

APPENDIX 2.8 –

Weir As-Builts / Plans in Manholes

FOR:

14th St. and Iron Weir in Mahole

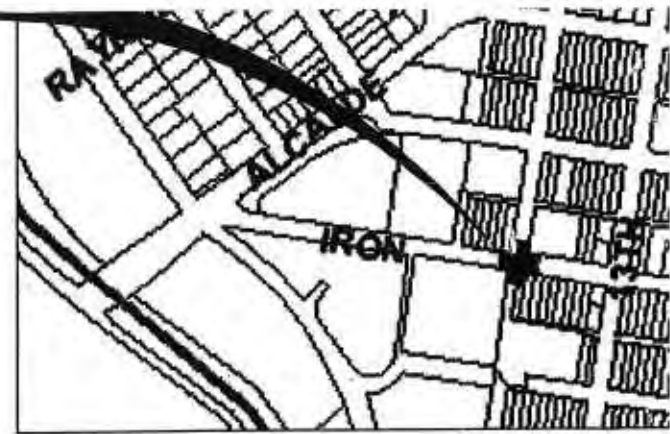
CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT



CONSTRUCTION PLANS
FOR

IRON AVE./14th ST.
JUNCTION BOX AND STORM DRAIN
RECONSTRUCTION
FLOOD CONTROL
ON-CALL CONTRACT

File:
796304
Iron-
14th



VICINITY MAP
ZONE ATLAS MAP NO. K-13

- NOTES
- ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED UNDER CONTRACT SHALL, EXCEPT AS OTHERWISE STATED OR PROVIDED FOR HEREON, BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1986 EDITION, AS AMENDED THROUGH UPDATE #7.
- THE CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING THE EXECUTION OF THE WATER VALVE SHUT-OFF PLAN WITH THE WATER SYSTEMS DIVISION (857-8200) SEVEN (7) WORKING DAYS IN ADVANCE OF ANY WORK THAT MAY AFFECT EXISTING PUBLIC WATER UTILITIES.
- TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, THE CONTRACTOR MUST CONTACT NEW MEXICO ONE CALLS SYSTEM (260-1990) FOR LOCATION OF EXISTING UTILITIES.
- PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OR SURVEYOR IMMEDIATELY SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
- FIVE (5) WORKING DAYS PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT TO CONSTRUCTION COORDINATIONS DIVISION A DETAILED CONSTRUCTION SCHEDULE. TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A BARRICADING PERMIT FROM THE CONST. COORDINATION DIVISION. CONTRACTOR SHALL NOTIFY BARRICADE ENGINEER (924-3400) PRIOR TO OCCUPYING AN INTERSECTION. REFER TO SECTION 19 OF THE GENERAL CONDITIONS OF THE STANDARD SPECIFICATIONS.
- ALL STREET STRIPING ALTERED OR DESTROYED SHALL BE REPLACED WITH PLASTIC REFLECTORIZED PAVEMENT MARKINGS BY CONTRACTOR TO LOCATION AS EXISTING OR AS INDICATED BY THIS PLAN SET.
- CONTRACTOR SHALL NOTIFY THE ENGINEER NOT LESS THAN SEVEN (7) DAYS PRIOR TO STARTING WORK IN ORDER THAT THE ENGINEER MAY TAKE NECESSARY MEASURES TO INSURE THE PRESERVATION OF SURVEY MONUMENTS. CONTRACTOR SHALL NOT DISTURB PERMANENT SURVEY MONUMENTS WITHOUT THE CONSENT OF THE ENGINEER AND SHALL NOTIFY THE ENGINEER AND BEAR THE EXPENSE OF REPLACING ANY THAT MAY BE DISTURBED WITHOUT PERMISSION. REPLACEMENT SHALL BE DONE ONLY BY THE CITY SURVEYOR. WHEN A CHANGE IS MADE IN THE FINISHED ELEVATIONS OF THE PAVEMENT OF ANY ROADWAY IN WHICH A PERMANENT SURVEY MONUMENT IS LOCATED, CONTRACTOR SHALL, AT HIS OWN EXPENSE, ADJUST THE MONUMENT COVER TO THE NEW GRADE UNLESS OTHERWISE SPECIFIED. REFER TO SECTION 4.4 OF THE GENERAL CONDITIONS OF THE STANDARD SPECIFICATIONS.
- ANY WORK AFFECTING AN ARTERIAL ROADWAY REQUIRES TWENTY-FOUR (24) CONSTRUCTION.
- CONTRACTOR SHALL MAINTAIN A GRAFFITI-FREE WORK SITE. CONTRACTOR SHALL PROMPTLY REMOVE ANY GRAFFITI FROM ALL EQUIPMENT, WHETHER PERMANENT OR TEMPORARY.
- THE FOLLOWING NOTES ALSO APPLY WHEN CHECKED:
- ☒ ALL UTILITIES AND UTILITY SERVICE LINES SHALL BE INSTALLED PRIOR TO PAVING.
 - ☒ BACKFILL COMPACTION SHALL BE ACCORDING TO SPECIFIED STREET USE.
 - ☒ TACK COAT REQUIREMENTS SHALL BE DETERMINED BY THE ENGINEER.
 - ☒ SIDEWALKS AND WHEELCHAIR RAMPS WITHIN THE CURB RETURNS SHALL BE CONSTRUCTED WHEREVER A NEW CURB RETURN IS CONSTRUCTED.
 - ☒ IF CURB IS DEPRESSED FOR A DRIVEPAD, THE DRIVEPAD SHALL BE CONSTRUCTED PRIOR TO ACCEPTANCE OF CURB AND GUTTER.
 - ☒ ALL STORM DRAINAGE FACILITIES SHALL BE COMPLETED PRIOR TO FINAL ACCEPTANCE.

| DESCRIPTION | INDEX | SHEET NO. |
|--------------------------------------|-------|-----------|
| COVER SHEET | | 1 |
| GENERAL NOTES | | 2 |
| DEMOLITION PLAN | | 3 |
| IRON AVE. STORM DRAIN PLAN & PROFILE | | 4 |
| WIER WALL DETAILS | | 5 |

RECORD DRAWINGS

I, James A. Pung of the City of Albuquerque, a Registered Professional Engineer in the State of New Mexico, do hereby certify, to the best of my knowledge and belief, that the infrastructure installed as part of this project has been inspected by me or by a qualified person under my direct supervision, and has been constructed in accordance with the plans and specifications approved by the City of Albuquerque, and that the original design intent of the approved plans has been met, except as noted on the as-built construction drawings. This Certification is based on site inspections by me or personnel under my direction, and survey information provided by Tamara Lang Swanson NMPS number _____.

James A. Pung 2/12/06
James A. Pung, NMPE 13117

WILSON & COMPANY
4900 LANG AVE N.E.
SUITE 100
ALBUQUERQUE, NEW MEXICO
87109



| | | | | | | |
|-----------------------------|--------|------------------|------|-----------------|------|---------------------|
| REV | SHEETS | CITY ENGINEER | DATE | USER DEPARTMENT | DATE | USER DEPARTMENT |
| ENGINEERS STAMP & SIGNATURE | | APPROVALS | | ENGINEER | DATE | ***** |
| | | DRG Chairman | | | | APPROVED FOR CONSTR |
| | | Transportation | | | | |
| | | Water/Wastewater | | | | |
| | | Hydrology | | | | |
| | | Parks | | | | |
| | | Constr. Mgmt. | | | | City Engineer D |
| | | Constr. Coord. | | | | |

GENERAL NOTES:

1. THE CONTRACTOR SHALL NOTIFY THE ALBUQUERQUE TRAFFIC ENGINEERING DIVISION THREE (3) WORKING DAYS IN ADVANCE OF ANY WORK REQUIRED REGARDING ALL EXISTING REGULATORY SIGNS AND SIGNALS THAT NEED TO BE REMOVED, RELOCATED, OR REINSTALLED. CALL 857-8680. REFER TO SECTION 18.4.4 OF THE SPECIFICATIONS.

2. THE CONTRACTOR WILL BE REQUIRED TO CONFINE HIS WORK WITHIN THE CONSTRUCTION LIMITS AND/OR R.O.W. TO PRESERVE EXISTING VEGETATION AND PRIVATE PROPERTY. OVERNIGHT PARKING OF CONSTRUCTION EQUIPMENT SHALL NOT OBSTRUCT DRIVEWAY OPENINGS OR DESIGNATED TRAFFIC LANES.

3. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN A SAFE AND ADEQUATE MEANS OF CHANNELING PEDESTRIAN TRAFFIC AROUND ALL WORK AREAS THROUGHOUT THE CONSTRUCTION PERIOD.

4. A DISPOSAL SITE, COMPLYING WITH ALL CITY ORDINANCES, SHALL BE OBTAINED BY THE CONTRACTOR FOR THE DISPOSAL OF ALL EXCESS EXCAVATION MATERIAL, ASPHALTIC PAVEMENT (EXCEPT MILLED BITUMINOUS CONCRETE PAVEMENT) AND OTHER WASTE MATERIALS. THE CONTRACTOR SHALL NOTIFY THE CITY OF ALBUQUERQUE OF THE LOCATION OF THE DISPOSAL SITE PRIOR TO THE REMOVAL AND ACTUAL DISPOSAL OF THE MATERIAL. ALL COSTS IN OBTAINING A DISPOSAL SITE AND HAUL THERETO SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION AND NO DIRECT PAYMENT WILL BE MADE THEREFOR.

5. CONTRACTOR TO CAREFULLY FIELD REVIEW SITE TO ASSESS EXTENT OF TRASH REMOVAL. TRASH REMOVAL SHALL BE INCIDENTAL TO PROJECT.

6. ALL VALLEY GUTTERS ARE 6' WIDE UNLESS OTHERWISE NOTED.

7. UNLESS OTHERWISE SHOWN, ALL DIMENSIONS ARE TO FACE OF CURB, INCLUDING RADII OF CURB RETURNS.

8. ALL FINISHED GRADES AND PROFILES SHOWN ARE FLOWLINE GRADES, UNLESS OTHERWISE NOTED.

9. CURB AND GUTTER SHOWN AS EXISTING AND NOT TO BE REMOVED UNDER THIS CONTRACT WHICH IS DAMAGED OR DISPLACED BY THE CONTRACTOR SHALL BE REMOVED AND REPLACED PER STD DWG 2415 BY THE CONTRACTOR AT HIS EXPENSE.

10. WHEN REMOVAL OF EXISTING CURB AND GUTTER OR SIDEWALK IS REQUIRED, REMOVE TO NEAREST JOINT.

11. WHEN ABUTTING NEW PAVEMENT TO EXISTING PAVEMENT, SAW CUT EXISTING PAVEMENT IN A STRAIGHT LINE AS REQUIRED TO REMOVE ANY BROKEN OR CRACKED PAVEMENT. PRIOR TO LAYING NEW PAVEMENT, THE EXPOSED EXISTING ASPHALT EDGE SHALL BE TACK-COATED.

12. WHEELCHAIR RAMPS SHALL BE CONSTRUCTED AT ALL CURB RETURNS CONSTRUCTED WITH THIS PROJECT AT THE LOCATIONS SHOWN ON PLANS, IN ACCORDANCE WITH THE CITY STANDARD DETAILS.

13. ALL WHEELCHAIR RAMP APPROACH SLOPES SHOWN ON STD DWG 2441 SHALL BE INCREASED IN LENGTH TO MAINTAIN 12:1 MAX SLOPE WHEN GRADE IS RISING FROM RAMP. SEE TABLE BELOW.

| RIISING GRADE | RAMP LENGTH |
|---------------|-------------|
| 0% | 8.1' |
| 0-1% | 9.2' |
| 1-2% | 10.6' |
| 2-3% | 12.6' |
| 3-4% | 15.5' |

14. CONTRACTOR IS TO EXERCISE DUE CARE TO AVOID DISTURBING ANY EXISTING UTILITIES. IT SHALL BE HIS RESPONSIBILITY TO COORDINATE WITH THE UTILITY COMPANIES IN ORDER TO PREVENT ANY SERVICE DISRUPTION THAT MIGHT RESULT FROM PROJECT CONSTRUCTION. IT SHALL BE HIS RESPONSIBILITY TO PROTECT AND PRESERVE UTILITY EQUIPMENT AFFECTED BY PROJECT CONSTRUCTION. SHOULD HE BREAK AN EXISTING UTILITY LINE DURING CONSTRUCTION ACTIVITIES HE SHALL BE RESPONSIBLE FOR UTILITY REPAIR COSTS.

15. ALL EXISTING UTILITIES SHOWN HEREIN WERE TAKEN FROM RECORD DRAWINGS, POTHOLES, FIELD SURVEYS, C.O.A. SYSTEMS UTILITIES MAPS AND INFORMATION PROVIDED BY THE UTILITY OWNERS AND ARE APPROXIMATE. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THEIR HORIZONTAL AND VERTICAL LOCATIONS AND PROVIDE PROTECTION FOR ALL UTILITIES WITHIN THE CONSTRUCTION AREA.

16. CONTRACTOR SHALL FIELD VERIFY LOCATION AND TYPE OF EXISTING UTILITIES TO BE ADJUSTED OR EXTENDED.

17. MANHOLE RIM ELEVATIONS SHOWN ON THESE PLANS ARE APPROXIMATE AND WILL VARY WITH THE FINISHED PAVEMENT ELEVATIONS.

18. CONTRACTOR TO VERIFY ALL EXISTING FIRE HYDRANT FLANGES, PADS, VALVE BOXES, MANHOLE RIMS AND TOP OF PIPE ELEVATIONS IN THE FIELD. ELEVATIONS SHALL BE ADJUSTED TO COMPLY WITH THE REQUIREMENTS OF STANDARD CITY DETAILS.

19. ELEVATIONS FOR PROPOSED WATERLINE CONNECTIONS TO EXISTING WATERLINES SHALL BE VERIFIED BY THE CONTRACTOR IN THE FIELD.

20. ALL WATER VALVE BOXES AND SEWER MANHOLES IN THE CONSTRUCTION AREA ARE TO BE ADJUSTED TO FINISH GRADE UNDER THIS CONTRACT, AND WILL BE PAID FOR AT CONTRACT UNIT PRICES.

21. THE CONTRACTOR SHALL NOTIFY THE LOCAL FIRE DEPARTMENT AT LEAST TWO (2) WORKING DAYS IN ADVANCE OF WHEN FIRE HYDRANTS WILL BE TAKEN OUT OF SERVICE AND RETURNED TO SERVICE.

22. ALL WATER SERVICES LISTED AS "DOUBLE" REFER TO DOUBLE METER BOX. A SEPARATE SERVICE LINE TO EACH METER IS REQUIRED. REFERENCE C.O.A. STD. DRAWINGS 2361, 2362.

23. ALL EXISTING GAS VALVE BOXES, GAS MANHOLES, ELECTRICAL MANHOLES, AND TELEPHONE MANHOLES WILL BE ADJUSTED TO GRADE BY OTHERS.

24. WHERE PULL BOXES ABUT BACK OF CURB OR ARE LOCATED IN A CONCRETE PAVED AREA, PROVIDE 3/4" EXPANSION MATERIAL AROUND THE PULL BOX. ALL PULL BOXES TO BE FLUSH WITH SURFACE OF CONCRETE.

25. THE CONTRACTOR SHALL MEET ALL THE REQUIREMENTS OF THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) AS WELL AS LOCAL REGULATIONS.

26. THE CONTRACTOR SHALL COORDINATE WITH PRIVATE UTILITY ENTITIES AS NEEDED FOR RELOCATION AND INSTALLATION OF PRIVATE UTILITIES. ENGINEER HAS NOTIFIED THE PRIVATE UTILITIES OF THIS PROJECT.

27. TEMPORARY EROSION FENCING (OR PERMANENT WALLS OR FENCING) SHALL BE USED TO PROTECT EXISTING RESIDENTIAL PROPERTY, STREETS LANDSCAPING AND THE DRAINAGE SYSTEMS FROM THE DEPOSITION OF ERODED MATERIAL.

28. CONSTRUCTION AREA SHALL BE CONTROLLED TO PREVENT TRESPASS USE BY 4WD'S, ORV'S AND MOTORCYCLES TO MINIMIZE NOISE, DUST, DESTRUCTION OF VEGETATION, WIND AND WATER EROSION.


29. PROPOSED WATERLINE INSTALLATION SHALL HAVE RESTRAINED JOINTS AT ALL WATERLINE VALVES, TEES, CROSSES, BENDS, AND FIRE HYDRANTS, UNLESS OTHERWISE NOTED. SEE "THRUST RESTRAINT REQUIREMENTS" BELOW.

UTILITY CONTACTS

| COMPANY | PHONE | MOBILE | CONTACT |
|---------------------|----------|--------|-----------------|
| CITY of ALBUQUERQUE | 768-2729 | | NANCY MUSINSKI |
| PNM - ELECTRIC | 241-3398 | | ART CHAVEZ |
| PNM - GAS | 241-7771 | | JOE DUNLOP |
| QWEST | 245-6374 | | ROSA KNIFFIN |
| COMCAST | 761-6221 | | ROBERT MARTINEZ |

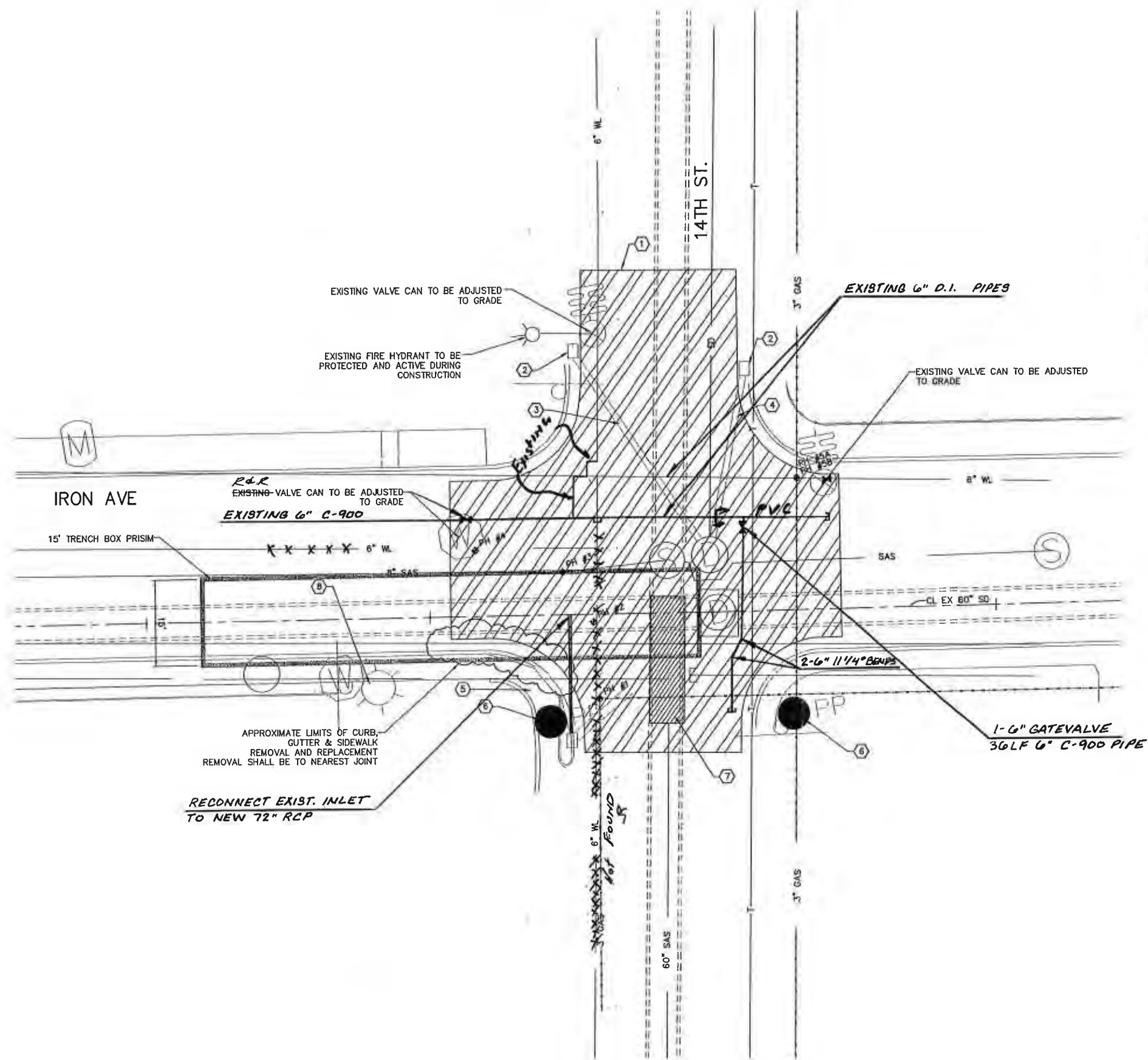
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| PAVED ROAD | UNPAVED ROAD | TRAIL | FENCE | BUILDING | LIGHT POLE | UTILITY POLES | GUY WIRE | TREE | TREE | TREE | TREE & BRUSH LINE | MANHOLE | FIRE HYDRANT | VAULT | BLOW-OFF VALVE | WATER VALVE | WATER METER | FIRE HYDRANT | SPRINKLER CONTROL BOX | ELECTRICAL, PULL BOX | ELECTRICAL, JUNCTION BOX | UTILITY, SANITARY MANHOLE | UTILITY, STORM DRAINAGE MANHOLE | UTILITY, UNKNOWN MANHOLE | TV PEDESTAL | TELEPHONE PEDESTAL | PROPERTY CORNER, EXISTING | TRAFFIC SIGNAL | WATER LINE, UNDERGROUND | GAS LINE, UNDERGROUND | TELEVISION LINE, UNDERGROUND | ELECTRIC LINE, UNDERGROUND | AREA OF DEMOLITION | PROPOSED CONCRETE | PROPOSED ASPHALT | PROPOSED SEAL COAT | PROPOSED RETAINING WALL | PROPOSED RIDGE LINE |
|------------|--------------|-------|-------|----------|------------|---------------|----------|------|------|------|-------------------|---------|--------------|-------|----------------|-------------|-------------|--------------|-----------------------|----------------------|--------------------------|---------------------------|---------------------------------|--------------------------|-------------|--------------------|---------------------------|----------------|-------------------------|-----------------------|------------------------------|----------------------------|--------------------|-------------------|------------------|--------------------|-------------------------|---------------------|

RECORD DRAWING
DATE 2-08-08

| | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------|
| WILSON & COMPANY 4900 LANG AVE. N.E. SUITE 100 ALBUQUERQUE, NEW MEXICO 87109 (505) 348-4000 FAX (505) 348-4072 www.wilsons.com |  CITY OF ALBUQUERQUE DEPARTMENT OF MUNICIPAL DEVELOPMENT IRON AVE/14th ST JUNCTION BOX & STORM DRAIN RECONSTRUCT GENERAL NOTES | Design Review Committee City Engineer Approval Last Design Update | No./Day/Yr. No./Yr. |
| City Project No. 7963.04 | Zone Map No. K-13 | Sheet 2 | of |

WCEA #0660012300
APRIL 2007

| | | |
|----------------------|-------------------------------------------|------------------------|
| AS-BUILT INFORMATION | CONTRACTOR WILSON & COMPANY | DATE 2-08-08 |
| BENCH MARKS | STD. ACS BRASS TABLET STAMPED "1-K13" | DATE 2-08-08 |
| SURVEY INFORMATION | FIELD NOTES | DATE 2-08-08 |
| ENGINEER'S SEAL | REVISIONS | DATE 2-08-08 |
| | WILSON & COMPANY, ENGINEERS & ARCHITECTS | DATE 2-08-08 |



REMOVAL KEYED NOTES

- 1 SAW CUT REMOVE & DISPOSE APPROXIMATELY 420 SY EXISTING PAVEMENT
- 2 EXISTING CATCH BASIN REMOVE & DISPOSE
- 3 EXISTING 18" SD 41 LF REMOVE & DISPOSE
- 4 EXISTING 18" SD 31 LF REMOVE & DISPOSE
- 5 EXISTING WHEELCHAIR RAMP TO BE RECONSTRUCTED
- 6 CONTRACTOR TO COORDINATE WITH PNM FOR TEMPORARY POWER POLE BRACING
- 7 EXISTING CONCRETE BLANKET TO BE PROTECTED SEE DETAIL THIS SHEET
- 8 EXISTING LIGHT POLE TO BE PROTECTED

POT HOLE TABLE

| POT HOLE NO. | UTILITY | MATERIAL | DEPTH TO TOP OF PIPE |
|--------------|-------------------|-------------------|----------------------|
| 1 | 3" GAS | WRAPED METALIC | 33" |
| 2 | 60" STORM DRAIN | CONCRETE CYLINDER | 58" |
| 3 | 8" SANITARY SEWER | PVC | 51" |
| 4 | 8" WATER LINE | PVC | 43" |
| 5A | 6" WATER LINE | IRON PIPE | 22" |
| 5B | 3" GAS | WRAPED METALIC | 42" |

RECORD DRAWING
DATE 2-08-08

GRAPHIC SCALE



| | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| WILSON & COMPANY 4000 LANG AVE N.E. SUITE 100 ALBUQUERQUE, NEW MEXICO 87110 (505) 348-4000 FAX (505) 348-4072 www.wilsonco.com | | CITY OF ALBUQUERQUE DEPARTMENT OF MUNICIPAL DEVELOPMENT IRON AVE/14th ST JUNCTION BOX & STORM DRAIN RECONSTRUCT DEMOLITION PLAN | |
| Design Review Committee | City Engineer Approval | Mo./Day/Yr. | Mo./Day/Yr. |
| City Project No. | Zone Map No. | Sheet | Of |
| 7963.04 | K-13 | 3 | |

WCEA #0660012300
APRIL 2007

AS-BUILT INFORMATION
CONTRACTOR **NM U I**
NOTED BY **TERESA LAND 948**
FULL-COVER IN **COA**
OPERATED BY **COA**
CHECKED BY **WAT**
MICRO-FILM INFORMATION

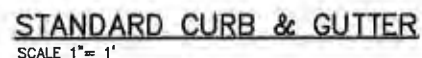
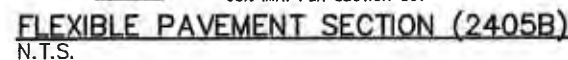
BENCH MARKS
STD. ACS BRASS TABLET STAMPED "1-K13"
SET IN TOP OF A CONCRETE POST, APPROX. 0.2 FT
BELOW CURB. THE STATION IS THEN 0.7 FT WEST
OF THE WEST CURB ON EIGHTH STREET, AND IS
APPROX. 225' SOUTH OF STOVER AVE.

SURVEY INFORMATION
FIELD NOTES
NO. BY DATE

ENGINEER'S SEAL
[Seal of Wilson & Company, Engineers & Architects, License No. 16209]

REVISIONS
NO. DATE BY
REMARKS
WILSON & COMPANY, ENGINEERS & ARCHITECTS

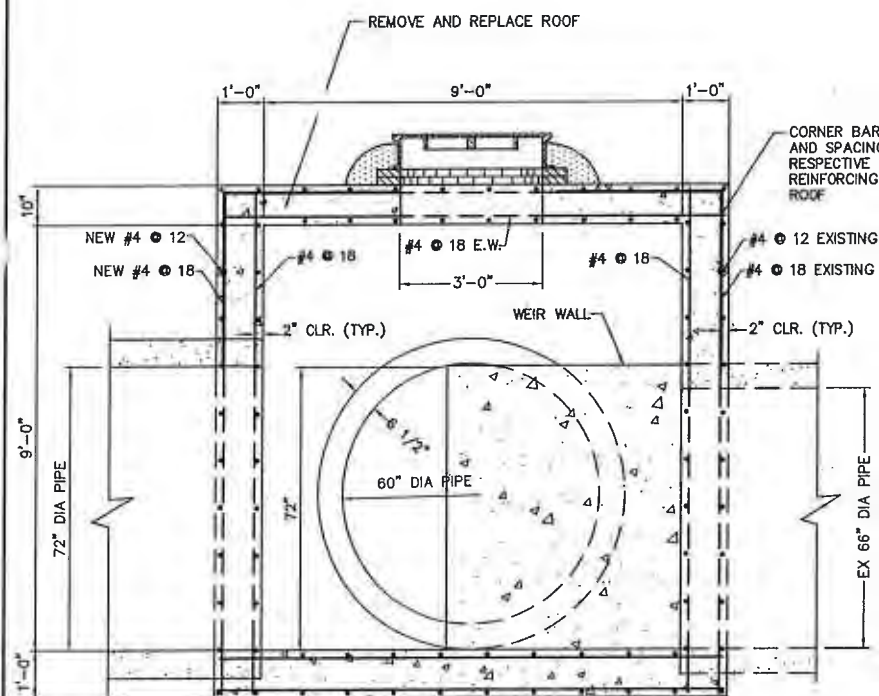
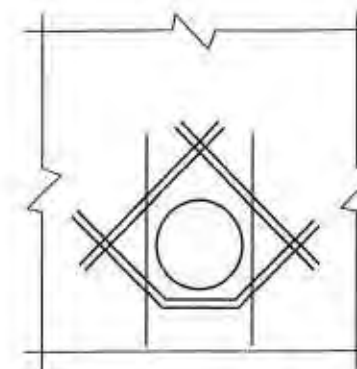
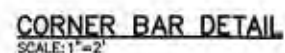
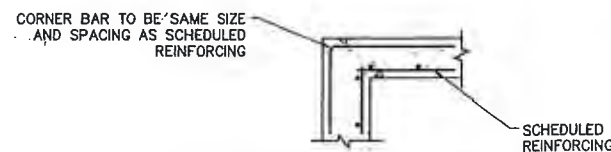
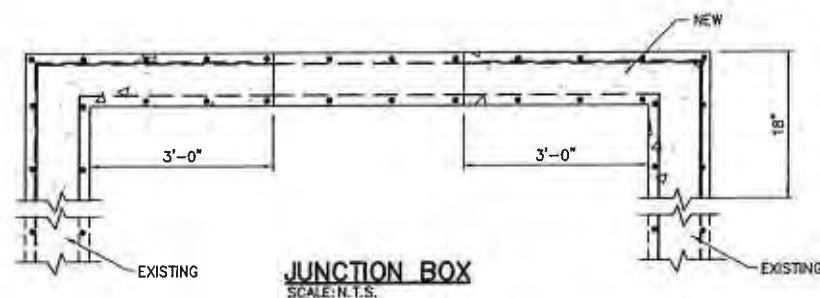
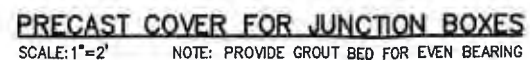
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APR 2007

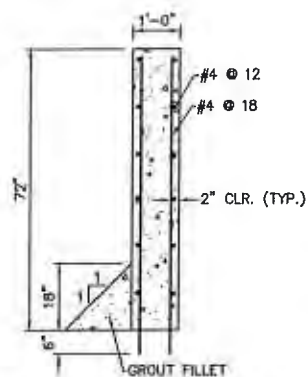
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| 3 | City Project No. | 7 |
|---|------------------|---|

Zone Map No.
K-13Sheet
4

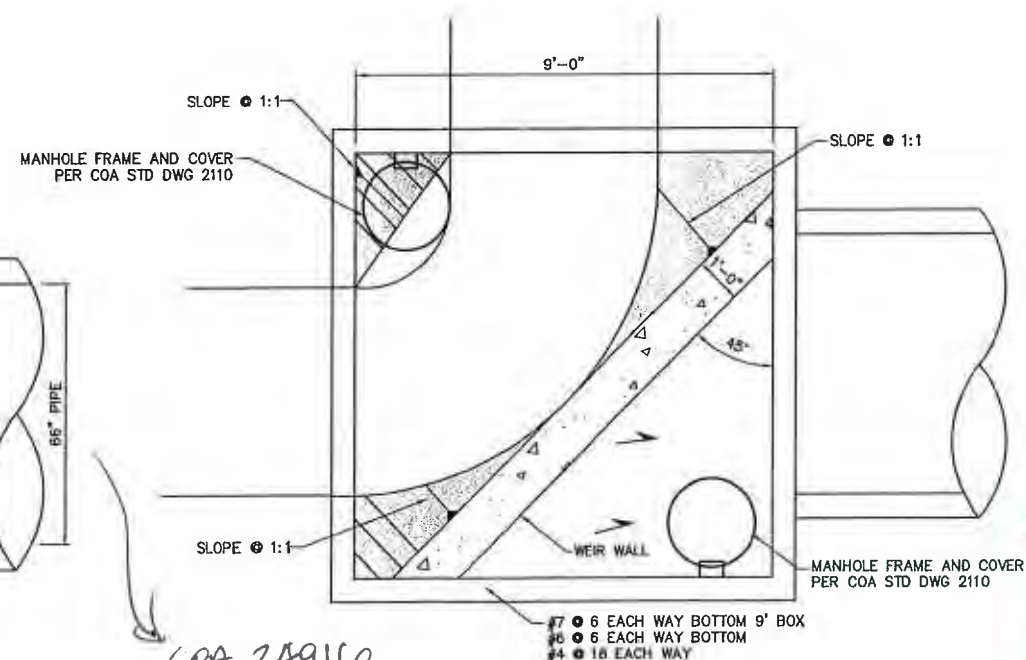
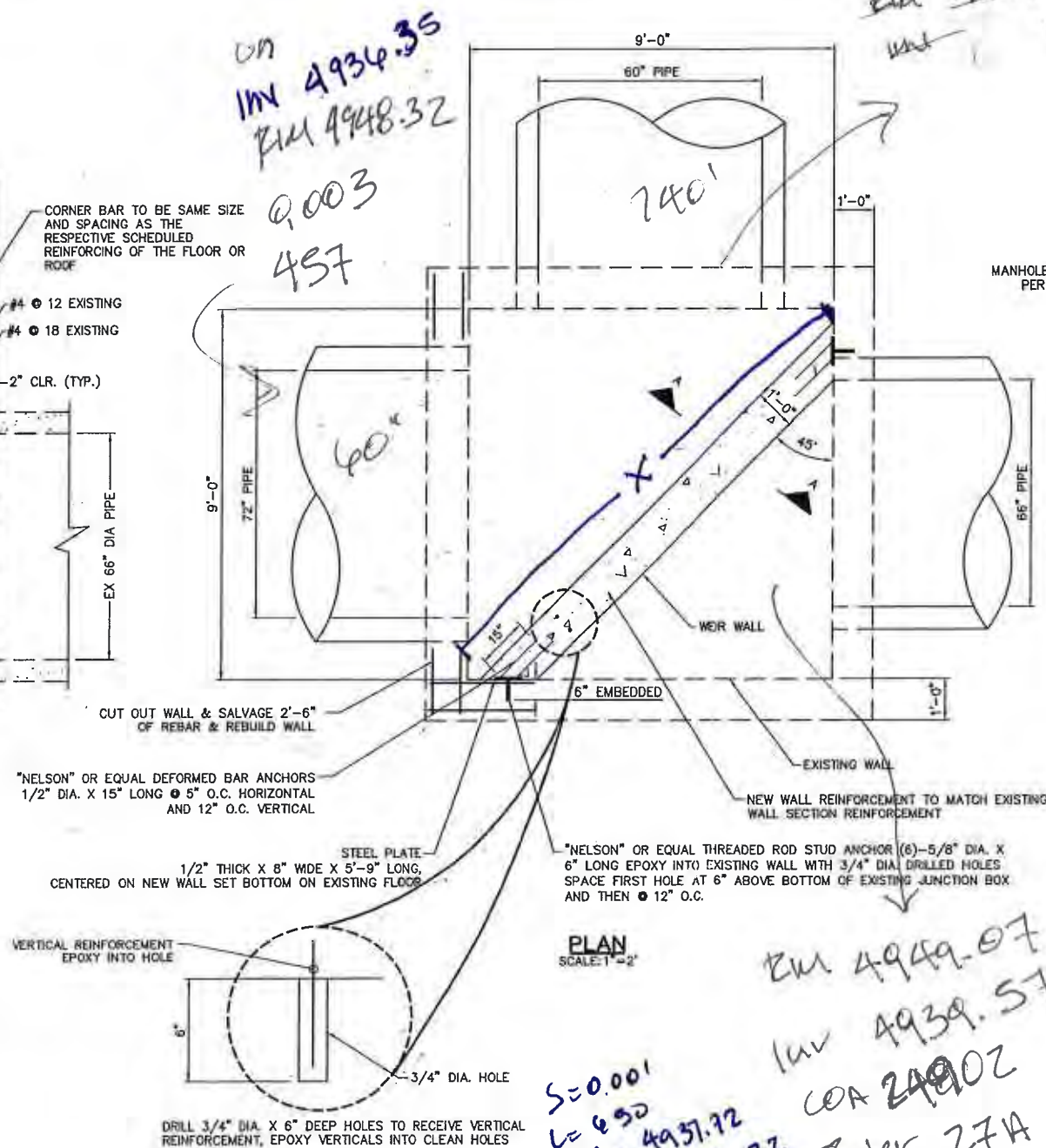


SECTION A-A

SECTION
SCALE: 1"=2'



WEIR WALL SECTION A-A
SCALE: 1"=2'



PLAN
SCALE: 1"=2'

RECORD DRAWMING
DATE 2-08-08

WEIR LENGTH CONCS ON BACK.

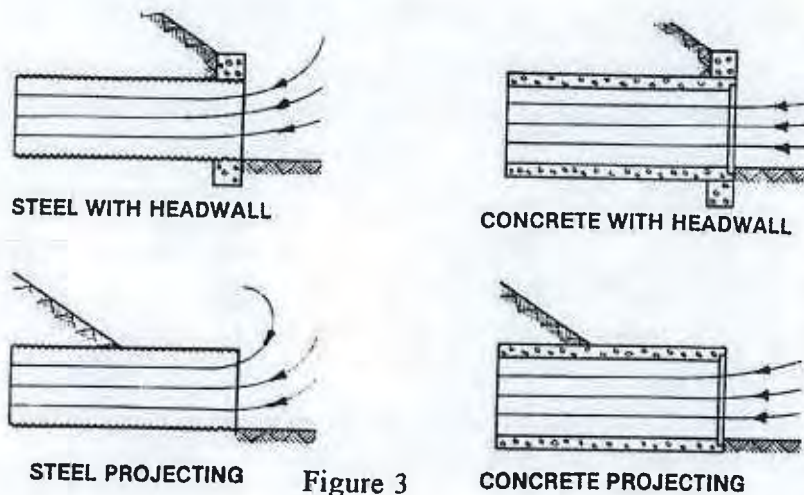
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WCEA #0660012300
APR 2007

A general rule-of-thumb is that when comparing corrugated metal pipe to reinforced concrete pipe, there should be at least a two-size differential for the same amount of flow through each pipe. Example: a 48" RCP is approximately equal to a 60" CSP, as to flow capacity.

It is recommended that Helical CSP Manning's "n" values be the same as for the annular corrugated CSP. See Info Brief #3001 - Helical "n" Values for CSP.

Culvert inlet geometry is an important factor to evaluate when considering corrugated steel pipe. A projecting thin edge culvert is the least efficient inlet of the four illustrated below:



Applied coatings (bituminous, asphaltic, etc.) do not improve the hydraulic characteristics of corrugated steel pipe. According to a Missouri DOT Durability Report, *"coatings such as bituminous or polymer materials cannot be used to lower the coefficient of roughness for CMP because the coating will be lost first, leaving the hydraulic conditions controlled by the uncoated CMP."*⁽⁹⁾

COUPLINGS AND JOINTS

There are a variety of pipe coupling systems used to join sections of corrugated metal pipe together. Coupling bands may be of the following types:⁽¹⁰⁾

- Bands with annular corrugations
- Bands with helical corrugations
- Bands with projections (dimples)
- Channel bands for upturned flanges
- Flat bands
- Smooth sleeve-type couplers