## GENERAL NOTES

1. ENGINEERING DEPARTMENT'S CIVIL/SITE INSPECTION STAFF SHALL BE NOTIFIED 48 HOURS BEFORE ANY CONSTRUCTION BEGINS TELEPHONE (928) 753-8195.

2. ALL CONSTRUCTION TO CONFORM TO M.A.G. SPECIFICATIONS AND DETAILS AND CITY OF KINGMAN SUPPLEMENT TO M.A.G. SPECIFICATIONS AND DETAILS, UNLESS MODIFIED ON THE PLANS.

3. COMPACTION SHALL COMPLY WITH M.A.G. SECTION 601 & CITY OF KINGMAN SUPPLEMENTS.

4. CONSTRUCTION QUANTITIES ON THESE PLANS ARE NOT VERIFIED BY THE CITY.

5. ALL WORK MUST COMPLY WITH REQUIREMENTS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

6. EXISTING OR NEWLY DAMAGED AND/OR DISPLACED CONCRETE CURB, GUTTER, SIDEWALK, OR DRIVEWAY SLAB THAT IS WITHIN THE RIGHT-OF-WAY SHALL BE REPAIRED OR REPLACED, AS NOTED BY CITY INSPECTORS, BEFORE FINAL ACCEPTANCE OF THE WORK.

7. EXACT POINT OF PAVEMENT MATCHING, TERMINATION AND OVERLAY, IF NECESSARY SHALL BE DETERMINED IN THE FIELD BY THE CITY ENGINEER OR HIS/HER AUTHORIZED REPRESENTATIVE.

8. AN APPROVED PAVING PLAN SHALL BE ON THE JOB SITE AT ALL TIMES. DEVIATIONS FROM THE PLAN MUST BE PRECEDED BY AN APPROVED PLAN REVISION.

9. OBSTRUCTIONS TO THE PROPOSED IMPROVEMENTS IN THE RIGHT-OF-WAY SHALL BE REMOVED OR RELOCATED BEFORE BEGINNING CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.

10. ALL EXISTING CATCH BASINS MUST BE RE-LOCATED WHEN THEY ARE SHOWN IN A NEWLY PROPOSED DRIVEWAY.

11. ANY AND ALL MORE STRINGENT REQUIREMENTS REQUIRED BY FEDERAL, STATE, COUNTY, OR LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.

12. NO PAVING CONSTRUCTION SHALL BE STARTED UNTIL ALL UTILITY & STORM DRAIN LINES ARE COMPLETED UNDER PROPOSED PAVED AREAS.

13. UTILITY FACILITIES IN CONFLICT WITH THIS WORK SHALL BE RELOCATED BY THE CONTRACTOR. THIS ACTIVITY SHALL BE COORDINATED WITH THE OWNER OF THE UTILITY TO PREVENT ANY UNNECESSARY INTERRUPTION OF SERVICE.

14. THE PAVING CONTRACTOR SHALL BE RESPONSIBLE FOR THE ADJUSTMENT AND PLACEMENT OF CONCRETE COLLARS, FRAMES, COVERS, AND VALVE BOXES AS NECESSARY FOR A COMPLETE JOB AS APPROVED BY THE CITY ENGINEER OR HIS/HER AUTHORIZED REPRESENTATIVE.

15. CONCRETE OR ASPHALT DAMAGED DURING THE COURSE OF CONSTRUCTION SHALL BE REMOVED AND REPLACED IN KIND PRIOR TO FINAL INSPECTION.

16. GRADING BETWEEN BACK OF CURB AND PROPERTY LINE SHALL BE LIMITED TO 4:1 SLOPE.

17. BASE COURSE SHALL NOT BE PLACED UNTIL SUB-GRADE HAS BEEN APPROVED BY THE CITY ENGINEER OR HIS/HER AUTHORIZED REPRESENTATIVE.

18. NO JOB WILL BE CONSIDERED COMPLETE UNTIL CURBS, PAVEMENTS AND SIDEWALKS HAVE BEEN SWEPT CLEAN OF ALL DIRT AND DEBRIS; AND SURVEY MONUMENTS ARE INSTALLED BY A LAND SURVEYOR, REGISTERED IN THE STATE OF ARIZONA.

## GENERAL NOTES (CONTINUED)

19. THE LOCATION OF ALL WATER VALVES, FIRE HYDRANTS AND MANHOLES MUST AT ALL TIMES DURING CONSTRUCTION BE REFERENCED BY TTHE CONTRACTOR AND MADE AVAILABLE TO THE CITY.

20. EXISTING STREET AND TRAFFIC SIGNS WILL BE MAINTAINED DURING CONSTRUCTION AND RELOCATED BY THE CONTRACTOR AS DIRECTED BY THE CITY ENGINEER OR HIS/HER AUTHORIZED REPRESENTATIVE.

21. TREES AND SHRUBBERY IN THE RIGHT-OF-WAY THAT CONFLICT WITH PROPOSED IMPROVEMENTS SHALL NOT BE REMOVED WITHOUT APPROVAL OF THE ENGINEERING INSPECTOR.

22. IF UNANTICIPATED CONDITIONS ARE ENCOUNTERED DURING THE COURSE OF CONSTRUCTION AND ARE BEYOND THE SCOPE OF THE DESIGN, THE CONTRACTOR MUST SUBMIT CHANGES FOR APPROVAL BY THE CITY OF KINGMAN AND THE ENGINEER.

23. OMISSIONS OR CONFLICTS BETWEEN VARIOUS ELEMENTS OF THE DRAWINGS, NOTES, DETAILS, AND SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY AND RESOLVED PRIOR TO PROCEEDING WITH THE WORK.

24. THE CONTRACTOR IS REQUIRED TO CONTACT BLUE STAKE TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION TO DETERMINE ACCURATE UTILITY LOCATIONS. THE CONTRACTOR MUST KEEP ALL BLUE STAKE REQUESTS UP TO DATE, AND COMPLY WITH APPLICABLE ARIZONA REVISED STATUTES PERTAINING TO BLUE STAKE.

25. THE CONTRACTOR SHALL SUPPLY AND SET ALL STAKES FOR THE LINES, LEVELS, OR MEASUREMENTS OF THE WORK IN THEIR PROPER PLACES. ANY EXPENSE INCURRED IN REPLACING ANY STAKES WHICH THE CONTRACTOR OR HIS SUBORDINATES MAY HAVE FAILED TO PRESERVE SHALL BE THE CONTRACTOR'S RESPONSIBILITY. CONTRACTOR SHALL ALLOCATE COSTS FOR SAID SERVICES IN HIS UNIT PRICES FOR THE PROJECT.

26. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE BENCHMARK AND COMPARE THE SITE CONDITIONS WITH THE PLANS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES OBSERVED. SHOULD ANY BENCHMARK, GRADE OR DESIGN INDICATED ON THE PLANS BE SUSPECT THE ENGINEER SHALL BE NOTIFIED OF SAID BENCHMARK, GRADE OR PROBLEM AT LEAST TWENTY-FOUR HOURS BEFORE CONSTRUCTION IS SCHEDULED TO BEGIN IN THE AFFECTED AREA.

27. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PREPARATION AND FURNISHING OF "AS CONSTRUCTED" RECORD PRINTS; INCLUDING THE WORK OF EACH SUB-CONTRACTOR.

28. CONTRACTOR SHALL PREPARE A STORMWATER POLLUTION PREVENTION (SWPP) PLAN FOR THE PROJECT AS REQUIRED UNDER THE AZPDES PERMIT PROGRAM, AND IN ACCORDANCE WITH THE 2013 STORMWATER CONSTRUCTION GENERAL PERMIT (CGP). THE CONTRACTOR IS RESPONSIBLE FOR PREPARING AND FILING ALL NOIs AND NOTs ASSOCIATED WITH THIS CONSTRUCTION ACTIVITY.

29. CONTRACTOR SHALL NOT LEAVE TRENCHES OR OTHER EXCAVATIONS OPEN/UNCOVERED AFTER WORKING HOURS. CONTRACTOR SHALL FOLLOW ALL APPLICABLE OSHA STANDARDS FOR TRENCH SAFETY.

SEE SHEET E07 FOR STRIPING NOTES

## STORM DRAIN STRUCTURE SUMMARY:

| CATCH BASIN # | SHEET # | DESCRIPTION/INLET TYPE | DETAIL LOCATION |
|---|---|---|---|
| E1 | E05 | TRASH RACK INLET | MAG STD. DTL. 502 & DETAIL E ON SHEET E08 |

**SURVEY NOTE:**
THIS PLAN IS BASED ON SURVEY DATA PROVIDED BY THE CITY OF KINGMAN'S SURVEYING DIVISION. THE ENGINEER MAKES NO REPRESENTATION OR GUARANTEE REGARDING THE ACCURACY OF THE SURVEY DATA REFERENCED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING FEATURES, PROPERTY CORNERS, PROJECT BOUNDARIES, RIGHTS-OF-WAY AND TOPOGRAPHIC SURVEY DATA PRIOR TO COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE OWNER'S AGENT IMMEDIATELY OF ANY DISCREPANCIES FOR RESOLUTION.

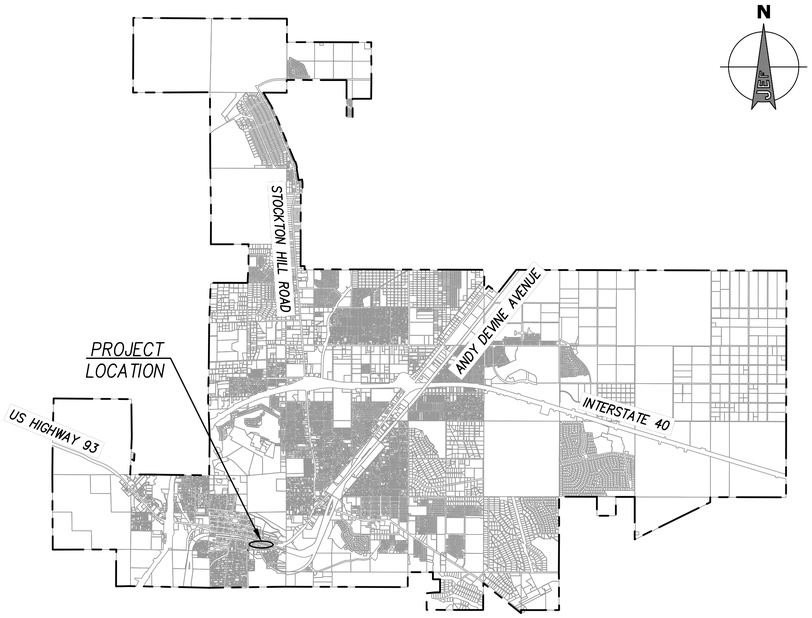
Call at least two full working days before you begin excavation.
ARIZONA 811 Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)
In Maricopa County: (602) 263-1100

JE FULLER define•communicate•solve
40 E Helen St
Tucson, AZ 85705
520 623 3112
www.jefuller.com

DRAINAGE IMPROVEMENT PROJECT FOR:

# 8TH STREET UNDERPASS

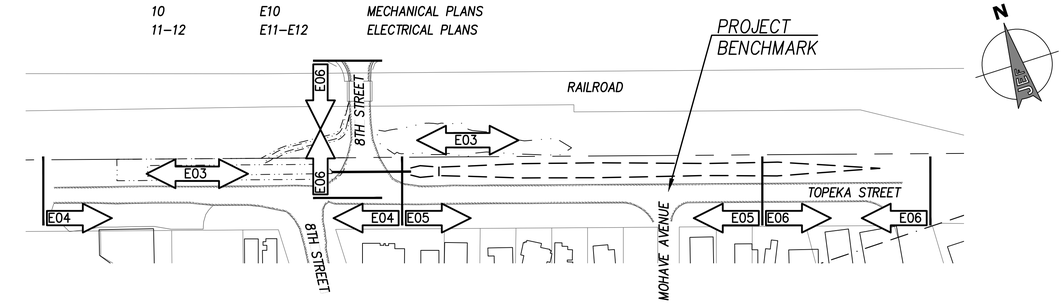
CITY OF KINGMAN CAPITAL IMPROVEMENT
PROJECT # ENG 16-0021




CITY OF KINGMAN OVERVIEW
SCALE: 1" = 5,000'

## DRAWING NUMBER & SHEET INDEX






KEY MAP
SCALE: 1" = 100'

## LEGEND

### EXISTING FEATURES

- INDEX CONTOUR (5' INTERVAL)
- INTERIM CONTOUR (1' INTERVAL)
- 2285 LABELS ON CONTOURS ARE NAVD88
- PARCEL LINE
- RIGHT OF WAY LINE
- STREET CENTERLINE
- SURVEY MONUMENT
- CONCRETE
- BACK OF CURB
- FACE OF CURB
- PAVEMENT EDGE
- FENCE LINE
- WALL LINE
- MAIL BOX
- SIDEWALK SCUPPER
- STREET SIGN
- OHE OVERHEAD ELECTRIC LINES
- G GAS LINES
- S SANITARY SEWER LINES
- SD STORM DRAIN LINES
- T TELEPHONE LINES
- W WATER LINES
- WATER METER
- WATER VALVE
- WATER FIRE HYDRANT
- WATER MANHOLE
- SANITARY SEWER MANHOLE
- TELE/ELECTRIC/LIGHT POLE
- GUY WIRE
- GAS VALVE

### DESIGN FEATURES

- SURVEY & CONSTRUCTION CENTERLINE
- GRADING LIMIT
- INDEX CONTOUR (5' INTERVAL)
- INTERIM CONTOUR (1' INTERVAL)
- 2315 LABELS ON CONTOURS ARE NAVD88
- STORM DRAIN LINE
- CATCH BASIN
- SD STORM DRAIN MANHOLE
- PAVEMENT EDGE
- FACE OF CURB
- BACK OF CURB
- SIDEWALK
- SIDEWALK/CONCRETE HATCH
- GRAVEL HATCH
- ASPHALT PAVEMENT
- FLOW DIRECTION

## ELEVATION DATUM AND PROJECT BENCHMARK:

THE ELEVATION DATUM FOR THIS PROJECT IS NAVD '88. THE BENCHMARK FOR THIS PROJECT IS CITY OF KINGMAN BM #91-125, WHICH IS A 2" BRASS DISK IN PAVEMENT LOCATED AT THE CENTERLINE INTERSECTION OF TOPEKA STREET AND MOHAVE AVENUE; SAID ELEVATION BEING 3372.36' (NAVD 88).

APPROVED FOR:
CITY OF KINGMAN

CITY ENGINEER (OR DESIGNEE)

AS-BUILT CERTIFICATION:
I HEREBY CERTIFY THAT THE "RECORD DRAWING" MEASUREMENTS AS SHOWN HEREON WERE MADE UNDER MY SUPERVISION OR AS NOTED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REGISTERED ENGINEER DATE
REGISTRATION NUMBER:

| | REVISION DESCRIPTION | BY | DATE | APP. |
|---|---|---|---|---|
| D | | | | |
| C | | | | |
| B | | | | |
| A | | | | |

| ASBUILT INFORMATION |
|---|
| DATE OF ACCEPTANCE |
| INSPECTED BY |
| REVISED BY |
| CHECKED BY |
| ADEQ FILE NUMBER |
| DATE OF ADEQ APPROVAL |
| CITY CONTRACT NUMBER |
| CONTRACTOR |

REFERENCE DRAWINGS


CITY OF KINGMAN
ENGINEERING DEPARTMENT
310 NORTH 4TH STREET
KINGMAN, ARIZONA 86401
PHONE (928) 753-8122 FAX (928) 753-8118


| | |
|---|---|
| DESIGNED BY | GWH |
| DRAWN BY | GWH |
| CHECKED BY | CBR |
| DATE DRAWN | 5/18/17 |
| HORIZ. SCALE | 1" = 20' |
| VERT. SCALE | 1" = 2' |

Registered Professional Engineer (Civil) CERTIFICATE NO. 33426 GEOFF W. HARRIS Date Signed
EXPIRES 03/31/20

DRAINAGE IMPROVEMENT PROJECT

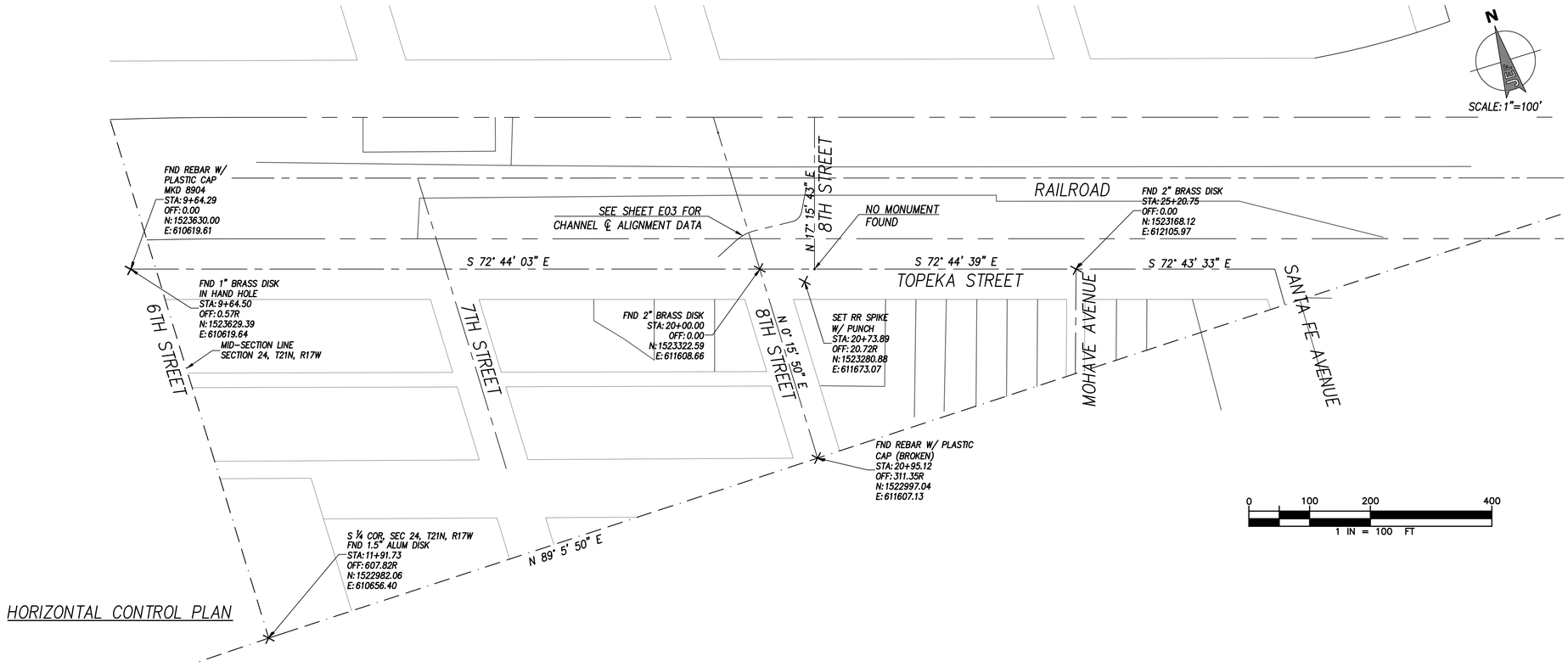
8TH STREET UNDERPASS

100% DESIGN PLANS

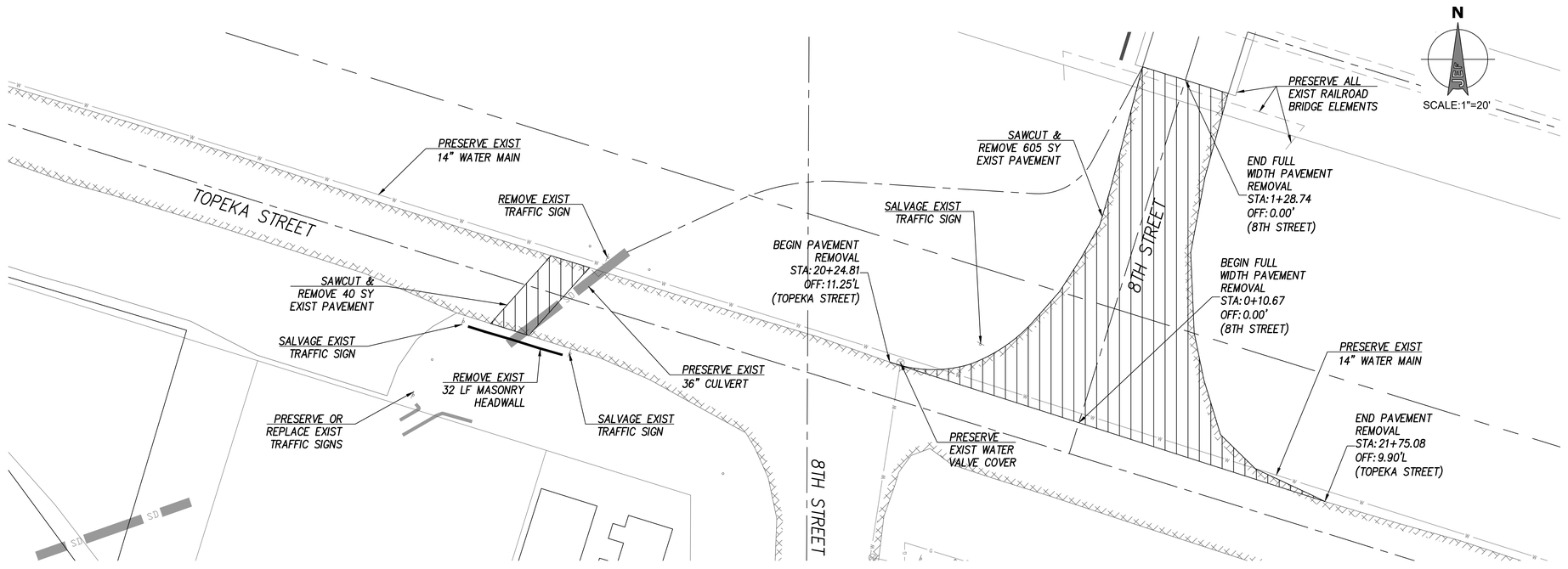
C.O.K. PROJECT NO.
ENG 16-0021

FILENAME
8th 100% Plans.dwg

SHEET NO.
E01
01 OF 12




HORIZONTAL CONTROL PLAN




DEMOLITION PLAN

## DEMOLITION QUANTITY LIST:

| MATERIAL DESCRIPTION: | TOT. QNTY.: | UNIT: |
|---|---|---|
| ASPHALT CONCRETE | 645 | SY |
| AGGREGATE BASE COURSE | 645 | SY |
| STREET SIGN & SIGN POST | 5 | EA |
| MASONRY HEADWALL | 32 | LF |

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DRAINAGE IMPROVEMENT PROJECT

C.O.K. PROJECT NO.
ENG 16-0021

FILENAME
8th 100% Plans.dwg


CITY OF KINGMAN
ENGINEERING DEPARTMENT
310 NORTH 4TH STREET
KINGMAN, ARIZONA 86401
PHONE (928) 753-8122 FAX (928) 753-8118

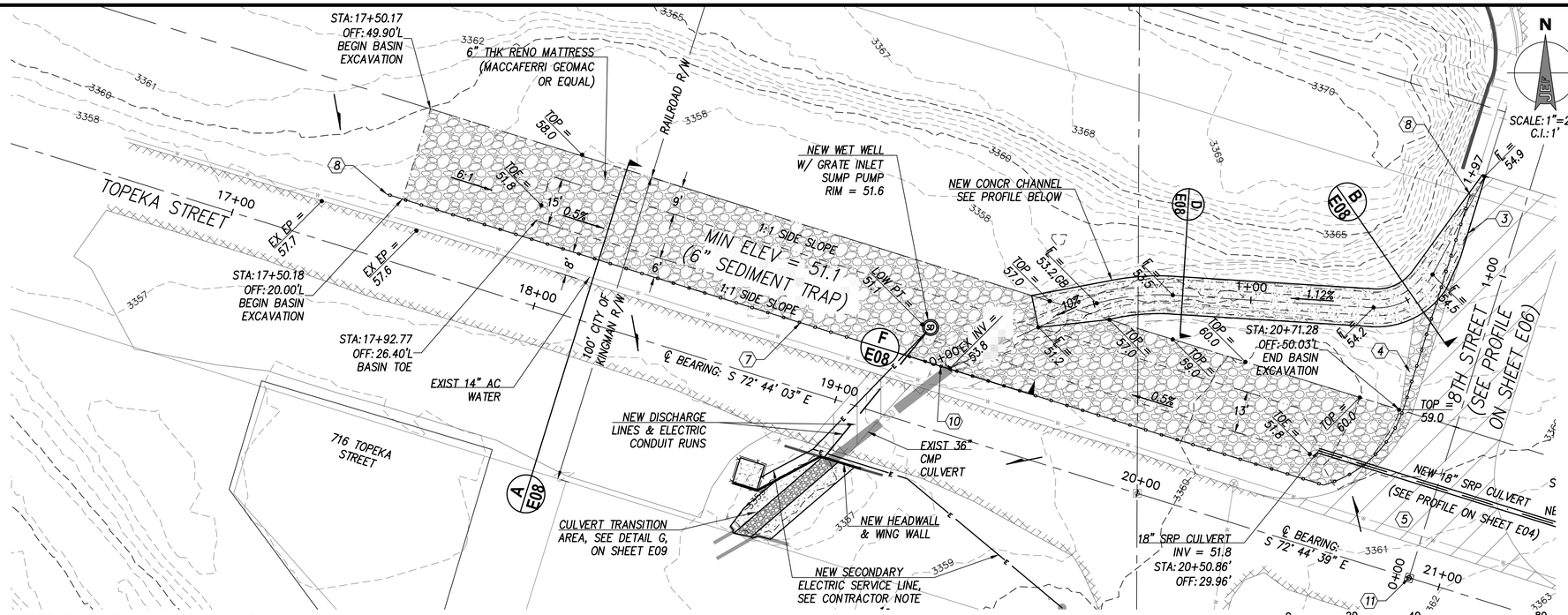

Registered Professional Engineer (Civil) CERTIFICATE NO. 33426 GEOFF W. HARRIS 03/19 STATE OF ARIZONA

EXPIRES 03/31/20

8TH ST. UNDERP.

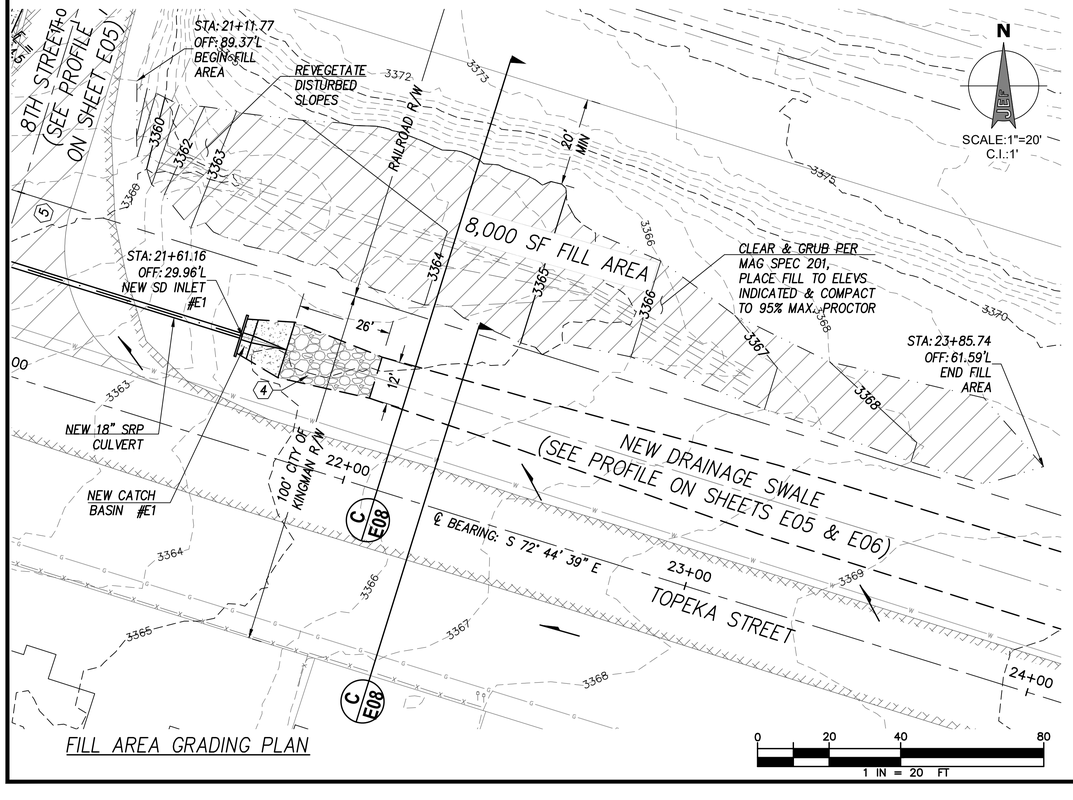
100% DESIGN PLANS

SHEET NO.
E02
02 OF 12

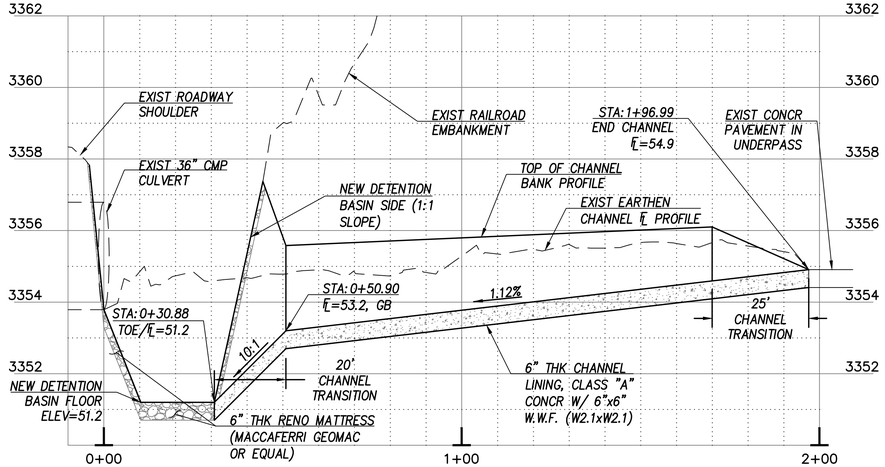



DETENTION BASIN GRADING PLAN

CONTRACTOR NOTE: CONTRACTOR TO COORDINATE WITH UNISOURCE ELECTRIC FOR CONSTRUCTION OF SECONDARY ELECTRIC SERVICE LINE.




FILL AREA GRADING PLAN




CONCRETE CHANNEL PROFILE

## MATERIALS QUANTITY LIST:

| MATERIAL DESCRIPTION: | SHT. QNTY.: | UNIT: |
|---|---|---|
| BASIN EXCAVATION | 1,590 | CY |
| CHANNEL EXCAVATION | 80 | CY |
| COMPACTED FILL | 125 | CY |

## KEYNOTE LIST:

1. PAVEMENT REPLACEMENT PER COK SD 200-51
2. SAWCUT LINE: TRIM, TACK AND JOIN EXIST ASPHALT TO NEW ASPHALT
3. APPLY TACK COAT TO FACE OF EXPOSED CONCR PRIOR TO PLACEMENT OF NEW ASPHALT
4. ROCK RIPRAP (D50=6", THK=12") W/ FILTER FABRIC LINER (MIRAFI 180N OR EQUAL)
5. NEW PAVEMENT (3" AC/6" ABC)
6. CHAIN LINK FENCING AND TWO MAN GATES PER MAG SD 160
7. TYPE A W-BEAM GUARDRAIL G4(2W) PER ADOT SD C-10.01 & C-10.03
8. W-BEAM GUARDRAIL END ANCHOR PER ADOT SD C-10.08
9. NOT USED
10. TYPE 1 NESTED GUARDRAIL OVER EXISTING 36" CULVERT PER ADOT SD C-10.06
11. NEW SURVEY MARKER PER MAG SD 120-1

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DRAINAGE IMPROVEMENT PROJECT

C.O.K. PROJECT NO.
ENG 16-0021

FILENAME
8th 100% Plans.dwg


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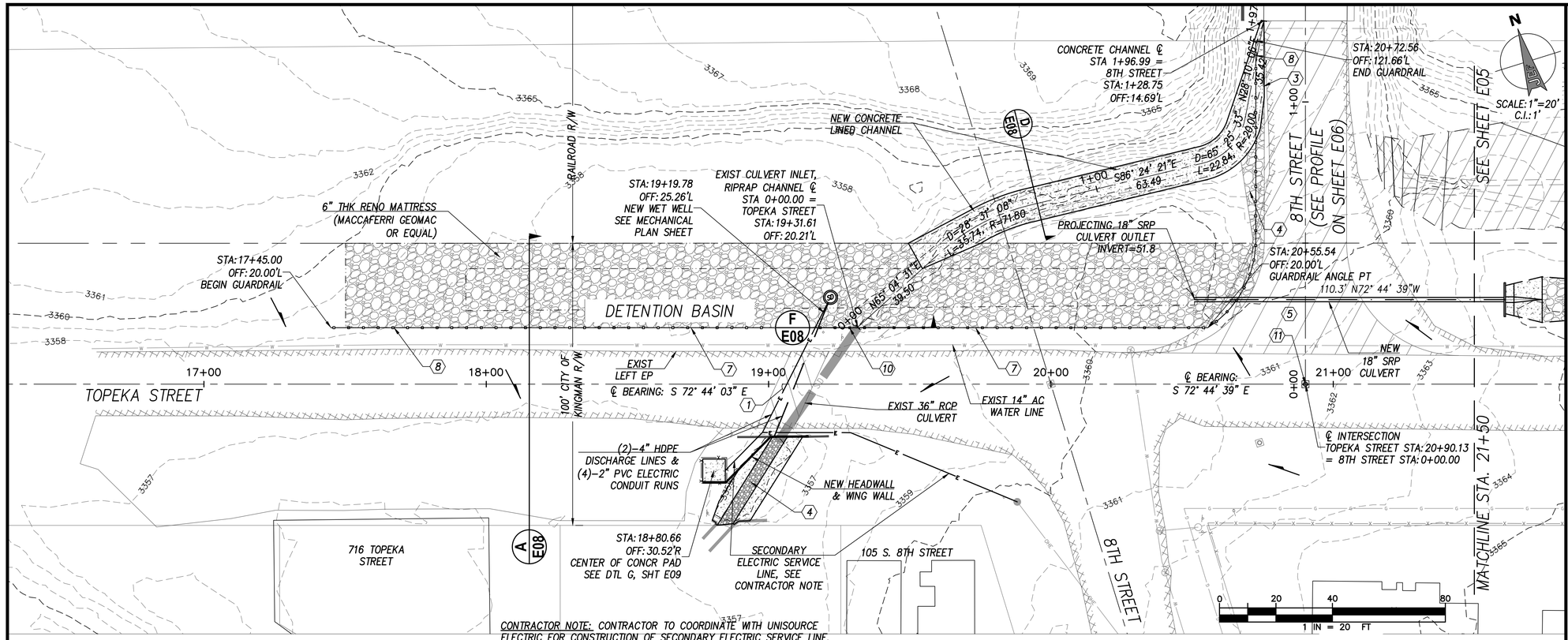
Registered Professional Engineer (Civil) CERTIFICATE NO. 33426 GEOFF W. HARRIS State of ARIZONA
EXPIRES 03/31/20

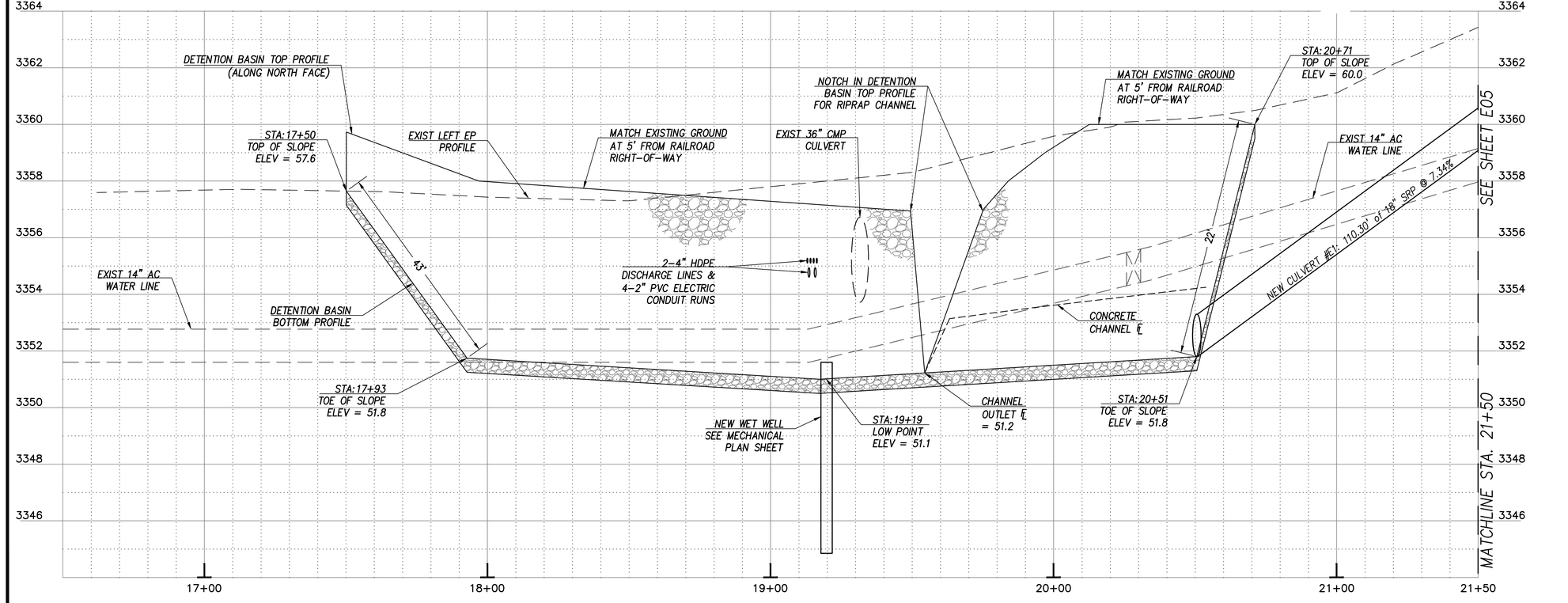
8TH ST. UNDERP.

100% DESIGN PLANS

SHEET NO.
E03
03 OF 12




CONTRACTOR NOTE: CONTRACTOR TO COORDINATE WITH UNISOURCE ELECTRIC FOR CONSTRUCTION OF SECONDARY ELECTRIC SERVICE LINE.




PLAN AND PROFILE

## MATERIALS QUANTITY LIST:

| MATERIAL DESCRIPTION: | SHT. QNTY.: | UNIT: |
|---|---|---|
| 6" THK RENO MATTRESS (MACCAFERRI GEOMAC OR EQUAL) | 1,430 | SY |
| ROCK FILL FOR MATTRESS | 240 | CY |
| W-BEAM GUARDRAIL | 418 | LF |
| 6" THK CLASS 'A' CONCRETE (CHANNEL) | 2,050 | SF |
| 4" DR 15.5 HDPE DISCHARGE LINES | 100 | LF |
| 2" SCHEDULE 40 PVC ELECTRIC CONDUIT | 300 | LF |
| ASPHALT PAVEMENT REPLACEMENT | 40 | SY |
| 18" DIA SPIRAL RIB PIPE | 110 | LF |

## KEYNOTE LIST:

1. PAVEMENT REPLACEMENT PER COK SD 200-51
2. SAWCUT LINE: TRIM, TACK AND JOIN EXIST ASPHALT TO NEW ASPHALT
3. APPLY TACK COAT TO FACE OF EXPOSED CONCR PRIOR TO PLACEMENT OF NEW ASPHALT
4. ROCK RIPRAP (D50=6", THK=12") W/ FILTER FABRIC LINER (MIRAFI 180N OR EQUAL)
5. NEW PAVEMENT (3" AC/6" ABC)
6. CHAIN LINK FENCING AND TWO MAN GATES PER MAG SD 160
7. TYPE A W-BEAM GUARDRAIL G4(2W) PER ADOT SD C-10.01 & C-10.03
8. W-BEAM GUARDRAIL END ANCHOR PER ADOT SD C-10.08
9. NOT USED
10. TYPE 1 NESTED GUARDRAIL OVER EXISTING 36" CULVERT PER ADOT SD C-10.06
11. NEW SURVEY MARKER PER MAG SD 120-1

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DRAINAGE IMPROVEMENT PROJECT

C.O.K. PROJECT NO. ENG 16-0021

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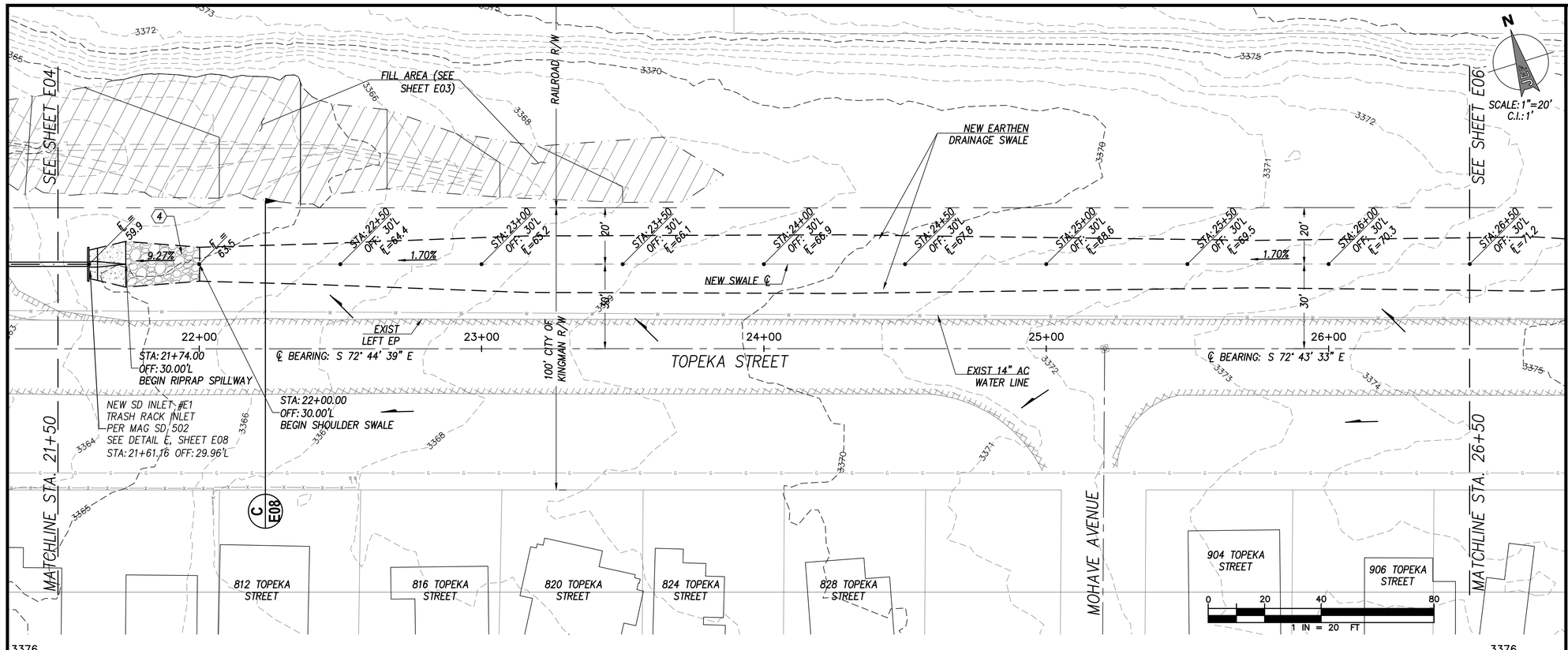
Professional Engineer CERTIFICATE NO. 33426 GEOFF W. HARRIS 07/19 STATE OF ARIZONA

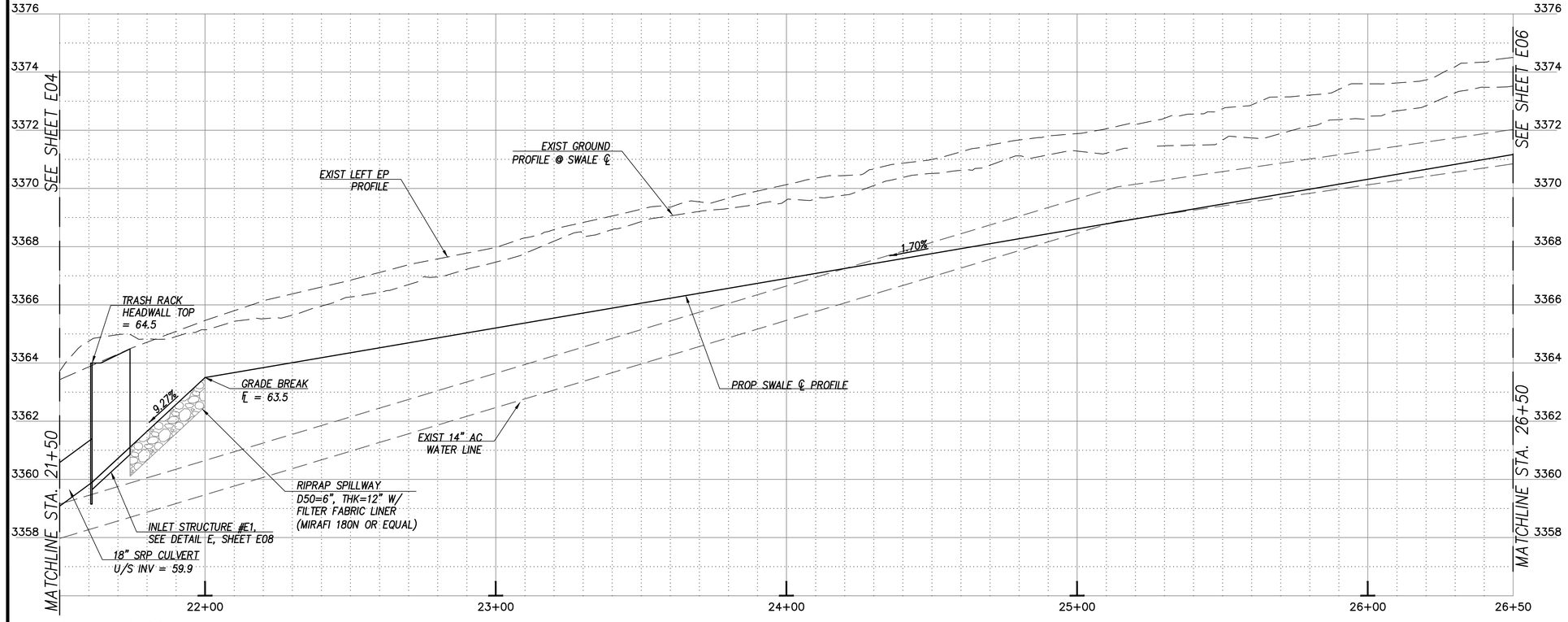
EXPIRES 03/31/20

8TH ST. UNDERP.

100% DESIGN PLANS

SHEET NO. E04 04 OF 12




PLAN AND PROFILE

## MATERIALS QUANTITY LIST:

| MATERIAL DESCRIPTION: | SHT. QNTY.: | UNIT: |
|---|---|---|
| CONCR TRASH RACK INLET STRUCTURE | 1 | EA |
| SWALE EXCAVATION | 394 | CY |
| ROCK RIPRAP (D50=6") | 19 | CY |
| FILTER FABRIC | 56 | SY |

## KEYNOTE LIST:

1. PAVEMENT REPLACEMENT PER COK SD 200-51
2. SAWCUT LINE: TRIM, TACK AND JOIN EXIST ASPHALT TO NEW ASPHALT
3. APPLY TACK COAT TO FACE OF EXPOSED CONCR PRIOR TO PLACEMENT OF NEW ASPHALT
4. ROCK RIPRAP (D50=6", THK=12") W/ FILTER FABRIC LINER (MIRAFI 180N OR EQUAL)
5. NEW PAVEMENT (3" AC/6" ABC)
6. CHAIN LINK FENCING AND TWO MAN GATES PER MAG SD 160
7. TYPE A W-BEAM GUARDRAIL G4(2W) PER ADOT SD C-10.01 & C-10.03
8. W-BEAM GUARDRAIL END ANCHOR PER ADOT SD C-10.08
9. NOT USED
10. TYPE 1 NESTED GUARDRAIL OVER EXISTING 36" CULVERT PER ADOT SD C-10.06
11. NEW SURVEY MARKER PER MAG SD 120-1



DRAINAGE IMPROVEMENT PROJECT

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Professional Engineer (Civil) CERTIFICATE NO. 33426 GEOFF W. HARRIS 07/19 STATE OF ARIZONA
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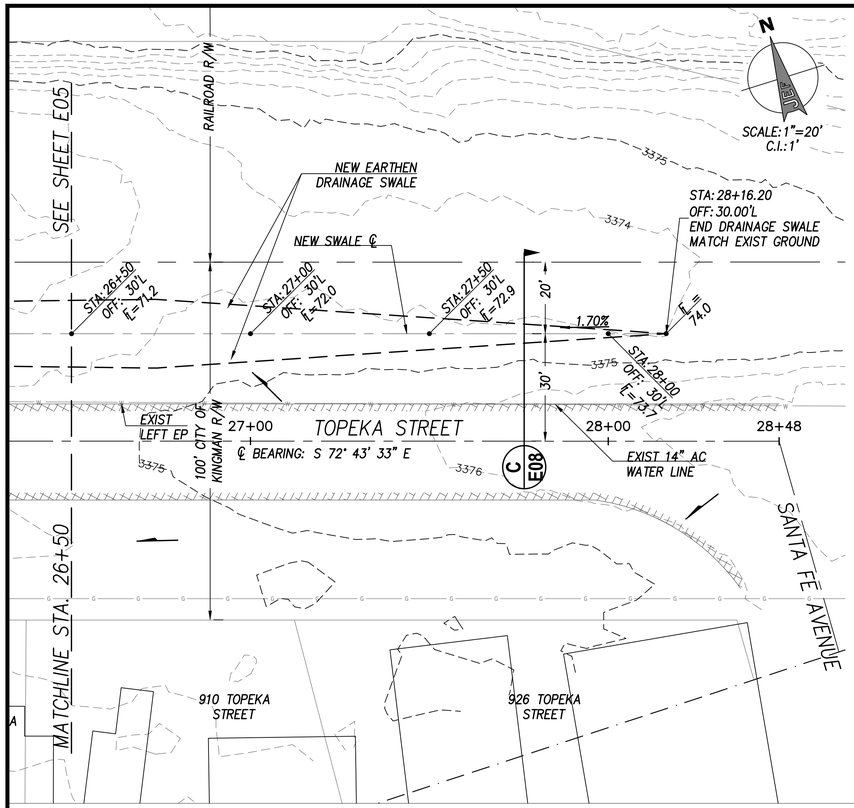
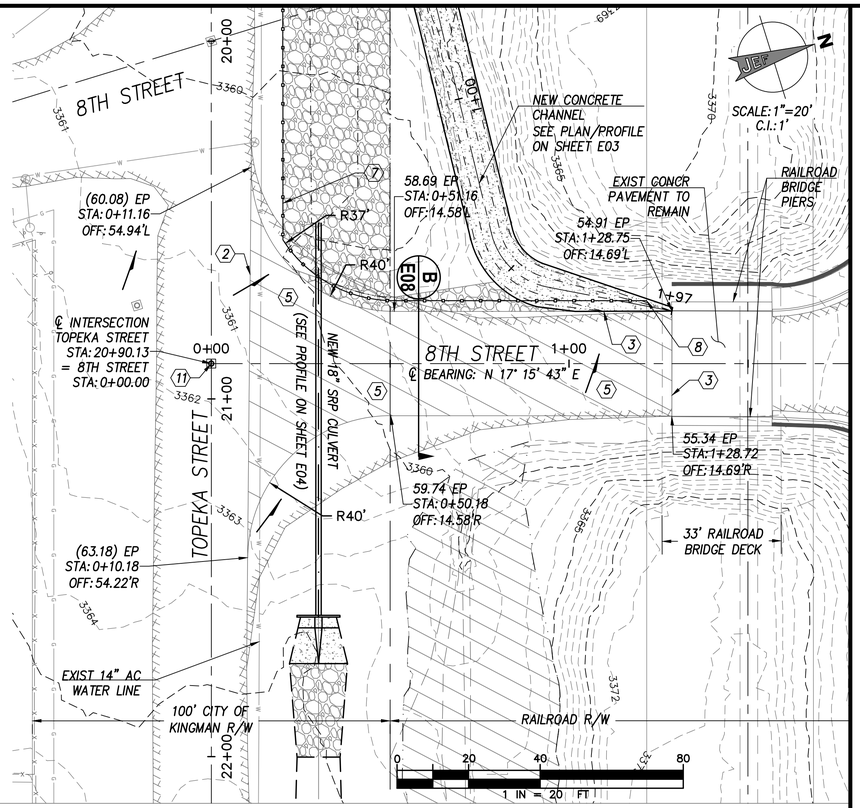
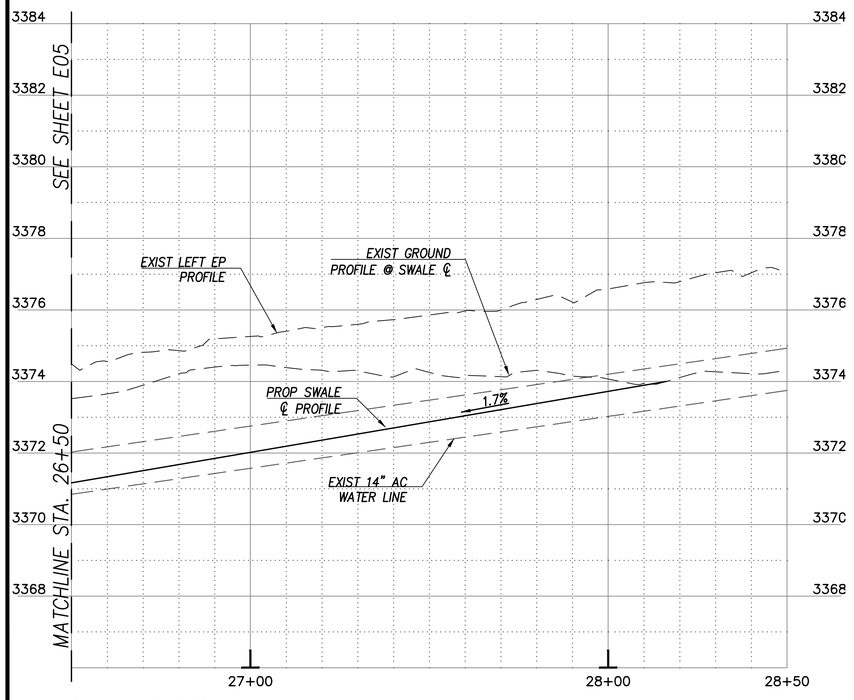
100% DESIGN PLANS

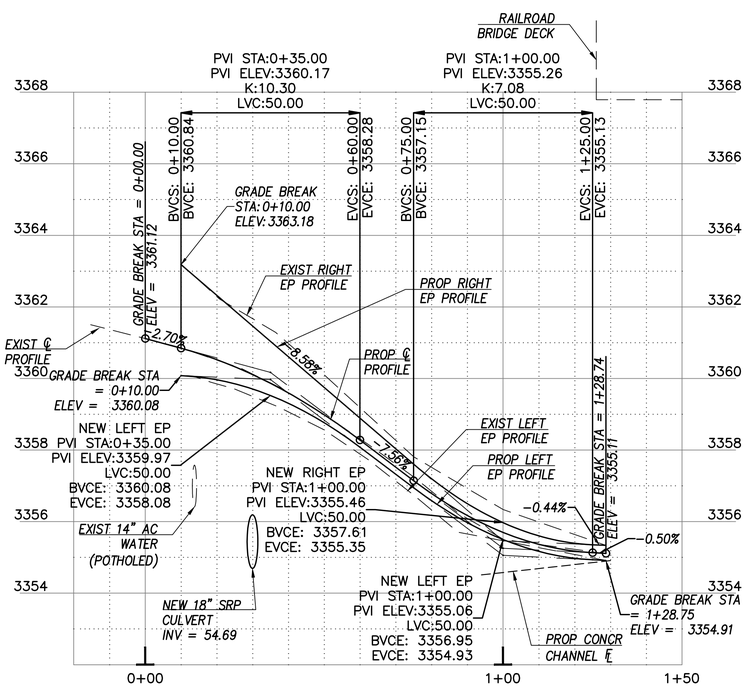
SHEET NO.
E05
05 OF 12




PLAN AND PROFILE




## MATERIALS QUANTITY LIST:

| MATERIAL DESCRIPTION: | SHT. QNTY.: | UNIT: |
|---|---|---|
| SWALE EXCAVATION | 80 | CY |
| ROAD GRADING (SUBGRADE PREP) | 606 | SY |
| 2" LIFT ASHPALTIC CONCRETE | 606 | SY |
| 6" LAYER COMPACTED AGGREGATE BASE COURSE | 606 | SY |
| ROCK RIPRAP (D50=6") | 12 | CY |
| FILTER FABRIC | 36 | SY |
| CONCRETE SURVEY MONUMENT | 1 | EA |

## KEYNOTE LIST:

1. PAVEMENT REPLACEMENT PER COK SD 200-51
2. SAWCUT LINE: TRIM, TACK AND JOIN EXIST ASPHALT TO NEW ASPHALT
3. APPLY TACK COAT TO FACE OF EXPOSED CONCR PRIOR TO PLACEMENT OF NEW ASPHALT
4. ROCK RIPRAP (D50=6", THK=12") W/ FILTER FABRIC LINER (MIRAFI 180N OR EQUAL)
5. NEW PAVEMENT (3" AC/6" ABC)
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7. TYPE A W-BEAM GUARDRAIL G4(2W) PER ADOT SD C-10.01 & C-10.03
8. W-BEAM GUARDRAIL END ANCHOR PER ADOT SD C-10.08
9. NOT USED
10. TYPE 1 NESTED GUARDRAIL OVER EXISTING 36" CULVERT PER ADOT SD C-10.06
11. NEW SURVEY MARKER PER MAG SD 120-1



DRAINAGE IMPROVEMENT PROJECT

C.O.K. PROJECT NO.
ENG 16-0021

FILENAME
8th 100% Plans.dwg

CITY OF KINGMAN
ENGINEERING DEPARTMENT
310 NORTH 4TH STREET
KINGMAN, ARIZONA 86401
PHONE (928) 753-8122 FAX (928) 753-8118

Registered Professional Engineer (Civil) CERTIFICATE NO. 33426 GEOFF W. HARRIS STATE OF ARIZONA

EXPIRES 03/31/20

# 8TH ST. UNDERP.

100% DESIGN PLANS

SHEET NO.
E06
06 OF 12

## STRIPING NOTES

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE FINAL SURFACE COURSE IS PLACED SO THAT THE STRIPING IS OFFSET ONE FOOT CLEAR OF THE CONSTRUCTION JOINT, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LAYOUT AND INSTALLATION OF THE PERMANENT PAVEMENT MARKINGS ON THE FINAL SURFACE COURSE FOLLOWING CONTROL POINTS THAT HAVE BEEN SET NO MORE THAN 50 FEET APART ALONG THE LINES TO BE STRIPED.

3. AT THE COMPLETION OF THE FINAL PAVEMENT SURFACE, CENTER LINES, LANE LINES, AND STOP BARS SHALL BE STRIPED WITH ONE APPLICATION OF STANDARD REFLECTORIZED TRAFFIC PAINT AT THE LOCATION OF THE PERMANENT STRIPING. THE PAINT SHALL HAVE A MAXIMUM THICKNESS OF 10 MILS WET (5 MILS DRY).

4. WHEN STRIPE OBLITERATION IS NECESSARY, IT SHALL BE ACCOMPLISHED BY APPROVED METHODS. PAINTING OVER STRIPING, REMOVAL OF PAVEMENT, AND OVERLAYING PAVEMENT DO NOT CONSTITUTE STRIPE OBLITERATION.

5. THE CONTRACTOR SHALL PRESERVE ALL ROADWAY SIGNS, SIGN SUPPORTS, OBJECT MARKERS, AND MILEPOSTS MARKERS. THE CONTRACTOR SHALL REPLACE ANY SIGNS, SIGN SUPPORTS, AND MARKERS DAMAGED AS A RESULT OF THE CONSTRUCTION AT THE CONTRACTOR'S EXPENSE.

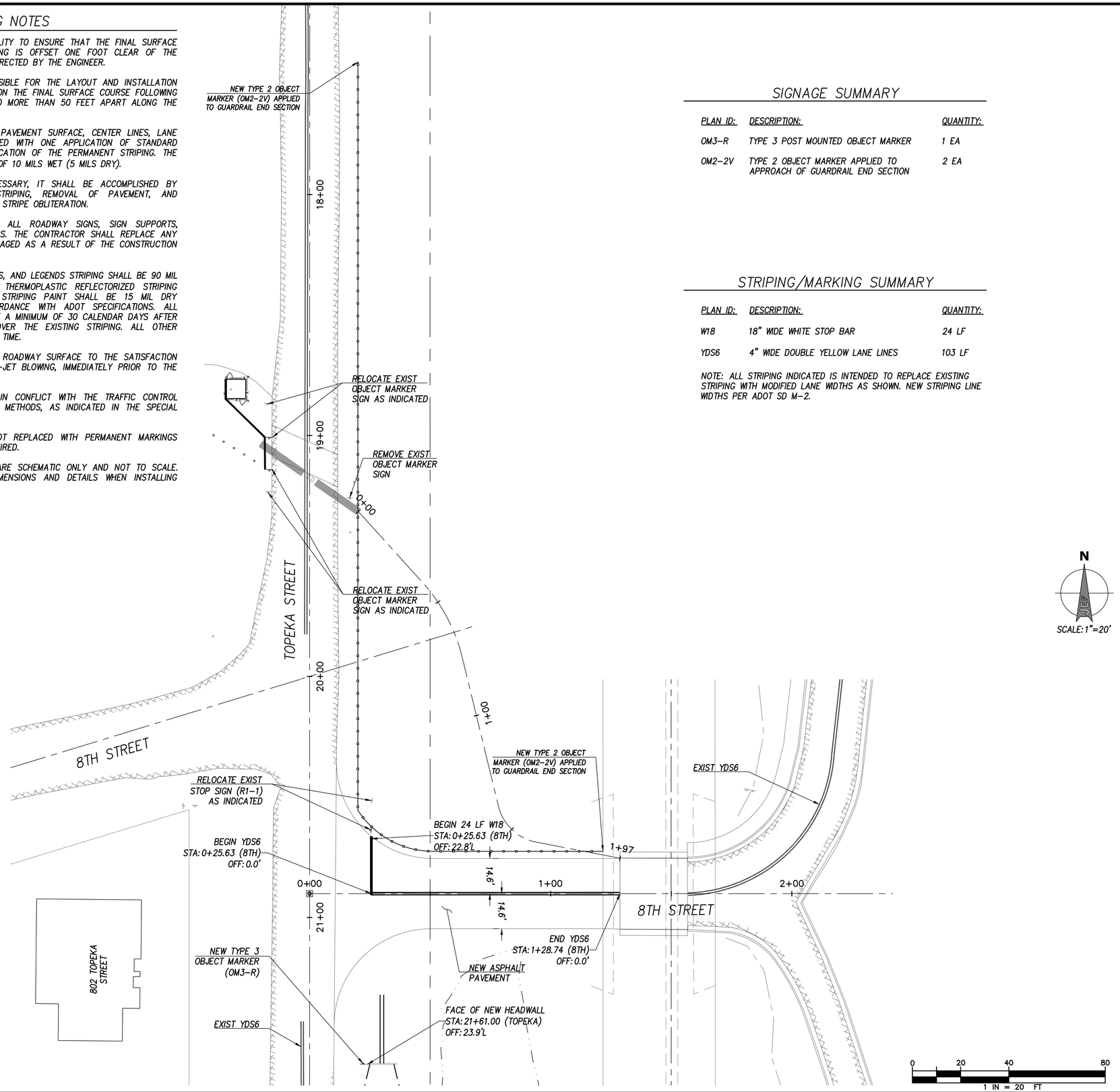
6. FINAL CROSSWALK, STOP BAR, ARROWS, AND LEGENDS STRIPING SHALL BE 90 MIL (0.090 INCHES) THICK ALKYD EXTRUDED THERMOPLASTIC REFLECTORIZED STRIPING PLACED OVER EXISTING STRIPING. FINAL STRIPING PAINT SHALL BE 15 MIL DRY THICKNESS WITH GLASS BEADS IN ACCORDANCE WITH ADOT SPECIFICATIONS. ALL PERMANENT STRIPING SHALL BE PLACED AT A MINIMUM OF 30 CALENDAR DAYS AFTER THE INITIAL STRIPING AND BE PLACED OVER THE EXISTING STRIPING. ALL OTHER MARKINGS SHALL BE APPLIED AT THE SAME TIME.

7. THE CONTRACTOR SHALL CLEAN THE ROADWAY SURFACE TO THE SATISFACTION OF THE ENGINEER, BY SWEEPING AND AIR-JET BLOWING, IMMEDIATELY PRIOR TO THE PLACEMENT OF ALL PAVEMENT MARKINGS.

8. ALL EXISTING PAVEMENT MARKINGS IN CONFLICT WITH THE TRAFFIC CONTROL PLANS SHALL BE REMOVED BY APPROVED METHODS, AS INDICATED IN THE SPECIAL PROVISIONS.

9. TEMPORARY PAVEMENT MARKINGS NOT REPLACED WITH PERMANENT MARKINGS SHALL BE REMOVED WHEN NO LONGER REQUIRED.

10. THE PAVEMENT MARKING DRAWINGS ARE SCHEMATIC ONLY AND NOT TO SCALE. THE CONTRACTOR SHALL FOLLOW ALL DIMENSIONS AND DETAILS WHEN INSTALLING PAVEMENT MARKINGS.




STRIPING PLAN

## SIGNAGE SUMMARY

| PLAN ID: | DESCRIPTION: | QUANTITY: |
|---|---|---|
| OM3-R | TYPE 3 POST MOUNTED OBJECT MARKER | 1 EA |
| OM2-2V | TYPE 2 OBJECT MARKER APPLIED TO APPROACH OF GUARDRAIL END SECTION | 2 EA |

## STRIPING/MARKING SUMMARY

| PLAN ID: | DESCRIPTION: | QUANTITY: |
|---|---|---|
| W18 | 18" WIDE WHITE STOP BAR | 24 LF |
| YDS6 | 4" WIDE DOUBLE YELLOW LANE LINES | 103 LF |

NOTE: ALL STRIPING INDICATED IS INTENDED TO REPLACE EXISTING STRIPING WITH MODIFIED LANE WIDTHS AS SHOWN. NEW STRIPING LINE WIDTHS PER ADOT SD M-2.



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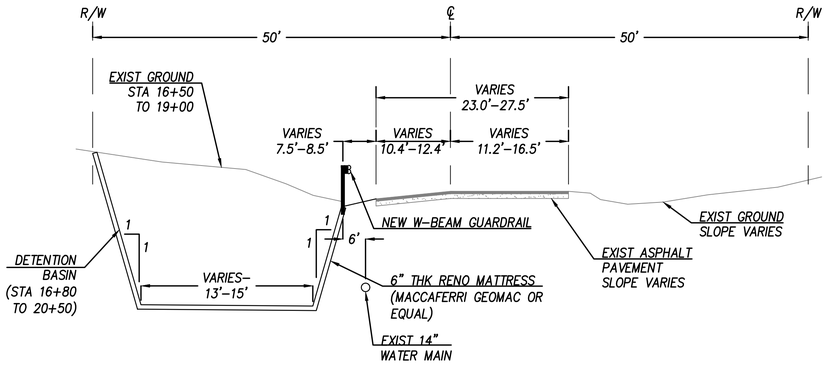
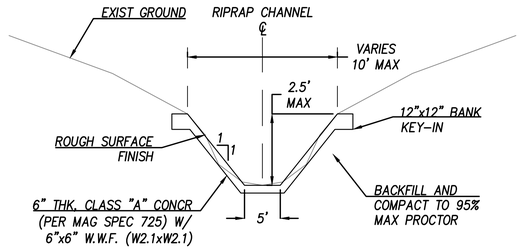
SHEET NO.
E07
07 OF 12

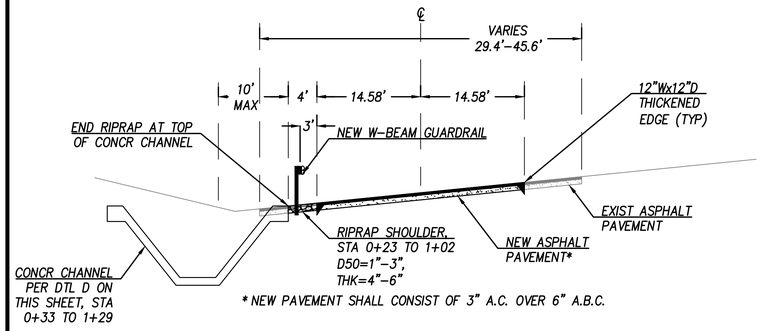



A **TYPICAL STREET CROSS SECTION** — SCALE NTS

TOPEKA STREET, STA 17+50 TO STA 21+00



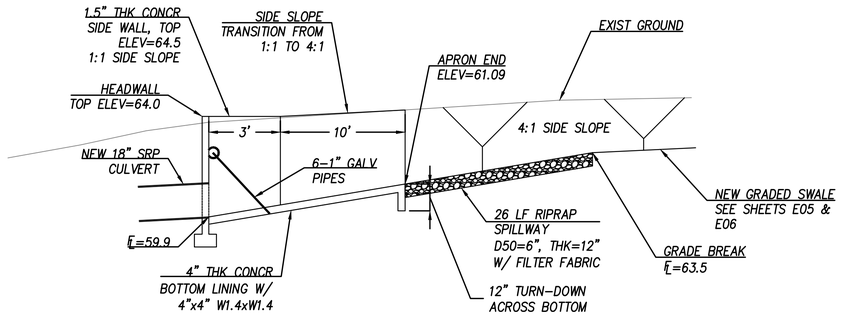

D **CONCRETE CHANNEL CROSS SECTION** — SCALE NTS




* NEW PAVEMENT SHALL CONSIST OF 3" A.C. OVER 6" A.B.C.

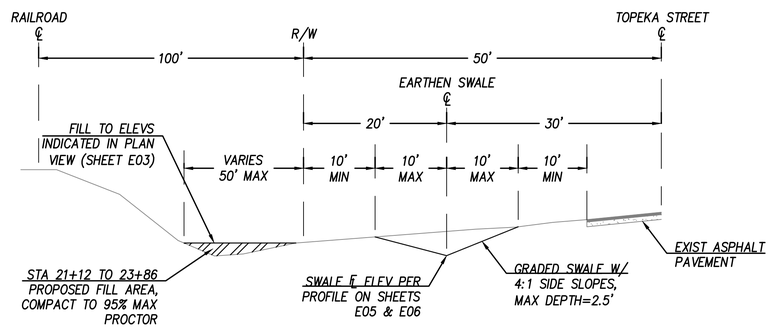
B **TYPICAL STREET CROSS SECTION** — SCALE NTS

8TH STREET, STA 0+10 TO STA 1+29



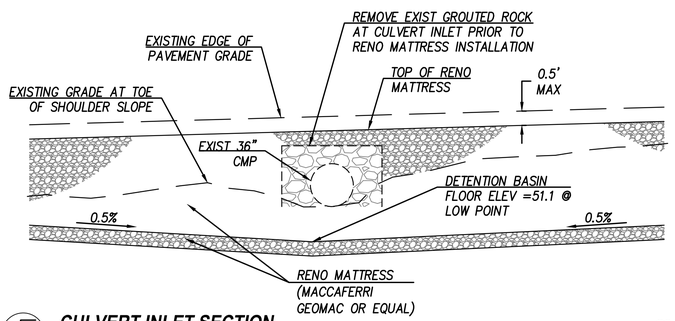

E **INLET #E1 DETAIL** — SCALE NTS

STRAIGHT TYPE INLET HEADWALL TRASH RACK PER MAG SD 502–2, STA 21+61




C **EARTHEN SWALE & FILL AREA CROSS SECTION** — SCALE NTS

TOPEKA STREET, STA 21+00 TO STA 28+16




F **CULVERT INLET SECTION** — SCALE NTS

TOPEKA STREET, STA 19+32

DETAILS



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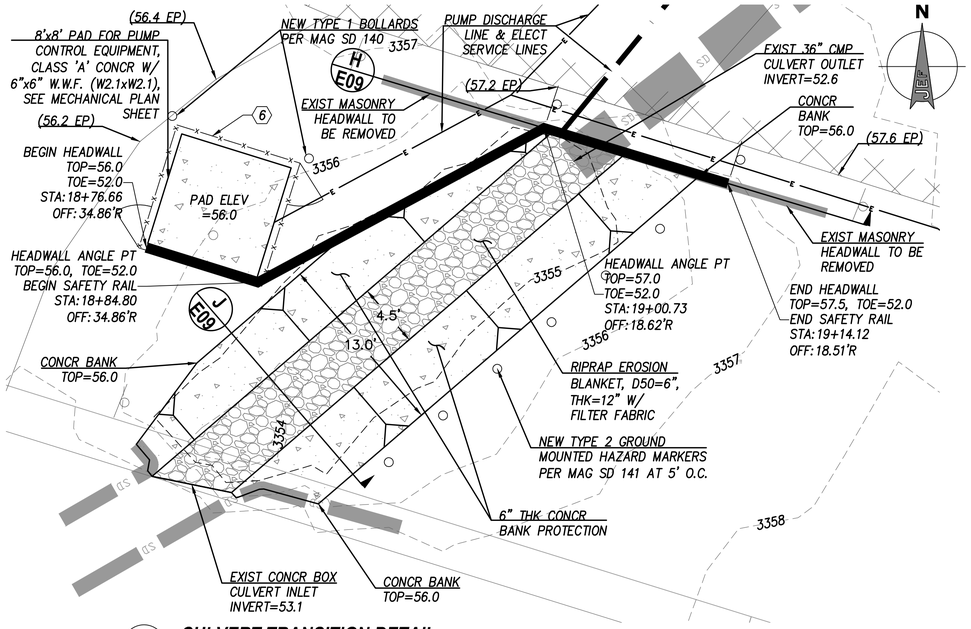
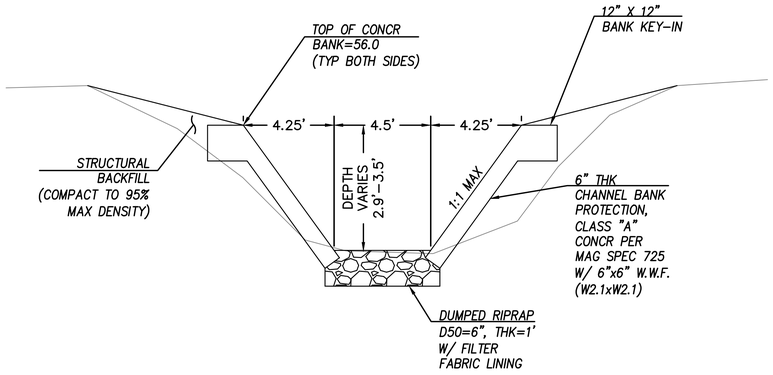
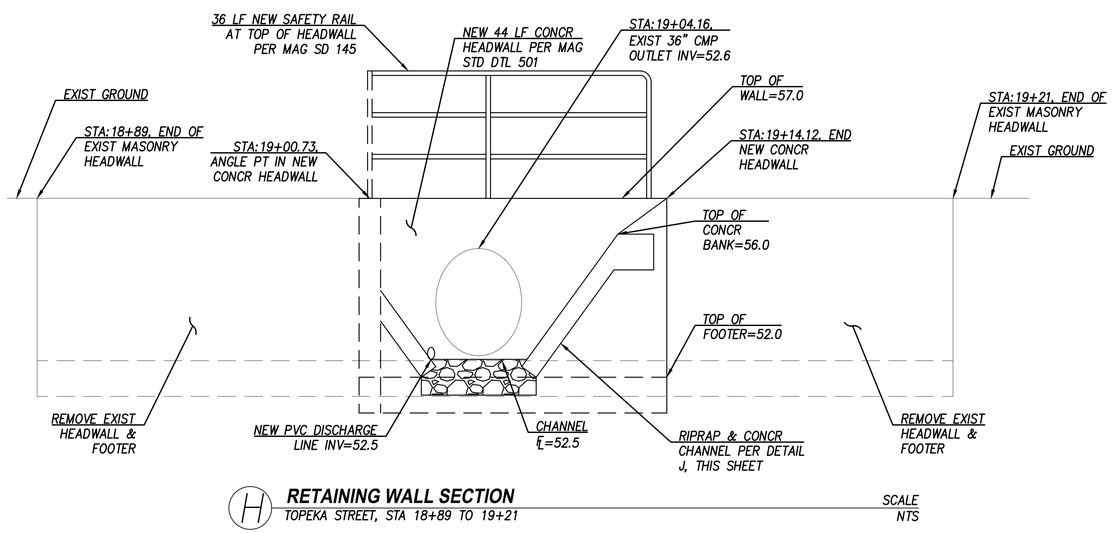
08 OF 12




**G** **CULVERT TRANSITION DETAIL**
TOPEKA STREET, STA 19+00
SCALE 1"=5'




**J** **CHANNEL SECTION**
TOPEKA STREET, STA 19+00
SCALE NTS




**H** **RETAINING WALL SECTION**
TOPEKA STREET, STA 18+89 TO 19+21
SCALE NTS

## MATERIALS QUANTITY LIST:

| MATERIAL DESCRIPTION: | SHT. QNTY.: | UNIT: |
|---|---|---|
| 6" CLASS 'A' CONCRETE PAD | 64 | SF |
| ROCK RIPRAP (D50=6") | 6 | CY |
| FILTER FABRIC | 18 | SY |
| 5' HIGH CONCRETE RETAINING WALL | 44 | LF |
| 6" THK CLASS 'A' CONCRETE (CHANNEL) | 390 | SF |
| BOLLARDS, TYPE 1 (MAG SD 140) | 2 | EA |
| HAZARD MARKERS, TYPE 2 (MAG SD 141) | 6 | EA |
| CHAIN LINK FENCING AND TWO GATES | 36 | LF |
| SAFETY RAIL (MAG SD 145) | 36 | LF |

## KEYNOTE LIST:

1. PAVEMENT REPLACEMENT PER COK SD 200-51
2. SAWCUT LINE: TRIM, TACK AND JOIN EXIST ASPHALT TO NEW ASPHALT
3. APPLY TACK COAT TO FACE OF EXPOSED CONCR PRIOR TO PLACEMENT OF NEW ASPHALT
4. ROCK RIPRAP (D50=6", THK=12") W/ FILTER FABRIC LINER (MIRAFI 180N OR EQUAL)
5. NEW PAVEMENT (3" AC/6" ABC)
6. CHAIN LINK FENCING AND TWO MAN GATES PER MAG SD 160
7. TYPE A W-BEAM GUARDRAIL G4(2W) PER ADOT SD C-10.01 & C-10.03
8. W-BEAM GUARDRAIL END ANCHOR PER ADOT SD C-10.08
9. NOT USED
10. TYPE 1 NESTED GUARDRAIL OVER EXISTING 36" CULVERT PER ADOT SD C-10.06
11. NEW SURVEY MARKER PER MAG SD 120-1



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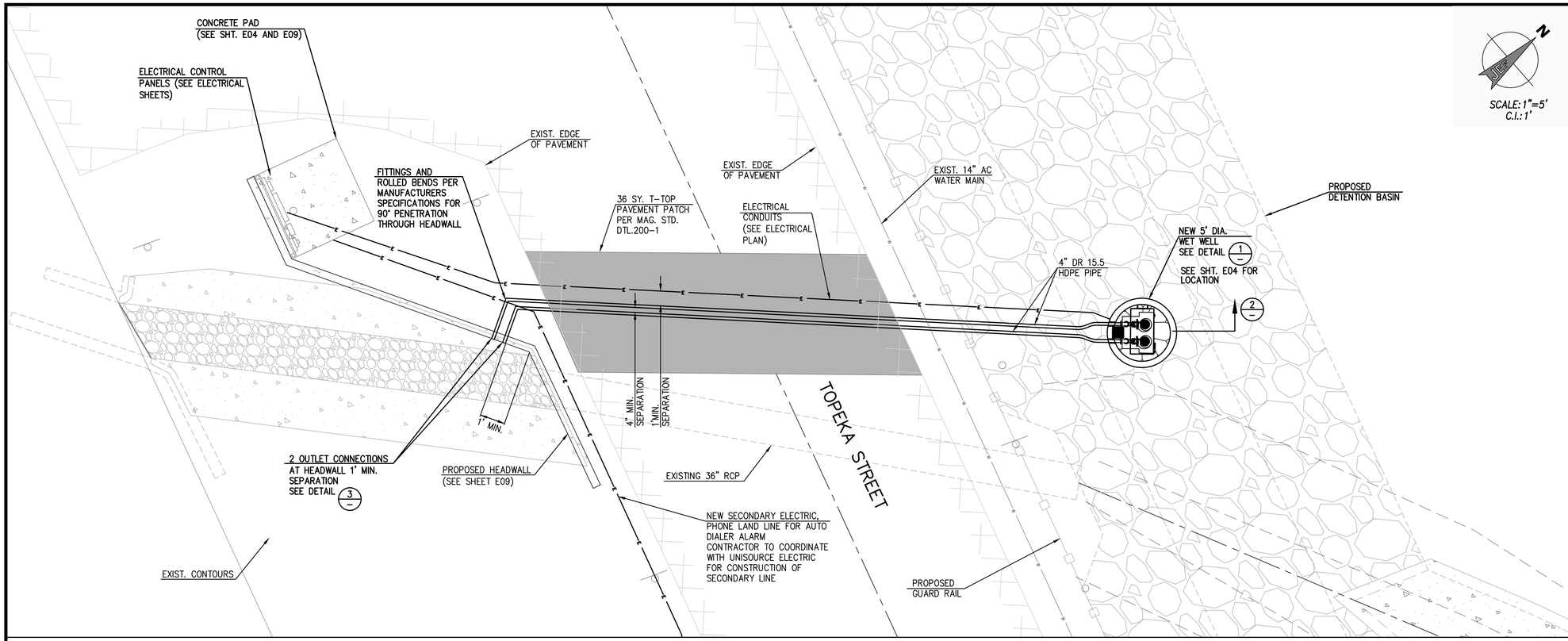
E09
09 OF 12

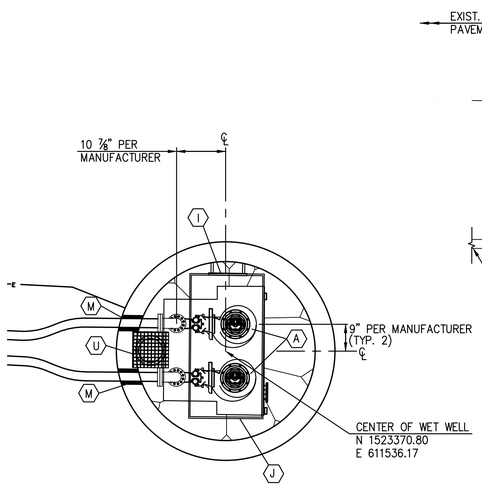
DETAILS



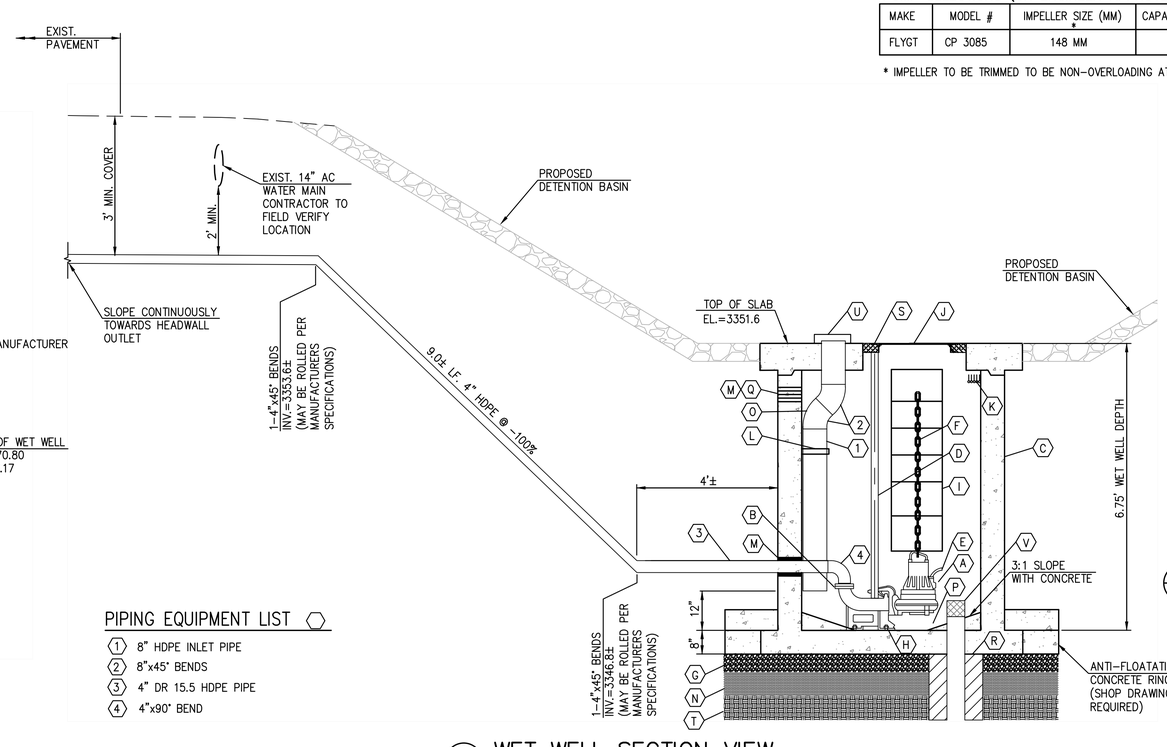

## PUMP SELECTIONS (OR ENGINEER APPROVED EQUAL)

| MAKE | MODEL # | IMPELLER SIZE (MM) | CAPACITY (GPM) | TDH (FT) | MAX HP (MOTOR) | RPM | VOLT | ϕ |
|---|---|---|---|---|---|---|---|---|
| FLYGT | CP 3085 | 148 MM | 200 | 15 | 2.4 | 1730 | 460 | 3 |

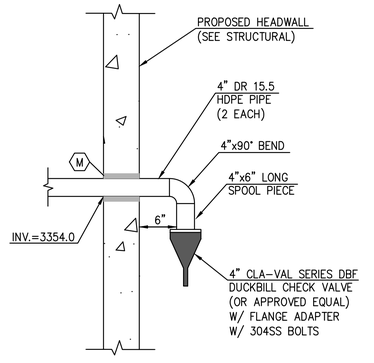
* IMPELLER TO BE TRIMMED TO BE NON-OVERLOADING AT SPECIFIED FLOW AND TDH.




1 WET WELL PLAN VIEW
1"=2'




2 WET WELL SECTION VIEW
1"=2'




3 OUTLET CONNECTIONS DETAIL
N.T.S.

## PIPING EQUIPMENT LIST

1. 8" HDPE INLET PIPE
2. 8"x45° BENDS
3. 4" DR 15.5 HDPE PIPE
4. 4"x90° BEND

## WET WELL EQUIPMENT NOTES

A. DUPLEX SUBMERSIBLE SEWAGE PUMPS WITH QUICK DISCONNECT DISCHARGE BOOT CONFORMING TO ASTM C 923. CONTRACTOR TO SUPPLY ELBOWS, GUIDE RAIL AND BRACKETS, POWER CABLES, CONTROL PANEL, AND ALL APPURTENANCES. (DESIGN CAPACITY PER TABLE BELOW.)

B. 4" DISCHARGE CONNECTION AND 4" ELBOW.

C. WET WELL – CONSTRUCTION SHALL BE CONCRETE WITH A MINIMUM OF 10,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS. CONCRETE SHALL CONFORM TO ASTM D-6783 STANDARDS. CONCRETE SECTIONS SHALL BE 5'-0" DIAMETER (INSIDE DIMENSION). WET WELL BASE AND COVER SHALL BE PER THE MANUFACTURERS RECOMMENDATIONS. SHOP DRAWINGS REQUIRED

D. GUIDE RAIL SYSTEM PER PUMP MANUFACTURER'S RECOMMENDATIONS.

E. PUMP POWER CABLE (FURNISHED BY MANUFACTURER) SHALL BE CONTINUOUS (NO SPLICES) FROM PUMP TO PULL BOX.

F. PUMP LIFTING SLINGS (FURNISHED BY THE MANUFACTURER).

G. A MIN. OF 6" OF COMPACTED LEVELING BED OF CRUSHED ROCK (3/4" DIA. SIZE.) MATERIAL SHALL BE COMPACTED WITH A MIN. OF 3 PASSES WITH A CERTIFIED COMPACTOR, OR UNTIL THE ONSITE INSPECTOR HAS DEEMED THE MATERIAL TO BE FIRM AND UNYIELDING, WHICHEVER IS GREATER.

H. 316 SS PUMP ANCHOR BOLTS, FOR BASE (SEE MANUFACTURERS SPECIFICATIONS).

I. LANE POLYPROPYLENE LADDER, OR APPROVED EQUAL.

J. 4' x 2.5' BILCO JD-AL H20 LOCKABLE ALUMINUM ACCESS COVER WITH DUAL DOORS, (OR APPROVED EQUAL) HINGES ON SHORT SIDES. DRAIN TO BE PLUGGED ON SITE.

K. UP TO EIGHT (8) 316 STAINLESS STEEL HOOKS FOR INSTRUMENTATION SWITCHES, POWER CABLES AND PUMP CHAINS.(SEE ELECTRICAL PLANS FOR CABLES).

L. STAINLESS STEEL PIPE STRAPS AND BOLTS. INSTALLED PER CONCRETE MANUFACTURERS RECOMMENDATIONS. SHOP DRAWINGS REQUIRED.

M. LINK SEAL OR APPROVED EQUAL. CONTRACTOR TO SUBMIT ON SIZE AND TYPE OF SEAL FOR EACH PIPE AND CORE SIZE.

N. A MIN. OF 8" OF AGGREGATE BASE COURSE COMPACTED TO A MIN. 95% OF OF THE MAX. DRY DENSITY DETERMINED PER ASTM D698 (STANDARD PROCTOR DENSITY) AT OPTIMUM MOISTURE CONTENT ±3%. MATERIAL SHALL COMPLY WITH SECTION 303 OF THE PIMA COUNTY ASSOCIATION OF GOVERNMENTS (PAG) SPECIFICATIONS AND DETAILS FOR PUBLIC IMPROVEMENTS LATEST EDITION.

O. 8" INLET PIPE.

P. MINIMUM CLEARANCE PER PUMP MANUFACTURER'S SPECIFICATIONS.

Q. CONDUIT PENETRATIONS PER ELECTRICAL PLANS.

R. ¾" DIAMETER GRAVEL DRAIN FILL 4" RADIUS AROUND DRAIN PIPE.

S. 2" ROUND UPPER GUIDE RAIL BRACKET PER PUMP MANUFACTURERS RECOMMENDATIONS. (2 REQUIRED.)

T. OVER EXCAVATE AND RE-COMPACT 8" (MIN.) NATIVE SOIL SURFACE TO A MIN. 95% OF THE MAX. DRY DENSITY DETERMINED PER ASTM D698 (STANDARD PROCTOR DENSITY) AT OPTIMUM MOISTURE CONTENT ±3%.

U. METAL DEBRIS CAGE W/MAX 3/4" OPENINGS, BOLTED TO SLAB. MIN. SIZE OF 12"x12"x6" TO REDUCE CHANCE OF CLOGGING.

V. 6" ADS CORRUGATED DRAIN PIPE (FOR INJECTION). TO 4' BELOW WET WELL BASE. INCLUDE DEBRIS SCREEN AT TOP AND CAP AT BOTTOM.

NOTES:

1. WET WELL MANUFACTURER TO PROVIDE BOUYANCY AND TRAFFIC RATING CALCULATIONS STAMPED BY A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF ARIZONA.
2. WHERE POSSIBLE ALL METAL WITHIN THE WET WELL SHALL BE TYPE 316 STAINLESS STEEL.
3. ALL CONSTRUCTION TO CONFORM TO LATEST M.A.G. CITY OF KINGMAN, AND MOHAVE.
4. NON-POTABLE WATER SERVICES SHALL BE INSTALLED WITH A MINIMUM OF 36" OF COVER AND 12" MINIMUM OF VERTICAL SEPARATION FROM GAS AND DRY UTILITIES. A HORIZONTAL SEPARATION 6' AND VERTICAL SEPARATION OF 2' SHALL BE MAINTAINED FROM POTABLE WATER AND SANITARY SEWER.
5. NON-POTABLE SERVICES SHALL BE HDPE WITH PURPLE STRIPE OR PURPLE POLYWRAP SLEEVE.



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730.03 SUMP PLAN-1 8-26-19.dwg

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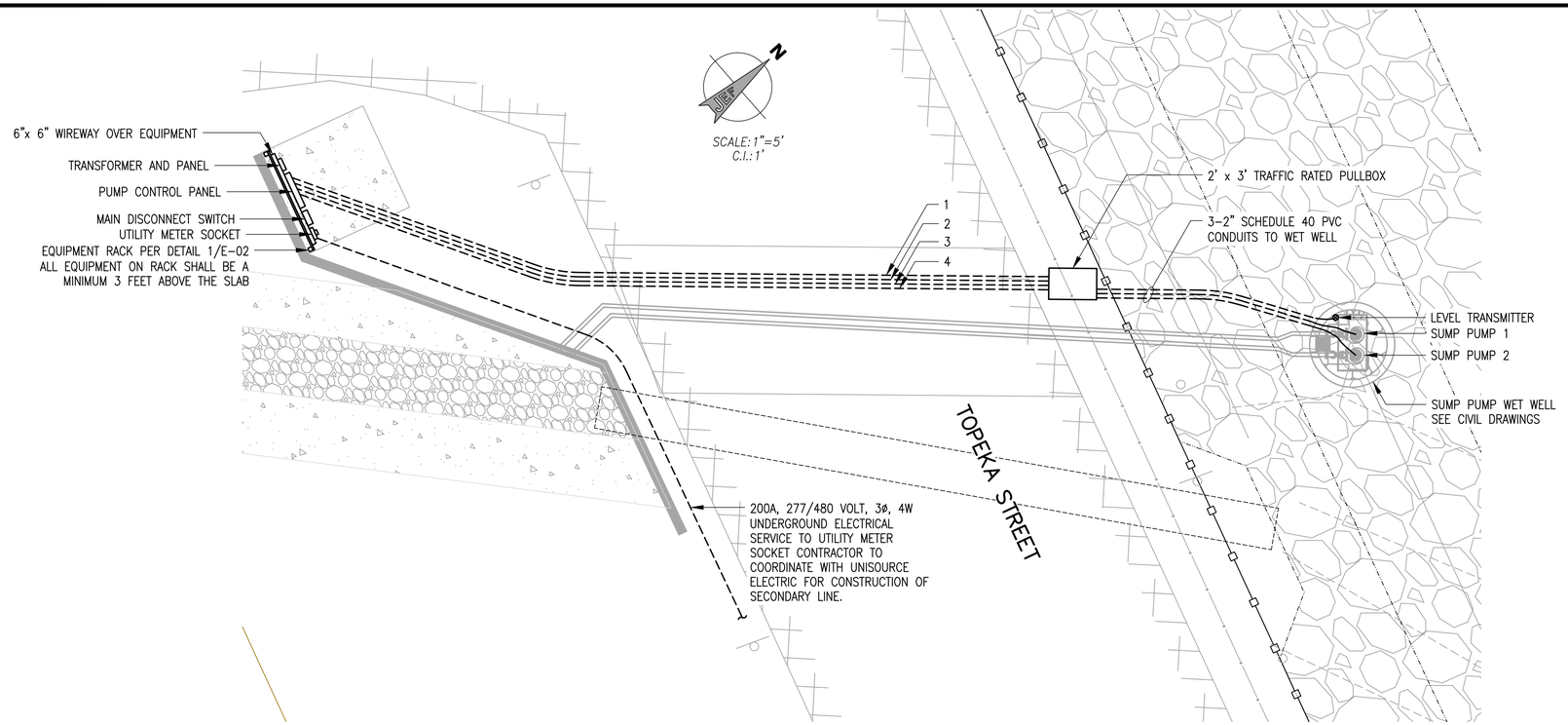
Registered Professional Engineer
CERTIFICATE NO. 62207
CURTIS M. MILES
DATE SIGNED 8/26/19
ARIZONA U.S.A.
EXPIRES 6/30/2022

8TH ST. UNDERP.

100% DESIGN PLANS

SHEET NO.
E10
10 OF 12



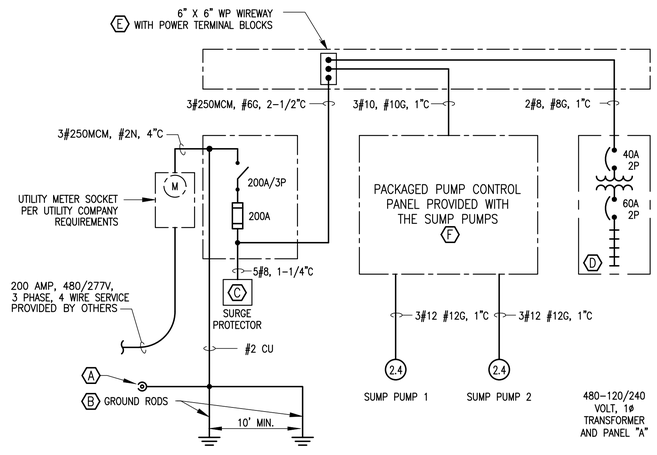

## ELECTRICAL SITE PLAN

SCALE: 1"=5'-0"

## CONDUIT SCHEDULE

| NO. | FROM | TO | CONDUIT | WIRE | COMMENT |
|---|---|---|---|---|---|
| 1 | PUMP CONTROL PANEL | SUMP PUMP 1 IN WET WELL VIA PULLBOX | 1 | 3#12, #12G | 480 VOLT POWER |
| 2 | PUMP CONTROL PANEL | SUMP PUMP 2 IN WET WELL | 1 | 3#12, #12G | 480 VOLT POWER |
| 3 | PUMP CONTROL PANEL | SUMP PUMPS 1 AND 2 IN WET WELL VIA PULLBOX | 1 | 8#14, #14G | MOTOR TEMPERATURE AND MOISTURE SENSORS |
| 4 | PUMP CONTROL PANEL | HYDROSTATIC LEVEL XMITTER IN WET WELL VAI PULLBOX | 1 | PER PANEL MFGR. | LEVEL SIGNAL FOR CONTROLS |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

* TSP = TWISTED SHIELDED PAIR INSTRUMENTATION CABLE, SEE SPECIFICATIONS




## ELECTRICAL SINGLE LINE DIAGRAM

NOT TO SCALE

## LOAD STUDY

LOADS AT 480 VOLT, 3ø:

| | |
|---|---|
| SUMP PUMP 1 (2.4HP) | 4.8A |
| SUMP PUMP 1 (2.4HP) | 4.8A |
| TRANSFORMER (10kVA) | 20.8A |
| SUBTOTAL | 30.4A |
| 25% LARGEST MOTOR | 1.2A |
| TOTAL | 31.6A |

A 200A, 480v, 3ø, 4W SERVICE IS ADEQUATE

## FAULT CURRENT

THE AVAILABLE FAULT FROM THE UTILITY TRANSFORMER IS 12,100 AMPERES PER UNISOURCE ENERGY. MAXIMUM MOTOR CONTRIBUTION IS 4(4.8A + 4.8A)=39A. TOTAL AVAILABLE FAULT IS 12,100A + 39A = 12,139A. ALL EQUIPMENT OPERATING AT 480 VOLTS SHALL BE RATED FOR A 14,000A FAULT, MINIMUM.

## SINGLE-LINE DIAGRAM KEYNOTES

A. EQUIPMENT RACK FRAME, ANY EXISTING ELECTRICAL GROUNDING SYSTEM, AND OTHER ELECTRODES PER NEC 250.50.
B. 3/4" X 10' COPPERCLAD STEEL GROUND RODS
C. SERVICE SURGE PROTECTOR, 480/277V, 3ø, 4W, 160,000A PER PHASE CAPACITY, STATUS LED, FUSED DISCONNECT SWITCH, UL1449 LISTED, EMERSON 560YC08ARAG1S, OR EQUAL, INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
D. 480-120/240V, 1 PHASE, 3 WIRE, 10KVA DRY TYPE TRANSFORMER WITH INTEGRAL 40 AMPERE PRIMARY AND 60 AMPERE SECONDARY CIRCUIT BREAKERS, AND 10 BOLT-ON CIRCUIT BREAKER BRANCH CIRCUIT PANEL SPACES (SEE PANEL SCHEDULE FOR REQUIRED BREAKERS), NEMA 3R ENCLOSURE, 18KAIC PRIMARY INTERRUPTING RATING, SQUARE D MPZB10S40F, OR EQUAL. BOND TRANSFORMER SECONDARY NEUTRAL TO #6 GROUND.
E. TAP CONDUCTOR LENGTHS TO DISCONNECT SWITCHES FROM WIREWAY TERMINAL BLOCKS SHALL NOT EXCEED 10' PER NEC 240.21(B)(1) FOR TAP CONDUCTORS #12 THRU #6. #4 AND LARGER TAP CONDUCTORS SHALL NOT EXCEED 25' PER NEC 240.21(B)(2).
F. SEE SHEET E-02 FOR PUMP CONTROL PANEL REQUIREMENTS.

RCE
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Registered Professional Engineer (Retired) CERTIFICATE NO. 14502 RICHARD P. CANNEY 6/14/18 ARIZONA U.S.A. EXPIRES 6/30/20

8TH ST. UNDERP.

100% DESIGN PLANS

SHEET NO. E11
11 OF 12

RCE JOB No. 16117

# ELECTRICAL SPECIFICATIONS AND GENERAL NOTES

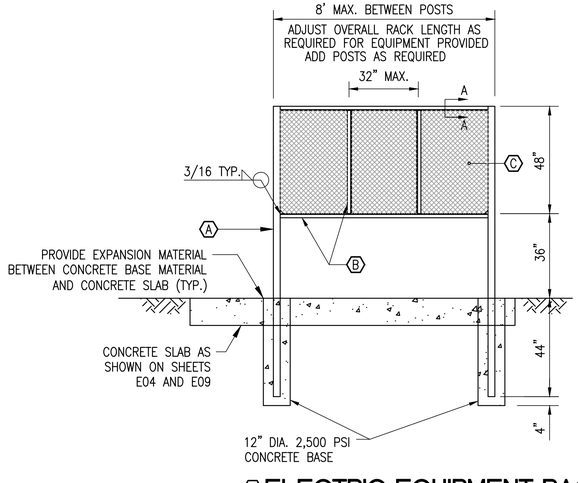
1. PERFORM WORK IN ACCORDANCE WITH THE CURRENTLY ADOPTED ISSUE OF THE NATIONAL ELECTRICAL CODE (NEC), STATE AND LOCAL REGULATIONS, AND OTHER ORDINANCES HAVING JURISDICTION.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE ELECTRIC UTILITY COMPANY AND TELEPHONE COMPANY TO DETERMINE DETAILS OF POWER AND TELEPHONE SERVICE REQUIREMENTS.
3. PROVIDE ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR THE COMPLETION OF THE WORK AS SHOWN AND SPECIFIED.
4. THE LAYOUT OF THE CONTRACT DRAWINGS IS DIAGRAMMATIC. IT IS NOT THE INTENT OF THESE PLANS AND/OR SPECIFICATIONS TO SHOW EVERY DETAIL OF CONSTRUCTION. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM AND PROVIDE ALL REQUIREMENTS NECESSARY FOR EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER.
5. CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO SUBMITTING BID TO VERIFY ALL EXISTING CONDITIONS, LOCATIONS, DIMENSIONS AND COUNTS AS SHOWN AND/OR SPECIFIED.
6. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH OTHER TRADES TO DETERMINE ELECTRICAL REQUIREMENTS, SPACES AND ADEQUATE CLEARANCES WITH RESPECT TO OTHER EQUIPMENT IN THE BUILDING, AND PROVIDE ANY RACEWAY, WIRING, OR CONNECTIONS REQUIRED FOR PROPER OPERATION.
7. KEEP AREAS IN WHICH WORK IS BEING PERFORMED FREE FROM DEBRIS AND LEAVE BROOM CLEAN AT END OF WORKING DAY.
8. EQUIPMENT, MATERIAL, AND WORKMANSHIP SHALL BE GUARANTEED FREE FROM DEFECTS FOR ONE YEAR FROM DATE OF ACCEPTANCE.
9. WORK PERFORMED SHALL BE DONE BY A LICENSED CONTRACTOR IN A FIRST-CLASS WORKMANLIKE MANNER AND ALL SYSTEMS SHALL BE TESTED IN PRESENCE OF THE OWNER TO DEMONSTRATE THAT EQUIPMENT IS WORKING PROPERLY. DEFECTS SHALL BE RECTIFIED AT NO COST TO THE OWNER. EQUIPMENT REQUIRING ADJUSTMENTS OR CALIBRATIONS FOR PROPER OPERATION SHALL BE SET BY THE CONTRACTOR AS NECESSARY, SPECIFIED OR DIRECTED BY THE OWNER. READOUTS SHALL BE IN STANDARD ENGINEERING UNITS (FEET, GPM, PSI, ETC.).
10. ELECTRICAL EQUIPMENT, DEVICES, AND MATERIAL SHALL BE NEW, UL LISTED FOR THE INTENDED USE AND SHALL MEET APPLICABLE NEMA, ANSI, AND ASTM STANDARDS. CONTROL PANELS SHALL BE ASSEMBLED BY A UL 508 CERTIFIED FACILITY AND SHALL BE SO LABELED.
11. WIRING DEVICES SHALL BE SPECIFICATION GRADE HUBBELL, LEVITON OR EQUAL. RECEPTACLES SHALL HAVE NYLON OR POLYCARBONATE FACES AND BE LABELED MEETING FEDERAL SPECIFICATIONS. UNLESS NOTED OTHERWISE, RECEPTACLES SHALL BE 120V, 15A, DUPLEX, EXCEPT THAT RECEPTACLES ON DEDICATED CIRCUITS (I.E. NO OTHER DEVICES ON CIRCUIT) SHALL BE 20A. RECEPTACLES ON DEDICATED CIRCUITS SHALL BE PROVIDED WITH ENGRAVED NAMEPLATES OR DEVICE PLATES READING "DEDICATED CIRCUIT" AND GIVING THE PANEL AND CIRCUIT NUMBER OF THE BREAKER FEEDING IT. RECEPTACLES LOCATED OUTDOORS SHALL BE PROVIDED WITH A DIE CAST METAL COVER THAT MAINTAINS A WEATHERPROOF RATING WITH AN ATTACHMENT PLUG INSERTED. SWITCHES SHALL BE 20A WITH NEOPRENE RUBBER PADS FOR QUIET OPERATION, HUBBELL 1221 (1P), 1222 (2P), OR 1223 (3W), LEVITON 1221-2 (1P), 1222-2 (2P), OR 1223-2 (3W), OR EQUAL, WITH WEATHERPROOF OPERATOR WHERE OUTDOOR.
12. USE STRANDED COPPER WIRE (LIGHTING AND RECEPTACLE CIRCUITS MAY BE SOLID). ALL CONDUCTOR INSULATION SHALL BE TYPE XHHW OR XHHW-2. IDENTIFY EACH CONDUCTOR AT EACH TERMINATION POINT WITH HEAT SHRINK OR PLASTIC SLEEVE TYPE WIRE MARKER PERMANENTLY MACHINE IMPRINTED WITH A UNIQUE COMBINATION OF NUMBERS AND LETTERS.
13. EQUIPMENT LUGS, CONNECTORS, AND TERMINATIONS, INCLUDED IN PANELS, SWITCHES, STARTERS, CONTACTORS, AND CIRCUIT BREAKERS SHALL BE SUITABLE FOR USE WITH CONDUCTOR OPERATING AT 75 DEGREE C.
14. ALL CONDUCTORS SHALL BE IN APPROVED RACEWAYS. USE:
    - A. GALVANIZED RIGID STEEL (GRS): WHERE CONDUIT BENDS UPWARD FROM UNDERGROUND TO ABOVE GROUND, USE GRS ELBOW WITH AN APPROVED PVC TO GRS COUPLER. GRS CONDUIT SHALL EXTEND A MINIMUM OF 24" BELOW GRADE. USE GRS IN ALL AREAS WHERE CONDUIT MAY BE EXPOSED TO PHYSICAL DAMAGE. USE THREADED STEEL FITTINGS. THREADS OF CONDUIT INSTALLED OUTDOORS SHALL BE COATED WITH ZINC RICH PAINT PRIOR TO MAKING UP. PROTECT UNDERGROUND METAL CONDUIT WITH HALF LAPPED 10 MIL PIPEWRAP TAPE, SCOTCHWRAP #50 TAPE OR EQUAL.
    - B. INTERMEDIATE METAL CONDUIT (IMC): MAY BE USED IN SIZES 1-1/2" AND LARGER IN LIEU OF RIGID STEEL. FITTINGS AND INSTALLATION SHALL BE AS FOR RIGID STEEL.
    - C. POLYVINYL CHLORIDE (PVC) SCHEDULE 40: MAY BE USED BELOW FINISHED GRADE. INSTALL 24 INCHES MINIMUM BELOW FINISHED GRADE SURROUNDED BY 3 INCHES OF SAND OR SELECTED FILL FREE OF ORGANIC MATTER, STICKS, GRAVEL, OR OTHER SHARP OBJECTS, EXCEPT THAT UNDER CONCRETE SLABS NO MINIMUM DEPTH IS REQUIRED.
    - D. LIQUIDTIGHT FLEXIBLE METAL CONDUIT: USE FOR EQUIPMENT REQUIRING FLEXIBLE CONNECTION (36 INCHES MAX LENGTH). SUITABLE FOR USE AS A GROUNDING CONDUCTOR PER NEC 250.118(7). USE STEEL FITTINGS. USE COMPRESSION TYPE CONNECTORS. DO NOT USE FLEXIBLE CONDUIT FOR DEVICES RIGIDLY MOUNTED TO COMMON SUPPORT STRUCTURES.
15. FITTINGS, BOXES, AND SUPPORTS SHALL BE PROVIDED AS REQUIRED TO PROVIDE A COMPLETE SYSTEM. CONDUIT BODIES, FS AND FD BOXES SHALL BE GALVANIZED CAST IRON, LARGER BOXES SHALL BE NEMA 3R PAINTED STEEL. USE WATERTIGHT THREADED HUBS FOR ALL CONDUIT CONNECTIONS TO THE TOPS OR SIDES OF ENCLOSURES THAT DO NOT HAVE INTEGRAL THREADED HUBS.
16. PROVIDE PULL BOXES FOR UNDERGROUND ELECTRICAL CONDUITS SUCH THAT NO SINGLE CONDUIT RUN HAS BENDS IN EXCESS OF 360 DEGREES. PULL BOXES SHALL BE PRECAST CONCRETE WITH H-20 HIGHWAY RATING UNLESS NOTE OTHERWISE. WARNING TAPES WHICH SAY "WARNING-BURIED ELECTRICAL" SHALL BE PLACED IN TRENCHES ABOVE ALL UNDERGROUND ELECTRIC CONDUITS. WARNING TAPE SHALL BE METALLIC TRACEABLE TYPE.
17. UNLESS NOTED OTHERWISE, FUSES SHALL BE TIME DELAY, CLASS RK-1, BUSS LPS-RK_SP, OR EQUAL. FUSES FOR MOTOR CONTROL CIRCUITS SHALL BE TIME DELAY, BUSS FNM, OR EQUAL. FUSES FOR CONTROL TRANSFORMER PRIMARY SHALL BE TIME DELAY, CLASS CC, BUSS FNQ-R, OR EQUAL.
18. DISCONNECT SWITCHES SHALL BE FUSED, 3 POLE, WITH CLASS R FUSE CLIPS AND VOLTAGE RATING AS REQUIRED UNLESS OTHERWISE SHOWN. OUTDOOR UNITS SHALL BE WEATHERPROOF, NEMA 3R. UNITS SHALL BE HEAVY DUTY, HORSEPOWER RATED, AND HAVE MEANS FOR PAD LOCKING IN THE OPEN POSITION.
19. MOTOR STARTERS SHALL BE COMBINATION FUSED DISCONNECT TYPE, WITH NEMA SIZED CONTACTORS AND FULL OR REDUCED VOLTAGE STARTING FEATURES AS SHOWN ON THE SINGLE-LINE DIAGRAM. DISCONNECT SWITCHES SHALL HAVE THE FEATURES SPECIFIED FOR DISCONNECT SWITCHES ABOVE. ENCLOSURES SHALL BE NEMA 3R RATED, AND PROVIDED WITH EXTRA SPACE FOR INSTALLATION OF AUXILIARY EQUIPMENT. MOTOR STARTERS SHALL BE ALLEN-BRADLEY, SQUARE D, CUTLER-HAMMER, OR EQUAL.
20. DISCONNECT SWITCHES, STARTERS PANELS, AND TIME CONTROLS SHALL BE LABELED WITH ENGRAVED PLASTIC LAMINATE NAMEPLATES ATTACHED WITH SCREWS. ALL ENCLOSURES CONTAINING VOLTAGES OF 120 VOLTS OR HIGHER SHALL BE PROVIDED WITH A 5" WIDE X 3-1/2" HIGH VINYL LABEL WITH PRESSURE SENSITIVE ADHESIVE READING "DANGER - 480 VOLTS" (OR APPROPRIATE VOLTAGE) AS MANUFACTURED BY SETON, OR EQUAL.
21. CIRCUIT BREAKERS SHALL BE INVERSE TIME TYPE (THERMAL-MAGNETIC). MULTI-POLE CIRCUIT BREAKERS SHALL BE COMMON TRIP. NO TIE HANDLES PERMITTED.
22. DO NOT USE PERFORATED STRAP IRON, PLUMBER'S TAPE OR TIE WIRE AS A RACEWAY OR DEVICE SUPPORT.
23. PROVIDE EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS. SIZE WIRE PER NEC TABLE 250.122.
24. CONTROL RELAYS AND TIME DELAY RELAYS SHALL BE TUBULAR PLUG-IN TYPE WITH SOCKET BASES, DPDT CONTACTS RATED A MINIMUM 10 AMPERES CONTINUOUS AT 120 VAC, AND 120 VAC COILS, UNLESS NOTED OTHERWISE. TIME DELAY RELAYS SHALL BE MULT-RANGE, 0-999 MINUTES, DAYTON 6A854. PHASE FAILURE RELAYS (PFR) SHALL BE SSAC PLMU11. PROVIDE ADDITIONAL RELAYS WIRED IN PARALLEL WHERE REQUIRED TO OBTAIN THE NUMBER OF CONTACTS INDICATED.
25. CONTROL SELECTOR SWITCHES AND PUSHBUTTONS SHALL BE NEMA 4/13, AND HAVE CONTACTS RATED A MINIMUM 10 AMPERES CONTINUOUS AT 120 VAC. PILOT LIGHTS SHALL BE NEMA 4/13, LED TYPE.
26. ELAPSED TIME METER (ETM) UNITS SHALL BE 6 DIGIT MINIMUM, INCLUDING 0.1 HOUR, NON-RESETABLE, AND WEATHERPROOF, TENOR MODEL 830-3-0201, WITH GASKET, OR EQUAL. PILOT DEVICES SHALL BE 30.5 MM SIZE. SELECTOR SWITCHES SHALL BE KEY OPERATED TYPE.
27. ALL REQUIRED SYSTEM SHUTDOWNS SHALL BE COORDINATED WITH THE OWNER AT LEAST FOUR DAYS IN ADVANCE OF THE SHUTDOWN.
28. INSULATE ALL ABOVE GRADE PIPING AND TUBING 1" AND SMALLER WITH 3/8" THICK, CLOSED CELL POLYETHYLENE FOAM PIPE INSULATION OF THE APPROPRIATE SIZE TO PROVIDE FREEZE PROTECTION.
29. ANALOG SIGNAL CIRCUITS SHALL BE TWISTED SHIELDED PAIR (TSP) CABLE, #16 AWG STRANDED COPPER PAIR CONDUCTOR WITH FULL FOIL OR METALIZED PLASTIC SHIELD, #18 DRAIN WIRE, WITH 600 VOLT RATED PVC INSULATION AND PVC OUTER JACKET, BELDEN 9342, OR EQUAL.
30. THREE BOUND SETS OF OPERATING AND MAINTENANCE INFORMATION SHALL BE PROVIDED FOR ALL EQUIPMENT. THIS INFORMATION SHALL CONSIST OF SHOP DRAWINGS, START-UP AND OPERATING PROCEDURES, PREVENTATIVE MAINTENANCE PROCEDURES, OVERHAUL INSTRUCTIONS, PARTS LISTS, CONTROL/CONNECTION DIAGRAMS, LUBRICATION INFORMATION AND ANY OTHER INFORMATION REQUIRED FOR COMPLETE OPERATION AND MAINTENANCE OF THE EQUIPMENT. EXTRANEOUS INFORMATION ON THE PAGES SHALL BE CROSSED OUT, AND THE SUPPLIED EQUIPMENT SHALL BE CLEARLY MARKED.

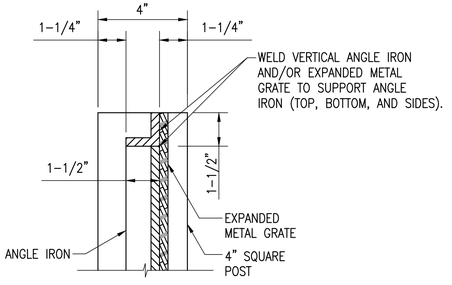
# PACKAGED SUMP PUMP CONTROL PANEL SPECIFICATIONS

THE TWO SUBMERSIBLE SUMP PUMPS SHALL BE PROVIDED WITH A UL 508 LABELED PUMP CONTROL PANEL CONSISTING OF A NEMA 3R ENCLOSURE WITH LOCKING, HINGED FRONT DOOR(S), AND DEAD FRONT PANEL BEHIND THE FRONT DOORS (NO OPERATING DEVICE HANDLES SHALL BE MOUNTED ON THE EXTERIOR DOOR FRONT), TO HOUSE THE SUMP PUMP ELECTRICAL CONTROLS. THE PANEL SHALL BE ARRANGED TO PROVIDE FULL CONTROL OF THE TWO SUMP PUMPS AND SHALL HAVE THE FEATURES LISTED BELOW.

1. A DUPLEX PUMP CONTROL PANEL CONFIGURED TO OPERATE ON A 480 VOLT, 3 PHASE POWER SUPPLY TO THE PANEL.
2. A MAIN DISCONNECT SWITCH INCORPORATING OVERCURRENT PROTECTION FOR THE PANEL WITH OPERATING HANDLE ON THE INNER DEAD FRONT PANEL ARRANGED TO PREVENT OPENING OF THE INNER DEAD FRONT PANEL WITHOUT OPENING THE DISCONNECTING MEANS TO DE-ENERGIZE THE INTERIOR OF THE PANEL.
3. FULL VOLTAGE MOTOR STARTERS, MOTOR OVERCURRENT AND OVERLOAD PROTECTION ALL SIZED FOR USE WITH THE TWO SEWAGE PUMPS.
4. A CONTROL POWER TRANSFORMER TO PROVIDE ALL REQUIRED CONTROL POWER FROM THE 480 VOLT SUPPLY TO THE PANEL.
5. A HYDROSTATIC LEVEL TRANSMITTER SUSPENDED IN THE SUMP PUMP WET WELL TO PROVIDE LEVEL CONTROL AS FOLLOWS: 1) START BOTH PUMP ON RISING LEVEL AT 5 FEET ABOVE BOTTOM OF SUMP; 2) STOP BOTH PUMPS ON RISING LEVEL AT 13 FEET ABOVE BOTTOM OF SUMP; 3) START BOTH PUMPS ON FALLING LEVEL AT 12 FEET ABOVE BOTTOM OF SUMP; 4) STOP BOTH PUMPS ON FALLING LEVEL AT 2 FEET ABOVE BOTTOM OF SUMP.
6. A HAND-OFF-AUTO SWITCH AND RED LED "RUNNING" PILOT LIGHT FOR EACH PUMP.
7. A POWER MONITOR TO SHUT DOWN THE PUMPS ON PHASE LOSS, PHASE REVERSAL, OR UNACCEPTABLE VOLTAGE.
8. SHUTDOWN OF THE PUMPS ON MOTOR WINDING OVERTEMPERATURE CONDITION WITH A RED "OVER TEMPERATURE" PILOT LIGHT FOR EACH PUMP.
9. SHUTDOWN OF THE PUMPS ON SEAL FAILURE CONDITION WITH A YELLOW "SEAL FAIL" IPILOT LIGHT FOR EACH PUMP.
10. RUN TIME HOUR METERS FOR EACH OF THE PUMPS.
11. ALARM BEACON ON TOP OF THE PANEL AND ALARM HORN WITH TEST/SILENCE PUSHBUTTON.
12. PROVIDE A CELLULAR TELEPHONE ALARM NOTIFICATION SYSTEM TO MONITOR AND TRANSMIT ALARM CONDITIONS OFF-SITE TO PREPROGRAMMED TELEPHONE NUMBERS. COORDINATE WITH OWNER FOR DESIRED TELEPHONE SERVICE (GSM OR CDMA) AND NUMBERS TO BE NOTIFIED. THE NOTIFICATION SYSTEM SHALL SEND APPROPRIATE NOTIFICATION FOR THE FOLLOWING: 1) EITHER PUMP RUNNING; 2) SUMP HIGH LEVEL AT 14 FEET ABOVE BOTTOM OF THE SUMP; 3) IF EITHER PUMP RUNS CONTINUOUSLY FOR 24 HOURS; 4) ON LOSS OF NORMAL UTILITY POWER TO THE STATION; 5) IF THE CONTRIOLS REQUEST A PUMP TO RUN AND THERE IS NO INDICATION OF A RUNNING CONDITION AS MONITORED BY AUXILLARY CONTACTS ON THE MOTOR STARTERS.

PROVIDE A SUBMITTAL CONTAINING CONTROL LADDER DIAGRAMS OF THE CONTROL PANEL AND INFORMATION ON ALL COMPONENTS FOR APPROVAL PRIOR TO FABRICATION OF THE PANEL.




**SECTION A-A**
NTS

NOTES:
1. ALL EXPOSED METAL SURFACES SHALL BE PAINTED BEFORE EQUIPMENT IS MOUNTED ON THE RACK.
2. ALL STEEL SHALL BE ASTM A-36 GRADE 40

## ⬡ELECTRIC EQUIPMENT RACK KEYNOTES

A 4" SQUARE STEEL TUBING POSTS, 3/8" MIMIMUM WALL THICKNESS, TYPICAL. WELD 3/8" TOP PLATE ON EACH POST AND GRIND WELDS SMOOTH.

B INTERIOR VERTICAL AND HORIZONTAL SUPPORTS, 1-1/2" X 1-1/2" X 1/4" STEEL ANGLE. QUANTITY AND SPACING AS NEEDED TO MOUNT EQUIPMENT.

C McNICHOLS 1-1/2 #9 STANDARD EXPANDED METAL CARBON STEEL GRATE, WELDED TO VERTICAL AND HORIZONTAL SUPPORTS.

## ① ELECTRIC EQUIPMENT RACK
NOT TO SCALE

# ELECTRICAL SYMBOL LEGEND

| | |
|---|---|
| 3 | RACEWAY EXPOSED (3 = CONDUIT NUMBER, SEE CONDUIT SCHEDULE) |
| | RACEWAY CONCEALED IN FLOOR OR UNDERGROUND. |
| | FLEXIBLE CONDUIT |
| | SWITCHES: |
| S | SINGLE POLE |
| SM | MANUAL MOTOR STARTER W/OVERLOAD ELEMENT |
| | 20A DUPLEX RECEPTACLE @ +18" AFF UNO, |
| | SPECIAL PURPOSE RECEPTACLE AS NOTED |
| J | JUNCTION BOX. SIZE AND INSTALL PER NEC 370. |
| NF | FUSED DISCONNECT SWITCH, NF=NON-FUSED |
| (1) | COMBINATION FUSED DISCONNECT, MAGNETIC MOTOR STARTER NUMBER INDICATES NEMA SIZE |
| | CIRCUIT BREAKER. |
| | SWITCH AND FUSE |
| | PANELBOARD - SEE PANEL SCHEDULE. |
| | LIGHT FIXTURE |
| CR | RELAY, CR=CONTROL RELAY, TR=TIMING RELAY, LR=LEVEL RELAY |
| CR1 | NORMALLY OPEN CONTACT |
| CR1 | NORMALLY CLOSED CONTACT |
| RESET | PUSHBUTTON |
| TR1 | NORMALLY OPEN, TIME CLOSING CONTACTS |
| TR1 | NORMALLY CLOSED, TIME OPENING CONTACTS |
| PSH | PRESSURE SWITCH |
| G | PILOT LIGHT, WP, LED TYPE, G=GREEN, R=RED |
| | MOUNT ON FRONT OF PANEL DOOR |
| | OVERLOAD ELEMENT |
| | TERMINAL |
| | FIELD MOUNTED INSTRUMENT |
| | GROUND |

| | |
|---|---|
| AFF | ABOVE FINISHED FLOOR. |
| AIC | AMPS INTERRUPTING CAPACITY |
| CU | COPPER |
| ETM | ELAPSED TIME METER, WP, 6 DIGET NON-RESETTALBE |
| FVNR | FULL VOLTAGE NON-REVERSING |
| GFI | GROUND FAULT INTERRUPTER. |
| G, GND | GROUND |
| MCB | MAIN CIRCUIT BREAKER |
| MLO | MAIN LUGS ONLY |
| NEC | NATIONAL ELECTRIC CODE |
| RVPW | REDUCED VOLTAGE PART WINDING |
| UNO | UNLESS NOTED OTHERWISE. |
| WP | WEATHERPROOF |

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DRAINAGE IMPROVEMENT PROJECT

C.O.K. PROJECT NO. ENG 16-00021

FILENAME E2.dwg


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8TH ST. UNDERP.

100% DESIGN PLANS

SHEET NO. E12
12 OF 12