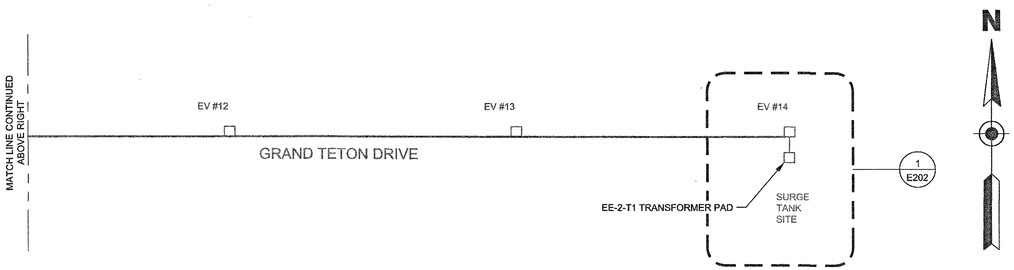
DPR# 2016-0060

SNWA approval is valid for one (1) year from the signature date. If construction within the easement or restricted pipe safety zone is not complete, plans must be resubmitted to SNWA for approval.

KEY NOTES: (#)

1. INSTALL NEW VAULT EV-5A TO REPLACE EXISTING VAULT EV-5, REFER TO SNWA ELECTRICAL DUCT BANK RELOCATION PLAN ON SHEET E200.
2. EXISTING VAULT EV-5 TO BE REMOVED.
3. NEW CABLES SPLICING SHALL BE MADE WITHIN SNWA VAULT EV-5A AT HEIGHT TO MATCH EXISTING EV-5 HEIGHT.
4. SPLICE NEW 5KV CABLES TO EXISTING WITHIN EXISTING SNWA VAULT EV-4 AND EV-6, AND SPLICE NEW CABLES WITHIN VAULT 5A. CONTRACTOR IS TO PROPERLY DISPOSE OF REMOVED CABLES.
5. EXISTING 5KV CABLES TO BE REMOVED AND REPLACED.





ELECTRICAL VAULT TABLE

EV	NORTHING	EASTING
1	N 820952.40	E 767883.96
2	N 820938.63	E 768457.26
3	N 820902.63	E 769745.19
4	N 819654.47	E 769761.33
5A		
6	N 818204.58	E 771188.50
7	N 818169.73	N 772487.24
8	N 818244.14	E 773175.09
9	N 818300.81	E 774774.08
10	N 818357.60	E 776373.04
11	N 818409.75	E 777947.58
12	N 818412.85	E 779572.58
13	N 818415.92	E 781172.58
14	N 818419.02	E 782692.57

1 POWER PLAN - OVERALL
SCALE: 1" = 400'-0"

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS

PH WEST HOLDINGS, INC.

VALLEY VISTA

S18 T19S R61E

POWER PLAN - OVERALL

DATE: 08/15/2017
DRAFTER: TJK
DESIGNER: TJK
CHECKED: TJK
PROJECT NO. SUN1403-000

tjk consulting engineers, inc.
8728 Spanish Ridge Avenue
Suite 100
Las Vegas, NV 89148
P: 702.871.3621
F: 702.871.8353
www.tjkengineers.com

PROFESSIONAL ENGINEER STATE OF NEVADA
THOMAS M. ANDERSON
EXP. 12-31-18
ELECTRICAL
No. 13946
5/8/18

E200
SHEET 119 OF 125

TJK # 17075
CLV 731-98
CNLV PROJECT NO. 57838
L-60221

PRO#:124070 AGREE#:115666 QS:124-07-SWINE,124-18-NW/NE

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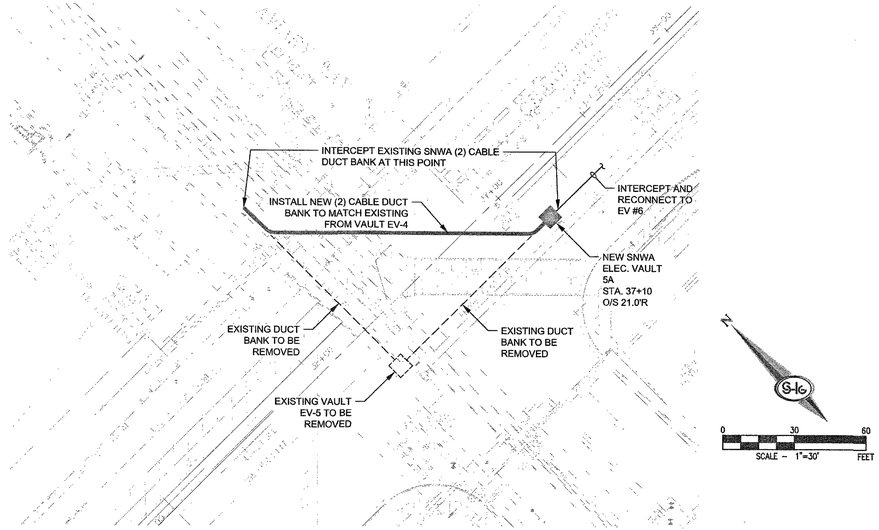
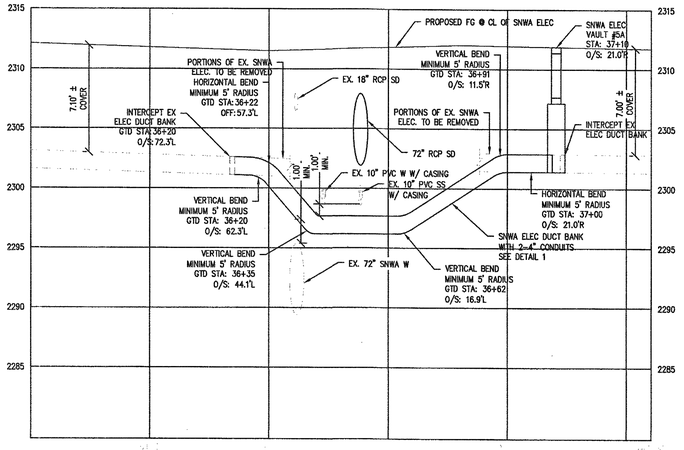
NOTE:

ALL WORK, MATERIALS AND EQUIPMENT SHALL CONFORM TO THE CURRENTLY ADOPTED IN AREA WHERE THERE WILL BE OPEN EXCAVATION OR THE GROUND ELEVATION IS LESS THAN THREE (3) FEET FROM THE TOP OF THE SNWA TRANSMISSION MAIN, NO EXCAVATION EQUIPMENT, OTHER THAN HAND HELD EQUIPMENT WILL BE ALLOWED WITHIN TEN (10) FEET OF THE PIPELINE IN THESE AREAS. THE CONTRACTOR IS TO PLACE CONCRETE BARRIER; I.E. JERSEY RAIL, TO IDENTIFY AND PROTECT THE NO EQUIPMENT ZONE.



1 POWER PLAN - AREA 1 - GRAND TETON AND AVIARY

SCALE: 1" = 30'-0"



SNWA ELECTRICAL DUCT BANK RELOCATION - PROFILE VIEW

HORIZ: 1" = 30'
VERT: 1" = 6'

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Alphonso Roberts, P.E. — Southern Nevada Water Authority — 9/5/18 Date

DPR#: 2016-0060

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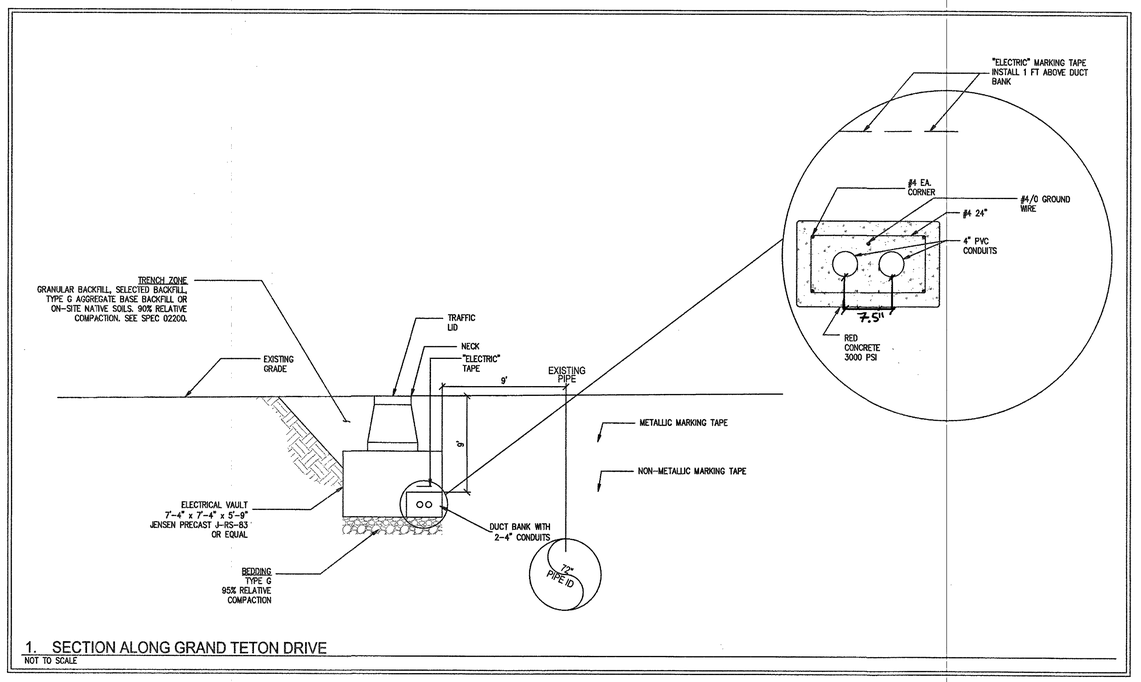
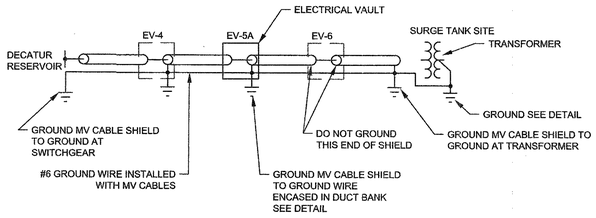


1. SECTION ALONG GRAND TETON DRIVE

NOT TO SCALE

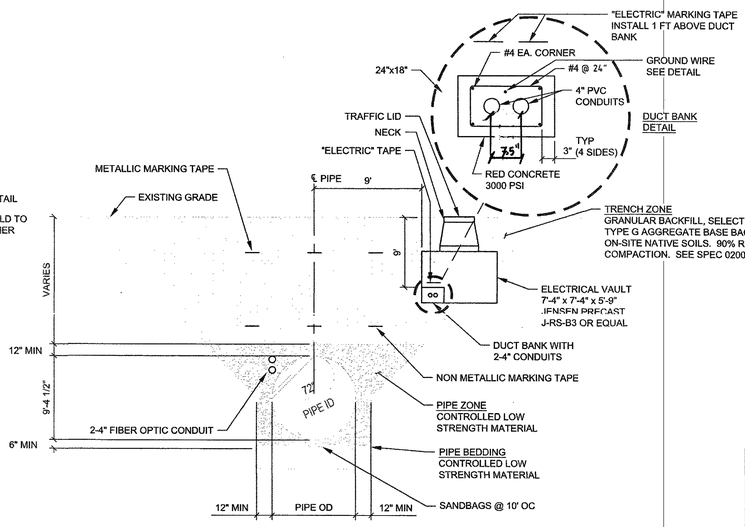


MV CABLE SHIELD NOTES:

1. TAKE SPECIAL CARE WHEN HANDLING MV CABLE NEAR THE NEVADA POWER TRANSMISSION LINE ALONG GRAND TETON BLV. THE TRANS MISSION LINE MAY INDUCE HARMFUL VOLTAGES IN THE MV CABLE SHIELD AND CONDUCTOR.
2. GROUND THE MV CABLE SHIELD AT THE DECATUR RESERVOIR, ELECTRICAL VAULT EV5 AND AT THE TRANSFORMER AT THE SURGE TANK SITE.
3. WHEN SPLICING MV CABLE, CONTINUE CABLE SHIELD THROUGH SPLICE EXCEPT AT ELECTRICAL VAULTS EV-5 AND EV-10, WHERE THE SHIELD IS TO BE DISCONTINUOUS. BREAK IN MV CABLE SHIELD IS TO REDUCE INDUCED VOLTAGE FROM TRANSMISSION LINE.
4. IT IS IMPORTANT THAT THE MV CABLE SHIELD IS GROUNDED AT ONE END ONLY TO AVOID CIRCULATING CURRENT IN THE MV CABLE SHIELD, WHICH MAY DAMAGE THE MV CABLE.

2 GROUNDING OF MV CABLE SHIELDS

SCALE: NTS



3 TRENCH SECTION ALONG GRAND TETON DRIVE

SCALE: NTS

tjk consulting engineers, inc.
8728 Spanish Ridge Avenue
Suite 100
Las Vegas, NV 89148
P: 702.871.3821
F: 702.871.8369
www.tjkengineers.com

TJK # 17075

CLV 731-98

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PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS

PH WEST HOLDINGS, INC.

VALLEY VISTA

S18 T19S R61E

POWER PLAN - AREA 1 - GRAND TETON AND AVIARY

DATE: 08/15/2017
DRAFTER: TJK
DESIGNER: TJK
CHECKED: TJK
PROJECT NO. SUN1403-000

PROFESSIONAL ENGINEER — STATE OF NEVADA — THOMAS M. ANDERSON — EXP. 12-31-18 — ELECTRICAL — No. 13946

5/8/18

E201
SHEET 120 OF 125

CNLV PROJECT NO. 5783.8
L-6022

PROJ.#:124070 AGREE#:115666 OS:124-07-SW/NE,124-18-NW/NE

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SOUTH 87°29'39" EAST, BEING THE SOUTH LINE OF GOVERNMENT LOT 19 OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP ON FILE IN THE CLARK COUNTY RECORDER'S OFFICE, IN FILE 104, PAGE 61 OF PARCEL MAPS.

NOTE:

"CAUTION – SNWA TEST LEADS ARE SHALLOW"

NOTE:

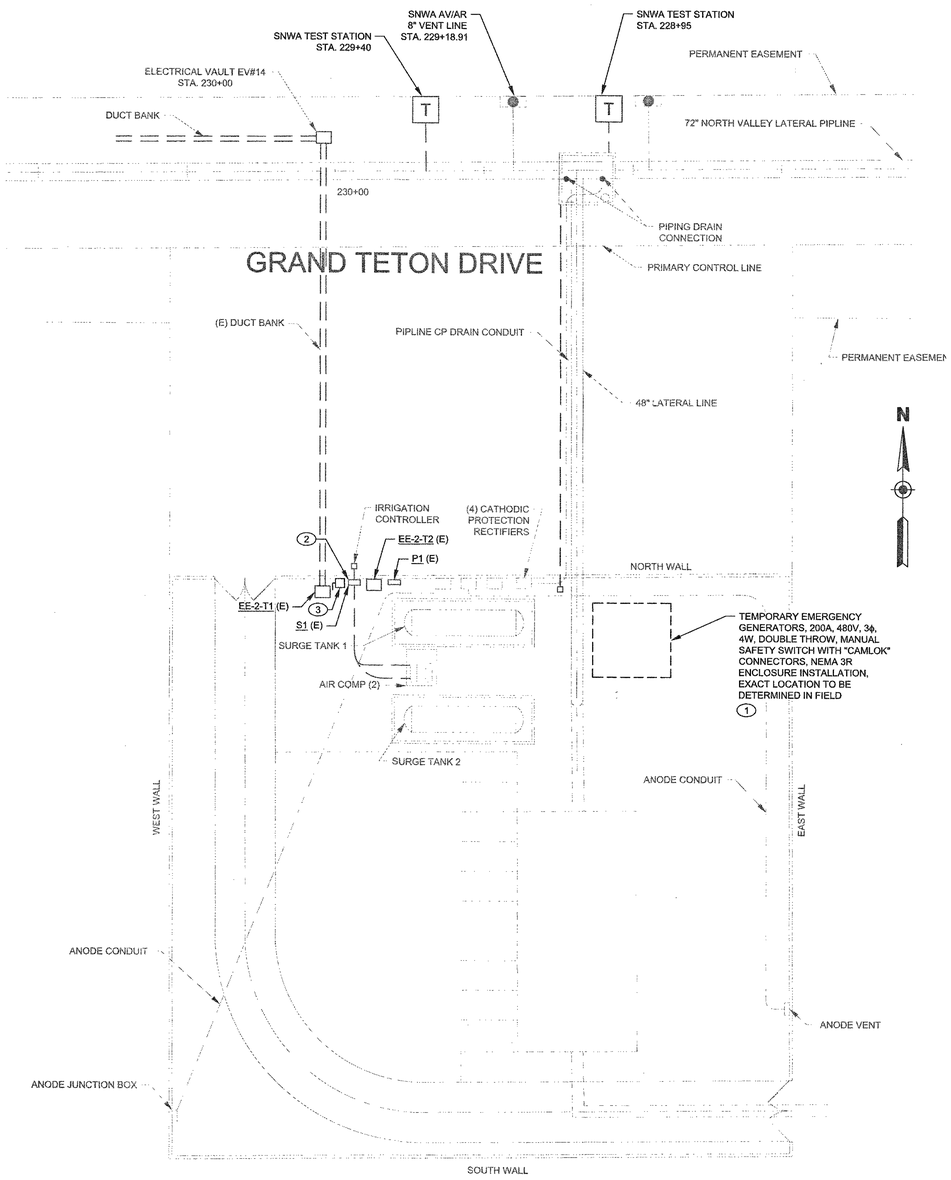
"SNWA FIBER OPTIC CONDUIT RUNS ALONG THE WEST/SOUTH SIDE OF THE SNWA LATERAL"

GENERAL NOTES:

1. OPERATIONS OF SURGE TANKS IS TO REMAIN IN SERVICE DURING DURATION OF GRAND TETON SNWA 5KV WORK.

KEY NOTES: (#)

1. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL (2) 125KW EMERGENCY GENERATORS AND 200A, 480V, 3ϕ, 4W, DOUBLE THROW, MANUAL SAFETY SWITCH WITH "CAMLOK" CONNECTORS, NEMA 3R ENCLOSURE TO PROVIDE CONTINUOUS (480/277V) TEMPORARY SERVICE TO EXISTING PANEL 'S1'.
2. LVVWD PERSONNEL TO PROVIDE ALL WORK AND MATERIALS TO DISCONNECT AND RE-CONNECT EXISTING PANEL 'S1'.
3. NEW 200A, 480Y/277V, 3ϕ, 4W 200A, 480V, 3ϕ, 4W, DOUBLE THROW, MANUAL SAFETY SWITCH WITH "CAMLOK" CONNECTORS, NEMA 3R ENCLOSURE.



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Alphonso Roberts, JR — Southern Nevada Water Authority — 9/5/18 — Date

DPR# 2016-0060

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1 POWER PLAN - AREA 2 - SURGE TANK SITE PLAN
SCALE: 1" = 20'-0"

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. AS TO USE	APP.

CITY OF NORTH LAS VEGAS

PH WEST HOLDINGS, INC.

VALLEY VISTA

POWER PLAN - AREA 2 - SURGE TANK SITE PLAN

S 18
T 19S
R 61E

DATE: 08/15/2017
DRAFTER: TJK
DESIGNER: TJK
CHECKED: TJK
PROJECT NO.
SUN1403-000

tjk consulting engineers, inc.
8728 Spanish Ridge Avenue
Suite 100
Las Vegas, NV 89148
P: 702.871.3621
F: 702.871.8353
www.tjkengineers.com

PROFESSIONAL ENGINEER STATE OF NEVADA
THOMAS M. ANDERSON
EXP. 12-31-18
ELECTRICAL
No. 13946
5/8/18

E202
SHEET 121 OF 125

TJK # 17075
C.V 731-98
CNLV PROJECT NO. 57838
L-6022

PROJ.#:124070 AGREE#:115666 QS:124-07-SW/NE,124-18-NW/NE

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.

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AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS. IT'S COSTLY.

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BENCHMARK:
NLV9117NWS
NAVD 88 ELEVATION PUBLISHED 6/30/15
699.482 METERS, 2294.88 FEET
ELEVATION USED FOR THESE PLANS, PRE-REVISION
699.511 METERS, 2294.98 FEET
RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM NO. NLV9117NWS, SET IN THE TOP OF CURB, LOCATED APPROX. 29 FEET SOUTH OF THE SOUTHEAST SOUTH BCR AT THE INTERSECTION OF GRAND TETON DR. AND ALIANTE PKWY.

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Southern Nevada Water Authority — 9/5/18 Date

DPR# 2016-0060

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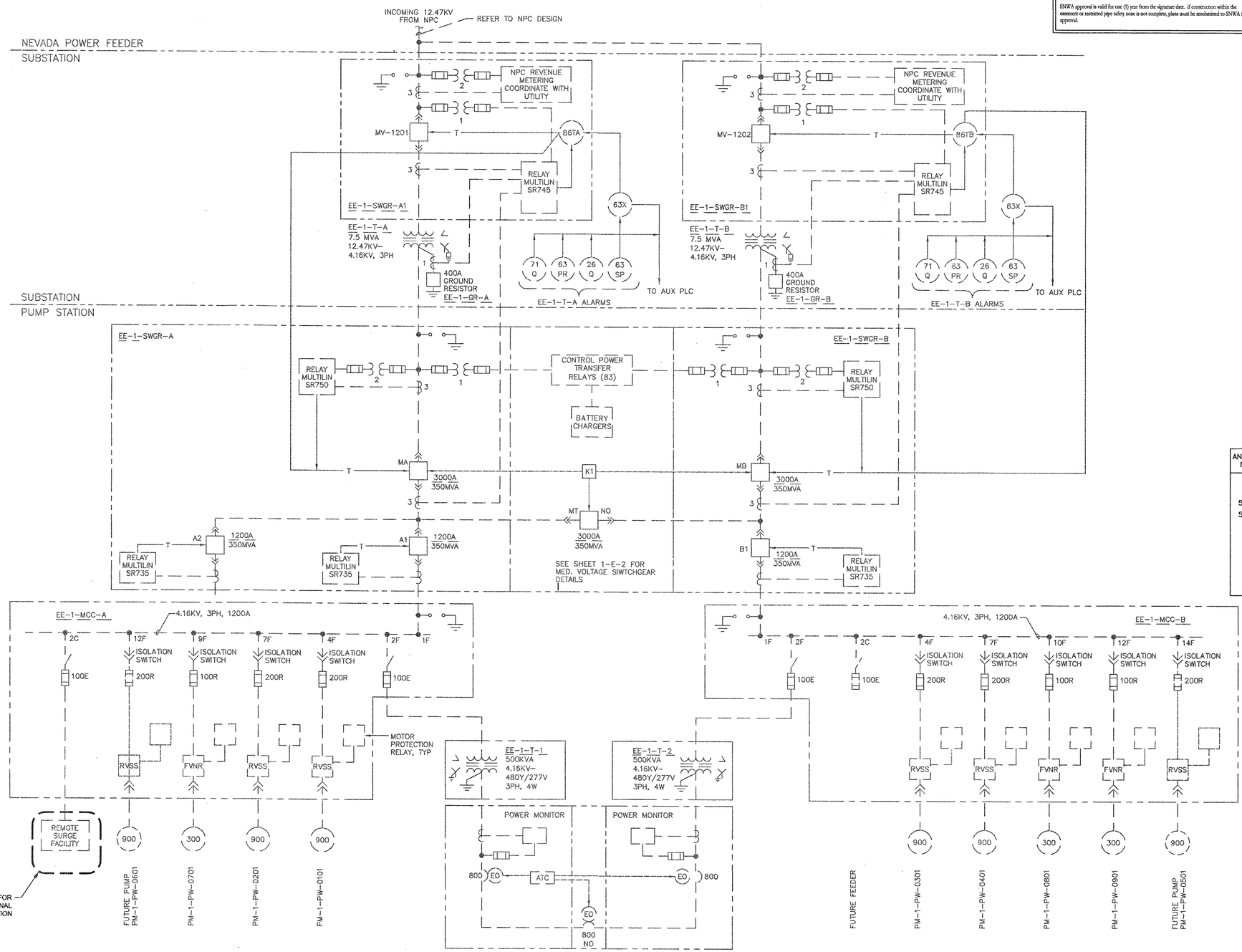

ANSI DEVICE NUMBER	DEFINITION
46/50	NEGATIVE SEQUENCE INSTANTANEOUS PHASE OVER CURRENT RELAY
46/51	NEGATIVE SEQUENCE TIME PHASE OVER CURRENT RELAY
50N/50G	INSTANTANEOUS GROUND OVER CURRENT RELAY
51N/51G	TIMED GROUND OVER CURRENT RELAY
59/81	OVER EXCITATION
59/81	TIME DELAY OVER VOLTAGE RELAY
81 U	FREQUENCY RELAY – UNDER FREQUENCY
83	AUTOMATIC TRANSFER RELAY
87	PERCENT CURRENT DIFFERENTIAL
87/50	UNRESTRAINED DIFFERENTIAL INSTANEOUS OVERCURRENT

LEGEND:
RVSS REDUCED VOLTAGE, SOLID STATE
FVNR FULL VOLTAGE, NON-REVERSING
ATC AUTOMATIC THROWOVER CONTROL

SINGLE LINE DIAGRAM (EXISTING FOR REFERENCE ONLY)

SCALE: NTS

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
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PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS

PH WEST HOLDINGS, INC.

VALLEY VISTA

SINGLE LINE

S 18 T 19S R 61E

DATE: 08/15/2017
DRAFTER: TJK
DESIGNER: TJK
CHECKED: TJK
PROJECT NO. SUN1403-000

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PROFESSIONAL ENGINEER STATE OF NEVADA THOMAS M. ANDERSON EXP. 12-31-19 ELECTRICAL No. 13946
5/8/18

TJK # 17075

CLV 731-98

E500
SHEET 122 OF 125

CNLV PROJECT NO. 57838
L-60221

PROJ#:124070 AGREE#:115666 QS:124-07-SW/NE,124-18-NW/NE

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Alphonse Roberts, PE — Southern Nevada Water Authority — 9/5/18 — Date

DPR# 2016-0060

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SINGLE LINE

GENERAL NOTES:

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KEY NOTES: (#)

1. ALL DISCONNECTION, LOCKOUT/TAG-OUT AND RECONNECTION OF FEEDERS SHALL BE BY SNWA PERSONNEL.
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3. PROVIDE NEW ELECTRICAL VAULT. SEE DETAIL 1 ON SHEET E201 FOR MORE INFORMATION.
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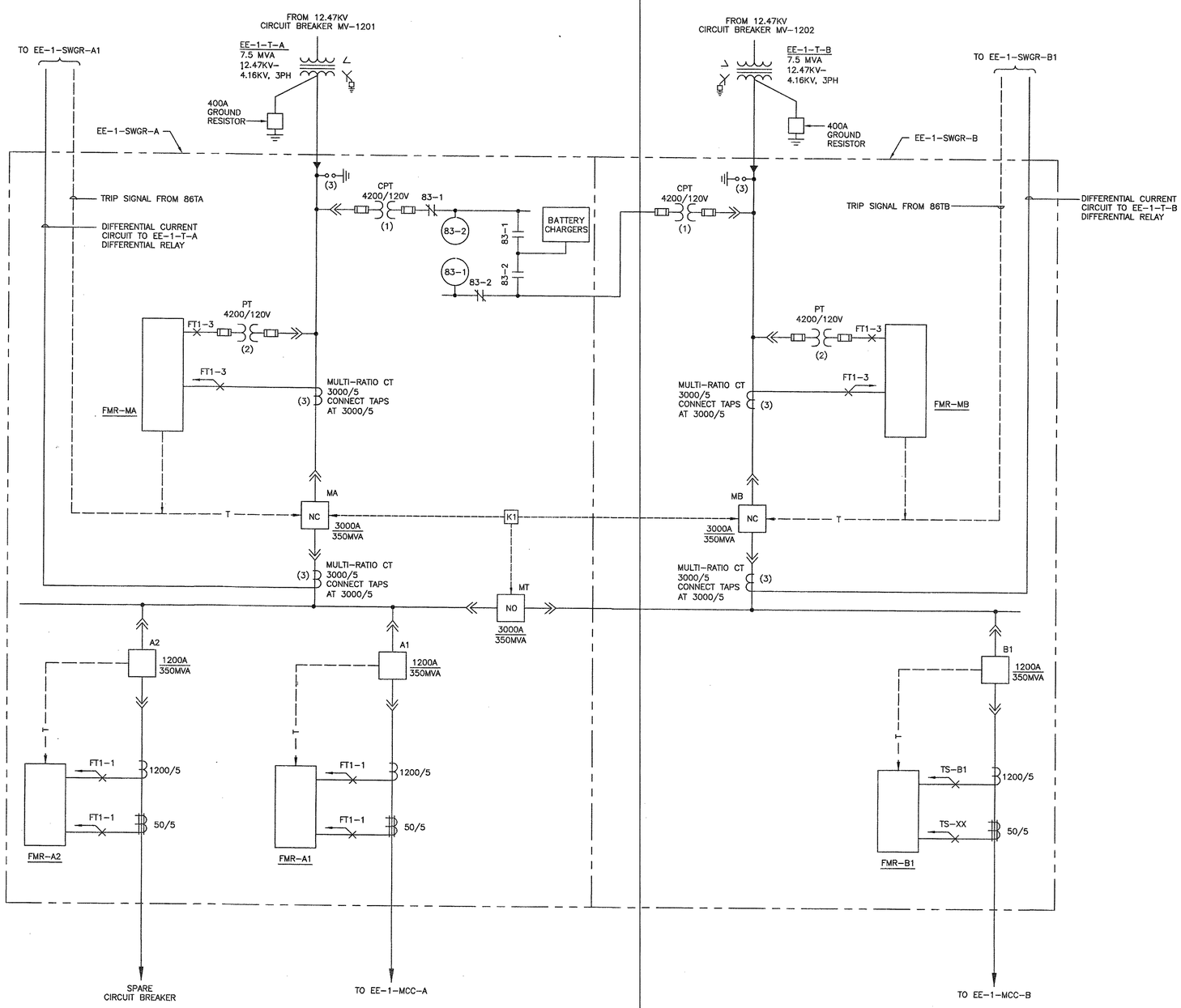

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50N/50G	INSTANTANEOUS GROUND OVER CURRENT RELAY
51N/51G	TIMED GROUND OVER CURRENT RELAY
51	TIMED PHASE OVER CURRENT RELAY
59	TIME DELAY OVER VOLTAGE RELAY
81 O/U	FREQUENCY RELAY - OVER OR UNDER FREQUENCY
83	AUTOMATIC TRANSFER RELAY

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SCALE: NTS

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS

PH WEST HOLDINGS, INC.

VALLEY VISTA

SINGLE LINE

S18 T19S R61E

DATE: 08/15/2017
DRAFTER: TJK
DESIGNER: TJK
CHECKED: TJK

PROJECT NO.
SUN1403-000

tjk consulting engineers, inc.
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PROFESSIONAL ENGINEER STATE OF NEVADA
THOMAS M. ANDERSON
EXP. 12-31-18
ELECTRICAL
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5/8/18

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CLV 731-98

E501

SHEET 123 OF 125

CNLV PROJECT NO. 57838
L-60221

PRO.#:124070 AGREE#:115666 QS:124-07-SW/NE,124-18-NW/NE

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Alphonso Roberts, II — Southern Nevada Water Authority — 9/5/18 Date

DPR# 2016-0060

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SCHEDULES

GENERAL NOTES:

1. SERVICE TO EXISTING PANEL 'S1' SHALL BE MAINTAINED FOR DURATION OF NV CABLE WORK AT GRAND TETON DRIVE, SERVICE INTERRUPTION SHALL BE KEPT TO ABSOLUTE MINIMUM FOR CONNECTION OF TEMPORARY POWER.

KEY NOTES: (#)

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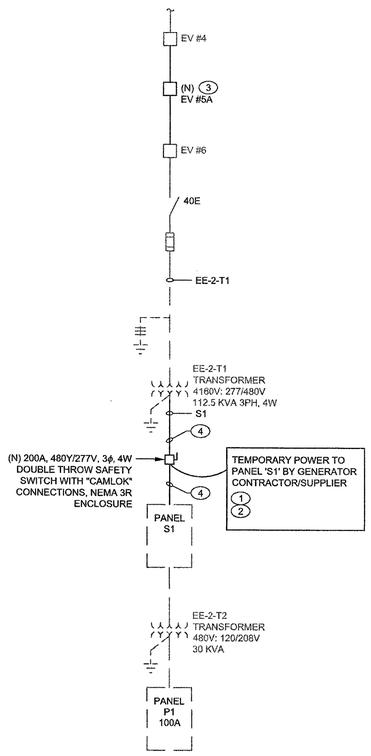
4. PERMANENT CONNECTION FROM EXISTING TRANSFORMER EE-2-TI TO NEW DOUBLE-THROW SWITCH AND FROM SWITCH TO EXISTING PANEL 'S1' SHALL BE BY SNWA.

FEEDER SCHEDULE - DISTRIBUTION EQUIPMENT

ALL CONDUIT AND CONDUCTOR VOLTAGE DROP WAS BASED ON DESIGN ESTIMATE AND DOES NOT REFLECT FIELD CONDITIONS. CONTRACTOR TO VERIFY ALL CONDUIT/CONDUCTOR WIRE SIZES FOR VOLTAGE DROP IN THE FIELD IF LONGER THAN WHAT HAS BEEN ESTIMATED. V17.2

FEEDER ID	DISTRIBUTION EQUIPMENT NAME	BUS AMPACITY	DISTANCE (ESTIMATE - FT)	TYPE	NUMBER OF RUNS	FEEDER SIZE	CONDUIT TYPE	VOLTAGE DROP (%)	MINIMUM AIC (AMPS) CALCULATED
EE-2-T1	TRANSFORMER EE-2-T1	7.4	17700	CU	1	3#2/0, 1#6, 4"C	NONMETALIC	0.52%	-
S1	PANEL S1	64.2	25	CU	1	3#4/0, 1#3/0, 2-1/2"C	NONMETALIC	0.04%	-

TO EE-1MCC-A SEE SHEET E500 FOR CONTINUATION



SINGLE LINE DIAGRAM (FOR REFERENCE ONLY)

SCALE: NTS

EXISTING PANEL P1

LOCATION: SURGE TANK
SUPPLY FROM:
MIN. BUS CAPACITY (A): 100
MAIN BREAKER:

VOLTAGE 120/208V
PHASES: THREE
WIRES: THREE
NOTES:

ENCLOSURE TYPE:
MOUNTING: EXISTING
AIC RATING (A):

NOTES	CKTS	LOAD	LOAD DESCRIPTION	CKT BRK TRIP	CONNECTED LOAD (VA)			CKT BRK TRIP	LOAD DESCRIPTION	LOAD	CKTS	NOTES
1	1	L	COMPRESSOR LIGHTING	20	300	A	100	30	SURGE ARRESTER	O	2	1
1	3	R	COMPRESSOR RECEPTACLE	20	200	B	100	30	SURGE ARRESTER	O	4	1
1	5	O	EAST PIPLINE CP RECTIFIER	20	1000	C	100	30	SURGE ARRESTER	O	6	1
1	7	O	WEST PIPLINE CP RECTIFIER	20	1000	A	500	20	UPS POWER	O	8	1
1	9	O	SURGE TANK NO.1 CP RECTIFIER	20	500	B	500	20	UPS POWER	O	10	1
1	11	O	SURGE TANK NO.2 CP RECTIFIER	20	500	C	180	20	PANEL RECEPTACLE	R	12	1
1	13	R	RECEPTACLE	20	180	A	750	20	CONTROL PANEL AIR CONDITIONER	M	14	1
1	15	R	RECEPTACLE	20	360	B	750	20	CONTROL PANEL AIR CONDITIONER	M	16	1
1	17	O	IRRIGATION CONTROLLER	20	500	C	720	20	LIGHTING	L	18	1
1	19	O	HEAT TRACE - 8WIFT X 50FT	20	400	A	720	20	LIGHTING	L	20	1
1	21		SPARE	20		B	520	20	LIGHTING	L	22	1
1	23		SPACE			C	520	20	LIGHTING	L	24	1
1	25		SPACE			A					26	1
1	27		SPACE			B					28	1
1	29		SPACE			C					30	1

	CONNECTED VA		DEMAND VA
TOTAL RECEPTACLE (R)	920	100%	920
TOTAL MOTOR (M) LOAD	1,500	138%	2,063
TOTAL LIGHTING (L) LOAD @ 125%	2,780	125%	3,475
TOTAL KITCHEN (K) LOAD @100%	0	0%	0
TOTAL FIXED (F) LOAD	0	0%	0
TOTAL OTHER (O) LOAD	5,200	100%	5,200
TOTAL ELEVATOR (EL) LOAD @ 100%	0	0%	0
TOTAL	10,400		11,658

	AMP/PHASE
CONNECT	A 57 B 142.3 C 150.8
DEMAND	A 136.6 B 136.6 C 136.6
TOTAL CONNECTED AMP	29
TOTAL DEMAND AMP	32
PERCENT LOADED	32%

NOTES:
1. EXISTING BREAKER
2. PROVIDE SHUNT TRIP DEVICE.
3. PROVIDE GFCI DEVICE.
4. PROVIDE RED CIRCUIT BREAKER
5. PROVIDE SUB-FEED BREAKER.
6. CONTROLLED VIA RELAY.
7. EXISTING LOAD REMOVED. REUSE EXISTING BREAKER.
8. CIRCUIT BREAKER CONTROLLED BY OTHER EQUIPMENT.
9. PROVIDE NEW BREAKER, MOUNTING HARDWARE, MATCH TYPE AND AIC RATING.

*CONNECTED PANEL (S) LOADS INCLUDED ABOVE

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EXISTING S1

LOCATION: SURGE TANK
SUPPLY FROM: EE-2-T1
MIN. BUS CAPACITY (A): 200
MAIN BREAKER: YES

VOLTAGE 480Y/277V
PHASES: THREE
WIRES: FOUR
NOTES:

ENCLOSURE TYPE:
MOUNTING: EXISTING
AIC RATING (A): 22000.00

NOTES	CKTS	LOAD	LOAD DESCRIPTION	CKT BRK TRIP	CONNECTED LOAD (VA)			CKT BRK TRIP	LOAD DESCRIPTION	LOAD	CKTS	NOTES
1	1	O			3900	A	3400			O	2	1
1	3	O	NORTH COMPRESSOR	25/3	3900	B	3400	30/3	TRANSFORMER EE-2-T2	O	4	1
1	5	O			3900	C	3400			O	6	1
1	7	O			3900	A	6800			R	8	1
1	9	O	WEST PIPLINE CP RECTIFIER	25/3	3900	B	6800	20/3	RECEPTACLE	R	10	1
1	11	O			3900	C	6800			R	12	1
1	13		SPARE		0	A	0	20	SPARE		14	1
1	15		SPARE		0	B	0	20	SPARE		16	1
1	17		SPARE		0	C	0	20	SPARE		18	1
	19		SPACE		0	A	0		SPACE		20	
	21		SPACE			B	0		SPACE		22	
	23		SPACE			C	0		SPACE		24	
	25					A					26	
	27					B					28	
	29					C					30	

	CONNECTED VA		DEMAND VA
TOTAL RECEPTACLE (R)	20,400	75%	15,200
TOTAL MOTOR (M) LOAD	0	0%	0
TOTAL LIGHTING (L) LOAD @ 125%	0	0%	0
TOTAL KITCHEN (K) LOAD @100%	0	0%	0
TOTAL FIXED (F) LOAD	0	0%	0
TOTAL OTHER (O) LOAD	33,600	100%	33,600
TOTAL ELEVATOR (EL) LOAD @ 100%	0	0%	0
TOTAL	54,000		48,800

	AMP/PHASE
CONNECT	A 165 B 165 C 165
DEMAND	A 158.7 B 158.7 C 158.7
TOTAL CONNECTED AMP	65
TOTAL DEMAND AMP	59
PERCENT LOADED	29%

NOTES:
1. EXISTING BREAKER
2. PROVIDE SHUNT TRIP DEVICE.
3. PROVIDE GFCI DEVICE.
4. PROVIDE RED CIRCUIT BREAKER
5. PROVIDE SUB-FEED BREAKER.
6. CONTROLLED VIA RELAY.
7. EXISTING LOAD REMOVED. REUSE EXISTING BREAKER.
8. CIRCUIT BREAKER CONTROLLED BY OTHER EQUIPMENT.
9. PROVIDE NEW BREAKER, MOUNTING HARDWARE, MATCH TYPE AND AIC RATING.

*CONNECTED PANEL (S) LOADS INCLUDED ABOVE

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TJK Consulting Engineers, Inc.

SNWA PH West
Holding RFC Facility

Close

Cable Pull Calculations

	#/C	Wire
Phase wire	3	2/0
Ground wire	1	1

This pull indicates a maximum tension (lb. 1,386
This pull indicates a maximum sidewall pressure (lb 187

Feeder Number: EV#4 to EV#5A
Origin: EV#4
Destination: EV#5A
Conduit Size: 4" PVC Sch 40 or HDPE
Number of Sets: 1
Length in Feet: 1390

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS

PH WEST HOLDINGS, INC.

VALLEY VISTA

SCHEDULES

S18 T19S R61E

DATE: 08/15/2017
DRAFTER: TJK
DESIGNER: TJK
CHECKED: TJK
PROJECT NO.
SUN1403-000

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CLV 731-98

PROFESSIONAL ENGINEER — STATE OF NEVADA — THOMAS M. ANDERSON — EXP. 12-31-18 — ELECTRICAL — No. 13946 — 5/8/18

E600
SHEET 124 OF 125

CNLV PROJECT NO. 57838
L-60221

PROJ.#:124070 AGREE#:115666 QS:124-07-SW/NE,124-18-NW/NE

GENERAL STRUCTURAL NOTES

GENERAL REQUIREMENTS

DRAWINGS

THESE DRAWINGS HAVE BEEN PREPARED USINGS STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE STRUCTURAL ENGINEERS IN THIS OR SIMILAR LOCALITIES. THEY NECESSARILY ASSUME THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKERS WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, IT IS UNDERSTOOD THAT THE CONTRACTOR WILL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR ALL MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.

MISCELLANEOUS ITEMS

CALCULATION AND DESIGN OF MISCELLANEOUS NON-STRUCTURAL ITEMS, SUCH AS STAIRS, RAILINGS, NON-STRUCTURAL WALLS AND PREFABRICATED STRUCTURAL ITEMS, SUCH AS FLOOR AND ROOF TRUSSES, ARE NOT INCLUDED AND ARE TO BE PROVIDED BY OTHERS UNLESS SPECIFICALLY NOTED ON THESE DRAWINGS.

CONSTRUCTION MEANS AND METHODS

THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DESIGN AND PROVIDE ADEQUATE SHORING, BRACING, FORM-WORK, ETC... AS REQUIRED FOR THE PROTECTION OF LIFE AND PROPERTY (INCLUDING UTILITIES) DURING CONSTRUCTION. CONSTRUCTION MATERIALS SHALL BE PLACED ON THE STRUCTURE SUCH THAT THE DESIGN LOADS ARE NOT EXCEEDED.

DIMENSIONS, INSERTS AND OPENINGS

THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS, CONDITIONS, AND ELEVATIONS WITH ARCHITECTURAL DRAWINGS PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR SHALL INFORM THE ARCHITECT IN WRITING OF ANY DISCREPANCIES OR OMISSIONS NOTED ON THE DRAWINGS. ANY SUCH DISCREPANCY, OMISSION, OR VARIATION NOT REPORTED BEFORE START OF CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. WHERE DISCREPENCIES OCCUR IN THESE DRAWINGS, NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STUCTURAL NOTES AND TYPICAL DETAILS.

CONTRACTOR SHALL ESTABLISH AND VERIFY ALL OPENINGS AND INSERTS FOR ARCHITECTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL WITH APPROPRIATE TRADES, DRAWINGS AND SUBCONTRACTORS PRIOR TO CONSTRUCTION.

STANDARDS

WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE EDITION REFERENCED IN THE GOVERNING BUILDING CODE.

TYPICAL DETAILS AND NOTES

TYPICAL DETAILS AND NOTES SHALL APPLY, THOUGH NOT NECESSARILY INDICATED AT A SPECIFIC LOCATION ON PLANS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT. DETAILS MAY SHOW ONLY ONE SIDE OF CONNECTION OR MAY OMIT INFORMATION FOR CLARITY.

SHOP DRAWINGS

SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL ITEMS. SHOP DRAWINGS ARE REVIEWED ONLY FOR GENEREAL COMPLIANCE WITH THE STRUCTURAL DRAWINGS. REVIEW DOES NOT INDICATE THAT THE SHOP DRAWINGS ARE CORRECT OR COMPLETE. RESPONSIBILITY FOR CORRECTNESS SHALL REST WITH THE CONTRACTOR. ANY CHANGES, SUBSTITUTIONS, OR DEVIATIONS FROM CONTRACT DRAWINGS SHALL BE CLOUDED. ANY OF THE AFOREMENTIONED SHALL NOT BE CONSIDERED APPROVED AFTER ENGINEER'S REVIEW UNLESS SPECIFICALLY NOTED ACCORDINGLY. THE SHOP DRAWINGS DO NOT SUPERSEDE OR REPLACE THE ORIGINAL CONTRACT DRAWINGS. ANY ENGINEERING PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW SHALL BEAR THE SEAL OF AN APPROPRIATELY REGISTERED ENGINEER. ENGINEERING SYSTEM SOLUTIONS SHALL NOT BE RESPONSIBLE FOR THE ADEQUACY OF ENGINEERING DESIGNS PERFORMED BY OTHERS. FIVE WORKING DAYS SHALL BE ALLOWED FOR THE ENGINEER'S REVIEW. CONTRACTOR SHALL PROVIDE A COPY OF EACH SUBMITTAL FOR ENGINEERING SYSTEM SOLUTIONS RECORDS.

SHOP DRAWINGS SHALL REFERENCE DATE AND DELTA (IF ANY) OF CONTRACT DRAWINGS.

MOLD

MOLD CONCERNS AND PREVENTION IS OUT OF ENGINEERING SYSTEM SOLUTIONS SCOPE OF SERVICES. ENGINEERING SYSTEM SOLUTIONS SHALL BE HELD HARMLESS, TO THE EXTENT OF THE LAW, FOR ALL MOLD PREVENTION AND MOLD RELATED CONCERNS.

DEFERRED SUBMITTALS

SPECIALTY ITEMS

PREFABRICATED OR SPECIALTY ITEMS AND THEIR COMPONENTS, WHICH ARE INDICATED BY THE STRUCTURAL DRAWINGS TO BE DESIGNED BY OTHERS, MAY BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AS A DEFERRED SUBMITTAL PROVIDED THAT SUCH SUBMITTAL IS AUTHORIZED BY THE AUTHORITY HAVING JURISDICTION. DEFERRED SUBMITTALS REQUIRED TO BE SUBMITTED TO THE STRUCTURAL ENGINEER OF RECORD SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:

- CONCRETE MIX DESIGN
- REBAR PLACEMENT SHOP DRAWINGS

PREPARATION

ALL DEFERRED SUBMITTALS SHALL INCLUDE CALCULATIONS AND DRAWINGS PREPARED IN ACCORDANCE WITH ALL APPLICABLE DESIGN CODES AND STAMPED BY AN APPROPRIATELY LICENSED PROFESSIONAL ENGINEER. SUBMITTALS SHALL SHOW LOCATION AND MAGNITUDE OF LOADS, SIZE AND CONFIGURATIONS OF MEMBERS, AND COMPATIBILITY WITH THE PRIMARY STRUCTURAL SYSTEM.

REVIEW

DEFERRED SUBMITTAL ITEMS SHALL BE REVIEWED IN ACCORDANCE WITH STANDARD SHOP DRAWING REVIEW PROCEDURES AS DESCRIBED IN THE GENERAL REQUIREMENTS SECTION OF THE GENERAL STRUCTURAL NOTES.

SPECIAL INSPECTIONS

A SPECIAL INSPECTOR SHALL BE PROVIDED TO OBSERVE WORK FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS. THE INSPECTOR SHALL SUBMIT A SIGNED STATEMENT TO THE OWNER, CONTRACTOR, AND ENGINEER INDICATING THE SPECIAL INSPECTION WORK WAS IN COMPLIANCE WITH THE PLANS AND SPECIFICATIONS.

SPECIAL INSPECTIONS SHALL BE PROVIDED FOR THE FOLLOWING WORK:

- BACKFILL
- REINFORCEMENT
- CONCRETE

BASIS FOR DESIGN

GOVERNING BUILDING CODE	2012 IBC (W/ SOUTHERN NEVADA AMENDMENTS)
DEAD LOAD	
STRUCTURE SELF-WEIGHT CONCRETE	150 PCF
POLE AND EQUIP SELF WT	
SOILS	
SOIL BEARING PRESSURE (D+L)	2000 PSF
MINIMUM FOOTING EMBEDMENT DEPTH	12 INCHES
LATERAL BEARING PRESSURE	100 PCF
COEFFICIENT OF FRICTION FOR LATERAL SLIDING RESISTANCE	0.25
SEISMIC	
SITE CLASS	C
SEISMIC DESIGN CATEGORY	C
Ss	0.485g
SDS (SHORT PERIOD)	0.388g
WIND	
BASIC WIND SPEED	115 MPH
EXPOSURE	C

FOUNDATION

DESIGN RECOMMENDATIONS

FIRM: OWENS GEOTECHNICAL INC; REPORT NO.: E-06-022; DATE: 26 APR 2006; AND UPDATE LETTER: FIRM: NOVA GEOTECHNICAL; DATE: 29 AUG 2016

CONSTRUCTION

ALL SITE PREPARATION, GRADING, COMPACTION TESTS, INSPECTIONS, ETC. SHALL BE FOLLOWED WITH STRICT ADHERENCE AND SHALL BE COMPLETED PRIOR TO ANY CONCRETE PLACEMENT. SEE ACI 325.3 FOR FURTHER REQUIREMENTS.

ENGINEERING SYSTEM SOLUTIONS ASSUMES NO LIABILITY FOR GROUNDWATER OR OTHER MEANS OF FLOODING.

FOOTING EMBEDMENT

ALL FOOTINGS SHALL EXTEND BELOW GRADE THE MINIMUM EMBEDMENT DEPTH AS NOTED ON THE FOUNDATION PLAN.

GRADE IS DEFINED AS FOLLOWS

THE LOWEST OF THE FOLLOWING (BEFORE LANDSCAPING):

- BUILDING PAD SUBGRADE
- LOWEST SURROUNDING SOIL GRADE WITHIN 5'-0" OF BUILDING

SLAB ON GRADE

SUPPORT PER THE GEOTECHNICAL RECOMMENDATIONS.

FOLLOW ACI 302.1 RECOMMENDATIONS FOR PLACING CONCRETE, CURING, AND QUALITY CONTROL.

BACKFILL

BACKFILL SHALL NOT BE PLACED AGAINST EXTERIOR WALLS UNTIL THE INTERIOR FLOOR SYSTEM CAN ADEQUATELY BRACE THE WALL.

BACKFILL AND RECOMPACT ALL TRENCHES PER THE GEOTECHNICAL REPORT. (MIN 90% DRY DENSITY)

DRAINAGE

PROVIDE ADEQUATE DRAINAGE AWAY FROM THE STRUCTURE.

REINFORCING STEEL

REINFORCING BARS SHALL BE DEFORMED, EXCEPT AS NOTED IN ACI 301.

USE OF EPOXY-COATED BARS IS NOT PERMITTED.

GRADE

ALL WELDED BARS SHALL BE GRADE 60, REFER TO ASTM STANDARD A706.

#4 BARS OR LARGER SHALL BE GRADE 60, REFER TO ASTM STANDARD A615.

#3 BARS OR SMALLER SHALL BE GRADE 40, REFER TO ASTM STANDARD A615.

CLEAR COVER

ALL DIMENSIONS NOT NOTED AS "CLR" ARE TO THE CENTER OF THE BAR.

FOR CLEAR COVER REQUIREMENTS REFER TO TYPICAL DETAIL "MINIMUM COVER FOR NON-PRESTRESSED STEEL".

REINFORCEMENT SUPPORTS

REINFORCEMENT SUPPORT SHALL BE PROVIDED TO MAINTAIN CLEAR DIMENSIONS SHOWN ON PLANS AND SHALL CONFORM TO ONE OF THE FOLLOWING SUPPORT TYPES: WIRE, COATED WIRE, PRECAST CONCRETE, PLASTIC.

REINFORCEMENT SUPPORT SHALL COMPLY WITH ACI 301.

LAP SPLICING

UNLESS NOTED OTHERWISE TACK WELDING OF REINFORCING BARS NOT ALLOWED.

FOR LAP LENGTH REQUIREMENTS REFER TO TYPICAL DETAIL "LAP LENGTH SCHEDULE".

MECHANICAL SPLICE COUPLERS

MECHANICAL SPLICE COUPLERS SHALL HAVE CURRENT ICC-ES APPROVAL AND SHALL BE CAPABLE OF DEVELOPING 125% OF THE STRENGTH OF THE BAR.

WELDING

WELDING OF REINFORCING BARS, METAL INSERTS, AND CONNECTIONS SHALL CONFORM TO AWS D1.4. BENDING SHALL BE MADE ONLY AT LOCATIONS SHOWN ON PLANS OR DETAILS. ALL REINFORCING SHALL BE BENT COLD. BARS SHALL NOT BE UN-BENT AND RE-BENT.

BENDING

BENDING SHALL BE MADE ONLY AT LOCATIONS SHOWN ON PLANS OR DETAILS. ALL REINFORCING SHALL BE BENT COLD. BARS SHALL NOT BE UNBENT AND REBENT. #5 BAR AND SMALLER MAY BE COLD FIELD BENT. #6 BAR AND LARGER SHALL NOT BE FIELD BENT WITHOUT PRIOR APPROVAL FROM ENGINEER.

PLACE AND DETAIL

ALL BARS SHALL BE DETAILED AND PLACED PER CRSI SPECIFICATIONS AND HANDBOOK. DOWEL ALL VERTICAL REINFORCING TO FOUNDATION. SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE.

CONCRETE

MATERIAL

MINIMUM 28 DAY COMPRESSIVE STRENGTH IS 4000 PSI

CEMENT SHALL BE TYPE V.

MAXIMUM W/C RATIO SHALL BE 0.45.

CONCRETE SLUMP SHALL BE 4-6 INCHES.

ALL CONCRETE SHALL BE NORMAL WEIGHT OF 145 POUND PER CUBIC FOOT UNLESS NOTED OTHERWISE, USING HARD ROCK AGGREGATES CONFORMING TO ASTM C33. MAXIMUM AGGREGATE SIZE FOR STRUCTURAL ELEMENTS SHALL NOT EXCEED 3/4".

BATCHING, MIXING, AND TRANSPORTING

BATCHING, MIXING, AND TRANSPORTING CONCRETE SHALL BE PER ACI 301.

CONCRETE MIXES SHALL BE DESIGNED BY A CERTIFIED LABORATORY AND APPROVED BY THE ENGINEER OF RECORD.

PORTLAND CEMENT SHALL CONFORM TO ACI 301.

WATER SHALL NOT BE ADDED AT THE JOB SITE SUCH THAT THE APPROVED MIX DESIGN W/C RATIO IS EXCEEDED.

FORM WORK

FORM WORK SHALL BE PER ACI 301.

PLACING

PLACING OF CONCRETE SHALL BE PER ACI 301.

PLACING OF CONCRETE BY MEANS OF PUMPING SHALL BE PER ACI 301.

WHERE THERE IS A RISK OF PREMATURE DRYING, SUCH AS IN HOT OR WINDY WEATHER, CURING MEASURES SHALL BE IMPLEMENTED PER THE RECOMMENDATIONS OF ACI 301.

CONSOLIDATION

CONSOLIDATION OF CONCRETE SHALL BE PER ACI 301.

EMBEDDED ITEMS

EMBEDDED ITEMS SHALL BE PLACED PER ACI 301.

CONDUITS AND PIPES SHALL NOT BE EMBEDDED IN STRUCTURAL CONCRETE WITHOUT WRITTEN APPROVAL FROM THE ENGINEER OF RECORD.

EMBEDDED CONDUITS, PIPES, AND SLEEVES SHALL NOT BE LARGER IN DIAMETER THAN 1/3 THE OVERALL THICKNESS OF THE SLAB, BEAM, OR WALL IN WHICH THEY ARE EMBEDDED AND SHALL NOT BE SPACED CLOSER THAN 3 DIAMETERS OR ELEMENT WIDTHS ON CENTER.

NO ALUMINUM EMBEDS SHALL BE IN DIRECT CONTACT WITH CONCRETE.

COLD WEATHER CONCRETING

WHEN THE AIR TEMPERATURE IS BELOW 40°F, COLD WEATHER CONCRETE PROCEDURES SHALL BE USED PER ACI 301.

A CONSTRUCTION PLAN SHALL BE SUBMITTED TO THE ENGINEER DETAILING THE PROTECTION PROCEDURES PRIOR TO PLACEMENT OF CONCRETE.

HOT WEATHER CONCRETING

PRIOR TO CONCRETE PLACEMENT, TOP 3 INCHES OF SUB-BASE SHALL BE WETTED SUFFICIENTLY TO SATURATE SUB-BASE WITHOUT ANY STANDING WATER.

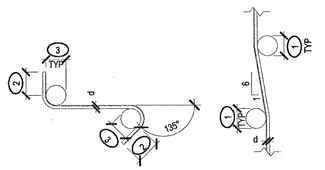
CONCRETE PLACEMENT TEMPERATURE MAY NOT EXCEED 90° FAHRENHEIT WHEN MEASURED IN ACCORDANCE WITH ASTM C1064.

STEEL FORMS AND REINFORCEMENT SHALL BE COOLED PRIOR TO CONCRETE PLACEMENT WHEN STEEL TEMPERATURES EXCEED 120° FAHRENHEIT.

MIX WATER, AGGREGATES, CONVEYING AND PLACING EQUIPMENT OR ANY COMBINATION OF THE ABOVE SHALL BE COOLED IF NECESSARY TO MAINTAIN PROPER CONCRETE PLACING TEMPERATURE.

MININUM REINFORCING COVER		
STRUCTURAL ELEMENT	COVER	TOLERANCE
FOOTING AND SLAB ON GRADE	3"	3/8"
WALLS (#5 OR SMALLER)	1 1/2"	3/8"
WALLS (#6 OR LARGER)	2"	1/2"
BEAMS AND COLUMNS	1 1/2"	3/8"
ELEVATED SLABS	3/4"	3/8"

2 / S1 MINIMUM COVER FOR REINFORCING STEEL
TDC102



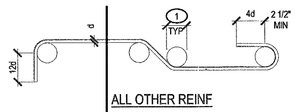
STIRRUP AND TIE HOOKS — OFFSET BAR

KEYNOTES:

1. MIN FINISHED BEND DIA: 6d FOR #3 THRU #8; 8d FOR #9, #10 AND #11; 10d FOR #14 AND #18
2. EXTENSION FOR STIRRUPS AND TIES ONLY: 90°: 6d FOR #5 AND SMALLER, 12d FOR #6 THRU #8 (3" MIN); 135°: 6d (3" MIN); 180°: 4d (2 1/2" MIN)
3. MIN FINISHED BEND DIA FOR STIRRUPS AND TIES ONLY: 4d FOR #5 AND SMALLER; 6d FOR #6 THRU #8

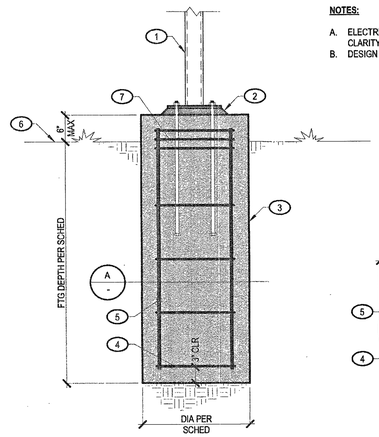
NOTES:

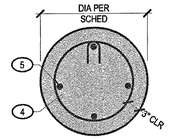
A. d = BAR DIA
B. ALL REINF SHALL BE BENT COLD UNO ON PLANS OR DETAILS
C. REINF SHALL NOT BE UN-BENT OR RE-BENT UNO



ALL OTHER REINF

3 / S1 STANDARD REBAR BENDING DETAILS
TDC103





SECTION A

LIGHT POLE FTG SCHED						
POLE TYPE	POLE HT	MAX ARM LENGTH	CAISSON DIA	FTG DEPTH	MAX LUMINAIRE SIZE	MAX LUMINAIRE WT
MBBX08	26' - 0"	15' - 0"	24"	5' - 3"	1.0 SQ FT	29 LB
2B226	26' - 4"	8' - 0"	24"	4' - 9"	1.0 SQ FT	29 LB

1 / S1 LIGHT POLE FOUNDATION
TDC702R

KEYNOTES:

1. LIGHTPOLE BASE PL AND ANCHOR BOLTS PER MFR
2. ±1 1/2" NON-SHRINK GROUT W/ LEVELING NUTS
3. CONC CAISSON
4. #3 TIES AT 10" O.C.
5. (4) #5 VERT
6. FINISHED GRADE PER CIVIL
7. (3) #3 TIES AT 2" O.C. AT T.O. CAISSON

NOTES:

A. ELECTRICAL CONDUITS NOT SHOWN FOR CLARITY
B. DESIGN BASED ON EA POLE HAVING (1) ARM

STANDARD ABBREVIATIONS

℄	CENTERLINE
(E)	EXISTING
AB	ANCHOR BOLT
ADDL	ADDITIONAL
ALT	ALTERNATE
ARCH	ARCHITECTURAL
ASD	ALLOWABLE STRESS DESIGN
BLDG	BUILDING
BLKG	BLOCKING
BN	BOUNDARY NAILING OR FASTENERS
BO	BOTTOM OF
BOT	BOTTOM
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
DBA	DEFORMED BAR ANCHOR
DBL	DOUBLE
DIA OR Ø	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DWG	DRAWING
EA	EACH
ELEV	ELEVATION
EN	EDGE NAILING
EQ	EQUAL
EQUIP	EQUIPMENT
EW	EACH WAY
FDN	FOUNDATION
FF	FINISH FLOOR
FLR	FLOOR
FN	FIELD NAILING
FT	FOOT
FTG	FOOTING
GA	GAUGE
GALV	GALVANIZED
GSN	GENERAL STRUCTURAL NOTES
GT	GIRDER TRUSS
HI	HIGH
HORIZ	HORIZONTAL
HSS	HOLLOW STRUCTURAL SHAPE
HT	HEIGHT
K	KIP (1,000 LBS)
KLF	KIPS PER LINEAR FOOT
KSF	KIPS PER SQUARE FOOT
KSI	KIPS PER SQUARE INCH
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LO	LOW
LONG	LONGITUDINAL
LRFD	LOAD AND RESISTANCE FACTOR DESIGN
LT	LIGHT
MAX	MAXIMUM
MECH	MECHANICAL
MFD	MANUFACTURED
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
NTS	NOT TO SCALE
O.C.	ON CENTER
OPP	OPPOSITE HAND
PL	PLATE
PLF	POUNDS PER LINEAR FOOT
PREFAB	PREFABRICATION
PRELIM	PRELIMINARY
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
REINF	REINFORCING
REQ'D	REQUIRED
RME	ROOF MOUNTED EQUIPMENT
SCHED	SCHEDULE
SIM	SIMILAR
SMS	SHEET METAL SCREW
SPEC	SPECIFICATION
STD	STANDARD
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
T.O.	TOP OF
TRANS	TRANSVERSE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
VIF	VERIFY IN FIELD
W	WITH
W/O	WITHOUT
WT	WEIGHT
WWF	WELDED WIRE FABRIC

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SEAL: STATE OF NEVADA — PROFESSIONAL ENGINEER — No. 15051 — CHRISTOPHER MEYER — Exp. 12/31/19 — STRUCTURAL — 05/08/2018

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PROJECT: VALLEY VISTA LIGHT POLE FOUNDATIONS
SLATER HANIFAN GROUP
NORTH LAS VEGAS, NV

SHEET TITLE: GENERAL STRUCTURAL NOTES

REV	DESCRIPTION	DATE
	MYLAR SET	05/08/2018
	SUBMIT FOR PERMIT	10/04/2017
	SUBMITTAL LOG	

DRAWN: TLR | CHECKED: SDG/GAM

PROJECT NUMBER: 17.2626
SHEET NUMBER: 731-99 L-6022 S1

PROJ.#:124070 AGREE#:115666 QS:124-07-SW/NE,124-18-NW/NE