

# CONSTRUCTION PLANS FOR 66" RAW WATER TRANSMISSION LINE (PHASE 2)

(FROM 17TH STREET NORTH AND SHERIDAN EXTENDING EAST  
AND SOUTH TO 13TH STREET NORTH AND THE BIG ARKANSAS RIVER)

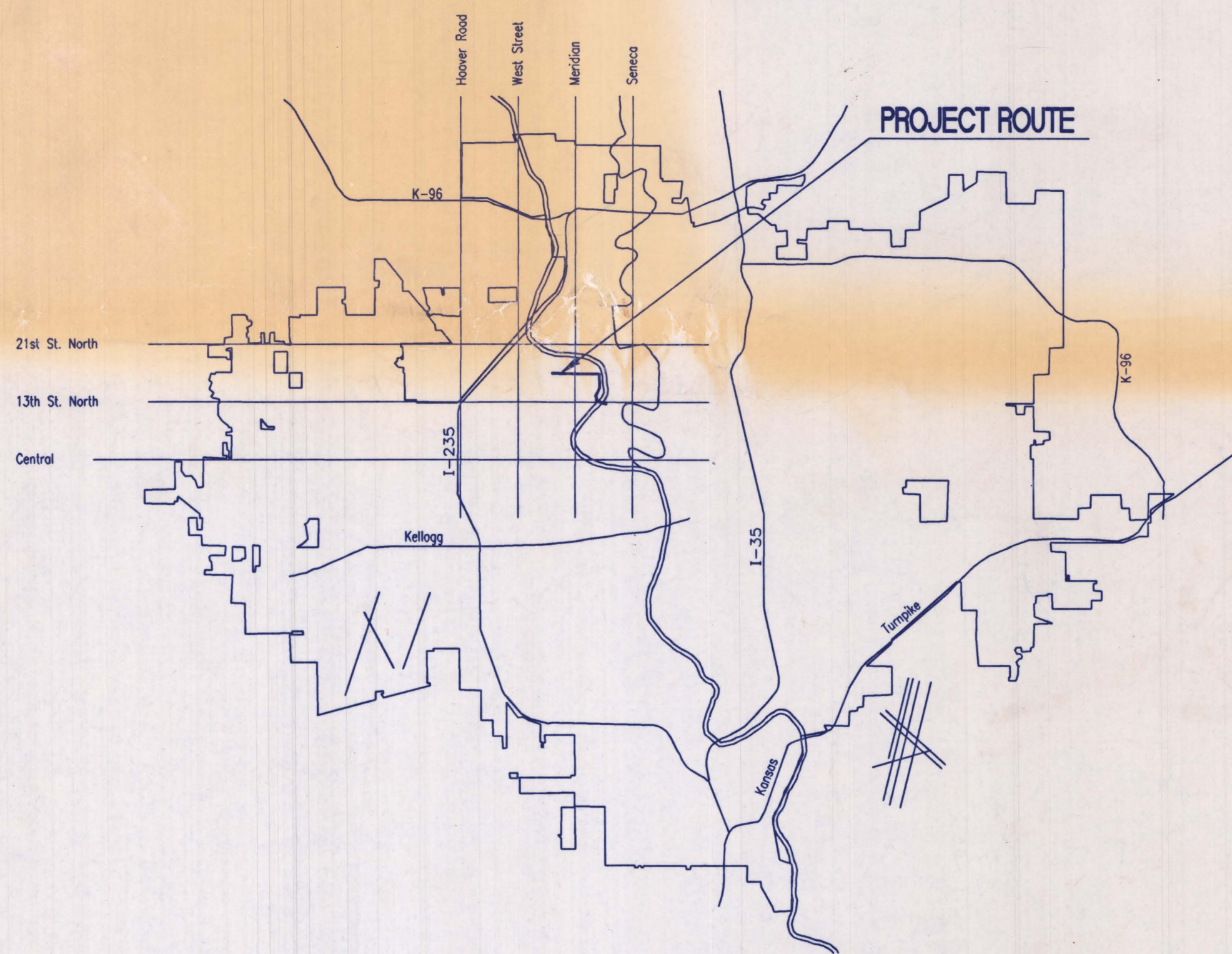
FOR

## THE CITY OF WICHITA,

SEDGWICK COUNTY, KANSAS

NEIL D. CABLE, P.E. - CITY ENGINEER

Contractor: B.R. & Const., Inc.  
 Superintendent -  
 Inspector - Gary L. Steinko  
 66" Steel American Spiral pipe - 792213  
 12" H.D.P.E. pipe - 609118  
 16" PVC C-905 S/Sy Spiral Pipe 792218  
 4" PVC Yellow main R/S pipe 792218  
 98" Steel Excavement - 22418  
 66" Air Valve Vault - 1Ea  
 12" Combination Air Valve Vault - 2Ea  
 20" Combination Air Valve Vault - 1Ea  
 16" Combination Air Valve Vault - 1Ea  
 Control Service Box Assembly - 792218  
 3" B Complete - 7-23-19  
 Valves open - 7-1-04



LOCATION MAP

### INDEX OF SHEETS

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SHEET NO. 23-24	STRUCTURAL DETAILS

OCA NO. 633720

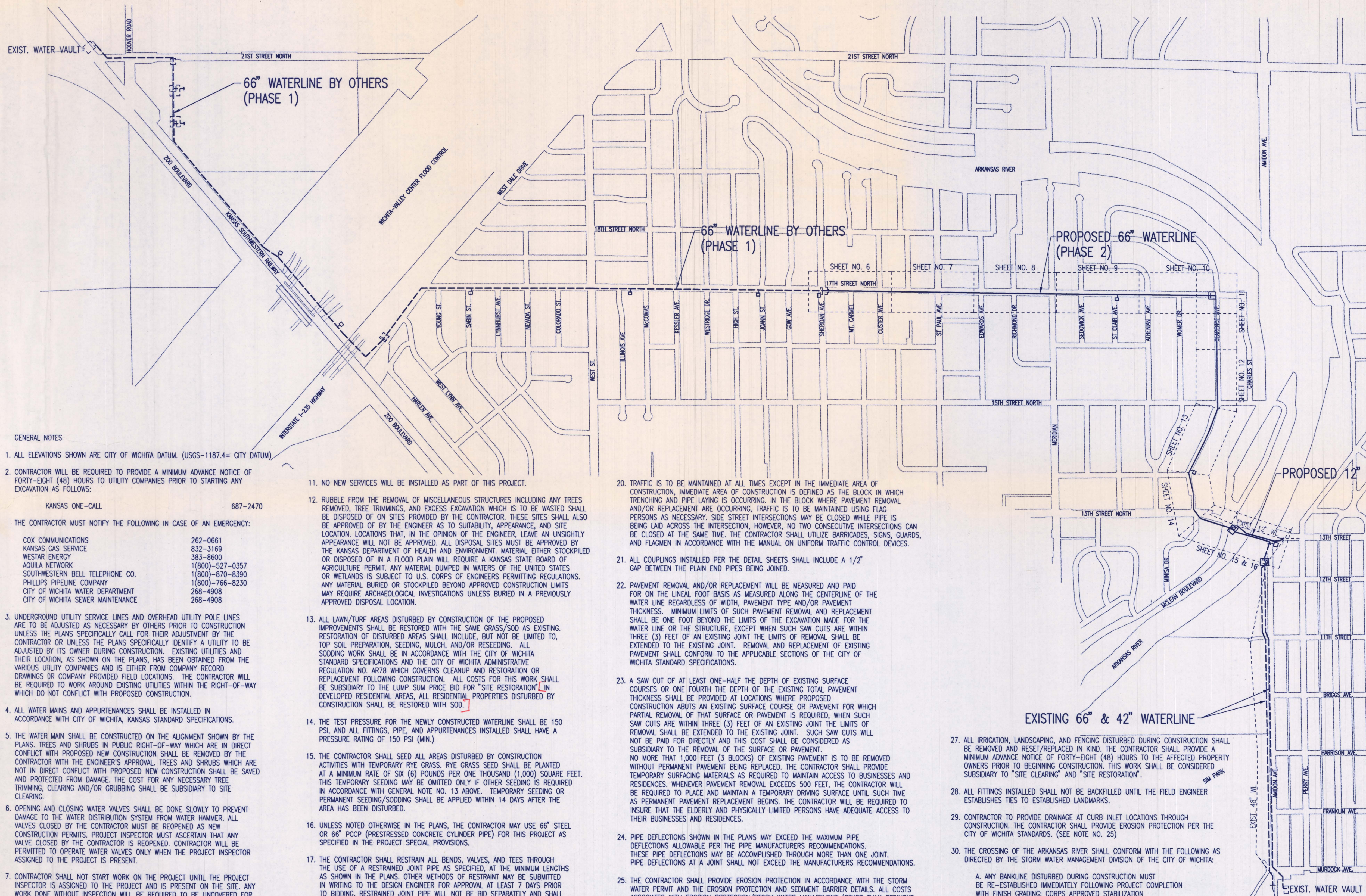
CITY OF WICHITA PROJECT NO. 448-89439

# OCTOBER 2002

PLANS PREPARED BY

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.  
ENGINEERS  
WICHITA, KANSAS





**LEGEND**

PROPOSED WATER MAIN	
FUTURE WATER MAIN	
PROPOSED WATER VALVE	
PROPOSED AIR VALVE	
PROPOSED FIRE HYDRANT	

**NOTE: WATERLINE VALVES TO BE OPERATED BY CONTRACTOR ONLY IF WATER DEPARTMENT REPRESENTATIVE IS ON SITE.**

**GENERAL NOTES**

- ALL ELEVATIONS SHOWN ARE CITY OF WICHITA DATUM. (USGS-1187.4= CITY DATUM)
- CONTRACTOR WILL BE REQUIRED TO PROVIDE A MINIMUM ADVANCE NOTICE OF FORTY-EIGHT (48) HOURS TO UTILITY COMPANIES PRIOR TO STARTING ANY EXCAVATION AS FOLLOWS:  

KANSAS ONE-CALL	687-2470
THE CONTRACTOR MUST NOTIFY THE FOLLOWING IN CASE OF AN EMERGENCY:	
COX COMMUNICATIONS	262-0661
KANSAS GAS SERVICE	832-3169
WESTAR ENERGY	383-8600
AQUILA NETWORK	1(800)-527-0357
SOUTHWESTERN BELL TELEPHONE CO.	1(800)-870-8390
PHILLIPS PIPELINE COMPANY	1(800)-766-8230
CITY OF WICHITA WATER DEPARTMENT	268-4908
CITY OF WICHITA SEWER MAINTENANCE	268-4908
- UNDERGROUND UTILITY SERVICE LINES AND OVERHEAD UTILITY POLE LINES ARE TO BE ADJUSTED AS NECESSARY BY OTHERS PRIOR TO CONSTRUCTION UNLESS THE PLANS SPECIFICALLY CALL FOR THEIR ADJUSTMENT BY THE CONTRACTOR OR UNLESS THE PLANS SPECIFICALLY IDENTIFY A UTILITY TO BE ADJUSTED BY ITS OWNER DURING CONSTRUCTION. EXISTING UTILITIES AND THEIR LOCATION, AS SHOWN ON THE PLANS, HAS BEEN OBTAINED FROM THE VARIOUS UTILITY COMPANIES AND IS EITHER FROM COMPANY RECORD DRAWINGS OR COMPANY PROVIDED FIELD LOCATIONS. THE CONTRACTOR WILL BE REQUIRED TO WORK AROUND EXISTING UTILITIES WITHIN THE RIGHT-OF-WAY WHICH DO NOT CONFLICT WITH PROPOSED CONSTRUCTION.
- ALL WATER MAINS AND APPURTENANCES SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF WICHITA, KANSAS STANDARD SPECIFICATIONS.
- THE WATER MAIN SHALL BE CONSTRUCTED ON THE ALIGNMENT SHOWN BY THE PLANS. TREES AND SHRUBS IN PUBLIC RIGHT-OF-WAY WHICH ARE IN DIRECT CONFLICT WITH PROPOSED NEW CONSTRUCTION SHALL BE REMOVED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL. TREES AND SHRUBS WHICH ARE NOT IN DIRECT CONFLICT WITH PROPOSED NEW CONSTRUCTION SHALL BE SAVED AND PROTECTED FROM DAMAGE. THE COST FOR ANY NECESSARY TREE TRIMMING, CLEARING AND/OR GRUBBING SHALL BE SUBSIDIARY TO SITE CLEARING.
- OPENING AND CLOSING WATER VALVES SHALL BE DONE SLOWLY TO PREVENT DAMAGE TO THE WATER DISTRIBUTION SYSTEM FROM WATER HAMMER. ALL VALVES CLOSED BY THE CONTRACTOR MUST BE REOPENED AS NEW CONSTRUCTION PERMITS. PROJECT INSPECTOR MUST ASCERTAIN THAT ANY VALVE CLOSED BY THE CONTRACTOR IS REOPENED. CONTRACTOR WILL BE PERMITTED TO OPERATE WATER VALVES ONLY WHEN THE PROJECT INSPECTOR ASSIGNED TO THE PROJECT IS PRESENT.
- CONTRACTOR SHALL NOT START WORK ON THE PROJECT UNTIL THE PROJECT INSPECTOR IS ASSIGNED TO THE PROJECT AND IS PRESENT ON THE SITE. ANY WORK DONE WITHOUT INSPECTION WILL BE REQUIRED TO BE UNCOVERED FOR INSPECTION.
- THE CONTRACTOR SHALL GIVE ALL PROPERTY OWNERS AND/OR TENANTS OF DEVELOPED PROPERTY DIRECTLY ADJUTING THE CONSTRUCTION OF THIS PROJECT A MINIMUM OF TEN (10) DAYS ADVANCE NOTICE PRIOR TO START OF CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PRESERVING SHOWN PROPERTY IRONS. THE CONTRACTOR SHALL BE REQUIRED TO RE-ESTABLISH ANY PROPERTY IRONS WHICH ARE DAMAGED OR DESTROYED BY HIS CONSTRUCTION OPERATIONS. SUCH IRONS SHALL BE RE-ESTABLISHED BY A LICENSED LAND SURVEYOR IN ACCORDANCE WITH STATE LAWS. ALL COSTS FOR THIS WORK SHALL BE SUBSIDIARY TO SITE RESTORATION.
- THE CONTRACTOR SHALL RESTORE ALL DITCHES, SWALES, ROAD SHOULDERS, ENTRANCES, AND BANK LINES TO THEIR ORIGINAL SLOPES AND GRADES EXCEPT AS SHOWN OTHERWISE.

- NO NEW SERVICES WILL BE INSTALLED AS PART OF THIS PROJECT.
- RUBBLE FROM THE REMOVAL OF MISCELLANEOUS STRUCTURES INCLUDING ANY TREES REMOVED, TREE TRIMMINGS, AND EXCESS EXCAVATION WHICH IS TO BE WASTED SHALL BE DISPOSED OF ON SITES PROVIDED BY THE CONTRACTOR. THESE SITES SHALL ALSO BE APPROVED OF BY THE ENGINEER AS TO SUITABILITY, APPEARANCE, AND SITE LOCATION. LOCATIONS THAT, IN THE OPINION OF THE ENGINEER, LEAVE AN UNSIGHTLY APPEARANCE WILL NOT BE APPROVED. ALL DISPOSAL SITES MUST BE APPROVED BY THE KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT. MATERIAL EITHER STOCKPILED OR DISPOSED OF IN A FLOOD PLAIN WILL REQUIRE A KANSAS STATE BOARD OF AGRICULTURE PERMIT. ANY MATERIAL DUMPED IN WATERS OF THE UNITED STATES OR WETLANDS IS SUBJECT TO U.S. CORPS OF ENGINEERS PERMITTING REGULATIONS. ANY MATERIAL BURIED OR STOCKPILED BEYOND APPROVED CONSTRUCTION LIMITS MAY REQUIRE ARCHAEOLOGICAL INVESTIGATIONS UNLESS BURIED IN A PREVIOUSLY APPROVED DISPOSAL LOCATION.
- ALL LAWN/TURF AREAS DISTURBED BY CONSTRUCTION OF THE PROPOSED IMPROVEMENTS SHALL BE RESTORED WITH THE SAME GRASS/SOD AS EXISTING. RESTORATION OF DISTURBED AREAS SHALL INCLUDE, BUT NOT BE LIMITED TO, TOP SOIL PREPARATION, SEEDING, MULCH, AND/OR RESEEDING. ALL SODDING WORK SHALL BE IN ACCORDANCE WITH THE CITY OF WICHITA STANDARD SPECIFICATIONS AND THE CITY OF WICHITA ADMINISTRATIVE REGULATION NO. AR78 WHICH GOVERNS CLEANUP AND RESTORATION OR REPLACEMENT FOLLOWING CONSTRUCTION. ALL COSTS FOR THIS WORK SHALL BE SUBSIDIARY TO THE LUMP SUM PRICE BID FOR "SITE RESTORATION" IN DEVELOPED RESIDENTIAL AREAS. ALL RESIDENTIAL PROPERTIES DISTURBED BY CONSTRUCTION SHALL BE RESTORED WITH SOD.
- THE TEST PRESSURE FOR THE NEWLY CONSTRUCTED WATERLINE SHALL BE 150 PSI, AND ALL FITTINGS, PIPE, AND APPURTENANCES INSTALLED SHALL HAVE A PRESSURE RATING OF 150 PSI (MIN.)
- THE CONTRACTOR SHALL SEED ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES WITH TEMPORARY RYE GRASS. RYE GRASS SEED SHALL BE PLANTED AT A MINIMUM RATE OF SIX (6) POUNDS PER ONE THOUSAND (1,000) SQUARE FEET. THIS TEMPORARY SEEDING MAY BE OMITTED ONLY IF OTHER SEEDING IS REQUIRED IN ACCORDANCE WITH GENERAL NOTE NO. 13 ABOVE. TEMPORARY SEEDING OR PERMANENT SEEDING/SODDING SHALL BE APPLIED WITHIN 14 DAYS AFTER THE AREA HAS BEEN DISTURBED.
- UNLESS NOTED OTHERWISE IN THE PLANS, THE CONTRACTOR MAY USE 66" STEEL OR 66" PCOP (PRESTRESSED CONCRETE CYLINDER PIPE) FOR THIS PROJECT AS SPECIFIED IN THE PROJECT SPECIAL PROVISIONS.
- THE CONTRACTOR SHALL RESTRAIN ALL BENDS, VALVES, AND TEES THROUGH THE USE OF A RESTRAINED JOINT PIPE AS SPECIFIED, AT THE MINIMUM LENGTHS AS SHOWN IN THE PLANS. OTHER METHODS OF RESTRAINT MAY BE SUBMITTED IN WRITING TO THE DESIGN ENGINEER FOR APPROVAL AT LEAST 7 DAYS PRIOR TO BIDDING. RESTRAINED JOINT PIPE WILL NOT BE BID SEPARATELY AND SHALL BE INCLUDED IN THE PRICE BID FOR PIPE IN PLACE.
- THE CONTRACTOR SHALL PROVIDE CORROSION CONTROL ITEMS AS OUTLINED IN THE SPECIFICATIONS FOR EACH TYPE OF PIPE BID. ALL PIPE CONNECTIONS MADE WITH PIPING OF DISSIMILAR MATERIALS SHALL INCLUDE DIELECTRIC ISOLATION. ALL CORROSION CONTROL MEASURES REQUIRED SHALL BE INCLUDED IN THE PRICE BID FOR PIPE.
- THE CONTRACTOR SHALL PROVIDE THREADED RODS AND COLLARS TO ANCHOR VALVES AND SLEEVES TO PROPOSED RESTRAINED JOINT PIPING, AS SHOWN IN THE PLANS. THREADED RODS AND COLLARS SHALL BE HIGH STRENGTH, HEAT TREATED CORTEN STEEL AND SHALL CONFORM TO ASTM A242, TYPE 2, AS MANUFACTURED BY STAR NATIONAL PRODUCTS OR APPROVED EQUAL. THE NUMBER OF TIEBOLT RESTRAINERS AND FASTENING METHOD SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS. TIE BOLTS SHALL BE DESIGNED FOR A TOTAL DESIGN PRESSURE OF 200 PSI.

- TRAFFIC IS TO BE MAINTAINED AT ALL TIMES EXCEPT IN THE IMMEDIATE AREA OF CONSTRUCTION. IMMEDIATE AREA OF CONSTRUCTION IS DEFINED AS THE BLOCK IN WHICH TRENCHING AND PIPE LAYING IS OCCURRING. IN THE BLOCK WHERE PAVEMENT REMOVAL AND/OR REPLACEMENT ARE OCCURRING, TRAFFIC IS TO BE MAINTAINED USING FLAG PERSONS AS NECESSARY. SIDE STREET INTERSECTIONS MAY BE CLOSED WHILE PIPE IS BEING LAID ACROSS THE INTERSECTION, HOWEVER, NO TWO CONSECUTIVE INTERSECTIONS CAN BE CLOSED AT THE SAME TIME. THE CONTRACTOR SHALL UTILIZE BARRICADES, SIGNS, GUARDS, AND FLAGMEN IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- ALL COUPLINGS INSTALLED PER THE DETAIL SHEETS SHALL INCLUDE A 1/2" GAP BETWEEN THE PLAIN END PIPES BEING JOINED.
- PAVEMENT REMOVAL AND/OR REPLACEMENT WILL BE MEASURED AND PAID FOR ON THE LINEAL FOOT BASIS AS MEASURED ALONG THE CENTERLINE OF THE WATER LINE REGARDLESS OF WIDTH, PAVEMENT TYPE AND/OR PAVEMENT THICKNESS. MINIMUM LIMITS OF SUCH PAVEMENT REMOVAL AND REPLACEMENT SHALL BE ONE FOOT BEYOND THE LIMITS OF THE EXCAVATION MADE FOR THE WATER LINE OR THE STRUCTURE, EXCEPT WHEN SUCH SAW CUTS ARE WITHIN THREE (3) FEET OF AN EXISTING JOINT THE LIMITS OF REMOVAL SHALL BE EXTENDED TO THE EXISTING JOINT. REMOVAL AND REPLACEMENT OF EXISTING PAVEMENT SHALL CONFORM TO THE APPLICABLE SECTIONS OF THE CITY OF WICHITA STANDARD SPECIFICATIONS.
- A SAW CUT OF AT LEAST ONE-HALF THE DEPTH OF EXISTING SURFACE COURSES OR ONE FOURTH THE DEPTH OF THE EXISTING TOTAL PAVEMENT THICKNESS SHALL BE PROVIDED AT LOCATIONS WHERE PROPOSED CONSTRUCTION ABUTS AN EXISTING SURFACE COURSE OR PAVEMENT FOR WHICH PARTIAL REMOVAL OF THAT SURFACE OR PAVEMENT IS REQUIRED, WHEN SUCH SAW CUTS ARE WITHIN THREE (3) FEET OF AN EXISTING JOINT THE LIMITS OF REMOVAL SHALL BE EXTENDED TO THE EXISTING JOINT. SUCH SAW CUTS WILL NOT BE PAID FOR DIRECTLY AND THIS COST SHALL BE CONSIDERED AS SUBSIDIARY TO THE REMOVAL OF THE SURFACE OR PAVEMENT. NO MORE THAN 1,000 FEET (3 BLOCKS) OF EXISTING PAVEMENT IS TO BE REMOVED WITHOUT PERMANENT PAVEMENT BEING REPLACED. THE CONTRACTOR SHALL PROVIDE TEMPORARY SURFACING MATERIALS AS REQUIRED TO MAINTAIN ACCESS TO BUSINESSES AND RESIDENCES. WHENEVER PAVEMENT REMOVAL EXCEEDS 500 FEET, THE CONTRACTOR WILL BE REQUIRED TO PLACE AND MAINTAIN A TEMPORARY DRIVING SURFACE UNTIL SUCH TIME AS PERMANENT PAVEMENT REPLACEMENT BEGINS. THE CONTRACTOR WILL BE REQUIRED TO INSURE THAT THE ELDERLY AND PHYSICALLY LIMITED PERSONS HAVE ADEQUATE ACCESS TO THEIR BUSINESSES AND RESIDENCES.
- PIPE DEFLECTIONS SHOWN IN THE PLANS MAY EXCEED THE MAXIMUM PIPE DEFLECTIONS ALLOWABLE PER THE PIPE MANUFACTURERS RECOMMENDATIONS. THESE PIPE DEFLECTIONS MAY BE ACCOMPLISHED THROUGH MORE THAN ONE JOINT. PIPE DEFLECTIONS AT A JOINT SHALL NOT EXCEED THE MANUFACTURERS RECOMMENDATIONS.
- THE CONTRACTOR SHALL PROVIDE EROSION PROTECTION IN ACCORDANCE WITH THE STORM WATER PERMIT AND THE EROSION PROTECTION AND SEDIMENT BARRIER DETAILS. ALL COSTS ASSOCIATED WITH EROSION PROTECTION/STORM WATER MANAGEMENT (OTHER THAN SEDIMENT BARRIERS SPECIFIED IN THE PLANS) SHALL BE INCLUDED IN THE LUMP SUM BID FOR "SITE RESTORATION". ALSO, ANY SLOPES GREATER THAN 6 (HORIZ.): 1 (VERT.) THAT IS DISTURBED SHALL INCLUDE EROSION PROTECTION EITHER BY SEEDING/MULCHING, THE USE OF EROSION MATS, OR OTHER APPROVED METHODS. ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE PROTECTED WITHIN 14 DAYS AFTER THE AREA IS DISTURBED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPORTING AND PROTECTING ANY EXISTING PIPELINES, VALVE BOXES, FIRE HYDRANTS AND THRUST RESTRAINTS WITHIN THE CONSTRUCTION AREA. ALL PRESSURE PIPELINES INCLUDING WATER AND GAS LINES AND ASSOCIATED FITTINGS SHALL BE ADEQUATELY SUPPORTED AND RESTRAINED TO PREVENT FAILURE OR DAMAGE TO PIPELINE AND SURROUNDING PROPERTY. THE CONTRACTOR SHALL COORDINATE EXCAVATION, RESTRAINT SYSTEM AND ISOLATION OF AFFECTED PIPELINES WITH RESPECTIVE PIPELINE OWNER AND ENGINEER. ANY THRUST BLOCKING OR RESTRAINT SYSTEMS DISTURBED BY CONSTRUCTION SHALL BE REPLACED IN AN EQUAL OR GREATER FASHION. THE CONTRACTOR SHALL PROVIDE PROPOSED PIPELINE EXCAVATION PLAN AND RESTRAINT SYSTEM(S) TO OWNER AND ENGINEER FOR APPROVAL PRIOR TO COMMENCING CONSTRUCTION. ALL COST ASSOCIATED WITH SUPPORTING, PROTECTING AND RESTRAINING EXISTING PIPELINES SHALL BE CONSIDERED SUBSIDIARY TO THE PRICE BID FOR PIPE.

- ALL IRRIGATION, LANDSCAPING, AND FENCING DISTURBED DURING CONSTRUCTION SHALL BE REMOVED AND RESET/REPLACED IN KIND. THE CONTRACTOR SHALL PROVIDE A MINIMUM ADVANCE NOTICE OF FORTY-EIGHT (48) HOURS TO THE AFFECTED PROPERTY OWNERS PRIOR TO BEGINNING CONSTRUCTION. THIS WORK SHALL BE CONSIDERED SUBSIDIARY TO "SITE CLEARING" AND "SITE RESTORATION".
- ALL FITTINGS INSTALLED SHALL NOT BE BACKFILLED UNTIL THE FIELD ENGINEER ESTABLISHES TIES TO ESTABLISHED LANDMARKS.
- CONTRACTOR TO PROVIDE DRAINAGE AT CURB INLET LOCATIONS THROUGH CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE EROSION PROTECTION PER THE CITY OF WICHITA STANDARDS. (SEE NOTE NO. 25)
- THE CROSSING OF THE ARKANSAS RIVER SHALL CONFORM WITH THE FOLLOWING AS DIRECTED BY THE STORM WATER MANAGEMENT DIVISION OF THE CITY OF WICHITA:
  - ANY BANKLINE DISTURBED DURING CONSTRUCTION MUST BE RE-ESTABLISHED IMMEDIATELY FOLLOWING PROJECT COMPLETION WITH FINISH GRADING; CORPS APPROVED STABILIZATION MATERIAL, AND BANKS AND FORESHORES MUST BE SEEDED WITH CORPS APPROVED VEGETATION (50/50 FESCUE/BROME MIX).
  - APPROVAL FROM ALL OTHER FEDERAL AND STATE AGENCIES (INCLUDING THE KC DISTRICT CORPS OF ENGINEERS FOR SECTION 404 PERMITTING) MUST BE OBTAINED PRIOR TO CONSTRUCTION.
  - THE FLOOD CONTROL SUPERVISOR MUST BE NOTIFIED, AT 288-4095, FIFTEEN (15) WORKING DAYS PRIOR TO BEGINNING CONSTRUCTION.
  - UPON PROJECT COMPLETION, PROVIDE A SET OF AS-BUILT DRAWINGS FOR THE PROJECT TO THE TULSA DISTRICT CORPS OF ENGINEERS AND A SET TO THE CITY OF WICHITA STORM WATER MANAGEMENT OFFICE.
  - PROVIDE SEDIMENT BARRIERS AT THE CROSSING OF THE ARKANSAS RIVER IN ACCORDANCE WITH THE EROSION CONTROL DETAILS.

**CONDUIT/SERVICE BOX ASSEMBLY**

The Contractor shall install a continuous conduit the entire length of the proposed 36" waterline. The conduit shall be CARLON OPTIC-GARD 1-1/4" diameter, SDR 11, PE Pipe or approved equal. The pipe shall be ribbed/smooth, orange in color, and shall contain a pre-installed poly pull rope. Where necessary, the pipe shall be jointed with metallic threaded sleeve couplings as manufactured by Carlon, or approved equal. Stainless Steel bands shall be installed every 20 feet along the 66" Waterline to secure the conduit to the top of the waterline. The Contractor shall connect the proposed conduit to the conduit as provided with the 66" Raw Water Transmission Line Phase 1. The Contractor shall connect to the existing conduit on both ends of the project with fittings and adaptors as required.

The service box assembly shall be QUAZITE COMPOSITE Part No. PG3048BA18 service box (30"W x 48"L x 18"D) with a QUAZITE COMPOSITE Part No. PG3048HA00 heavy duty locking cover, or approved equal. The locking cover for the service box shall be imprinted with "CITY OF WICHITA".

The conduit entering and exiting the service box assembly shall extend to an elevation approximately 12" below grade. The pre-installed poly rope shall extend a minimum of 3' inside the service box. The service box shall be placed on a 6" crushed rock base (compacted to 95% of ASTM D698) extending a minimum of 12" around the box perimeter. A 12" wide x 12" thick concrete border (COW concrete pavement mix) shall be placed flush around the top of the service box assembly.

Service Boxes shall be installed along the route of the waterline as listed in the Service Box Location table. The locations of the service boxes shown in the Service Box Location table are approximate. Maximum spacing for service boxes shall be 1,200 feet. The service boxes shall be placed along the outside limits of the waterline excavation except where such placement would fall within a paved or unpaved vehicular travelway. Service boxes shall be situated at least 5' outside of all vehicle travelways, and in locations as approved by the Field Engineer.

**SERVICE BOX LOCATION TABLE**

APPROX. WATERLINE STATION	OFFSET
206+00	12' Rt.
217+20	12' Rt.
228+60	12' Rt.
236+15	12' Rt.
244+00	12' Rt.
250+00	12' Rt.
257+00	12' Lt.
265+23	12' Lt.
269+43	8' Lt.
270+72	8' Lt.
275+12	8' Rt.

(Approx. 7,931 L.F. conduit required.)



No.	Revision	By	Date

CITY OF WICHITA, KANSAS  
NEIL D. CABLE, P.E. - CITY ENGINEER  
66" RAW WATER TRANSMISSION LINE (PHASE 2)  
**WATERLINE KEY MAP**  
CITY OF WICHITA PROJECT NO. 448-89439

**Professional Engineering Consultants, P.A.**  
303 S. TOPEKA • WICHITA, KANSAS 67202  
316-262-2691 • FAX 316-262-3003

DSNR: MDK OPER: JLM SCALE: 1"=600.00  
01/2000/00040/Phase 2/WLKEYMAP 10-22-2002 05:11:43 pm

BENCH MARKS

- BM #1- CITY OF WICHITA BM AT THE NW CORNER OF THE INTERSECTION OF HOOVER AND 21ST ST. N. ELEV.= 139.07
- BM #2- CHISELED "d" ON E. SIDE OF RAILROAD CROSSING LIGHT ON N. SIDE OF 21ST ST. N. JUST W. OF HOOVER. ELEV.= 138.50
- BM #3- RAILROAD SPIKE IN S. FACE OF POWER POLE ON N. SIDE OF 21ST ST. N., 4TH POLE E. OF HOOVER, ADJACENT TO E. SIDE OF STORAGE UNITS. ELEV.= 140.64
- BM #4- CHISELED "d" ON TOP OF NORTHERLY CURB TO MEDIAN IN 200 BLVD., JUST EASTERLY OF HOOVER ENTRANCE TO ZOO BLVD. WHERE GRASS BEGINS AND ASPHALT ENDS. ELEV.= 139.43
- BM #5- CHISELED "d" ON TOP OF SOUTHERLY CURB TO MEDIAN IN 200 BLVD., JUST WESTERLY OF WINDMILL RD. WHERE GRASS BEGINS AND ASPHALT ENDS. ELEV.= 138.85
- BM #6- CHISELED "d" ON SOUTHWESTERLY CORNER OF RAILROAD BRIDGE OVER BIG DITCH, NORTHERLY SIDE OF ZOO BLVD. ELEV.= 143.54
- BM #7- CITY OF WICHITA BM ON NE CORNER OF RAILROAD BRIDGE. ELEV.= 142.99
- BM #8- CHISELED "d" ON TOP OF CURB WESTERLY SIDE OF WESTDALE, ±50' NORTHERLY OF RAILROAD TRACKS. ELEV.= 141.36
- BM #9- CHISELED "d" ON TOP OF CURB AT NE CORNER OF WESTDALE AND 17TH ST. N. ELEV.= 130.61
- BM #10- CHISELED "d" ON TOP OF CURB E. CURB RETURN, NE CORNER OF NEVADA AND 17TH ST. N. ELEV.= 130.64
- BM #11- CITY OF WICHITA BM AT SW CORNER OF WEST ST. AND 17TH ST. N. ELEV.= 130.15
- BM #12- CHISELED "d" ON TOP OF CURB S. CURB RETURN, SE CORNER OF HIGH AND 17TH ST. N. ELEV.= 128.73
- BM #13- CITY OF WICHITA BM AT SE CORNER OF INTERSECTION OF SHERIDAN AND 17TH ST. N. ELEV.= 125.15
- BM #14- RAILROAD SPIKE IN S. FACE OF HIGHLINE POLE JUST N. OF 17TH ST. N., CENTER MEDIAN OF ST. PAUL. ELEV.= 124.52
- BM #15- CITY OF WICHITA BM AT NE CORNER OF INTERSECTION OF MERIDIAN AND 17TH ST. N. ELEV.= 122.77
- BM #16- CHISELED "d" ON TOP OF CURB N. CURB RETURN, NE CORNER OF WESTPORT AND 17TH ST. N. ELEV.= 120.95
- BM #17- CHISELED "d" ON TOP OF CURB N. CURB RETURN, NW CORNER OF BELLAVISTA AND 17TH ST. N. ELEV.= 119.97
- BM #18- CITY OF WICHITA BM AT SE CORNER OF BRIDGE OVER ARKANSAS RIVER ON AMIDON. ELEV.= 128.01
- BM #19- CHISELED "d" ON TOP OF CURB E. CURB RETURN, SE CORNER OF CLARENCE AND 15TH ST. N. ELEV.= 119.04
- BM #20- CHISELED "d" ON TOP OF CURB W. CURB RETURN, NW CORNER OF CLARENCE AND 13TH ST. N. ELEV.= 119.35
- BM #21- AMIDON AND 13TH ST. N., U.S.G.S. STANDARD DISC STAMPED "1725WB 1939". ELEV.= 124.85
- BM #22- RAILROAD SPIKE IN N. FACE OF POWER POLE ON W. SIDE OF AMIDON, JUST S. OF 12TH ST. N. ELEV.= 120.53
- BM #23- CHISELED "d" ON TOP OF CURB E. CURB RETURN, SE CORNER OF AMIDON AND BRIGGS. ELEV.= 117.04
- BM #24- CHISELED "d" ON TOP OF CURB E. CURB RETURN, SE CORNER OF AMIDON AND FRANKLIN. ELEV.= 115.63
- BM #25- CITY OF WICHITA BM AT AMIDON AND MURDOCK. ELEV.= 115.54
- BM #26- CHISELED "d" ON SW CORNER OF CONCRETE ELECTRIC LINE VAULT IN MEDIAN OF AMIDON AND SIMS PARK DR. ELEV.= 114.15
- BM #27- CHISELED "d" ON SW CORNER OF CONCRETE WATER VAULT, JUST SE OF SE CORNER OF WICHITA WATER WORKS BUILDING ON SIMS PARK DR. ELEV.= 115.88

1" = 600'



No.	Revision	By	Date

CITY OF WICHITA, KANSAS  
NEIL D. CABLE, P.E.— CITY ENGINEER  
66' RAW WATER TRANSMISSION LINE (PHASE 2)  
**HORIZONTAL & VERTICAL CONTROL MAP**  
CITY OF WICHITA PROJECT NO. 448-89439  
**Professional Engineering Consultants, P.A.**  
303 S. TOPEKA • WICHITA, KANSAS 67202  
316-262-2691 • FAX 316-262-3003

Designed by	MDK	Job No.	34-00040-042	Sht. 3 of 24
Drawn by	JLM	Date	March 2001	



Pt. No. 321  
N-1,693,741.7483, E-1,640,366.5570  
Found lot corner at SW corner of 13th St. N. and Minisa, 3/4" bar approx. 12" deep.  
9.37° E PK nail in North face of power pole.  
4.37° N to back of the sidewalk.

Pt. No. 328  
N-1,691,701.1697, E-1,641,258.0612  
Mag nail set at center of Briggs and Amidon.  
34.40° SE to BM # 23, a chiseled "d" on East curb return of the SE corner.  
37.25° SW to Mag nail in top of wood fence post.  
38.57° NW to Mag nail in top of wood fence post.

Pt. No. 330  
N-1,691,041.1200, E-1,641,267.0904  
3/4" pipe in thimble at the centerlines of Amidon and Harrison St.  
37.25° NE to chiseled "+" in top of curb.  
34.97° SE to PK nail in SW face of light pole.  
70.48° WSW to 60d nail in North face of 15" Cottonwood tree.

Pt. No. 331  
N-1,690,380.8992, E-1,641,276.1027  
3/4" pipe in thimble at the centerlines of Amidon and Franklin.  
38.09° NE to chiseled "+" in top of curb.  
36.54° SE to PK nail in SW face of light pole.  
87.43° SW to PK nail in North face 20" Cedar tree.

Pt. No. 332  
N-1,689,710.6050, E-1,641,285.1924  
3/4" pipe in thimble at the centerline of Amidon and 10' South of centerline of Murdock.  
21.2° SE to chiseled "+" at centerline curb inlet.  
47.2° NNE to chiseled "+" on North side of curb inlet.  
30.75° S to PK nail in East face of 18" Birch tree.

Pt. No. 333  
N-1,689,723.1474, E-1,641,660.2936  
3/4" pipe in thimble at the centerlines of Murdock and Perry St.  
33.13° NE to PK nail in SE face of light pole.  
33.82° NW to the centerline of nut on fire hydrant.  
67.85° SE to the corner of masonry fence.

Pt. No. 334  
N-1,689,725.7263, E-1,642,030.3560  
3/4" pipe in thimble at the centerlines of Murdock and Coolidge.  
No ties

Pt. No. 401  
N-1,698,287.7701, E-1,628,234.9672  
60d nail at North back of curb in turn lane of East bound Zoo Boulevard.  
115° ESE to nose of curb and gutter island.  
75° NW along curb line to centerline of Hoover extended South.

Pt. No. 402  
N-1,697,036.5642, E-1,629,307.3230  
PK nail in asphalt in median of Zoo Boulevard.  
30° SE to end of asphalt in median paving.  
31.9° SSE to BM #5.  
3' N to back of curb West bound Zoo Blvd.

Pt. No. 403  
N-1,695,910.1040, E-1,630,317.9302  
#4 bar on North side of Zoo Blvd. and East of floodway.  
5.3° SE to centerline of 12' traffic barrier wall.  
24.6° NE to wrought iron fence.  
55.3° E to edge water surface at NE corner of floodway bridge.

Pt. No. 404  
N-1,695,164.0886, E-1,630,975.7397  
#4 bar near easterly corner of the intersection of Westdale Dr. and Zoo Blvd.  
5' SW to North back of curb in NW bound Zoo Blvd.  
6.2° ENE to West corner 3'x3' concrete traffic signal base.  
22.9° N to SE bolt on railroad traffic signal base.  
28.4° NE to the centerline of the South rail of the railroad tracks.

Pt. No. 405  
N-1,695,946.6835, E-1,631,236.8465  
PK nail in North edge of asphalt sidewalk.  
4.5° SE to North back of curb in Westdale Dr.  
80° NE to the centerline of Westlawn.  
49.93° SW of the centerline of fire hydrant.  
64.76° N of railroad spike in South power pole.

Pt. No. 406  
N-1,696,338.1674, E-1,631,532.7356  
PK nail on North edge of asphalt road/bike path at Westdale and 17th St. N.  
1' NW to edge of asphalt pavement in Westdale.  
9.3° W to "Bike" sign post.  
on-line with centerline 17th St. N. E-W extended.

Pt. No. 407  
N-1,696,336.7633, E-1,632,740.9963  
PK nail at the centerlines of 17th St. N. and Nevada St.  
46.95° SSE to NW corner of curb inlet.  
46.8° NNE to SW corner of curb inlet.

Pt. No. 408  
N-1,696,331.8919, E-1,634,102.8128  
PK nail at the centerlines of 17th St. N. and McComas South.  
55.43° NE to the centerline of fire hydrant top.  
46.59° SE to PK nail in West face of power pole.

Pt. No. 409  
N-1,696,325.4493, E-1,634,797.5713  
PK nail at the centerlines of 17th St. N. and Westridge St.  
41.07° NE to the SW corner of curb inlet.  
47.03° SE to the centerline of fire hydrant top.

Pt. No. 410  
N-1,696,320.1722, E-1,635,432.1332  
PK nail at the centerlines of 17th St. N. and Joann St.  
47.42° SE to the centerline of fire hydrant top.  
34.46° SW to PK nail in East face of power pole.

Pt. No. 411  
N-1,696,314.0731, E-1,636,114.3324  
PK nail at the centerlines of 17th St. N. and Sheridan.  
51.96° NW to the centerline of fire hydrant.  
47.18° SW to SW corner of curb inlet.

Pt. No. 412  
N-1,696,302.4164, E-1,637,434.8302  
PK nail at the centerline of concrete joint in 17th St. N. and 5' West of the centerline of St. Paul St.  
49.93° SW of the centerline of fire hydrant.  
64.76° N of railroad spike in South power pole.

Pt. No. 413  
N-1,696,294.8377, E-1,638,307.5484  
60d nail in concrete joint at the centerlines of 17th St. N. and Richmond.  
34.61° SW of PK nail in East face of power pole.  
46.94° SE to the centerline of fire hydrant.

Pt. No. 414  
N-1,696,284.9106, E-1,639,459.9012  
PK nail at the centerlines of 17th St. N. and St. Clair.  
31° SW to the street sign pole.  
33.54° SE to PK nail in West face of light pole.

Pt. No. 415  
N-1,696,274.6273, E-1,640,629.8281  
PK nail at the centerlines of 17th St. N. and Bellavista St.  
35° NW to SE corner of curb inlet.  
45.09° SW to the centerline of fire hydrant.

Pt. No. 416  
N-1,695,031.5113, E-1,640,653.0324  
PK nail at the centerlines of 15th St. N. and Westridge St. N.  
38.44° SE to the centerline of fire hydrant.  
33.72° NE to PK nail in South face of light pole.

Pt. No. 417  
N-1,694,346.1483, E-1,640,362.3029  
PK nail in the centerline of Clarence St. on-line with North face of house #1508.

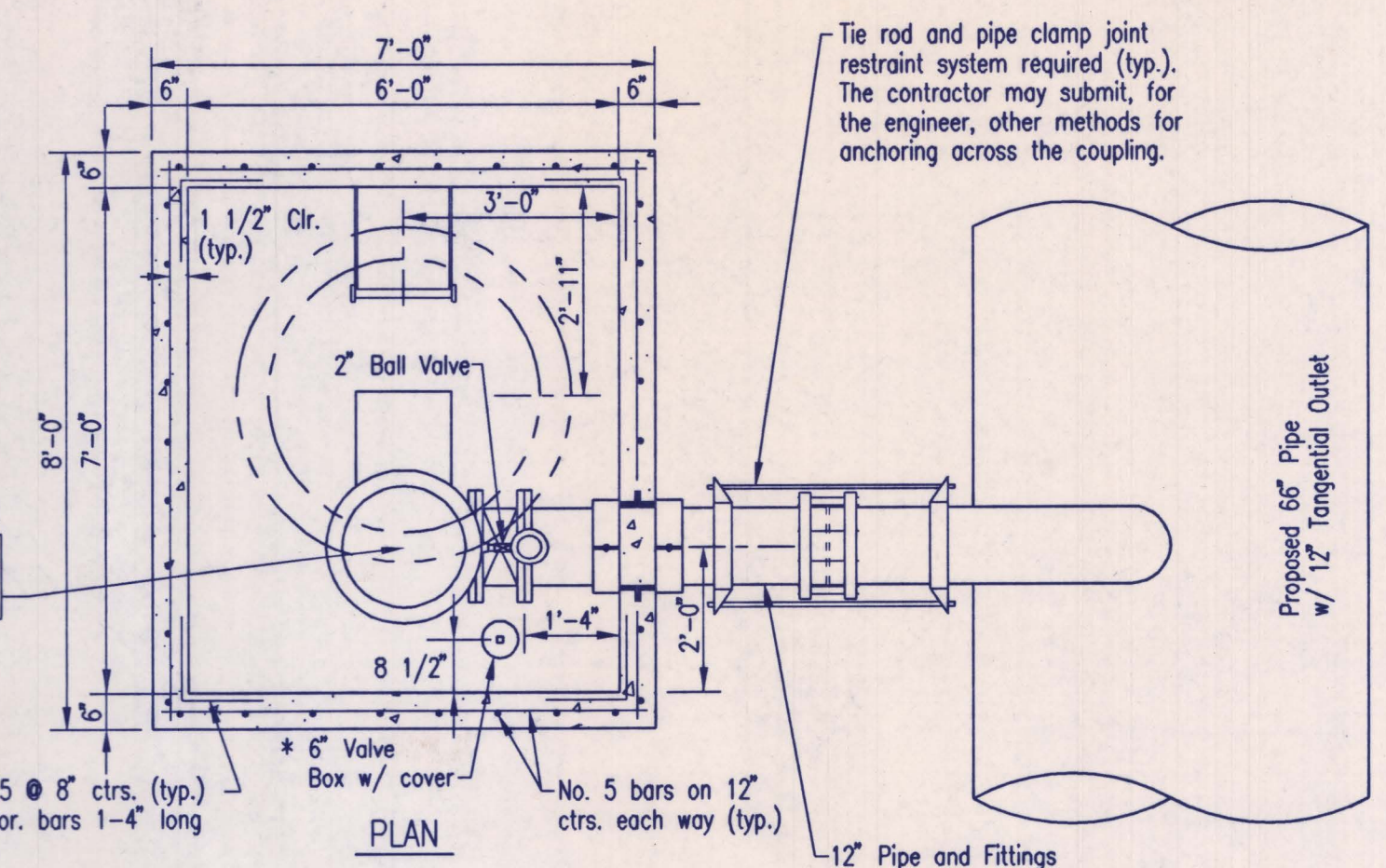
Pt. No. 418  
N-1,693,806.7527, E-1,640,843.8420  
#4 bar at the SE corner of the intersection of McLean and 13th St. N.  
8.8° N to the back of the sidewalk.  
63.57° ENE to the SW corner of the wing wall at bridge.  
35° SE to 60d nail in West face of 24" Elm.

Pt. No. 419  
N-1,693,293.3119, E-1,641,193.1404  
#4 bar at centerline of 8' concrete sidewalk.  
36° SE to the NW corner of concrete base for electric box TS-511.  
63.14° E to PK nail in South face of light pole.

Pt. No. 420  
N-1,692,361.0805, E-1,641,248.9402  
60d nail at centerline of concrete joints in 11th St. N. and Amidon St.  
38.55° NE to the centerline of fire hydrant.  
31.57° SE to PK nail in North face of light pole.

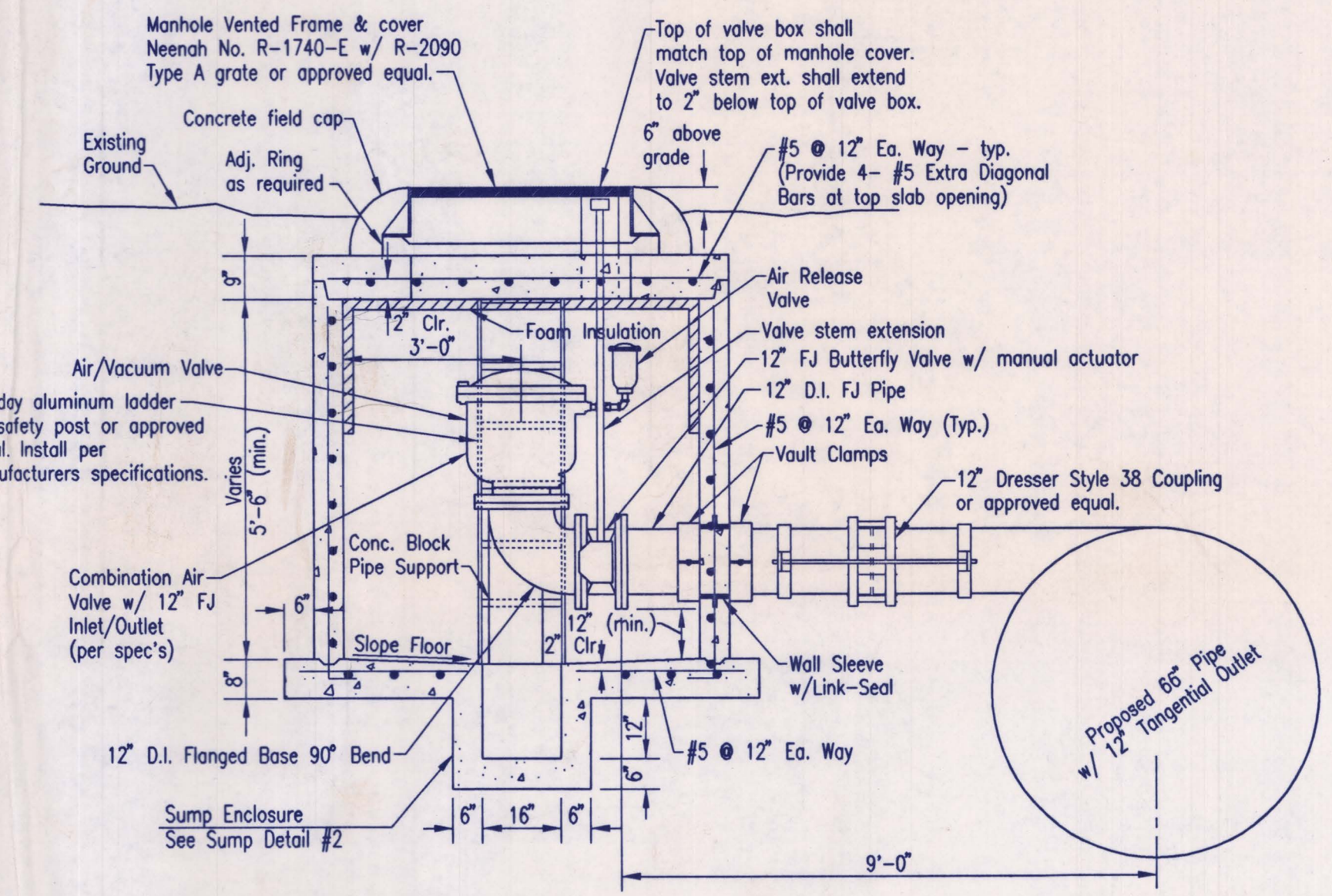
DSWR: MDK OPER: JLM SCALE: 1"=600.00  
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Conc. Vault, @ WL Sta. 233+00.00, 10.67' RL  
 Conc. Vault, @ WL Sta. 264+80.00, 10.67' RL



PLAN

Tie rod and pipe clamp joint restraint system required (typ.). The contractor may submit, for the engineer, other methods for anchoring across the coupling.



SECTION

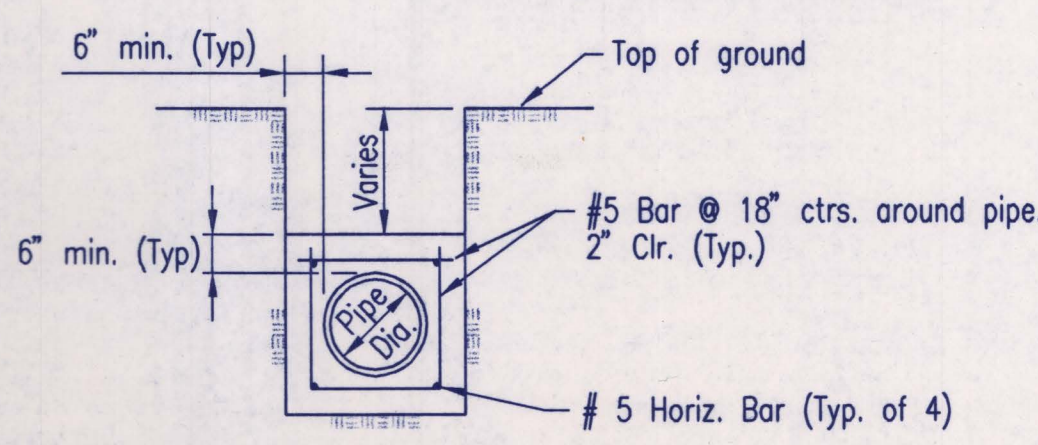
**12" COMBINATION AIR VALVE VAULT**

(See Sheet No. 9 & 13)  
 NO SCALE

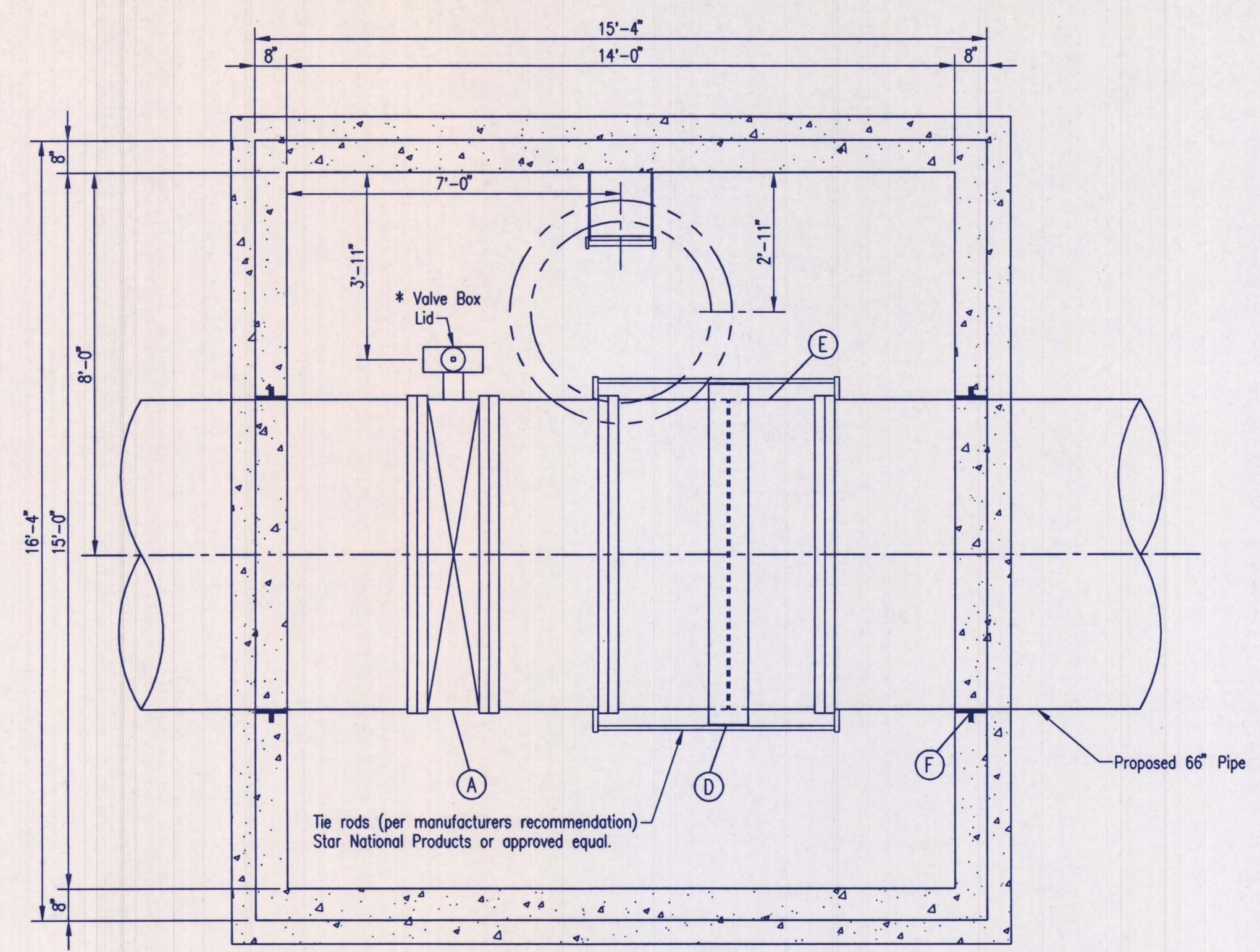
NOTE: PROVIDE A "CONFINED ENTRY SPACE WARNING" SIGN, CHAMPION AMERICAN MODEL 73415HH OR APPROVED EQUAL, FOR VAULT AT LOCATION AS APPROVED BY THE ENGINEER. THE "CONFINED ENTRY SPACE WARNING" SIGN SHALL BE FASTENED TO THE TOP OF ALL VAULTS. IF NECESSARY FOR LANDSCAPING OR SITE CONSIDERATIONS, THE SIGN MAY BE FASTENED TO THE VAULT LID IF IT DOES NOT IMPEDE ACCESS OR AIR FLOW.

THE CONTRACTOR SHALL PROVIDE VERTICAL FITTINGS AS REQUIRED TO MEET THE REQUIREMENTS FOR DEPTH OF THE VAULT SHOWN IN THE DETAIL. THE TOP OF THE 12" PIPING INTO THE VAULT SHALL BE 5.2' (MIN.) BELOW EXISTING GRADE.

\* VALVE BOXES SHALL BE FURNISHED WITH TAMPER PROOF LOCKING LIDS. McGARD INTIMIDATOR CURB-LOCK OR APPROVED EQUAL. TWO SOCKET WRENCH KEYS SHALL BE PROVIDED FOR EACH SIZE AND TYPE OF LOCKING LID. TYPICAL ALL VAULTS.

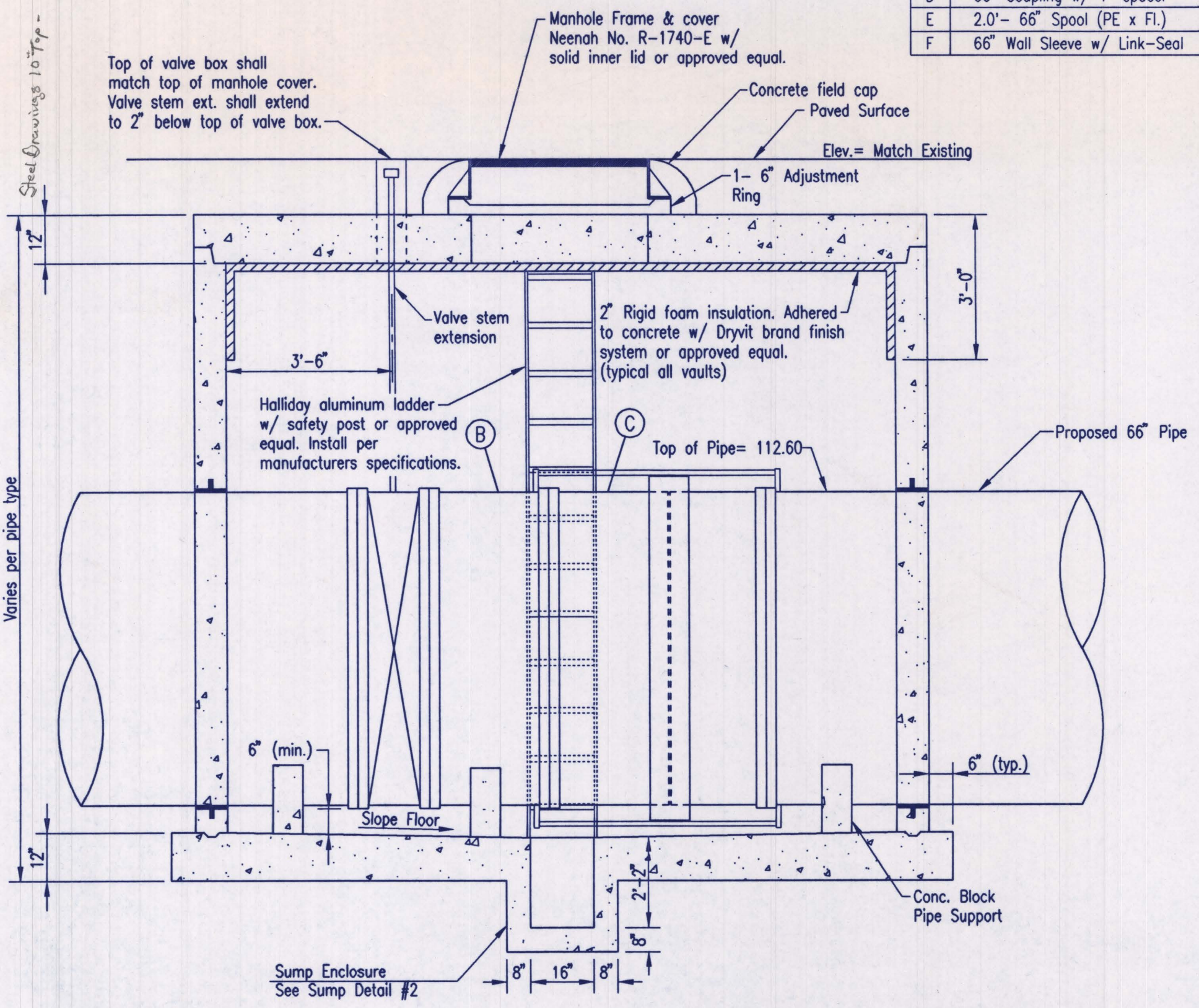


CONCRETE ENCASEMENT DETAIL



PLAN

A	66" Flanged Butterfly Valve
B	2.5'- 66" Spool (FL x FL)
C	2.5'- 66" Spool (FL x PE)
D	66" Coupling w/ 1" spacer
E	2.0'- 66" Spool (PE x FL)
F	66" Wall Sleeve w/ Link-Seal

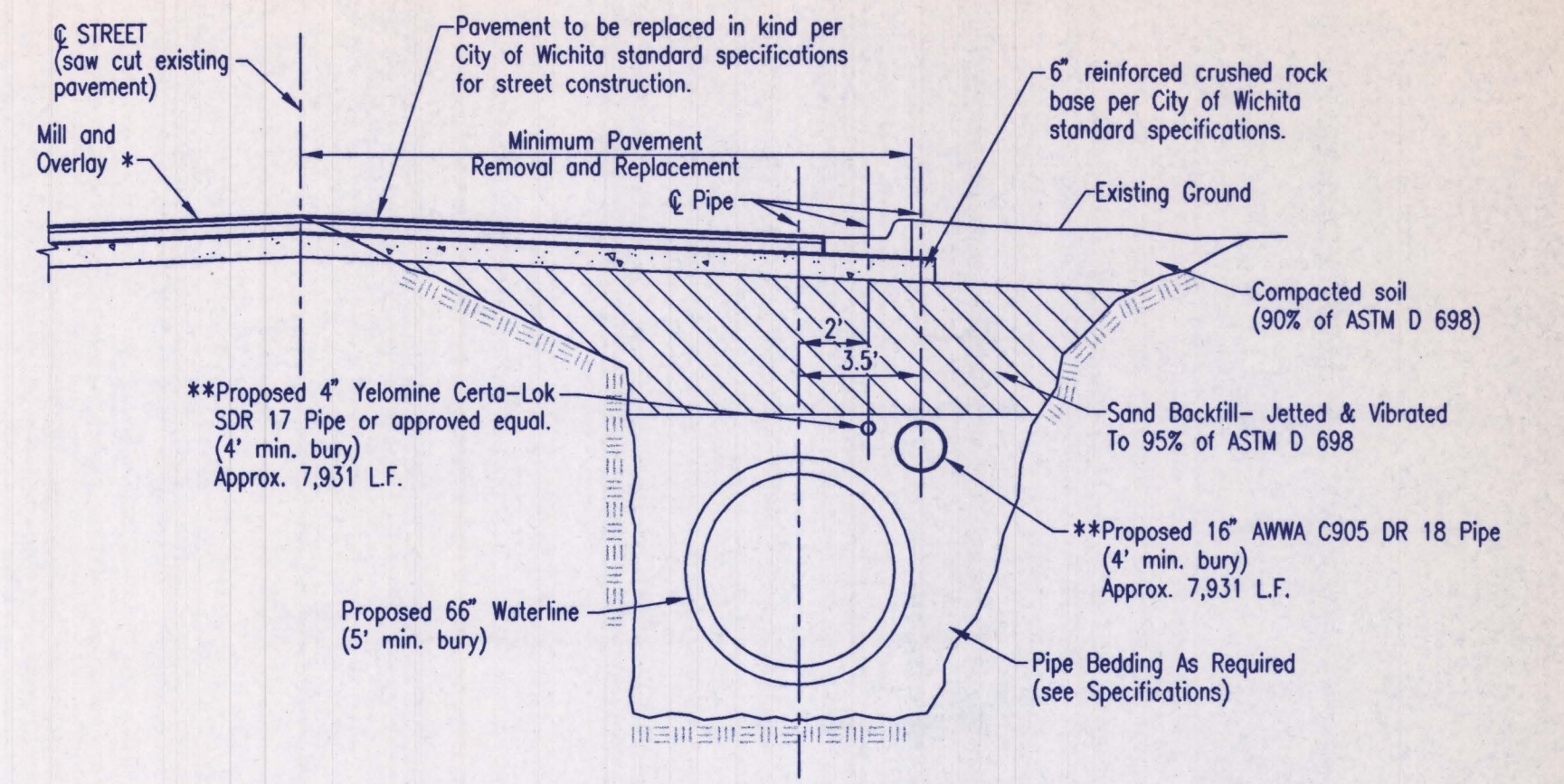


SECTION

**LINE VALVE VAULT DETAIL**

(WL NO. 1, Sta. 243+64.00, See Sheet No. 10)  
 NO SCALE

THE CONTRACTOR SHALL UTILIZE RESTRAINED JOINT PIPE AND TIE RODS TO RESTRAIN ALL PIPING AT THE VALVE LOCATIONS.  
 SEE SHEET NO. 23 FOR STRUCTURAL DETAILS.



**PAVEMENT REMOVAL AND REPLACEMENT DETAIL**

(PHASE 2)

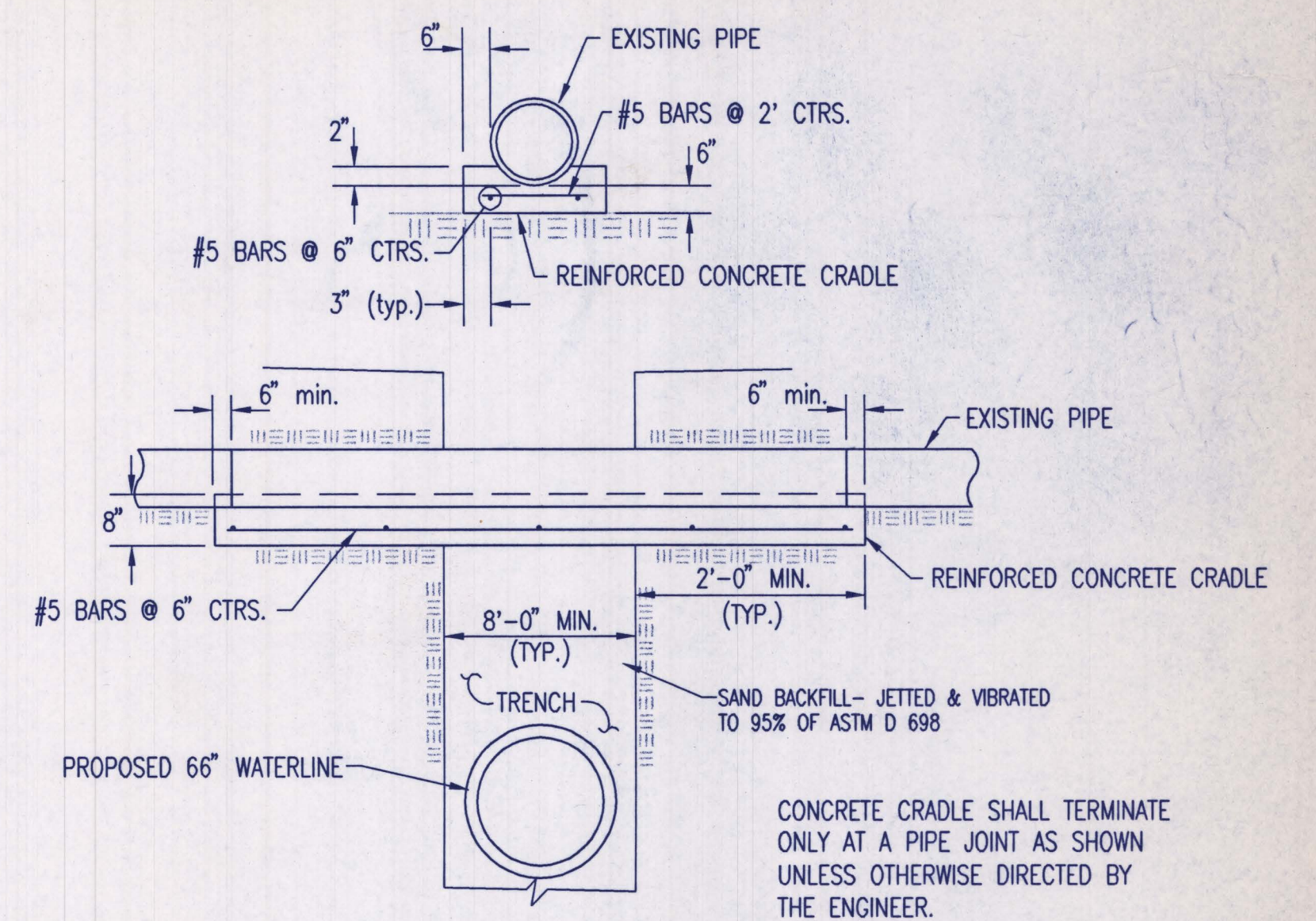
\* IF EXISTING ROAD IS ASPHALTIC CONCRETE, THE CONTRACTOR SHALL MILL AND OVERLAY UNDISTURBED PORTION OF STREET PER CITY OF WICHITA STANDARDS. (APPROX. 33,386 S.F.)

PAVEMENT REPLACEMENT SHALL BE IN LIKE KIND. ASPHALT PAVEMENT ON RESIDENTIAL STREETS SHALL BE SIX-INCH CONCRETE BASE WITH A TWO-INCH ASPHALT SURFACE COURSE. ASPHALT PAVEMENT REPLACEMENT ON ARTERIAL STREETS SHALL BE EIGHT-INCH CONCRETE WITH TWO-INCH SURFACE COURSE. CONCRETE PAVEMENT SHALL BE EIGHT AND TEN INCHES RESPECTIVELY FOR RESIDENTIAL AND ARTERIAL STREETS.

\*\* THE CONTRACTOR SHALL PROVIDE 4" AND 16" RESTRAINED JOINT PIPE AND/OR FITTINGS FOR ALL VALVES, SPECIALS, BENDS EQUAL TO OR GREATER THAN 1 1/4", AND STA. 275+00.00 TO STA. 279+11.33 (RIVER CROSSING). THE PROPOSED PIPELINES SHALL BE DEFLECTED AROUND VALVE AND AIR RELEASE VAULTS OR OTHER OBSTRUCTIONS USING MAXIMUM JOINT DEFLECTIONS OF 4". THE CONTRACTOR SHALL PROVIDE PROPOSED PIPELINE RESTRAINT SYSTEM(S) AND/OR RESTRAINT DEVICES(S) TO OWNER AND ENGINEER FOR REVIEW AND APPROVAL PRIOR TO COMMENCING CONSTRUCTION. ALL COSTS ASSOCIATED WITH SUPPORTING AND RESTRAINING THE PROPOSED PIPELINES SHALL BE CONSIDERED SUBSIDIARY TO THE PRICE BID FOR PIPE.

THE PROPOSED 4" AND 16" PIPELINES SHALL BE INSTALLED BY TRENCHLESS CONSTRUCTION METHODS AT THE STREET CROSSINGS WHERE THE 66" PIPELINE IS INSTALLED BY BORING AND CASING UNLESS OTHERWISE INDICATED IN THE PLANS. THE CONTRACTOR, AT HIS OPTION AND WITH THE APPROVAL OF THE OWNER AND ENGINEER, MAY UTILIZE EITHER DIRECTIONAL DRILLING OR BORING AND CASING METHODS TO INSTALL THE 4" AND 16" PIPELINES AT THESE LOCATIONS.

PIPELINE CONSTRUCTION SHALL CONFORM TO APPLICABLE CITY OF WICHITA STANDARD SPECIFICATIONS AND DETAILS EXCEPT AS OTHERWISE REQUIRED ON THE PLANS OR AS MODIFIED IN THE SPECIAL PROVISIONS.

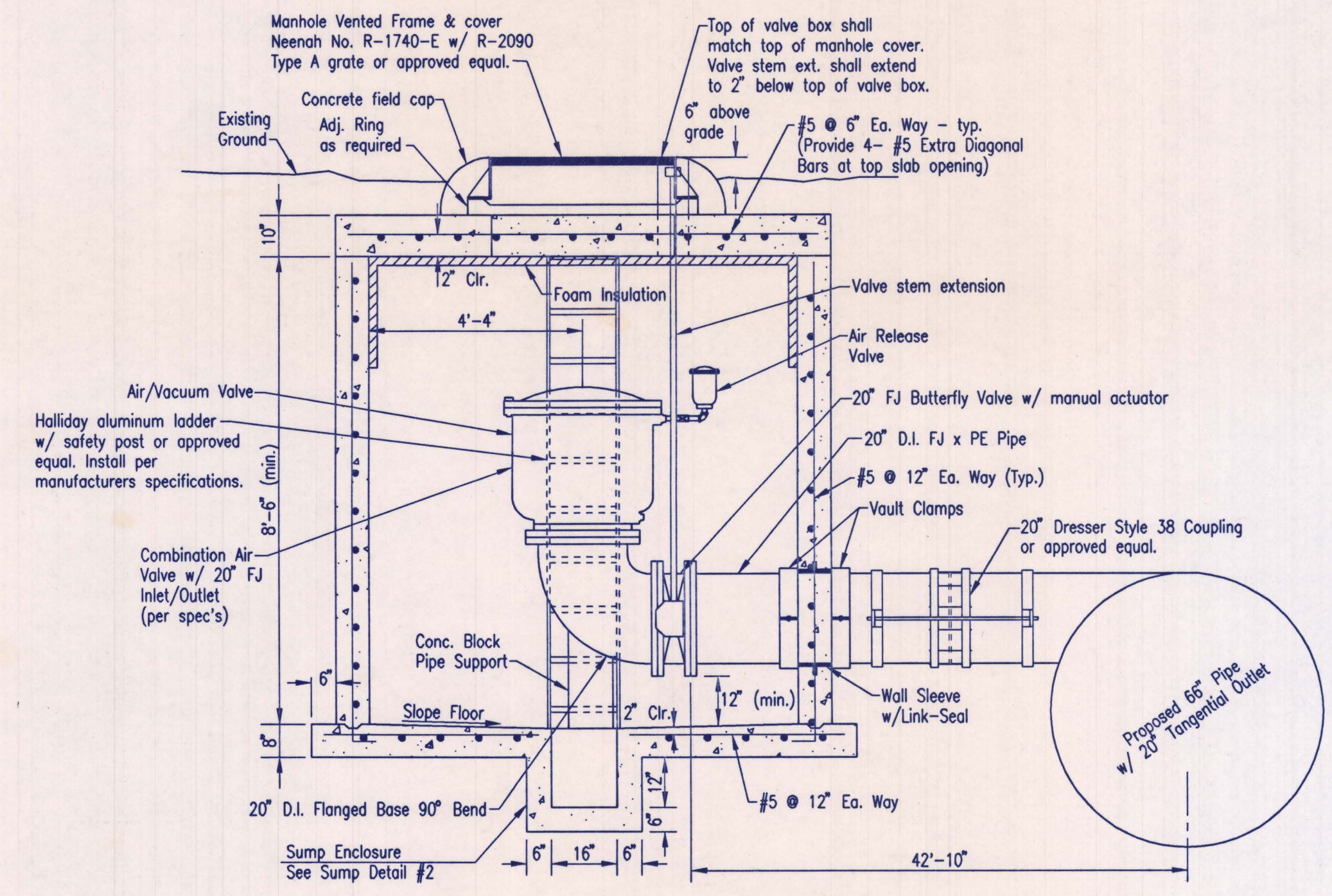
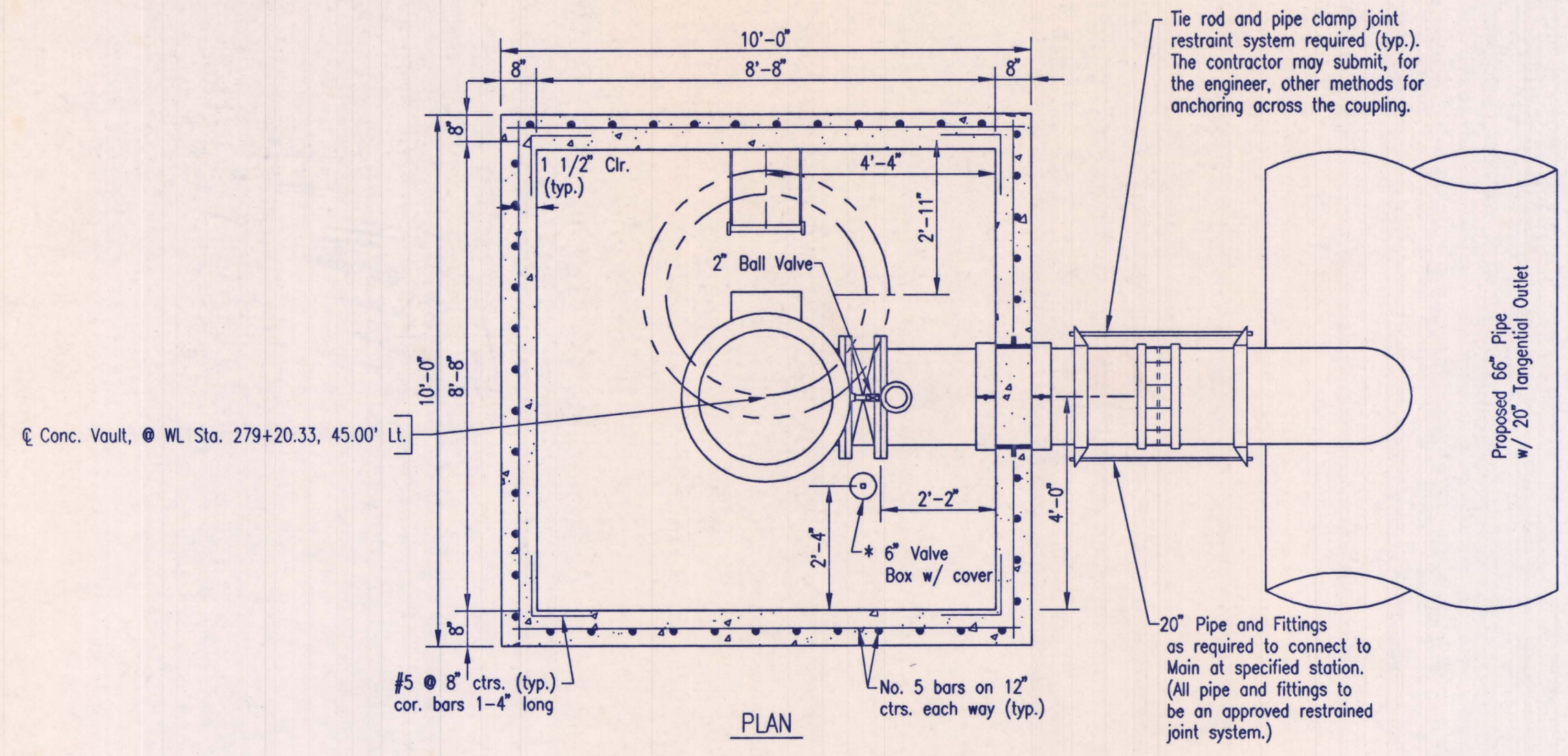


CONCRETE CRADLE DETAIL



No.	Revision	By	Date
CITY OF WICHITA, KANSAS NEIL D. CABLE, P.E. - CITY ENGINEER 66" RAW WATER TRANSMISSION LINE (PHASE 2) <b>WATERLINE DETAILS</b> CITY OF WICHITA PROJECT NO. 448-89439 <b>Professional Engineering Consultants, P.A.</b> 303 S. TOPEKA • WICHITA, KANSAS 67202 316-262-2691 • FAX 316-262-3003			
Designed by	MDK	Job No.	34-00040-042
Drawn by	JLM	Date	March 2001
			Sht. 4 of 24





**20" COMBINATION AIR VALVE VAULT**

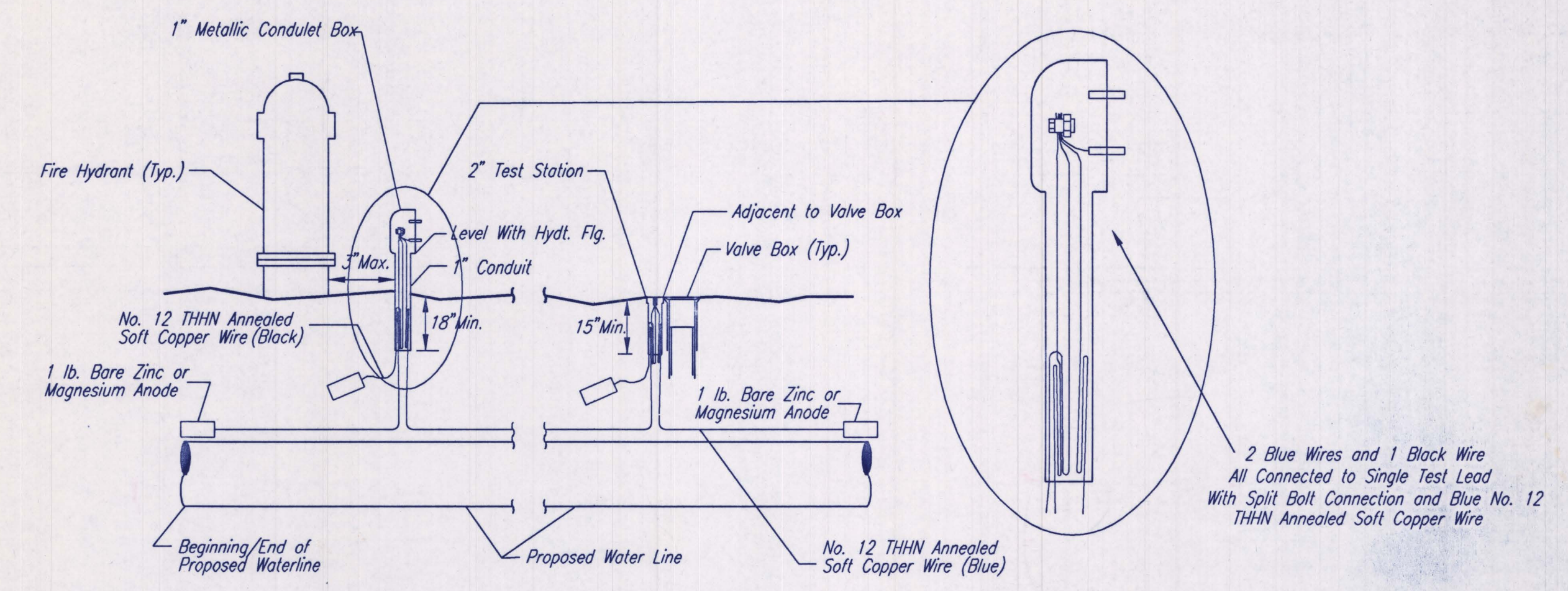
(See Sheet No. 15)  
NO SCALE

NOTE: PROVIDE A "CONFINED ENTRY SPACE WARNING" SIGN, CHAMPION AMERICAN MODEL 73415HH OR APPROVED EQUAL, FOR VAULT AT LOCATION AS APPROVED BY THE ENGINEER. THE "CONFINED ENTRY SPACE WARNING" SIGN SHALL BE FASTENED TO THE TOP OF ALL VAULTS. IF NECESSARY FOR LANDSCAPING OR SITE CONSIDERATIONS, THE SIGN MAY BE FASTENED TO THE VAULT LID IF IT DOES NOT IMPEDE ACCESS OR AIR FLOW.

THE CONTRACTOR SHALL PROVIDE VERTICAL FITTINGS AS REQUIRED TO MEET THE REQUIREMENTS FOR DEPTH OF THE VAULT SHOWN IN THE DETAIL. THE TOP OF THE 20" PIPING INTO THE VAULT SHALL BE 7.5" (MIN.) BELOW EXISTING GRADE.

\* VALVE BOXES SHALL BE FURNISHED WITH TAMPER PROOF LOCKING LIDS. McGARD INTIMIDATOR CURB-LOCK OR APPROVED EQUAL. TWO SOCKET WRENCH KEYS SHALL BE PROVIDED FOR EACH SIZE AND TYPE OF LOCKING LID. TYPICAL ALL VAULTS.

TOP OF VAULT SHALL BE REMOVABLE. SEE STRUCTURAL SHEET 23 FOR DETAIL OF LIFTING PLATES.



**TRACER WIRE**

Conductive type pipe locator/tracer wire shall be installed to locate waterline pipes. The wire shall extend the entire length of the proposed pipe. The wire shall be taped to the waterline and pulled with the pipe. Split-bolt connectors shall be used at splice locations. Electrical tape shall cover all splices so no bare wire is exposed. Test stations shall be installed adjacent to all fire hydrants along the waterline and at blowoffs or valves near the ends of the waterlines. Any exceptions to the location of test stations shall be approved by the engineer. At each test station, the tracer wire shall be connected to a 1 lb. zinc or magnesium anode. Anodes shall also be attached to the tracer wire at both the beginning and the end of the proposed waterline. A typical layout of the tracer wire and test station is provided in the above figure.

**WIRE**

The tracer wire shall be Blue No. 12 THHN annealed soft copper wire with thermal plastic insulation. The insulation shall be heat, oil, and gasoline resistant as manufactured by Temple Electric or approved equal. To allow for grade adjustment, a minimum of 12" of excess wire shall be coiled at the bottom of the test station for all wires. The insulation sheathing shall be removed such that 1" bare copper wire is exposed at all points of connection. Contractor shall attach wire being installed with proposed water main to any tracer wire installed with adjacent waterline projects.

**TEST STATIONS**

The test station for fire hydrant applications shall be a 1 inch galvanized conduit style test station as manufactured by AGRA Industries with a removable solid cover having two leads extending from the face or approved equal. The test station for valve applications shall be 2 inch flush style test station T2PS3B as manufactured by HANDLEY Industries or approved equal. The conduit style shall be attached to a 1 inch rigid galvanized conduit with a minimum length of 36" and plastic end bushing. The flush style shall have the word "WATER" stamped or molded into the lid. All test stations shall be manufactured using molded blue tops or sufficiently coated with blue enamel paint. The tracer wire and the anode wire shall be installed to allow 10 inches of wire within the test station. In concrete environments such as sidewalks or in the downtown area the contractor shall use the flush style test station. The location of all test stations shall be approved by the engineer, recorded, and shown in the as-built drawings.

**ANODES**

The anodes shall be 1 lb. bare zinc or magnesium. The anodes shall be buried at the same elevation as the waterline at each test station. The anodes shall be connected to Black No. 12 THHN annealed soft copper wire which shall be extended to the test station.

**TRACER WIRE DETAIL**

COST IS SUBSIDIARY TO PIPE INSTALLATION

DSNR: MDK OPER: JLM SCALE: 1=1.00  
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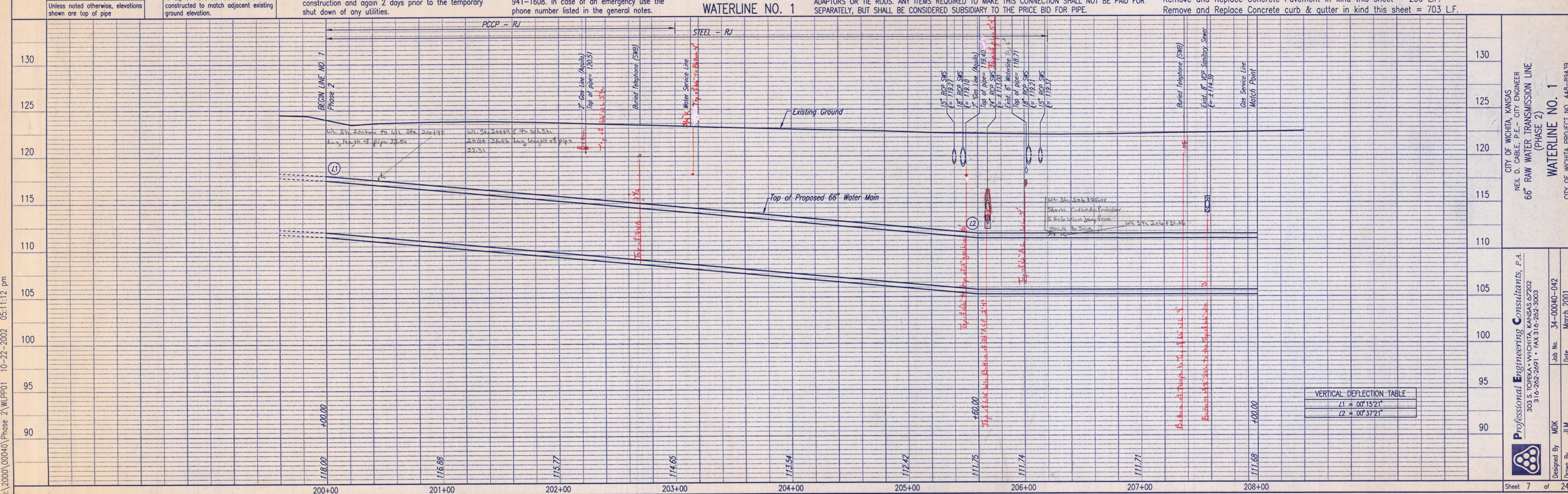
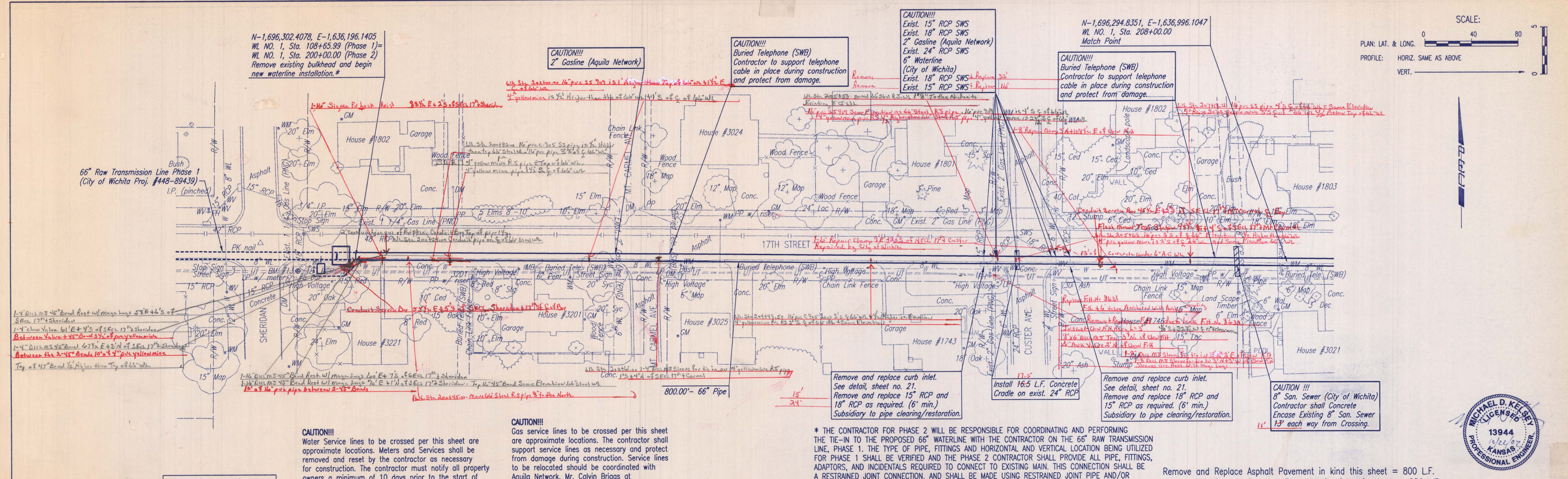
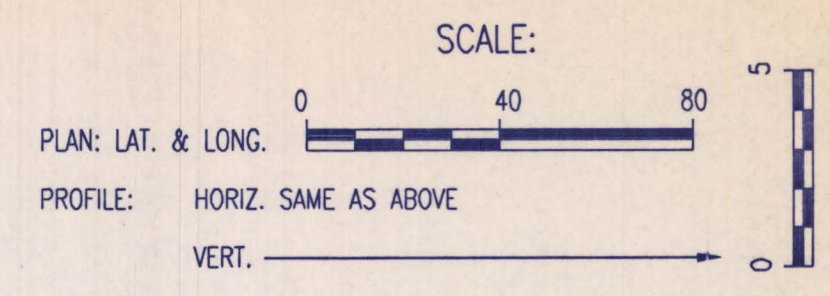


No.	Revision	By	Date
CITY OF WICHITA, KANSAS NEIL D. CABLE, P.E. - CITY ENGINEER 66" RAW WATER TRANSMISSION LINE (PHASE 2) <b>WATERLINE DETAILS</b> CITY OF WICHITA PROJECT NO. 448-89439 <b>Professional Engineering Consultants, P.A.</b> 303 S. TOPEKA • WICHITA, KANSAS 67202 316-262-2691 • FAX 316-262-3003			
Designed by	MDK	Job No.	34-00040-042
Drawn by	JLM	Date	March 2001
			Sht. 6 of 24

DATE: \_\_\_\_\_ BY: \_\_\_\_\_  
 CHECKED: \_\_\_\_\_  
 PLAN

DATE: \_\_\_\_\_ BY: \_\_\_\_\_  
 CHECKED: \_\_\_\_\_  
 PROFILE

DSNR: MDK OPER: JLM SCALE: 1"=40.00  
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N-1,696,302.4078, E-1,636,196.1405  
 WL NO. 1, Sta. 108+65.99 (Phase 1)=  
 WL NO. 1, Sta. 200+00.00 (Phase 2)  
 Remove existing bulkhead and begin  
 new waterline installation.\*

**CAUTION!!!**  
 2" Gasline (Aquila Network)

**CAUTION!!!**  
 Buried Telephone (SWB)  
 Contractor to support telephone  
 cable in place during construction  
 and protect from damage.

**CAUTION!!!**  
 Exist. 15" RCP SWS  
 Exist. 18" RCP SWS  
 2" Gasline (Aquila Network)  
 Exist. 24" RCP SWS  
 6" Waterline  
 (City of Wichita)  
 Exist. 18" RCP SWS & Repair  
 Exist. 15" RCP SWS & Repair

**CAUTION!!!**  
 Buried Telephone (SWB)  
 Contractor to support telephone  
 cable in place during construction  
 and protect from damage.

N-1,696,294.8351, E-1,636,996.1047  
 WL NO. 1, Sta. 208+00.00  
 Match Point

**CAUTION!!!**  
 Water Service lines to be crossed per this sheet are  
 approximate locations. Meters and Services shall be  
 removed and reset by the contractor as necessary  
 for construction. The contractor must notify all property  
 owners a minimum of 10 days prior to the start of  
 construction and again 2 days prior to the temporary  
 shut down of any utilities.

**CAUTION!!!**  
 Gas service lines to be crossed per this sheet  
 are approximate locations. The contractor shall  
 support service lines as necessary and protect  
 from damage during construction. Service lines  
 to be relocated should be coordinated with  
 Aquila Network, Mr. Calvin Briggs at  
 941-1608. In case of an emergency use the  
 phone number listed in the general notes.

\* THE CONTRACTOR FOR PHASE 2 WILL BE RESPONSIBLE FOR COORDINATING AND PERFORMING  
 THE TIE-IN TO THE PROPOSED 66" WATERLINE WITH THE CONTRACTOR ON THE 66" RAW TRANSMISSION  
 LINE, PHASE 1. THE TYPE OF PIPE, FITTINGS AND HORIZONTAL AND VERTICAL LOCATION BEING UTILIZED  
 FOR PHASE 1 SHALL BE VERIFIED AND THE PHASE 2 CONTRACTOR SHALL PROVIDE ALL PIPE, FITTINGS,  
 ADAPTORS, AND INCIDENTALS REQUIRED TO CONNECT TO EXISTING MAIN. THIS CONNECTION SHALL BE  
 A RESTRAINED JOINT CONNECTION, AND SHALL BE MADE USING RESTRAINED JOINT PIPE AND/OR  
 ADAPTORS OR TIE RODS. ANY ITEMS REQUIRED TO MAKE THIS CONNECTION SHALL NOT BE PAID FOR  
 SEPARATELY, BUT SHALL BE CONSIDERED SUBSIDIARY TO THE PRICE BID FOR PIPE.

Remove and Replace Asphalt Pavement in kind this sheet = 800 L.F.  
 Remove and Replace Concrete Pavement in kind this sheet = 256 L.F.  
 Remove and Replace Concrete curb & gutter in kind this sheet = 703 L.F.



CITY OF WICHITA, KANSAS  
 NEIL D. CABLE, P.E. - CITY ENGINEER  
 66" RAW WATER TRANSMISSION LINE  
 (PHASE 2)  
 WATERLINE NO. 1  
 CITY OF WICHITA PROJECT NO. 448-89439

Professional Engineering Consultants, P.A.  
 303 S. TOPEKA • WICHITA, KANSAS 67202  
 316-262-2691 • FAX 316-262-3003

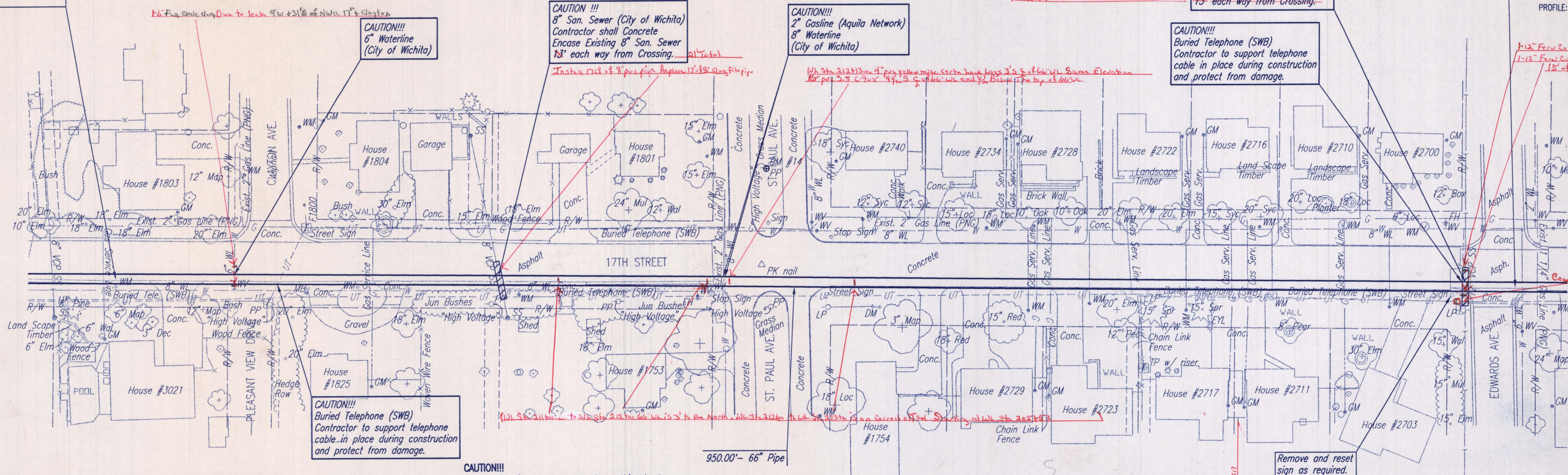
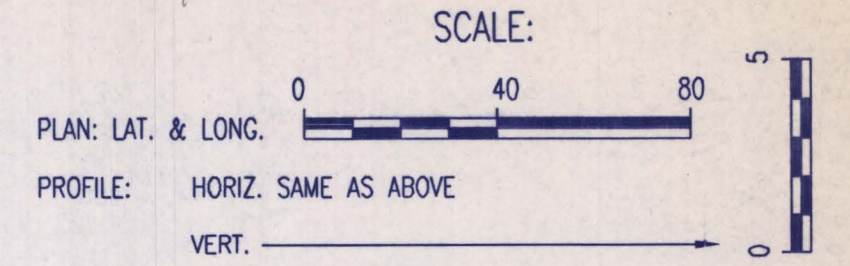
Designed By: MDK  
 Drawn By: JLM  
 Job No.: 34-00040-042  
 Date: March 2001

N-1,696,294.8351, E-1,636,996.1047  
 WL NO. 1, Sta. 208+00.00  
 Match Point

Between two Repair Clamps 12.5' of pipe concrete pipe  
 1/2" R/W Circle Clamp 11' x 19' x 1/2" of Nuts 17" x 1/2" long  
 1/2" R/W Circle Clamp Due to Leak 9' x 1/2" of Nuts 17" x 1/2" long

CAUTION !!!  
 12" San. Sewer (City of Wichita)  
 Contractor shall Concrete  
 Encase Existing 12" San. Sewer  
 13' each way from Crossing.

N-1,696,285.8426, E-1,637,946.0621  
 WL NO. 1, Sta. 217+50.00  
 Match Point



DATE	BY
CHECKED	CHECKED
PLAN	

DATE	BY
CHECKED	CHECKED
PROFILE	

CAUTION!!!  
 Buried Telephone (SWB)  
 Contractor to support telephone  
 cable in place during construction  
 and protect from damage.

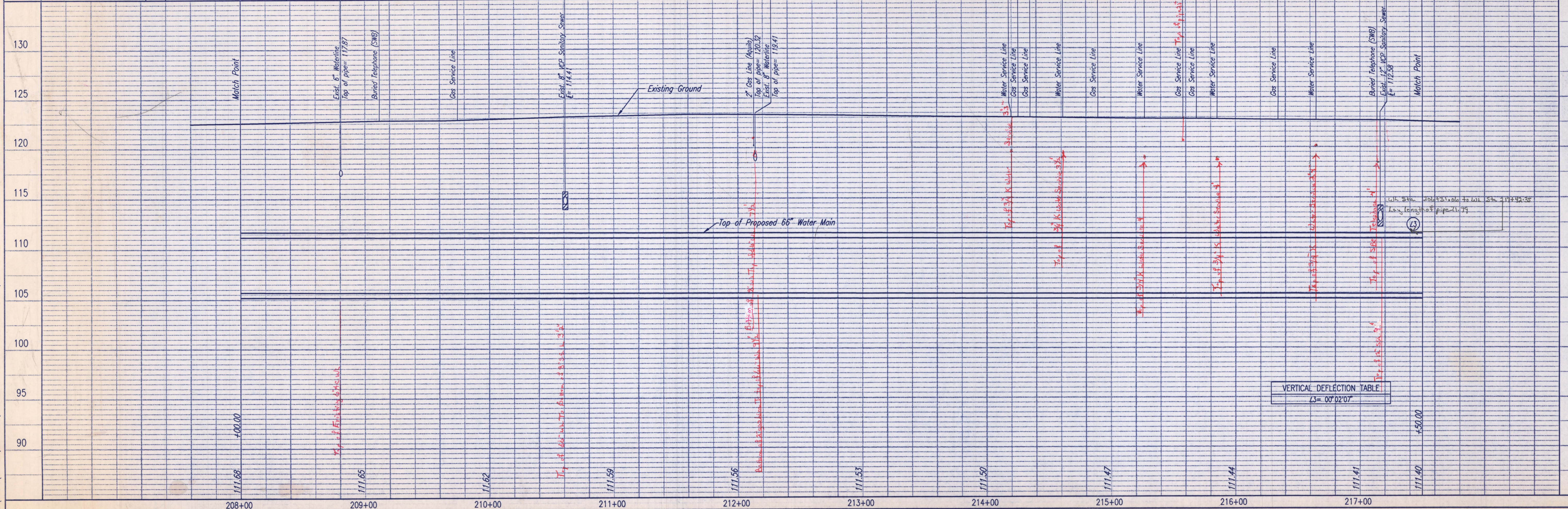
CAUTION!!!  
 Gas service lines to be crossed per this sheet  
 are approximate locations. The contractor shall  
 support service lines as necessary and protect  
 from damage during construction. Service lines  
 to be relocated should be coordinated with  
 Aquila Network, Mr. Calvin Briggs at  
 941-1608. In case of an emergency use the  
 phone number listed in the general notes.

Unless noted otherwise, elevations  
 shown are top of pipe

All top of valve box elevations shall be  
 constructed to match adjacent existing  
 ground elevation.

WATERLINE NO. 1

Remove and Replace Asphalt Pavement in kind this sheet = 450 L.F.  
 Remove and Replace Concrete Pavement in kind this sheet = 623 L.F.  
 Remove and Replace Concrete curb & gutter in kind this sheet = 844 L.F.



DSNR, MDK OPER. JLM SCALE: 1"=40.00  
 Q:\2000\00040\Phase 2\WLPP02 10-22-2002 03:42:35 pm

CITY OF WICHITA, KANSAS  
 NEIL D. CABLE, P.E. - CITY ENGINEER  
 66" RAW WATER TRANSMISSION LINE  
 (PHASE 2)  
 WATERLINE NO. 1  
 CITY OF WICHITA PROJECT NO. 448-89439

Professional Engineering Consultants, P.A.  
 303 S. TOPEKA - WICHITA, KANSAS 67202  
 316-266-2691 • FAX 316-262-3003

Job No. 34-00040-042  
 Date March 2001

Designed By MDK  
 Drawn By JLM

Sheet 8 of 24



N-1,696,285.8426, E-1,637,946.0621  
WL NO. 1, Sta. 217+50.00  
Match Point

CAUTION!!!  
8" Waterline  
(City of Wichita)

CAUTION!!!  
8" San. Sewer (City of Wichita)  
Contractor shall Concrete  
Encase Existing 8" San. Sewer  
13' each way from Crossing.

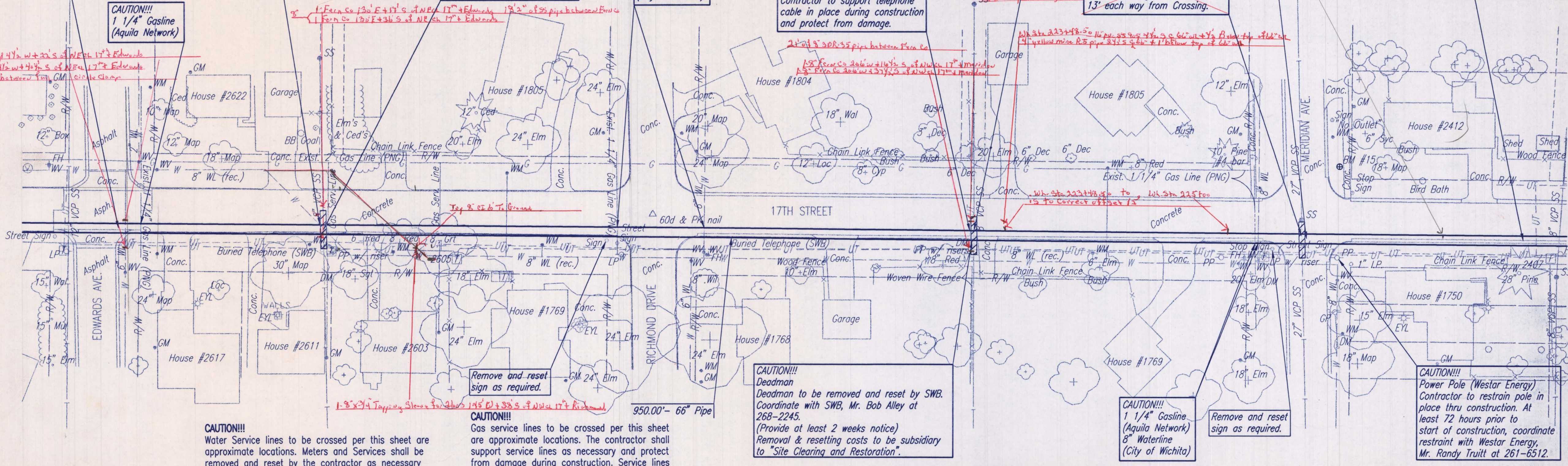
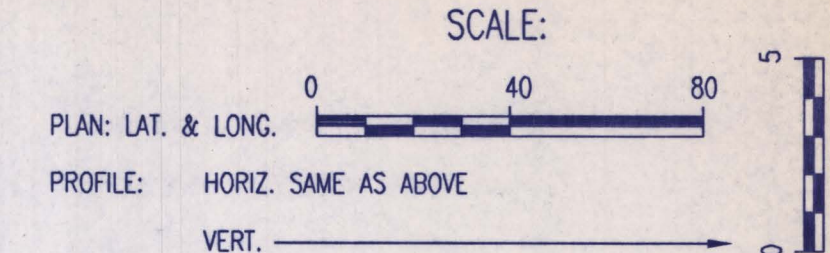
CAUTION!!!  
1 1/4" Gasline  
(Aquila Network)  
6" Waterline  
(City of Wichita)

CAUTION!!!  
Buried Telephone (SWB)  
Contractor to support telephone  
cable in place during construction  
and protect from damage.

N-1,696,278.2368, E-1,638,749.5235  
WL NO. 1, Sta. 225+53.50  
Horizontal Deflection  
Defl. = 0° 06' 45"

CAUTION!!!  
27" San. Sewer (City of Wichita)  
Contractor shall Concrete  
Encase Existing 27" San. Sewer  
13' each way from Crossing.

N-1,696,277.1383, E-1,638,896.0220  
WL NO. 1, Sta. 227+00.00  
Match Point



CAUTION!!!  
Water Service lines to be crossed per this sheet are approximate locations. Meters and Services shall be removed and reset by the contractor as necessary for construction. The contractor must notify all property owners a minimum of 10 days prior to the start of construction and again 2 days prior to the temporary shut down of any utilities.

CAUTION!!!  
Gas service lines to be crossed per this sheet are approximate locations. The contractor shall support service lines as necessary and protect from damage during construction. Service lines to be relocated should be coordinated with Aquila Network, Mr. Calvin Briggs at 941-1608. In case of an emergency use the phone number listed in the general notes.

CAUTION!!!  
Deadman  
Deadman to be removed and reset by SWB. Coordinate with SWB, Mr. Bob Alley at 268-2245. (Provide at least 2 weeks notice) Removal & resetting costs to be subsidiary to "Site Clearing and Restoration".

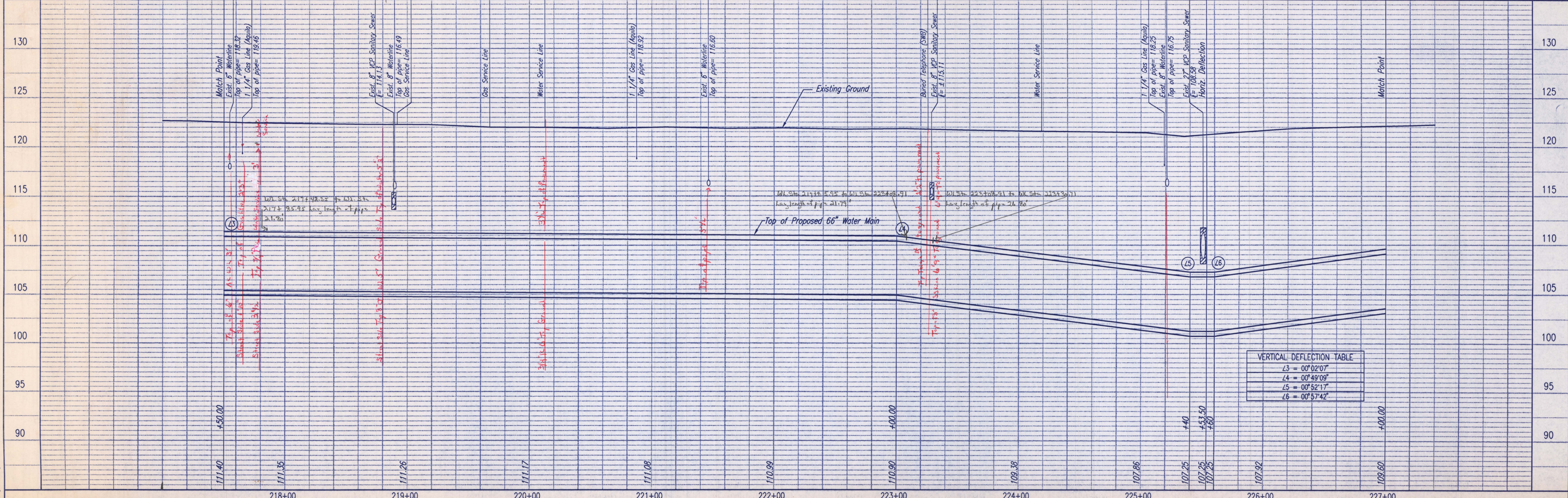
CAUTION!!!  
1 1/4" Gasline  
(Aquila Network)  
6" Waterline  
(City of Wichita)

CAUTION!!!  
Power Pole (Westar Energy)  
Contractor to restrain pole in place thru construction. At least 72 hours prior to start of construction, coordinate restraint with Westar Energy, Mr. Randy Truitt at 261-6512.

Remove and Replace Asphalt Pavement in kind this sheet = 15 L.F.  
Remove and Replace Concrete Pavement in kind this sheet = 935 L.F.  
Remove and Replace Concrete curb & gutter in kind this sheet = 855 L.F.



WATERLINE NO. 1



BY	DATE
CHECKED	CHECKED
PLAN	

BY	DATE
CHECKED	CHECKED
PROFILE	

DSNR: MDK OPER: JLM SCALE: 1"=40.00  
Q:\2000\00040\Phase 2\WLP03 10-22-2002 03:42:03 pm

N-1,696,277.1383, E-1,638,896.0220  
WL NO. 1, Sta. 227+00.00  
Match Point

**CAUTION!!!**  
Buried Telephone (SWB)  
Contractor to support telephone  
cable in place during construction  
and protect from damage.

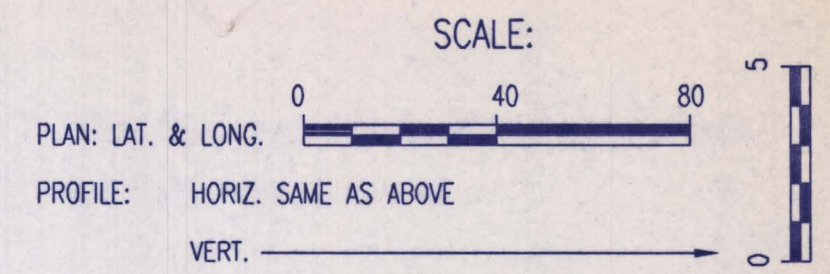
**CAUTION !!!**  
8" San. Sewer (City of Wichita)  
Contractor shall Concrete  
Encase Existing 8" San. Sewer  
13' North and 10' South from Crossing.

**CAUTION!!!**  
8" Waterline  
(City of Wichita)  
2" Gasline  
(Aquila Network)

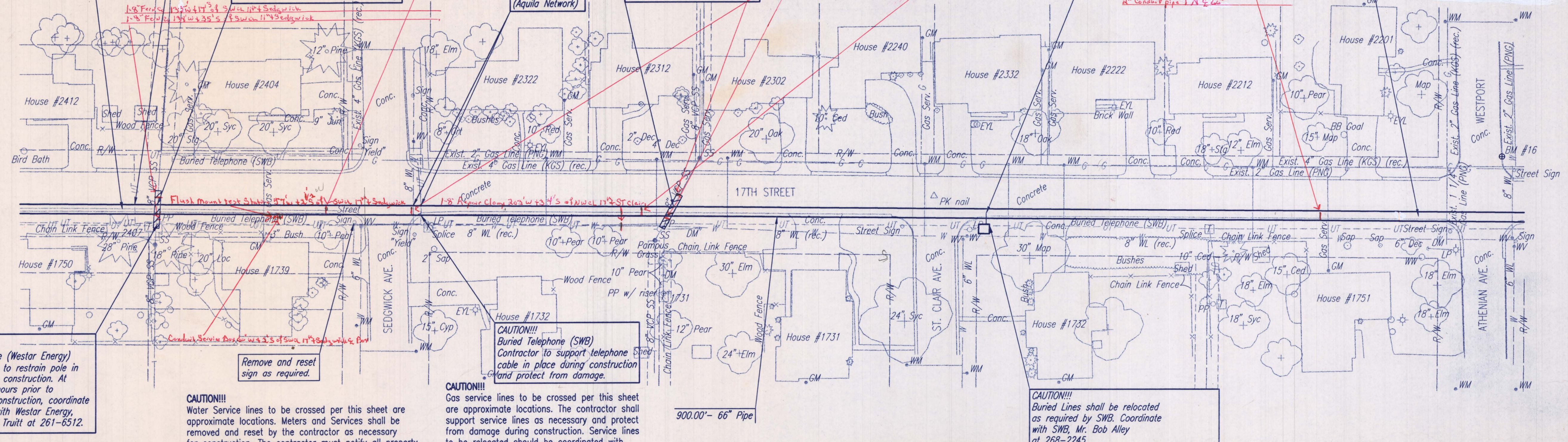
**CAUTION !!!**  
8" San. Sewer (City of Wichita)  
Contractor shall Concrete  
Encase Existing 8" San. Sewer  
13' each way from Crossing.

N-1,696,272.6390, E-1,639,496.0051  
WL NO. 1, Sta. 233+00.00  
Install 12" Combination Air  
Valve Vault. From E. of Valve Vault  
See detail, sheet no. 4.

N-1,696,270.3894, E-1,639,795.9967  
WL NO. 1, Sta. 236+00.00  
Match Point



BY	DATE
CHECKED	CHECKED
PLAN	



**CAUTION!!!**  
Power Pole (Westar Energy)  
Contractor to restrain pole in  
place thru construction. At  
least 72 hours prior to  
start of construction, coordinate  
restraint with Westar Energy,  
Mr. Randy Truitt at 261-6512.

**CAUTION!!!**  
Water Service lines to be crossed per this sheet are  
approximate locations. Meters and Services shall be  
removed and reset by the contractor as necessary  
for construction. The contractor must notify all property  
owners a minimum of 10 days prior to the start of  
construction and again 2 days prior to the temporary  
shut down of any utilities.

**CAUTION!!!**  
Gas service lines to be crossed per this sheet are  
approximate locations. The contractor shall  
support service lines as necessary and protect  
from damage during construction. Service lines  
to be relocated should be coordinated with  
Aquila Network, Mr. Calvin Briggs at  
941-1608. In case of an emergency use the  
phone number listed in the general notes.

**CAUTION!!!**  
Buried Lines shall be relocated  
as required by SWB. Coordinate  
with SWB, Mr. Bob Alley  
at 268-2245.  
(Provide at least 2 weeks notice)  
Relocation costs if any to be borne by SWB.

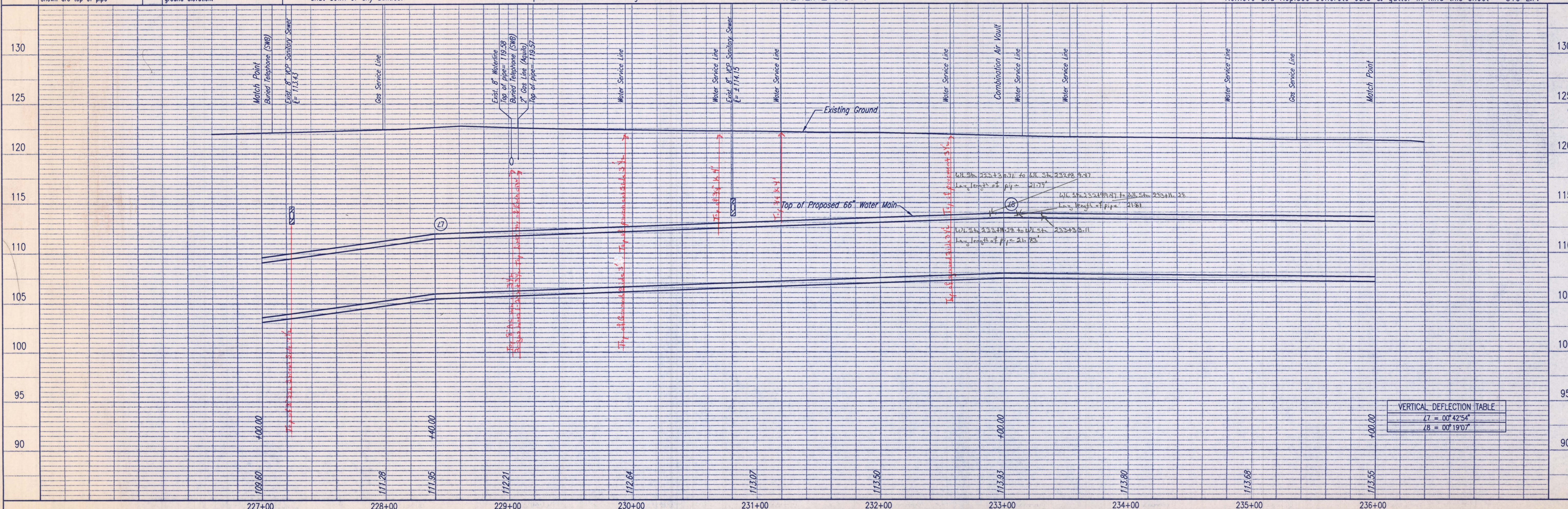
Remove and Replace Concrete Pavement in kind this sheet = 900 L.F.  
Remove and Replace Concrete curb & gutter in kind this sheet = 810 L.F.



**WATERLINE NO. 1**

BY	DATE
CHECKED	CHECKED
PROFILE	

DSNR: MOK OPER. JLM SCALE: 1"=40.00  
G:\2000\00040\Phase 2\WLP04 10-22-2002 03:41:27 pm



Professional Engineering Consultants, P.A.  
303 S. TOPEKA - WICHITA, KANSAS 67202  
316-262-2691 • FAX 316-262-3005

City of Wichita, Kansas  
Neil D. Keller, P.E. - City Engineer  
66" RAW WATER TRANSMISSION LINE  
(PHASE 2)  
WATERLINE NO. 1  
City of Wichita Project No. 448-89439

Designed By: MDK  
Drawn By: JLM  
Job No.: 34-00040-042  
Date: March 2001

Sheet 10 of 24



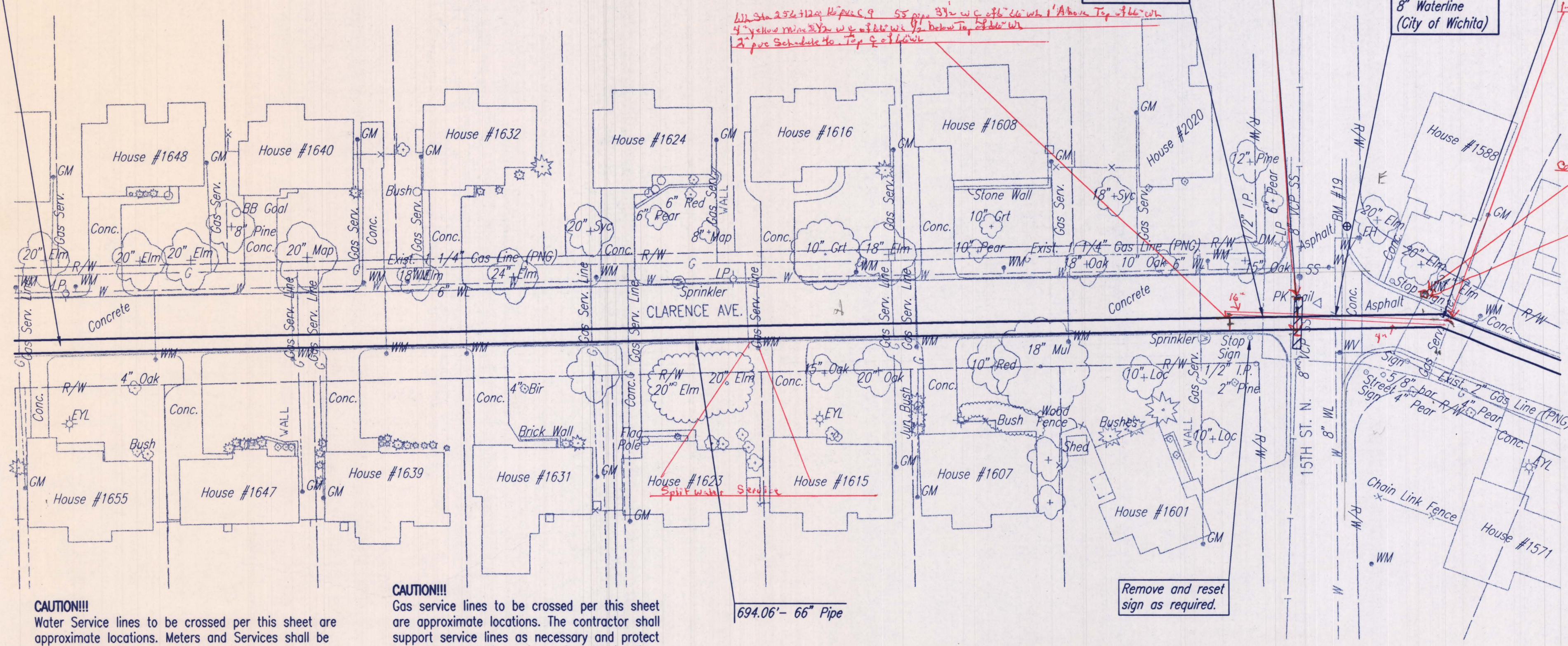
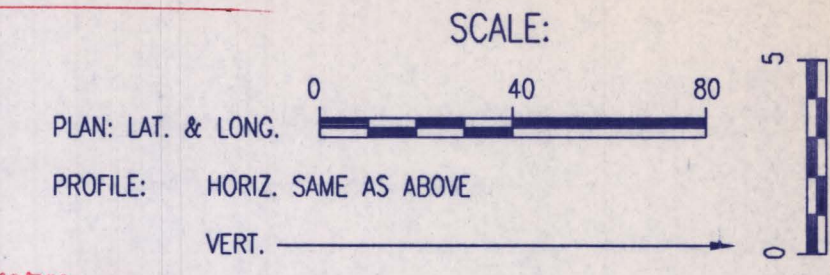


N-1,695,663.3622, E-1,640,631.2364  
 WL NO. 1, Sta. 250+25.00  
 Match Point

1-8" Fire Grade Repair along 7 1/2' S + 1/2' W N.E. Corner + 15' S  
 1-8" Fire Grade Repair along 7 1/2' S + 3' W N.E. Corner + 15' S  
 Between 2 Repair Slabs 15' S - 30' S per pipe

**CAUTION !!!**  
 8" San. Sewer (City of Wichita)  
 Contractor shall Concrete  
 Encase Existing 8" San. Sewer  
 +3' each way from Crossing.  
 20' Total

23' R/S Bend 40' S + 24' E SWCC Clearance +15' S  
 N-1,694,969.4213, E-1,640,644.1896  
 WL NO. 1, Sta. 257+19.06  
 1- 66" Horizontal Bend  
 Defl. = 23' 16" 44"  
 PC Curve No. 1



**CAUTION!!!**  
 Water Service lines to be crossed per this sheet are approximate locations. Meters and Services shall be removed and reset by the contractor as necessary for construction. The contractor must notify all property owners a minimum of 10 days prior to the start of construction and again 2 days prior to the temporary shut down of any utilities.

**CAUTION!!!**  
 Gas service lines to be crossed per this sheet are approximate locations. The contractor shall support service lines as necessary and protect from damage during construction. Service lines to be relocated should be coordinated with Aquila Network, Mr. Calvin Briggs at 941-1608. In case of an emergency use the phone number listed in the general notes.

**WATERLINE NO. 1**

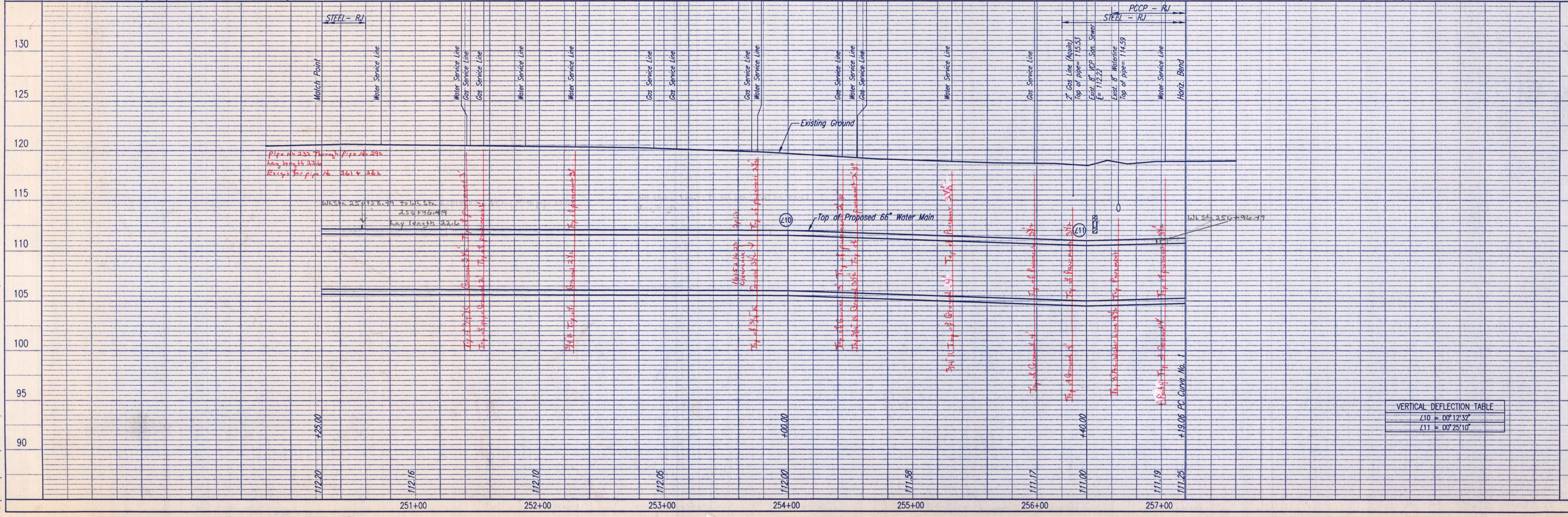
Remove and Replace Asphalt Pavement in kind this sheet = 66 L.F.  
 Remove and Replace Concrete Pavement in kind this sheet = 628 L.F.  
 Remove and Replace Concrete curb & gutter in kind this sheet = 609 L.F.



PLAN	CHECKED	DATE
	CHECKED	

PROFILE	CHECKED	DATE
	CHECKED	

DSNR: MDK OPER JLM SCALE: 1=40.00  
 G:\2000\00040\Phase 2\WLP07 10-22-2002 03:39:56 pm



CITY OF WICHITA, KANSAS  
 NEIL D. CABLE, P.E. - CITY ENGINEER  
**66" RAW WATER TRANSMISSION LINE (PHASE 2)**  
**WATERLINE NO. 1**  
 CITY OF WICHITA PROJECT NO. 448-89439

Professional Engineering Consultants, P.A.  
 303 S. TOPEKA • WICHITA, KANSAS 67202  
 316-262-2691 • FAX 316-262-3003

Designed By: MDK  
 Drawn By: JLM  
 Job No. 34-00040-042  
 Date: March 2001

Sheet 13 of 24

N-1,694,969.4213, E-1,640,644.1896  
WL NO. 1, Sta. 257+19.06  
PC Curve No. 1

**CAUTION!!!**  
Power Pole  
Power Pole to be removed and reset by Westar Energy. Coordinate with Westar Energy, Mr. Randy Truitt at 261-6512. (Provide at least 2 weeks notice)  
Removal & resetting costs to be subsidiary to "Site Clearing and Restoration".

N-1,694,809.9148, E-1,640,584.8786  
WL NO. 1, Sta. 258+89.27  
PT Curve No. 1= PC Curve No. 2

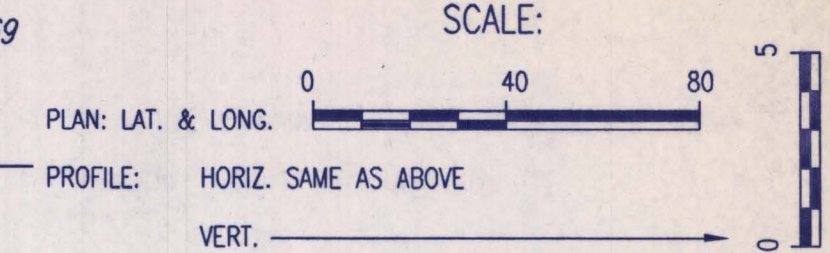
**CAUTION!!!**  
Light Pole & Power Pole  
Poles to be removed and reset by Westar Energy. Coordinate with Westar Energy, Mr. Randy Truitt at 261-6512. (Provide at least 2 weeks notice)  
Removal & resetting costs to be subsidiary to "Site Clearing and Restoration".

N-1,694,585.8894, E-1,640,492.0876  
WL NO. 1, Sta. 261+31.94  
PT Curve No. 2

**CAUTION!!!**  
Light Pole & Deadman  
Light Pole & Deadman to be removed and reset by Westar Energy. Coordinate with Westar Energy, Mr. Randy Truitt at 261-6512. (Provide at least 2 weeks notice)  
Removal & resetting costs to be subsidiary to "Site Clearing and Restoration".

N-1,694,274.1619, E-1,640,337.2530  
WL NO. 1, Sta. 264+80.00  
Install 12" Combination Air Valve Vault. *Front of Valve inside of Vault*  
See detail, sheet no. 4.

N-1,694,235.9374, E-1,640,318.2669  
WL NO. 1, Sta. 265+22.68  
1- 66" Horizontal Bend  
Defl. = 39" 16" 18"

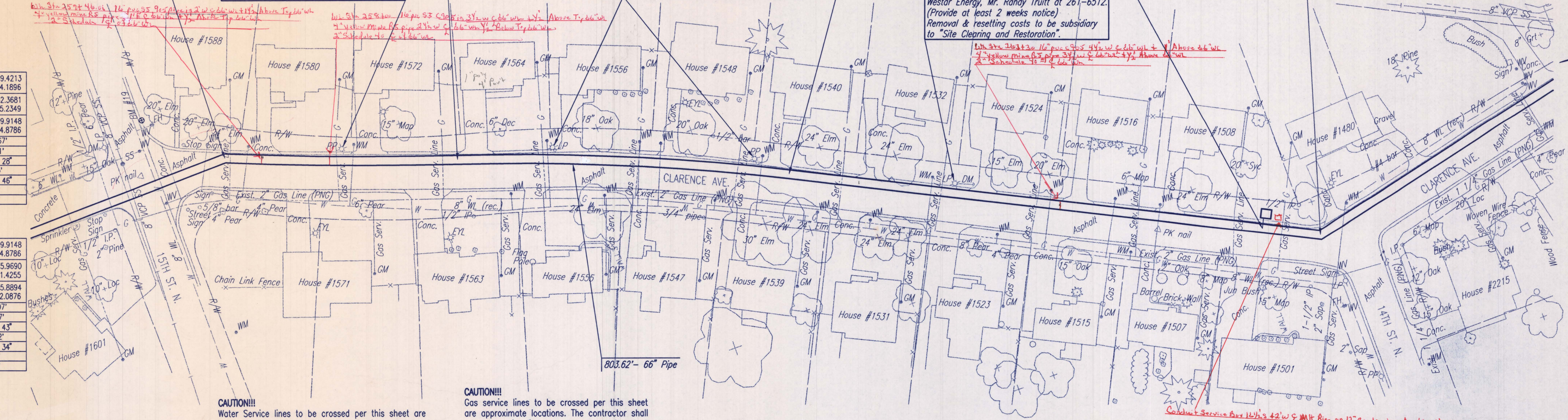


CURVE NO. 1	
P.C. coords.	N-1,694,969.4213 E-1,640,644.1896
Center coords.	N-1,693,952.3681 E-1,643,135.2349
P.T. coords.	N-1,694,809.9148 E-1,640,584.8786
Radius	2,690.67'
Arc length	170.21'
Central angle	03° 37' 28"
Tangent length	85.13'
Degree of curve	02° 07' 46"
External distance	1.35'
Middle ordinate	1.35'

CURVE NO. 2	
P.C. coords.	N-1,694,809.9148 E-1,640,584.8786
Center coords.	N-1,695,375.9690 E-1,638,901.4255
P.T. coords.	N-1,694,585.8894 E-1,640,492.0876
Radius	1,776.07'
Arc length	242.67'
Central angle	07° 49' 43"
Tangent length	121.52'
Degree of curve	03° 13' 34"
External distance	4.15'
Middle ordinate	4.14'

DATE	BY	CHECKED	CHECKED

DATE	BY	CHECKED	CHECKED



**CAUTION!!!**  
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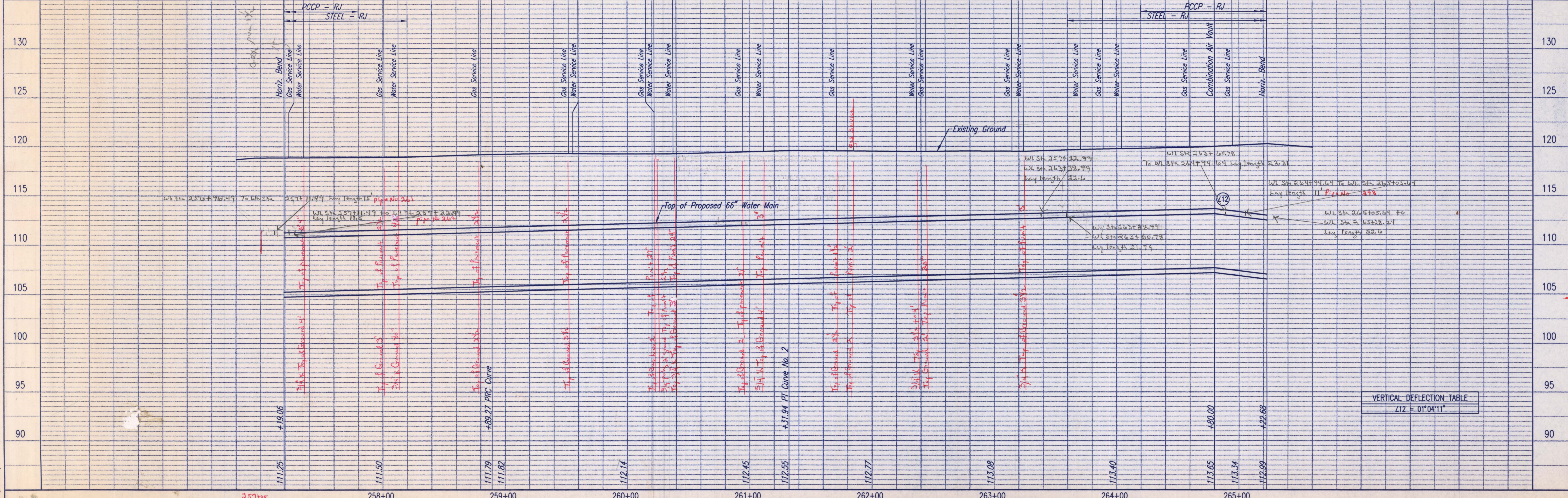
**CAUTION!!!**  
Gas service lines to be crossed per this sheet are approximate locations. The contractor shall support service lines as necessary and protect from damage during construction. Service lines to be relocated should be coordinated with Aquila Network, Mr. Calvin Briggs at 941-1608. In case of an emergency use the phone number listed in the general notes.

Unless noted otherwise, elevations shown are top of pipe

All top of valve box elevations shall be constructed to match adjacent existing ground elevation.

**WATERLINE NO. 1**

Remove and Replace Asphalt Pavement in kind this sheet = 804 L.F.  
Remove and Replace Concrete Pavement in kind this sheet = 248 L.F.  
Remove and Replace Concrete curb & gutter in kind this sheet = 804 L.F.



VERTICAL DEFLECTION TABLE	
112	01' 04" 11"



DSNR: MDK OPER. JLM SCALE: 1"=40.00  
Q:\2000\00040\Phase 2\WLP08 10-22-2002 03:39:26 pm

Professional Engineering Consultants, P.A.  
303 S. TOPKA - WICHITA, KANSAS 67202  
316-262-2691 • FAX 316-262-3003

City of Wichita, Kansas  
Neil D. Cable, P.E. - City Engineer  
66" RAW WATER TRANSMISSION LINE  
(Phase 2)  
WATERLINE NO. 1  
City of Wichita Project No. 448-89439

Designed By: MDK  
Drawn By: JLM  
Job No.: 34-00040-042  
Date: March 2001

Sheet 14 of 24

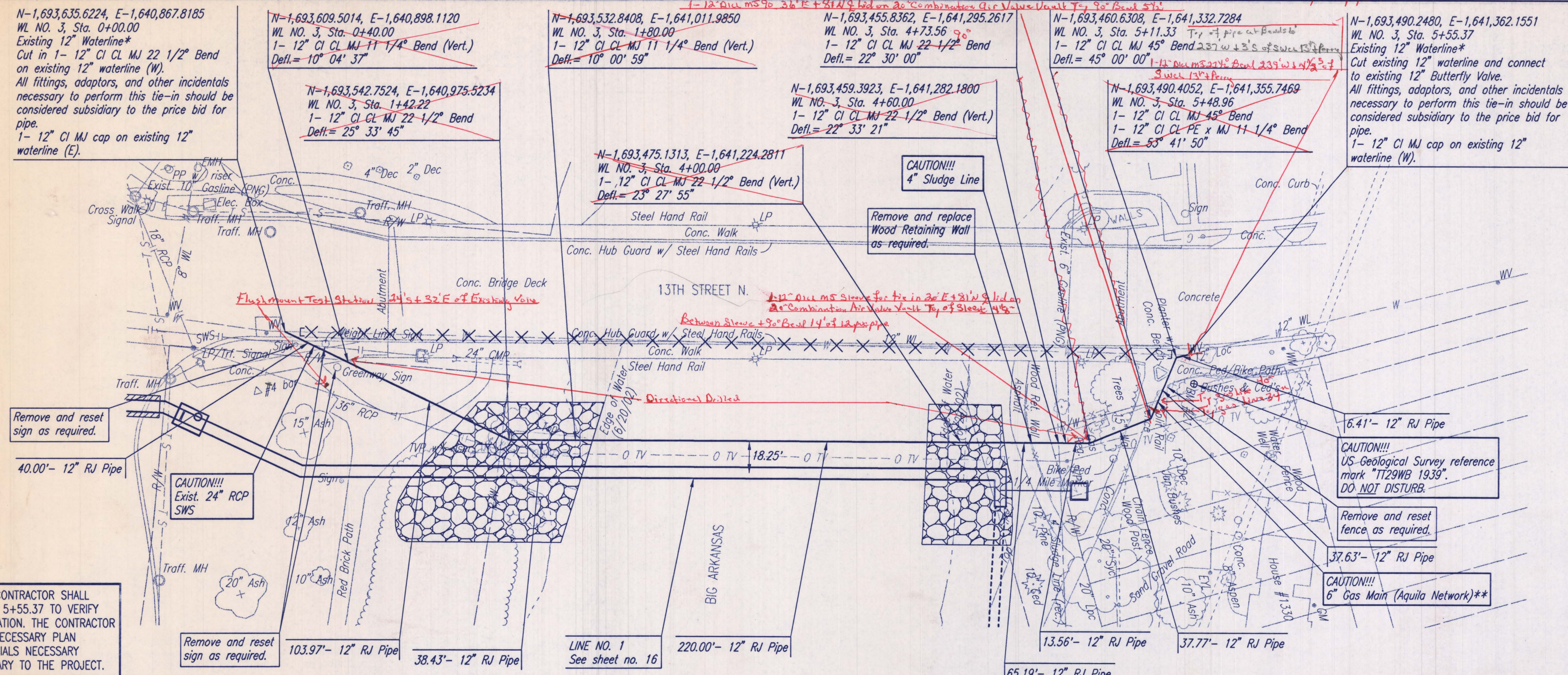




DATE: \_\_\_\_\_ BY: \_\_\_\_\_  
 CHECKED: \_\_\_\_\_  
 PLAN

DATE: \_\_\_\_\_ BY: \_\_\_\_\_  
 CHECKED: \_\_\_\_\_  
 PROFILE

DSNR: MDK OPER: JLM SCALE: 1"=40.00  
 G:\2000\00040\Phase 2\WLPPT5 10-22-2002 03:37:12 pm



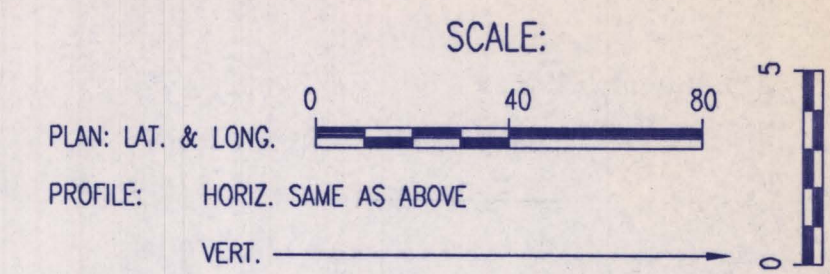
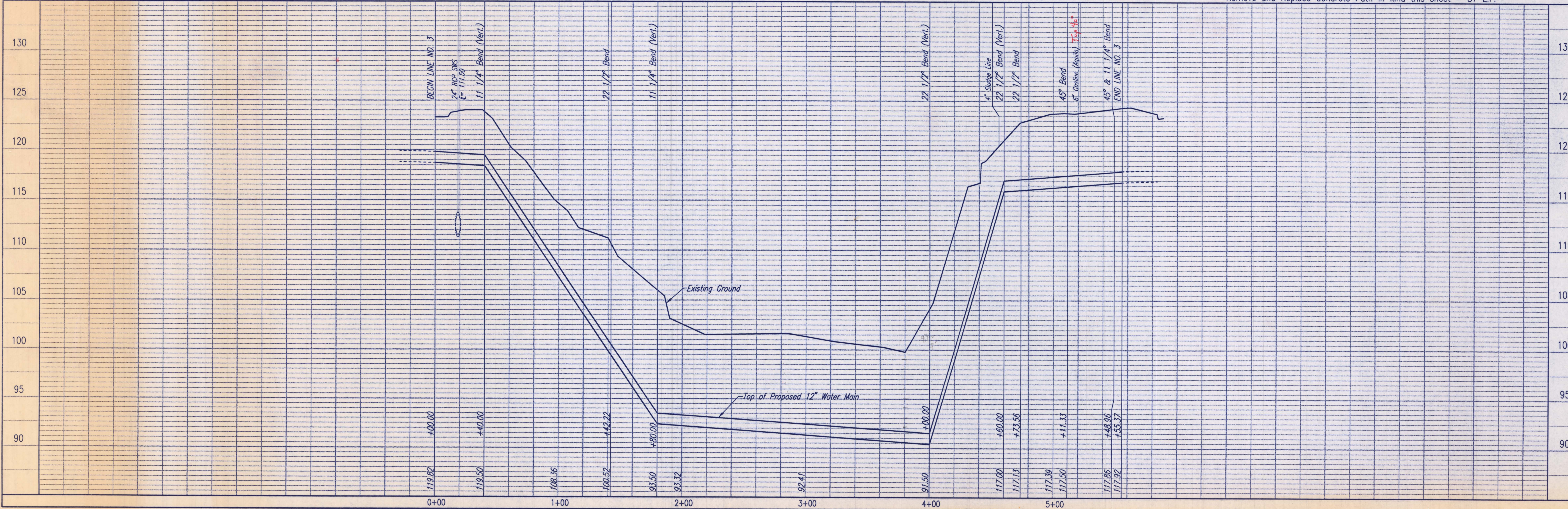
\*PRIOR TO BEGINNING CONSTRUCTION AND ORDERING PIPE THE CONTRACTOR SHALL EXCAVATE THE EXISTING 12" WATERLINE AT STATION 0+00.00 & 5+55.37 TO VERIFY PIPE SIZE, TYPE, FITTINGS, AND HORIZONTAL AND VERTICAL LOCATION. THE CONTRACTOR SHALL REPORT HIS FINDINGS TO THE ENGINEER SO THAT ANY NECESSARY PLAN MODIFICATIONS MAY BE MADE. ANY ADDITIONAL LABOR OR MATERIALS NECESSARY TO COMPLETE THE CONNECTION SHALL BE CONSIDERED SUBSIDIARY TO THE PROJECT.

\*\* Contractor will be required to contact Aquila Network, Mr. Calvin Briggs at 941-1608 a minimum of 10 days prior to commencing work in this area in order to have an Aquila Network representative on site at the time of construction.

Remove and Replace Asphalt Path in kind this sheet = 9 L.F.  
 Remove and Replace Concrete Pavement in kind this sheet = 13 L.F.  
 Remove and Replace Concrete Path in kind this sheet = 57 L.F.

WATERLINE NO. 3

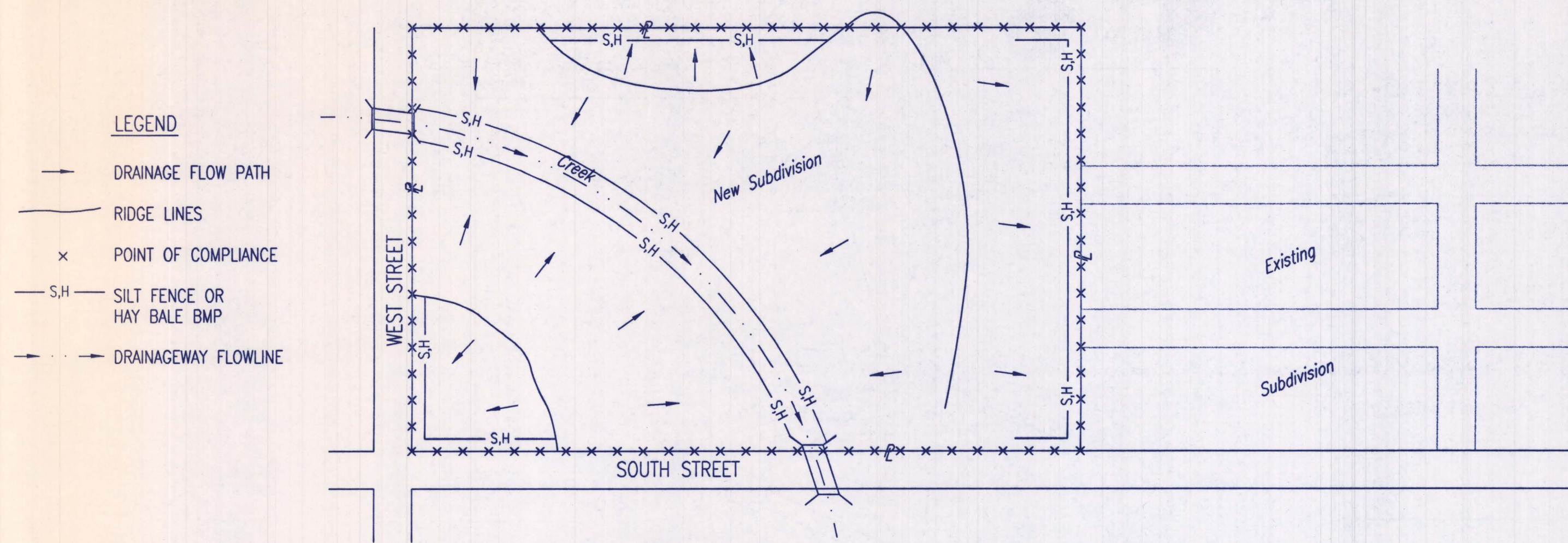
✕ - Denotes Waterline to be Abandoned.



CITY OF WICHITA, KANSAS  
 NEIL D. CABLE P.E. - CITY ENGINEER  
 66" RAW WATER TRANSMISSION LINE  
 (PHASE 2)  
 WATERLINE NO. 3  
 CITY OF WICHITA PROJECT NO. 448-89439

Professional Engineering Consultants, P.A.  
 303 S. OREGON, WICHITA, KANSAS 67202  
 316-262-2691 • FAX 316-262-5005  
 Designed By: MDK  
 Drawn By: JLM  
 Job No.: 34-00040-042  
 Date: March 2001

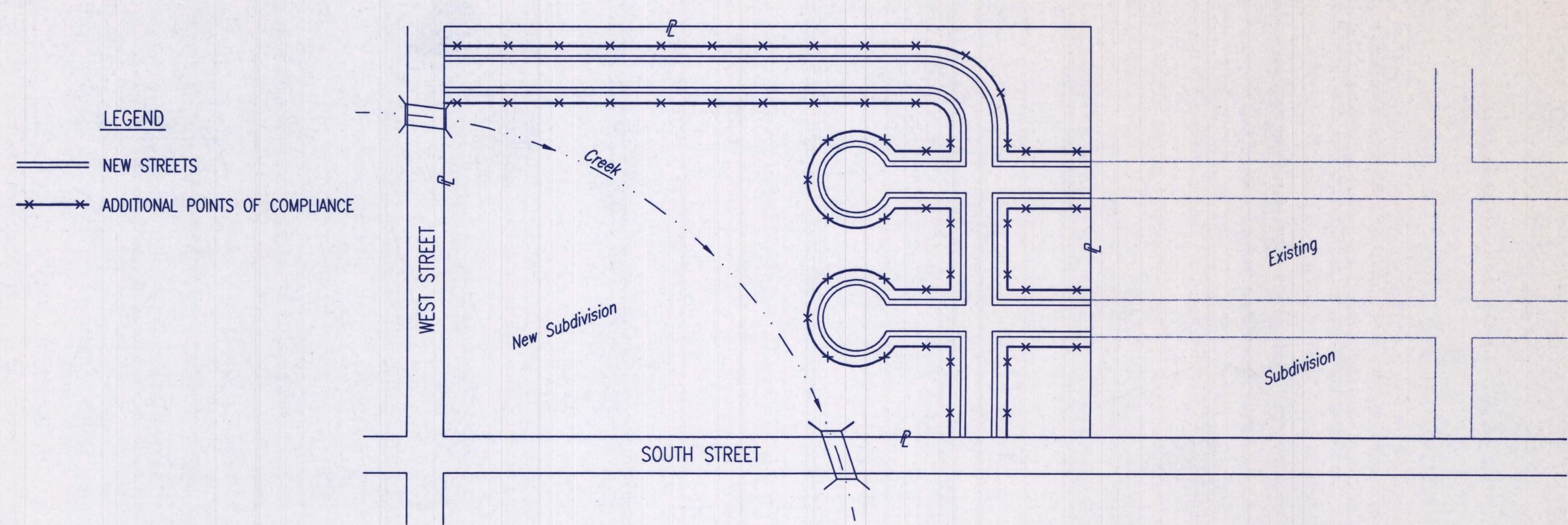
PHASE 1 - INITIAL EARTHWORK AND UTILITIES (EXCEPT STORM SEWER)



- LEGEND**
- DRAINAGE FLOW PATH
  - RIDGE LINES
  - x POINT OF COMPLIANCE
  - S.H- SILT FENCE OR HAY BALE BMP
  - - - DRAINAGEWAY FLOWLINE

1. DURING THIS PHASE OF SUBDIVISION CONSTRUCTION, THE POINTS OF COMPLIANCE ARE THE PERIMETER BOUNDARIES AND ANY DRAINAGE WAYS OR STORM SEWERS DRAINING THROUGH OR FROM THE SITE. SHOULD LAKES BE CONSTRUCTED WITHIN THE SUBDIVISION THAT WILL DISCHARGE DURING STORMS, THEY ARE ALSO A POINT OF COMPLIANCE.
2. HAYBALES OR SILT FENCE MUST BE CONSTRUCTED ALONG THE PROPERTY LINE WHERE ON SITE WATER CAN DRAIN OFF THE PROPERTY. THESE BMP'S WILL ALSO BE INSTALLED ALONG ANY DRAINAGE DITCH OR LAKE THAT CAN DISCHARGE.
3. SHOULD SILT OR SEDIMENT ENTER THE DITCHES OR GUTTERLINES ON THE ADJACENT BOUNDARY STREETS, APPROPRIATE BMP'S WILL BE PLACED WITHIN THE SUBDIVISION TO PREVENT THIS.
4. ANY MUD TRACKED ONTO ADJACENT STREETS WILL BE REMOVED AT THE END OF EACH WORK DAY.
5. CONTRACTORS WORKING WITHIN THE SITE WILL NOT BE REQUIRED TO USE INDIVIDUAL BMP'S AS LONG AS THOSE SPECIFIED ABOVE ARE IN PLACE AND EFFECTIVE. CONTRACTORS WORKING ON THE BOUNDARY LINE STREETS OR ON ADJACENT PROPERTIES TO EXTEND UTILITIES ARE EXPECTED TO USE BMP'S AT THEIR WORK LOCATIONS, AS NEEDED.
6. UTILIZE STABILIZED CONSTRUCTION ENTRANCE AT ENTRANCE AND EXIT ONTO ANY EXISTING PUBLIC STREETS.
7. THE SUBDIVISION DEVELOPER (OWNER) SHALL INSTALL AND MAINTAIN THE ON-SITE BMP'S.

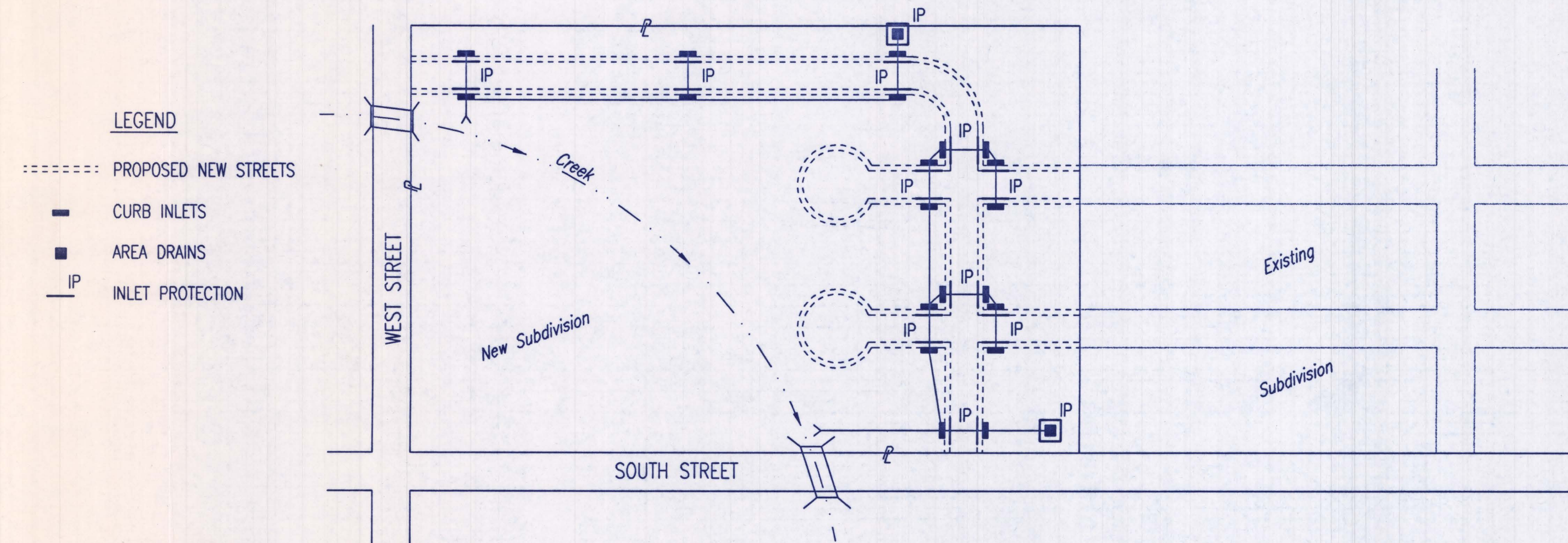
PHASE 3 - STREET CONSTRUCTION



- LEGEND**
- == NEW STREETS
  - x-x-x-x ADDITIONAL POINTS OF COMPLIANCE

1. DURING THIS PHASE OF SUBDIVISION CONSTRUCTION, NEW STREETS ARE INSTALLED. ALL BMP'S INSTALLED DURING PHASE 1 AND 2 MUST STILL BE MAINTAINED. THE POINT OF COMPLIANCE NOW SHIFTS TO THE BACK OF CURB ALONG EACH STREET.
2. CURB OPENING INLET PROTECTION:
  - A. SUMP AREAS - INLET PROTECTION SHALL BE PROVIDED WHEN STREET SUBGRADE WORK IS COMPLETED.
  - B. NON-SUMP LOCATIONS - PROVIDE INLET PROTECTION AS SOON AS BASE COURSE ASPHALT IS INSTALLED, BEFORE THE SURFACE COURSE LIFT.
3. BMP'S WILL BE REQUIRED BACK OF CURB WHEREVER WATER CAN FLOW OVER THE CURB AND THE CURB HAS BEEN BACKFILLED TO WITHIN 3" OR LESS OF THE TOP OF CURB (SEE CURB BACKFILL DETAIL). FOR CURBS NOT YET ENTIRELY BACKFILLED (3" OR MORE BELOW TOP OF CURB), BMP'S WILL BE REQUIRED AT POINTS WHERE WATER BREAKS OVER CURB WHICH COULD RESULT IN THE PLACEMENT OF SEDIMENT IN THE GUTTER.
4. SEE DETAIL THIS SHEET ON BACK OF CURB PROTECTION.
5. THE BACK OF CURB PROTECTION SPECIFIED ON THIS PLAN MAY HAVE TO BE SUPPLEMENTED WITH HAYBALE OR SILT FENCE BMP'S AT LOCATIONS WHERE CONCENTRATED FLOW RESULTS IN SEDIMENT BEING CARRIED OVER THE EXCELSIOR MATS.
6. THE STREET CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLING BACK OF CURB BMP'S.
7. THE INDIVIDUAL LOT OWNERS WILL BE RESPONSIBLE FOR MAINTAINING THE BACK OF CURB BMP'S IN FRONT OF THEIR LOTS UNTIL SUCH TIME AS ADJACENT DISTURBED EARTH IS STABILIZED WITH GRASS OR SOD.

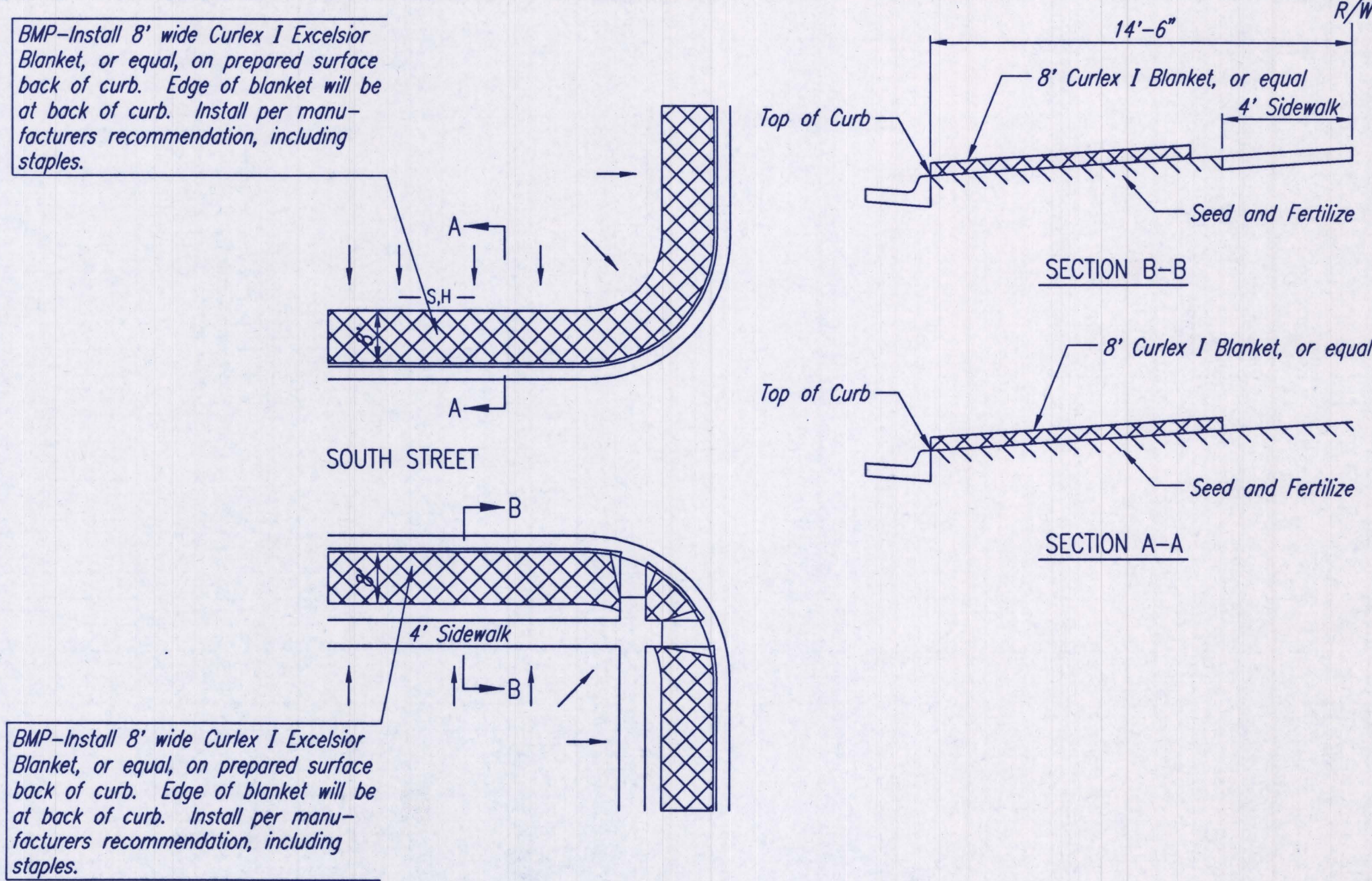
PHASE 2 - INSTALLATION OF STORM SEWER



- LEGEND**
- - - - - PROPOSED NEW STREETS
  - CURB INLETS
  - AREA DRAINS
  - IP- INLET PROTECTION

1. DURING THIS PHASE OF SUBDIVISION DEVELOPMENT, ALL BMP'S REQUIRED IN PHASE 1 SHALL REMAIN IN PLACE AND BE MAINTAINED.
2. AS NEW STORM SEWERS, WITH INLETS, ARE INSTALLED, THE STORM SEWERS MUST NOW BE PROTECTED SO ALL NEW INLETS BECOME POINTS OF COMPLIANCE.
3. AREA DRAINS - AS SOON AS WATER CAN FLOW INTO THESE DRAINS, HAYBALE OR SILT FENCE PROTECTION WILL BE INSTALLED AROUND THEM.
4. CURB OPENING INLETS - AS SOON AS WATER CAN FLOW INTO THESE DRAINS, INLET PROTECTION BMP'S MUST BE INSTALLED. SEE PHASE 3 - STREET CONSTRUCTION.
5. THE STORM SEWER CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLING THESE BMP'S. IF WATER CANNOT FLOW INTO CURB INLETS UNTIL STREET CONSTRUCTION IS COMPLETE, THEN STREET CONTRACTOR WILL INSTALL INLET PROTECTION.
6. THE SUBDIVISION DEVELOPER WILL MAINTAIN THESE BMP'S ONCE INSTALLED.
7. ONCE ALL DISTURBED GROUND DRAINING TO AN INLET HAS BEEN RESTABILIZED WITH GRASS OR SOD, THE SUBDIVISION DEVELOPER WILL BE RESPONSIBLE FOR PERMANENTLY REMOVING THE INLET PROTECTION.

- GENERAL NOTES:**
1. THE INTENT OF ALL SOIL EROSION BEST MANAGEMENT PRACTICES (B.M.P.'S) IS TO PREVENT ERODED SOIL FROM ENTERING DITCHES, STORM SEWERS, OR ANY OTHER DRAINAGE FEATURE.
  2. THIS SHEET IS INTENDED TO PROVIDE GUIDELINES AS TO WHAT TYPE OF BMP'S WILL BE INSTALLED DURING THE CONSTRUCTION PROCESS. CONTRACTORS ARE EXPECTED TO BID PROJECTS ACCORDINGLY.
  3. BMP'S SHALL BE MAINTAINED DURING THE CONSTRUCTION PROCESS TO REMAIN EFFECTIVE. MAINTENANCE SHALL BE AS INDICATED ON THE BMP DETAIL SHEETS.
  4. PERSONS DESTROYING BMP'S SHALL BE RESPONSIBLE FOR IMMEDIATELY REPAIRING THEM OR INSTALLING SUITABLE REPLACEMENT BMP'S.
  5. THE DEVELOPMENT OF ANY SUBDIVISION THAT DISTURBS 5 ACRES OR MORE WILL REQUIRE A FEDERAL/STATE NPDES STORMWATER PERMIT. THE PREPARATION OF A STORMWATER POLLUTION PREVENTION PLAN IS REQUIRED. EROSION CONTROL BMP'S ARE REQUIRED. THE DETAILS SHOWN ON THIS SHEET ARE THE MINIMUM STANDARDS TO BE SHOWN ON POLLUTION PREVENTION PLAN.
  6. FOR SUBDIVISIONS SMALLER THAN 5 ACRES, SOIL EROSION BMP'S ARE REQUIRED. ALSO, DEVELOPERS AND CONTRACTORS ARE ENCOURAGED TO DEVELOP POLLUTION PREVENTION PLANS FOR EACH PROJECT PRIOR TO CONSTRUCTION.
  7. FAILURE TO USE AND MAINTAIN BMP'S IS A VIOLATION OF SECTION 16.32 OF THE CITY CODE AND WILL SUBJECT THE SUBDIVISION DEVELOPER AND CONTRACTORS TO THE PENALTIES PROVIDED THEREIN.
  8. THE APPLICATION OF BMP'S SHOWN ON THIS SHEET IS FOR SITUATIONS NORMALLY ENCOUNTERED. FROM TIME TO TIME, SITUATIONS WILL ARISE THAT MAY REQUIRE A DIFFERENT BMP OTHER THAN THAT SHOWN. BMP'S, OTHER THAN THOSE SHOWN, MAY BE UTILIZED SO LONG AS THEY ARE EFFECTIVE AND MAINTAINED.
  9. A STABILIZED EARTH SURFACE IS DEFINED AS ONE THAT IS HARD SURFACED WITH CONCRETE, ASPHALT, OR THE LIKE, OR ONE ON WHICH 70% OF THE GRASS HAS GERMINATED ON THE ENTIRE SURFACE.



BMP-Install 8' wide Curlex I Excelsior Blanket, or equal, on prepared surface back of curb. Edge of blanket will be at back of curb. Install per manufacturer's recommendation, including staples.

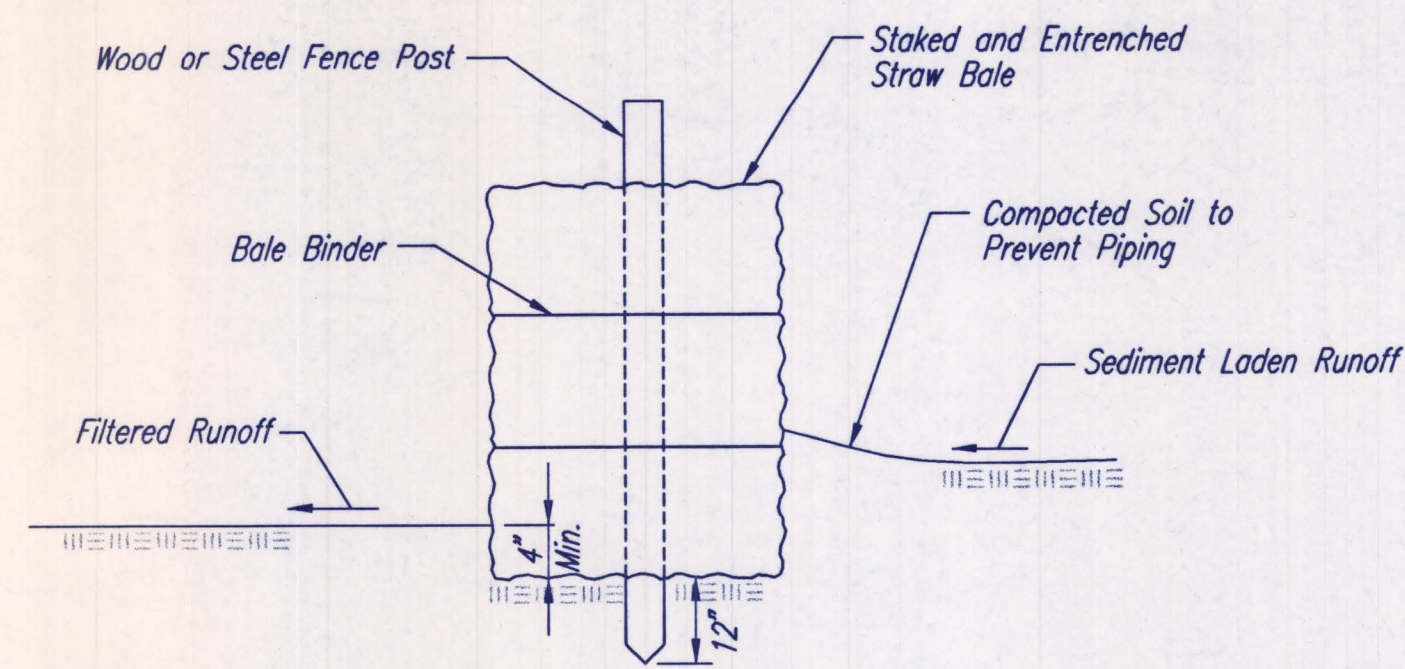
BMP-Install 8' wide Curlex I Excelsior Blanket, or equal, on prepared surface back of curb. Edge of blanket will be at back of curb. Install per manufacturer's recommendation, including staples.

BACK OF CURB PROTECTION DETAIL

CURB BACKFILL DETAIL

DSNR: COW OPER: JLM SCALE: 1=1.00 Q:\2000\00040\Phase 2\SEBMP SUBDIVISION-R14 10-22-2002 03:35:37 pm

		<b>SOIL EROSION BMP'S SUBDIVISION DEVELOPMENT PROCESS</b>	
		CHRISTOPHER M. CARRIER, P.E. STORM WATER ENGINEER	
PROJECT NUMBER	OCA NO.		
448-89439	633720		
DATE	SHEET 18 OF 24		
MAY 2001			



**STRAW BALE BARRIERS**

**Material Specification:**

Bale slope barriers may be constructed of wheat straw, oat straw, prairie hay, or bromegrass hay that is free of weeds declared noxious by the Kansas State Board of Agriculture. The stakes used to anchor the bales should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long.

**Placement:**

A slope barrier should be used at the toe of a slope when a ditch does not exist. The slope barrier should be placed on nearly level ground 5' to 10' away from the toe of a slope. The barrier is placed away from the toe of the slope to provide adequate storage for settling out sediment.

When practicable, bale slope barriers should be placed along contours to avoid a concentration of flow.

Bale slope barriers can also be placed along right-of-way fence lines to keep sediment from crossing onto adjacent property. When placed in this manner, the slope barrier will not likely follow contours.

**Proper installation method:**

Excavate a trench the length of the planned slope barrier that is 4" deep and a bale's width wide. Make sure that the trench is excavated along a single contour. When practicable, slope barriers should be placed along contours to avoid a concentration of flow. Place the soil on the upslope side of the trench for later use.

Place the bales in the trench, making sure that they are butted tightly. Two stakes should be driven through each bale along the centerline of the ditch check, approximately 6" to 8" in from the bale ends. Stakes should be driven at least 12" into the ground.

Once all the bales have been installed and anchored, place the excavated soil against the upslope side of the check and compact it. The compacted soil should be no more than 3" to 4" deep.

**List of common placement/installation mistakes to avoid:**

When practical, do not place bale slope barriers across contours. Slope barriers should be placed along contours to avoid a concentration of flow. Concentrated flow over a slope barrier creates a scour hole on the downslope side of the barrier. The scour hole eventually undermines the bales and the barrier fails.

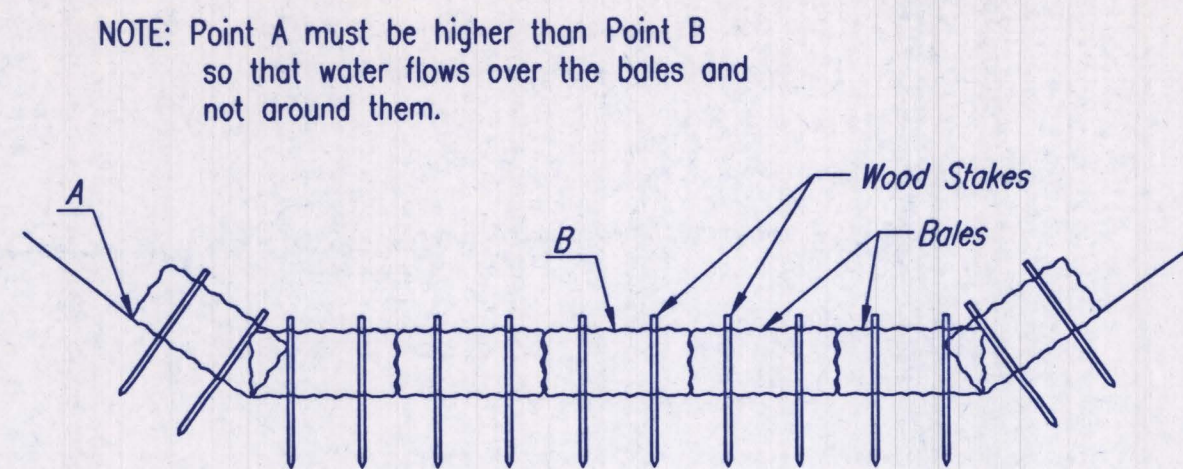
Do not place bale slope barriers in areas with shallow soils underlain by rock. If the barrier is not anchored sufficiently, it will wash out.

Bale slope barriers must be dug into the ground. Bales at ground level do not work because they allow water to flow under the barrier.

**Inspection and Maintenance:**

Bale slope barriers should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Are there any points along the slope barrier where water is concentrating?
- Does water flow under the slope barrier?
- Does water flow through spaces between abutting bales?
- Are any bales dislodged?
- Are bales decomposing due to age and/or water damage?
- Does sediment need to be removed from behind the slope barrier?



**STRAW BALE DITCH CHECKS**

**Material Specification:**

Bale ditch checks may be constructed of wheat straw, oat straw, prairie hay, or bromegrass hay that is free of weeds declared noxious by the Kansas State Board of Agriculture. The stakes used to anchor the bales should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long.

Optional: The downstream scour apron should be constructed of a double-netted straw erosion-control blanket at least 6' wide.

Optional: The metal landscape staples used to anchor the erosion-control blanket should be at least 8" long.

**Placement:**

Bale ditch checks should be placed perpendicular to the flowline of the ditch. The ditch check should extend far enough so that the ground level at the ends of the check is higher than the top of the lowest center bale. This prevents water from flowing around the check.

Checks should not be placed in ditches where high flows are expected. Rock checks should be used instead.

Bales should be placed in ditches with slopes of 6% or less. For slopes steeper than 6%, rock checks should be used.

The following table provides check spacing for a given ditch grade:

Ditch grade (%)	Check Spacing (feet)
0.5	200
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	30

**Proper installation method:**

Excavate a trench perpendicular to the ditch flowline that is 4" deep and a bale's width wide. Extend the trench in a straight line along the entire length of the proposed ditch check. Place the soil on the upstream side of the trench—it will be used later.

Optional: On the downstream side of the trench, roll out a length of erosion-control blanket (scour apron) equal to the length of the trench. Place the upstream edge of the erosion-control blanket along the bottom upstream edge of the trench. The erosion control blanket should be anchored in the trench with one row of 8" landscape staples placed on 18" centers.

The remainder of the erosion-control blanket (the portion that is not lying in the trench) will serve as the downstream scour apron. This section of the blanket should be anchored to the ground with 8" landscape staples placed around the perimeter of the blanket on 18" centers. The remainder of the blanket should be anchored using two evenly spaced rows of 8" landscape staples on 18" centers placed perpendicular to the flowline of the ditch.

Place the bales in the trench, making sure that they are butted tightly. Two stakes should be driven through each bale along the centerline of the ditch check, approximately 6" to 8" in from the bale ends. Stakes should be driven at least 12" into the ground.

Once all the bales have been installed and anchored, place the excavated soil against the upstream side of the check and compact it. The compacted soil should be no more than 3" to 4" deep and extend upstream no more than 24".

**List of common placement/installation mistakes to avoid:**

Do not place a bale ditch check directly in front of a culvert outlet. It will not stand up to the concentrated flow.

Do not place bale ditch checks in ditches that will likely experience high flows. They will not stand up to concentrated flow.

Follow prescribed ditch-check spacing guidelines. If spacing guidelines are exceeded, erosion will occur between the ditch checks.

Do not allow water to flow around the ditch check. Make sure that the ditch check is long enough so that the ground level at the ends of the check is higher than the top of the lowest center bale.

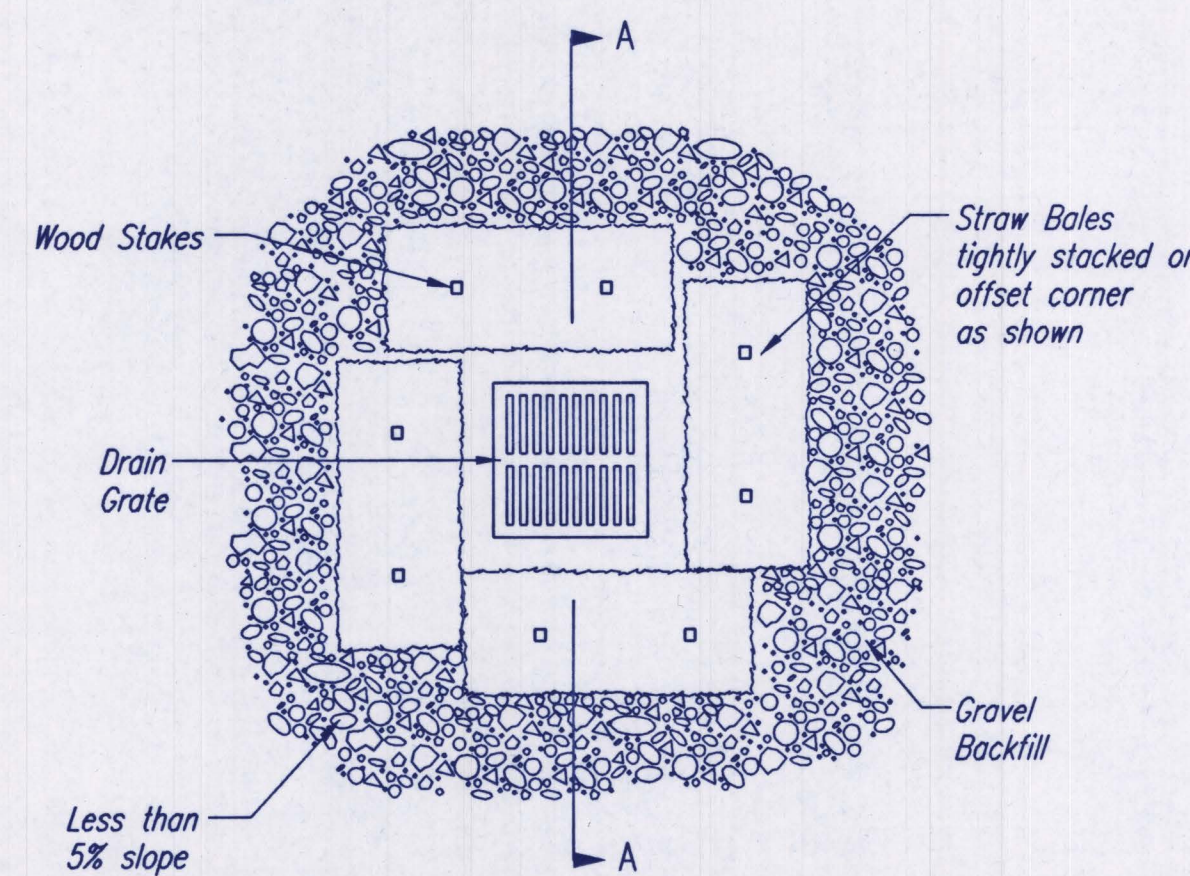
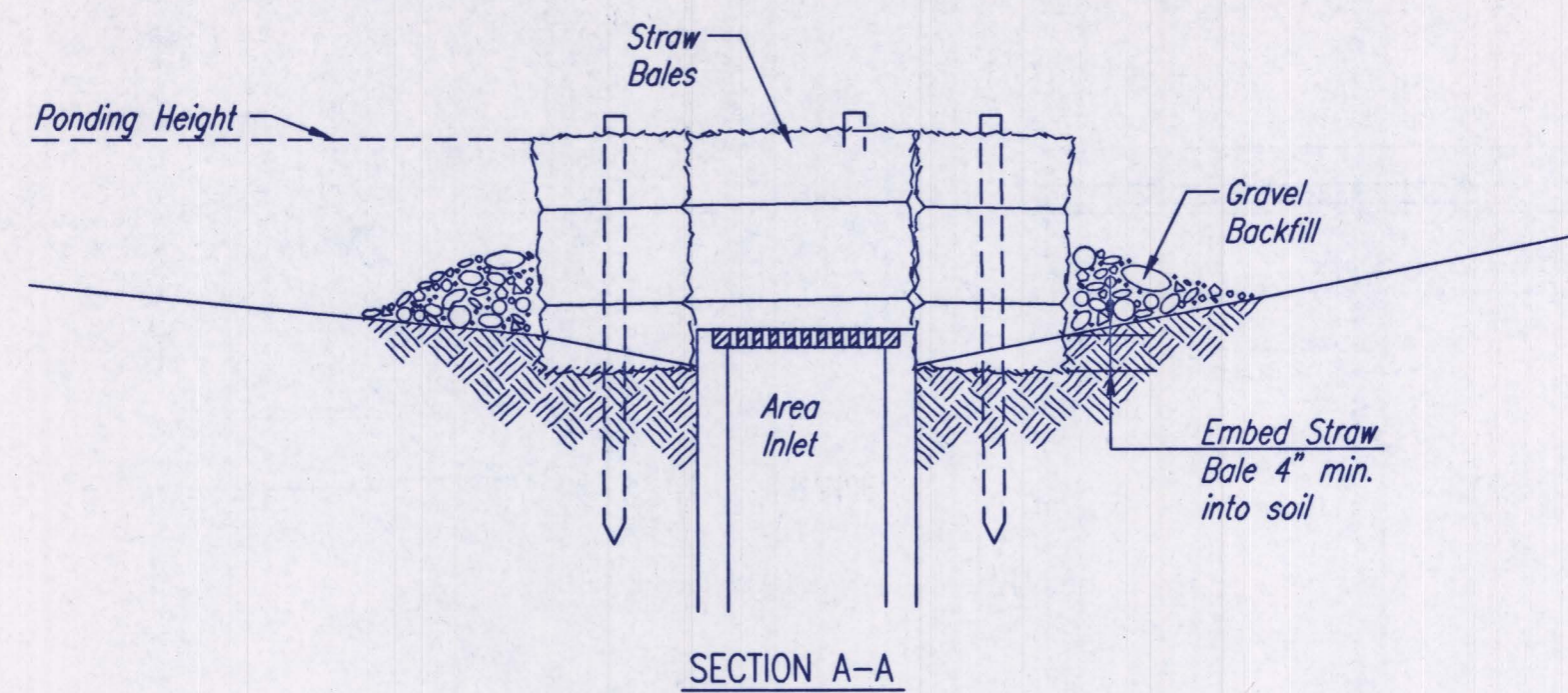
Do not place bale ditch checks in channels with shallow soils underlain by rock. If the check is not anchored sufficiently, it will wash out.

Bale ditch checks must be dug into the ground. Bales at ground level do not work because they allow water to flow under the check.

**Inspection and Maintenance:**

Bale ditch checks should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Does water flow around the ditch check?
- Does water flow under the ditch check?
- Does water flow through spaces between abutting bales?
- Are any bales and/or scour aprons (optional) dislodged?
- Are bales decomposing due to age and/or water damage?
- Does sediment need to be removed from behind the ditch check?



**STRAW BALE BARRIERS FOR AREA INLETS**

**(INLET PROTECTION)**

**Material Specification:**

Bale area inlet barriers should be constructed of wheat straw, oat straw, prairie hay, or bromegrass hay that is free of weeds declared noxious by the Kansas State Board of Agriculture.

The stakes used to anchor the bales should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long.

**Placement:**

Bale area inlet barriers should be placed directly around the perimeter of a drop inlet. When a bale area inlet barrier is located near an inlet that has steep approach slopes, the storage capacity behind the barrier is drastically reduced. Timely removal of sediment must occur for a barrier to operate properly in this location.

**Proper Installation Method:**

Excavate a trench around the perimeter of the area inlet that is at least 4" deep by a bale's width wide.

Place the bales in the trench, making sure that they are butted tightly. Some bales may need to be shortened to fit into the trench around the area inlet. Two stakes should be driven through each bale, approximately 6" to 8" in from the bale ends. Stakes should be driven at least 12" into the ground.

Once all the bales have been installed and anchored, place the excavated soil against the receiving side of the barrier and compact it. The compacted soil should be no more than 3" to 4" deep.

Note: When a bale area inlet barrier is placed in a shallow median ditch, make sure that the top of the barrier is not higher than the paved road. In this configuration, water may spread onto the roadway causing a hazardous condition.

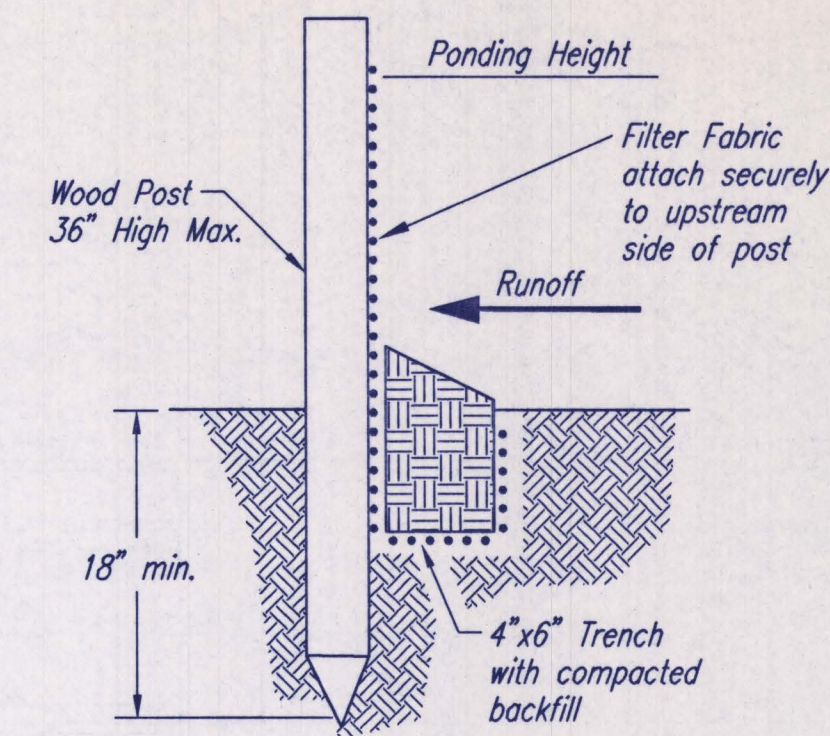
**List of common placement installation mistakes to avoid:**

Bales should be placed directly against the perimeter of the area inlet. This allows overtopping water to flow directly into the inlet instead of onto nearby soil causing scour. Bale area inlet barriers must be dug into the ground. Bales at ground level do not work because they allow water to flow under the barrier.

**Inspection and Maintenance:**

Bale area inlet barriers should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Does water flow under the area inlet barrier?
- Does water flow through spaces between abutting bales?
- Are any bales dislodged?
- Are bales decomposing due to age and/or water damage?
- Does sediment need to be removed from behind the area inlet barrier?



**SILT FENCE BARRIERS**

**SILT FENCE BARRIERS**

**Material Specification:**

Silt fence fabric should conform to the AASHTO M288 96 silt fence specification. The posts used to support the silt fence fabric should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long. Silt fence fabric should be attached to the wooden posts with staples, wire, zip ties, or nails.

**Placement:**

A slope barrier should be used at the toe of a slope when a ditch does not exist. The slope barrier should be placed on nearly level ground 5' to 10' away from the toe of a slope. The barrier is placed away from the toe of the slope to provide adequate storage for settling out sediment.

When practicable, silt fence slope barriers should be placed along contours to avoid a concentration of flow.

Silt fence slope barriers can also be placed along right-of-way fence lines to keep sediment from crossing onto adjacent property. When placed in this manner, the slope barrier will not likely follow contours.

**Proper installation method:**

Excavate a trench the length of the planned slope barrier that is 6" deep by 4" wide. Make sure that the trench is excavated along a single contour. When practicable, slope barriers should be placed along contours to avoid a concentration of flow. Place the soil on the upslope side of the trench for later use.

Roll out a continuous length of silt fence fabric on the downslope side of the trench. Place the edge of the fabric in the trench starting at the top upslope edge. Line all three sides of the trench with the fabric. Backfill over the fabric in the trench with the excavated soil and compact. After filling the trench, approximately 24" to 36" of silt-fence fabric should remain exposed.

Lay the exposed silt fence upslope of the trench to clear an area for driving in the posts. Just downslope of the trench, drive posts into the ground to a depth of at least 18".

Place posts no more than 4' apart.

Attach the silt fence to the anchored post with staples, wire, zip ties, or nails.

**List of common placement/installation mistakes to avoid:**

When practicable, do not place silt fence slope barriers across contours. Slope barriers should be placed along contours to avoid a concentration of flow. When the flow concentrates, it overtops the barrier and the silt fence slope barrier quickly deteriorates.

Do not place silt-fence posts on the upslope side of the silt fence fabric. In this configuration, the force of the water is not restricted by the posts, but only by the staples (wire, zip ties, nails, etc.). The silt fence will rip and fail.

Do not place silt fence slope barriers in areas with shallow soils underlain by rock. If the barrier is not sufficiently anchored, it will wash out.

Silt fence slope barriers must be dug into the ground—silt fence at ground level does not work because water will flow underneath.

Silt fence slope barriers must be dug into the ground—silt fence at ground level does not work because water will flow underneath.

**Inspection and Maintenance:**

Silt fence slope barriers should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

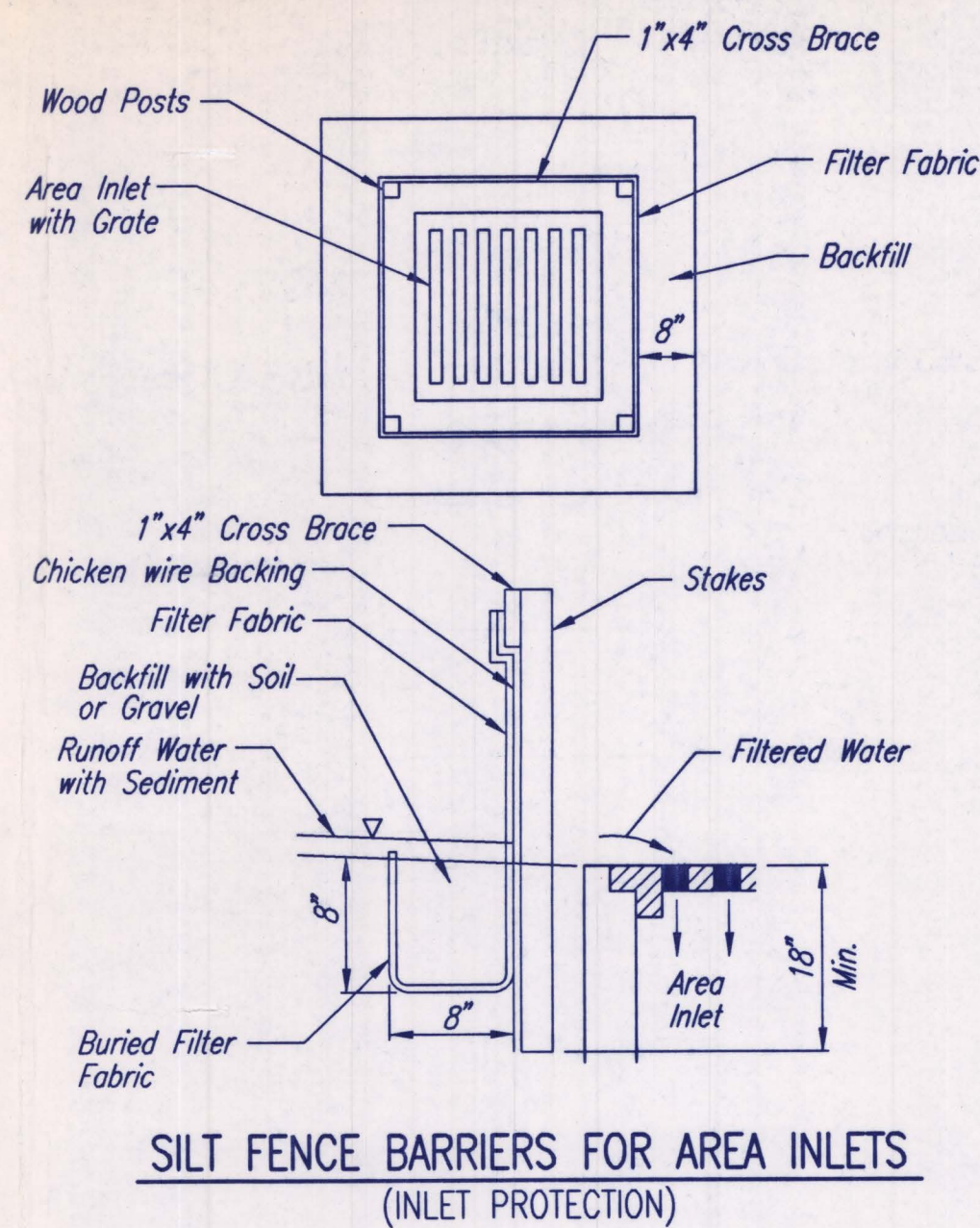
- Are there any points along the slope barrier where water is concentrating?
- Does water flow under the slope barrier?
- Do the silt fences sag excessively?
- Has the silt fence torn or become detached from the posts?
- Does sediment need to be removed from behind the slope barrier?

**SOIL EROSION  
BMP DETAILS**

CHRISTOPHER M. CARRIER, P.E.  
STORM WATER ENGINEER

PROJECT NUMBER	OCA NO.
448-89439	633720
DATE	SHEET 19 OF 24
MAY 2001	

DSNR: COW OPER: JLM SCALE: 1"=1.00  
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**SILT FENCE BARRIERS FOR AREA INLETS**  
(INLET PROTECTION)

**Material Specification:**

Silt fence fabric should conform to the AASHTO M288 96 silt fence specification. The wire or polymeric mesh backing used to help support the silt fence fabric should conform to the AASHTO M288 96 silt fence specification. The posts used to support the silt fence fabric should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long. The material used to frame the tops of the posts should be 1" by 4" boards. Silt fence fabric and support backing should be attached to the wooden posts and frame with staples, wire, zip ties, or nails.

**Placement:**

Place a silt fence drop inlet barrier in a location where it is unlikely to be overtopped. Water should flow through silt fence, not over it. Silt fence barriers for area inlets often fail when repeatedly overtopped. When used as a barrier for area inlets, silt fence fabric and posts must be supported at the top by a wooden frame. When a silt fence barrier for area inlets is located near an inlet that has steep approach slopes, the storage capacity behind the barrier is drastically reduced. Timely removal of sediment must occur for a barrier to operate properly in this location.

**Proper installation method:**

Excavate a trench around the perimeter of the area inlet that is at least 8" deep by 8" wide. Drive posts to a depth of at least 18" around the perimeter of the area inlet. The distance between posts should be 4' or less. If the distance between two adjacent corner posts is more than 4', add another post(s) between them. Connect the tops of all the posts with a wooden frame made of 1" by 4" boards. Use nails or screws for fastening. Attach the wire or polymeric-mesh backing to the outside of the post/frame structure with staples, wire, zip ties, or nails. Roll out a continuous length of silt fence fabric long enough to wrap around the perimeter of the area inlet. Add more length for overlapping the fabric joint. Place the edge of the fabric in the trench, starting at the outside edge of the trench. Line all three sides of the trench with the fabric. Backfill over the fabric in the trench with the excavated soil and compact. After filling the trench, approximately 24" to 36" of silt fence fabric should remain exposed. Attach the silt fence to the outside of the post/frame structure with staples, wire, zip ties, or nails. The joint should be overlapped to the next post.

Note: When a silt fence barrier for area inlet is placed in a shallow median ditch, make sure that the top of the barrier is not higher than the paved road. In this configuration, water may spread onto the roadway causing a hazardous condition.

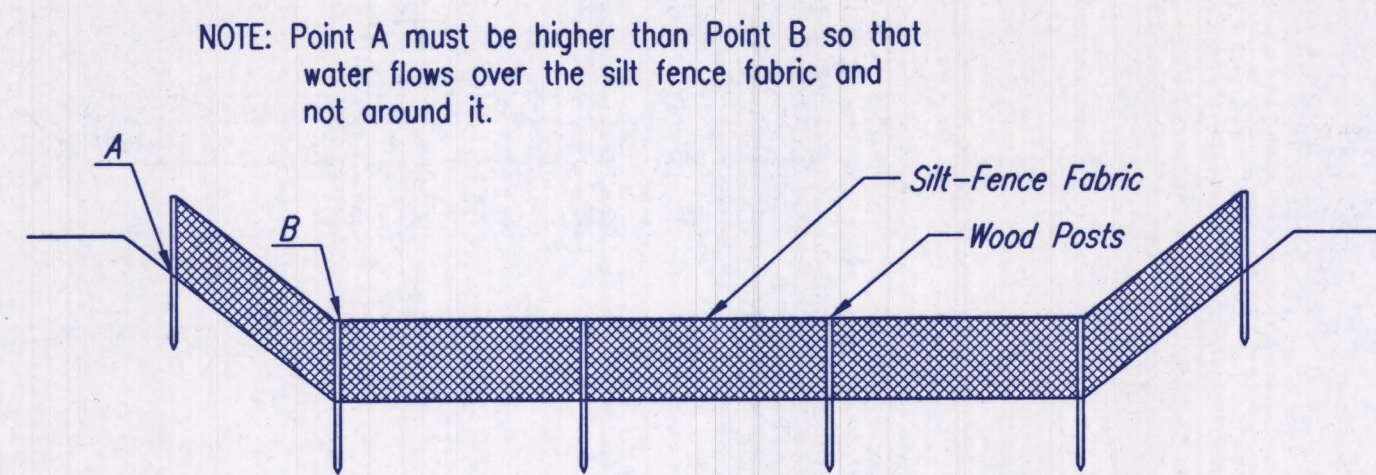
**List of common placement/installation mistakes to avoid:**

Water should flow through a silt fence barrier for area inlet—not over it. Place a silt fence barrier for area inlet in a location where it is unlikely to be overtopped. Silt fence barrier for area inlets often fail when repeatedly overtopped. Do not place posts on the outside of the silt fence barrier for area inlet. In this configuration, the force of the water is not resisted by the posts, but only by the staples (wire, zip ties, nails, etc.). The silt fence will rip and fail. Do not install silt fence barrier for area inlets without framing the top of the posts. The corner posts around area inlets are stressed in two directions whereas a normal silt fence is only stressed in one direction. This added stress requires more support.

**Inspection and Maintenance:**

Silt fence barrier for area inlets should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Does water flow under the silt fence?
- Does the silt fence sag excessively?
- Has the silt fence torn or become detached from the posts?
- Does sediment need to be removed from behind the area inlet barrier?



**ELEVATION**  
**SILT FENCE DITCH CHECKS**  
(STREAM PROTECTION)

**Material Specification:**

Silt fence fabric should conform to the AASHTO M288 96 silt fence specification. The posts used to support the silt fence fabric should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long. Silt fence fabric should be attached to the wooden posts with staples, wire, zip ties, or nails.

**Placement:**

Place silt fence in ditches where it is unlikely that it will be overtopped. Water should flow through a silt fence ditch check, not over it. Silt fence ditch checks often fail when overtopped. Silt fence ditch checks should be placed perpendicular to the flowline of the ditch. The silt fence should extend far enough so that the ground level at the ends of the fence is higher than the top of the low point of the fence. This prevents water from flowing around the check. Checks should not be placed in ditches where high flows are expected. Rock checks should be used instead. Silt fence should be placed in ditches with slopes of 6% or less. For slopes steeper than 6%, rock checks should be used.

The following table provides check spacing for a given ditch grade:

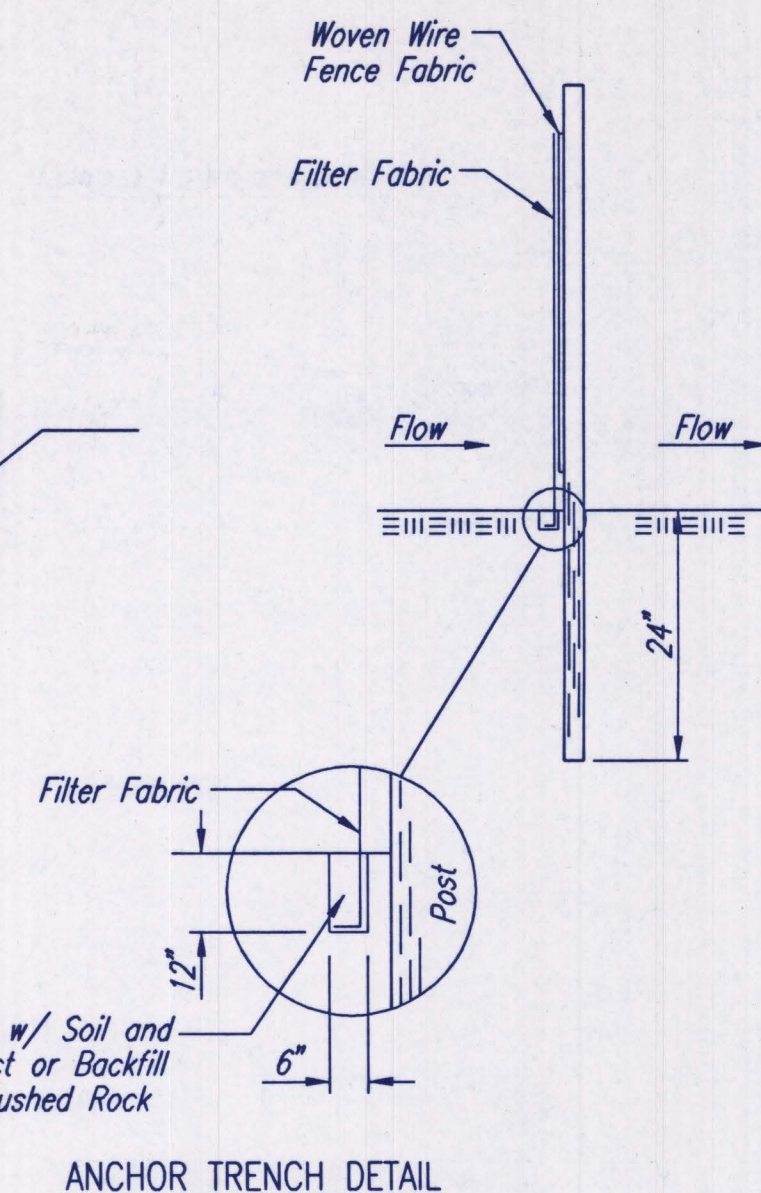
Ditch Check Ditch grade (%)	Spacing Check Spacing (feet)
0.5	200
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	30

**Proper installation method:**

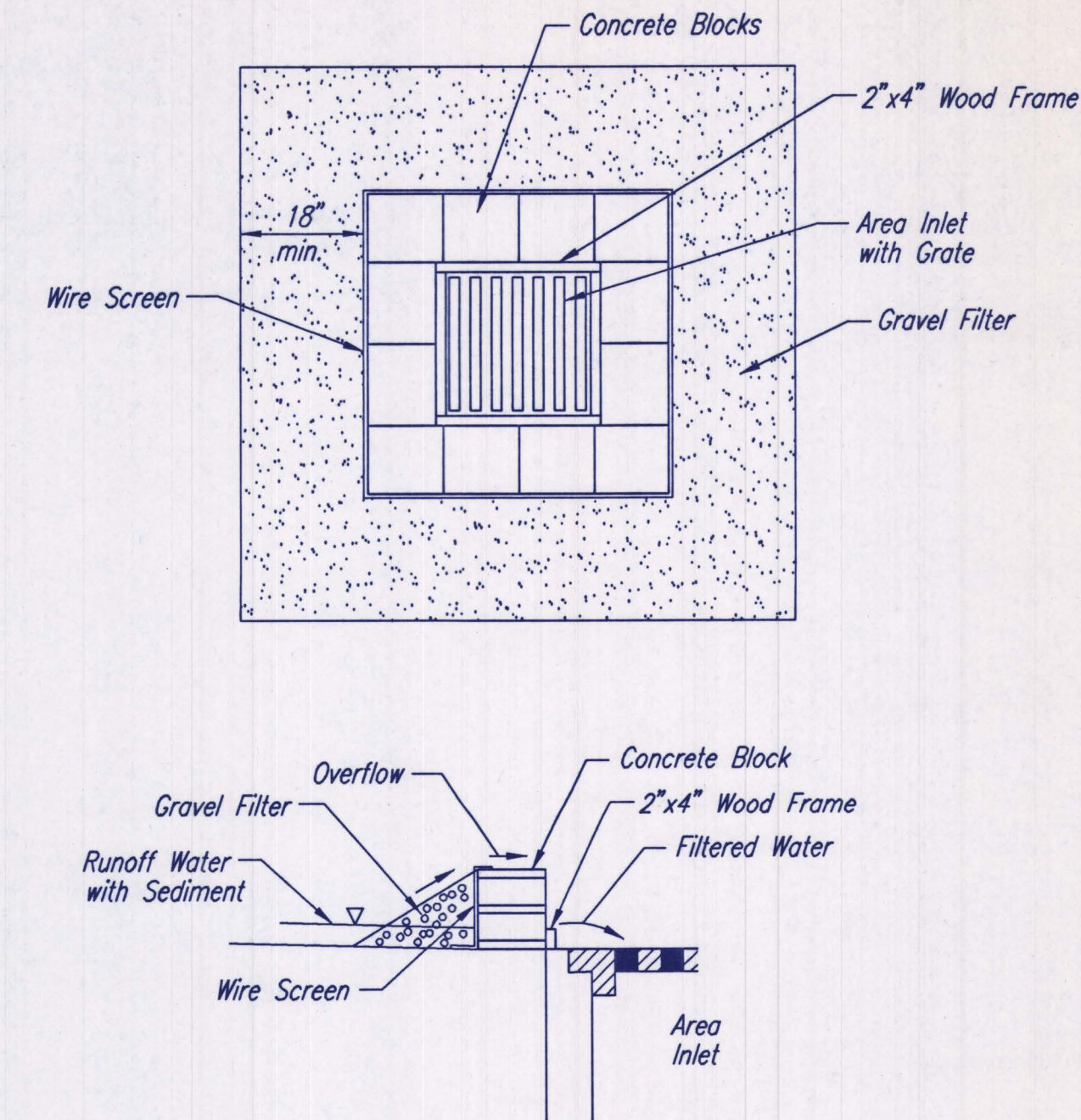
Excavate a trench perpendicular to the ditch flowline that is at least 12" deep by 6" wide. Extend the trench in a straight line along the entire length of the proposed ditch check. Place the soil on the upstream side of the trench for later use. Roll out a continuous length of silt fence fabric on the downstream side of the trench. Place the edge of the fabric in the trench starting at the top upstream edge of the trench. Line two sides of the trench with the fabric as shown on detail. Backfill over the fabric in the trench with the excavated soil and compact. After filling the trench, approximately 24" to 36" of silt fence fabric should remain exposed. Lay the exposed silt fence on the upstream side of the trench to clear an area for driving in the posts. Just downstream of the trench, drive posts into the ground to a depth of at least 24". Place posts no more than 4' apart. Attach the silt fence to the anchored post with staples, wire, zip ties, or nails.

**List of common placement/installation mistakes to avoid:**

Water should flow through a silt fence ditch check—not over it. Place silt fence in ditches where it is unlikely that it will be overtopped. Silt fence installations quickly deteriorate when water overtops them. Do not place silt fence posts on the upstream side of the silt fence fabric. In this configuration, the force of the water is not resisted by the posts, but only by the staples (wire, zip ties, nails, etc.). The silt fence will rip and fail. Do not place a silt fence ditch check directly in front of a culvert outlet. It will not stand up to the concentrated flow. Do not place silt fence ditch checks in ditches that will likely experience high flows. They will not stand up to concentrated flow. Follow prescribed ditch check spacing guidelines. If spacing guidelines are exceeded, erosion will occur between the ditch checks. Do not allow water to flow around the ditch check. Make sure that the ditch check is long enough so that the ground level at the ends of the fence is higher than the low point on the top of the fence. Do not place silt fence ditch checks in channels with shallow soils underlain by rock. If the check is not anchored sufficiently, it will wash out.



**ANCHOR TRENCH DETAIL**



**CONCRETE BLOCK FILTER FOR AREA DRAIN**  
(INLET PROTECTION)

Gravel barriers provide little filtering of large inflow waters. However, when installed correctly and maintained, they can effectively treat low runoff flows.

Placement of gravel filters around area drains must be completed in a manner that will not cause local flooding.

Gravel filters can be used if the immediate and adjacent area to the area drain consists of soil or pavement.

Only gravel filters are to be installed on top of the pavement.

**Instructions for Installing:**

- STEP 1: Place concrete blocks around the grate. The blocks can be stacked one or two high and should be supported by a 2"x4" board.
- STEP 2: Wrap 1/2" mesh wire screen around the concrete blocks.
- STEP 3: Place 1" to 1-1/2" diameter rock around the blocks and wire screen. Be sure the rock extends down from the top of the concrete block.
- STEP 4: To prevent damage to vehicles, signs warning drivers about the structures may be necessary.

An alternative method is use of gravel bags that are supported to prevent collapsing.

Use of rock having diameters smaller than 1" may result in clogging of pores and reduce the amount of water flowing into an inlet.

**Maintenance:**

All gravel filters installed around area drains should be inspected and repaired after each runoff event. Sediment should be removed when material is within 3" of the top of any block. Periodically, the gravel should be raked to increase infiltration and filtering of runoff waters. Accumulated sediment is to be removed immediately from roads and streets after every runoff event.

**Inspection and Maintenance:**

Silt fence ditch checks should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

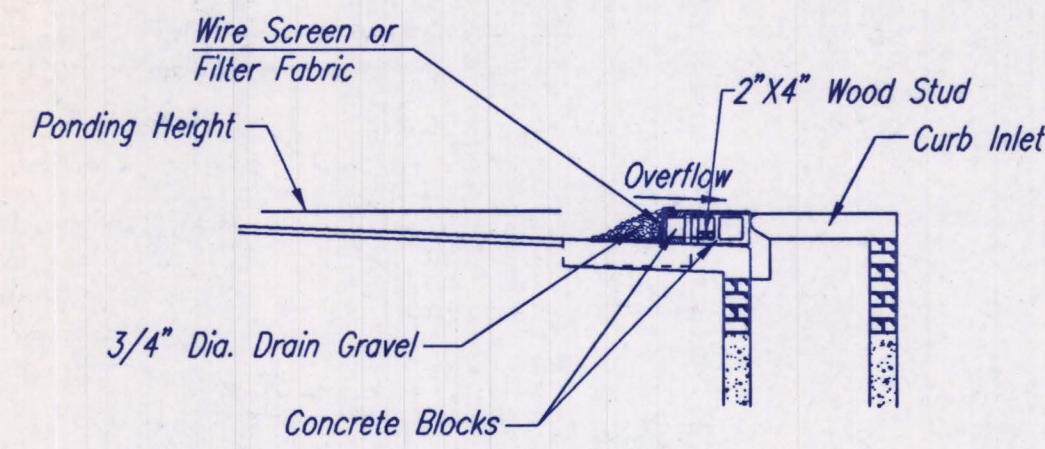
- Does water flow around the ditch check?
- Does water flow under the ditch check?
- Does the silt fence sag excessively?
- Has the silt fence torn or become detached from the posts?
- Does sediment need to be removed from behind the ditch check?

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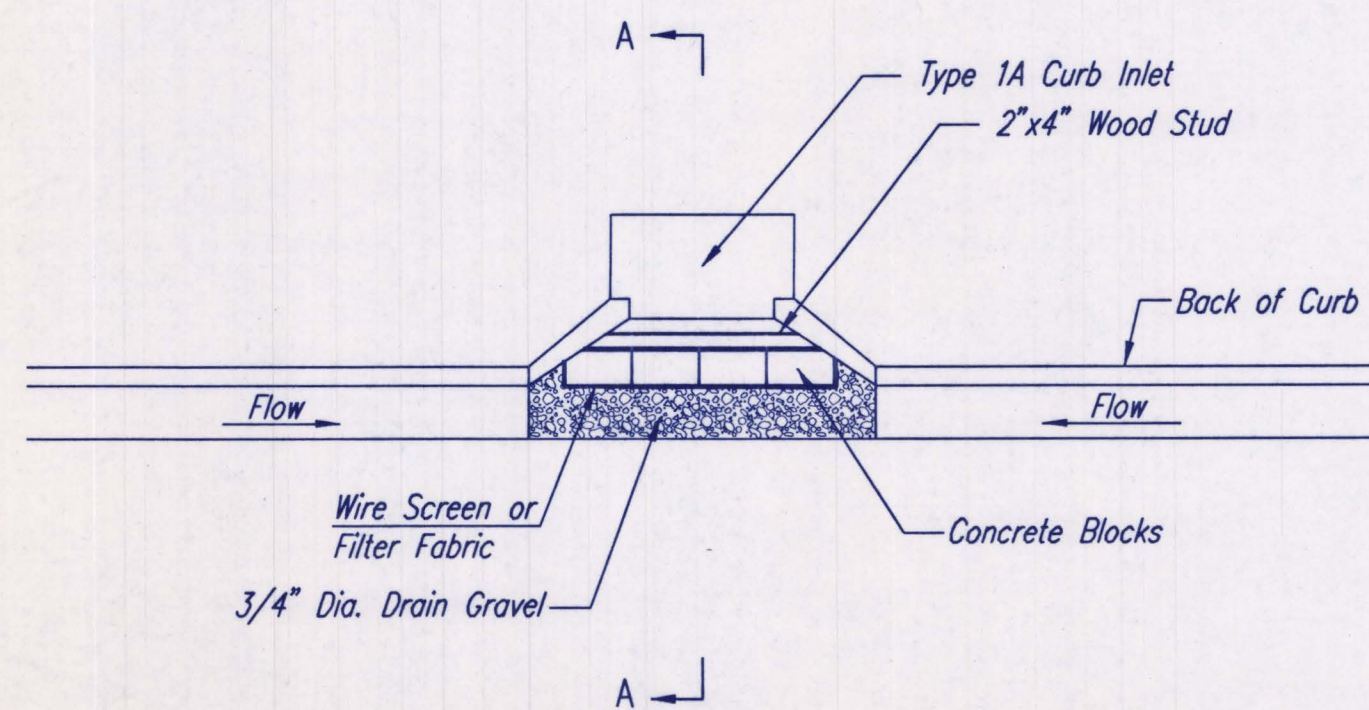
**SOIL EROSION  
BMP DETAILS**

CHRISTOPHER M. CARRIER, P.E.  
STORM WATER ENGINEER

PROJECT NUMBER	OCA NO.
448-89439	633720
DATE	SHEET 20 OF 24
MAY 2001	



SECTION A-A



**CURB INLET GRAVEL FILTERS**  
(INLET PROTECTION-RESIDENTIAL STREETS ONLY)

NOTE: Other types of curb inlet protection may be approved by the city so long as equal protection is provided.

A gravel inlet filter shall be installed at sump locations on residential streets. This type of protection is not to be used on arterial or collector streets at any time that it would pose an undue traffic hazard.

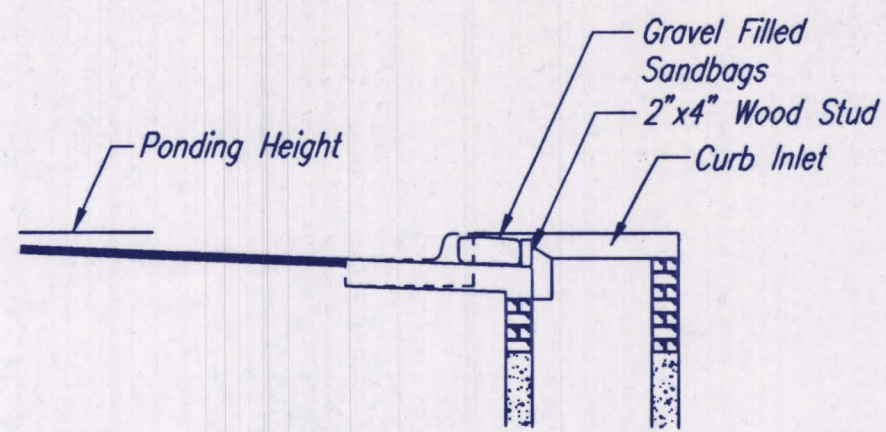
Instructions for Installing:

- STEP 1: Place concrete blocks around the inlet as shown on drawing. Insert 2x4 board as shown.
- STEP 2: Wrap 1/2" mesh wire screen around the concrete blocks.
- STEP 3: Place 1" to 1-1/2" diameter rock around the blocks and wire screen. Be sure the rock extends down from the top of the concrete block.
- STEP 4: To prevent damage to vehicles, signs warning drivers about the structures may be necessary. An alternative installation is the use of gravel bags supported by a 2"x4" board to prevent collapsing.

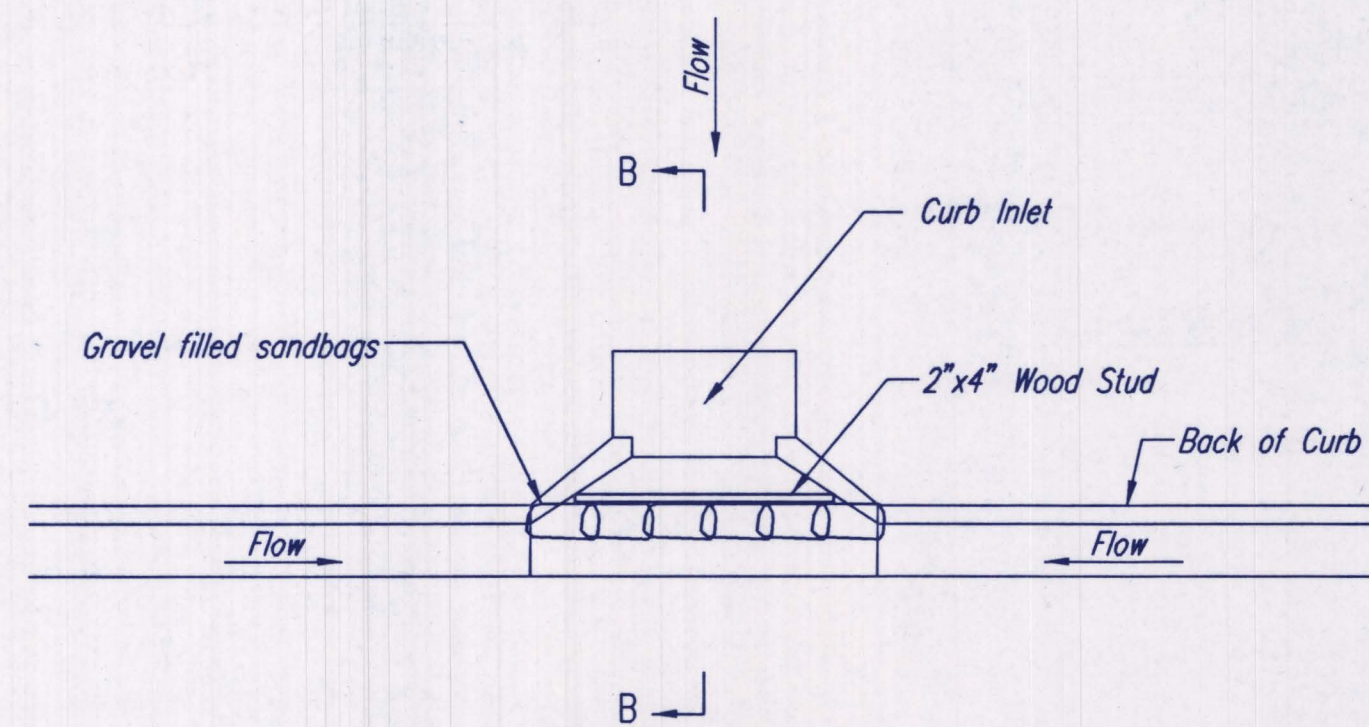
Use of rock with diameters smaller than 1" in the bag may result in clogging of pores and reduce the amount of water flowing into an inlet.

Maintenance:

All curb inlet gravel filters shall be inspected and repaired after each runoff event. Sediment deposits are to be removed once material is within 8 cm (3 inches) of the top of any block. Periodically, the gravel shall be raked to increase infiltration and filtering of runoff waters. Accumulated sediment is to be removed immediately from roads and streets.

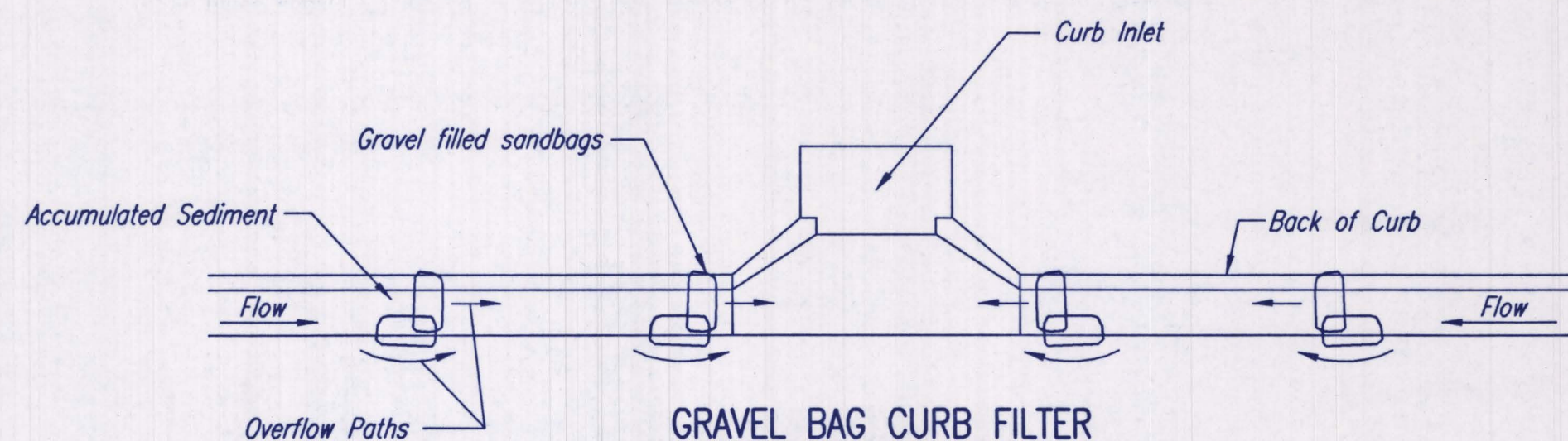


SECTION B-B



**CURB INLET SANDBAG FILTERS**  
(INLET PROTECTION)

NOTE: Other types of curb inlet protection may be approved by the City so long as equal protection is provided.



**GRAVEL BAG CURB FILTER**  
(INLET PROTECTION)

NOTE: Place two or more sets of bags in a manner that results in maximum support. The flow line bag must be lower than top of curb.

CURB SEDIMENT TRAPS

When inlets are located on streets having a grade (i.e., sump conditions do not exist), installing gravel (or sand) bags in the gutter flow line to create small sediment traps can be considered. Gravel bags are recommended over sand bags to allow for drainage.

If the spacing between bags becomes too large, little sediment may be trapped. Spacing of bags should be completed using the table or graph that illustrates placement distances based upon street slope. When installed in the gutter, bag tops must be lower than the sidewalk.

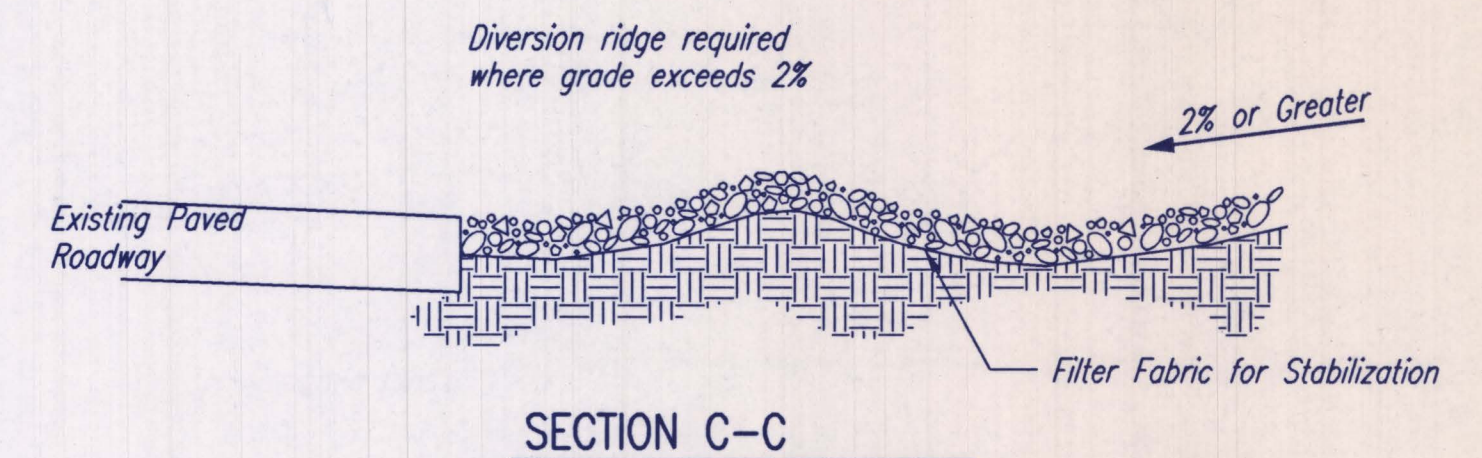
Spacing:

Gravel bags are to be placed according to street grades using the following table or graph that appears below.

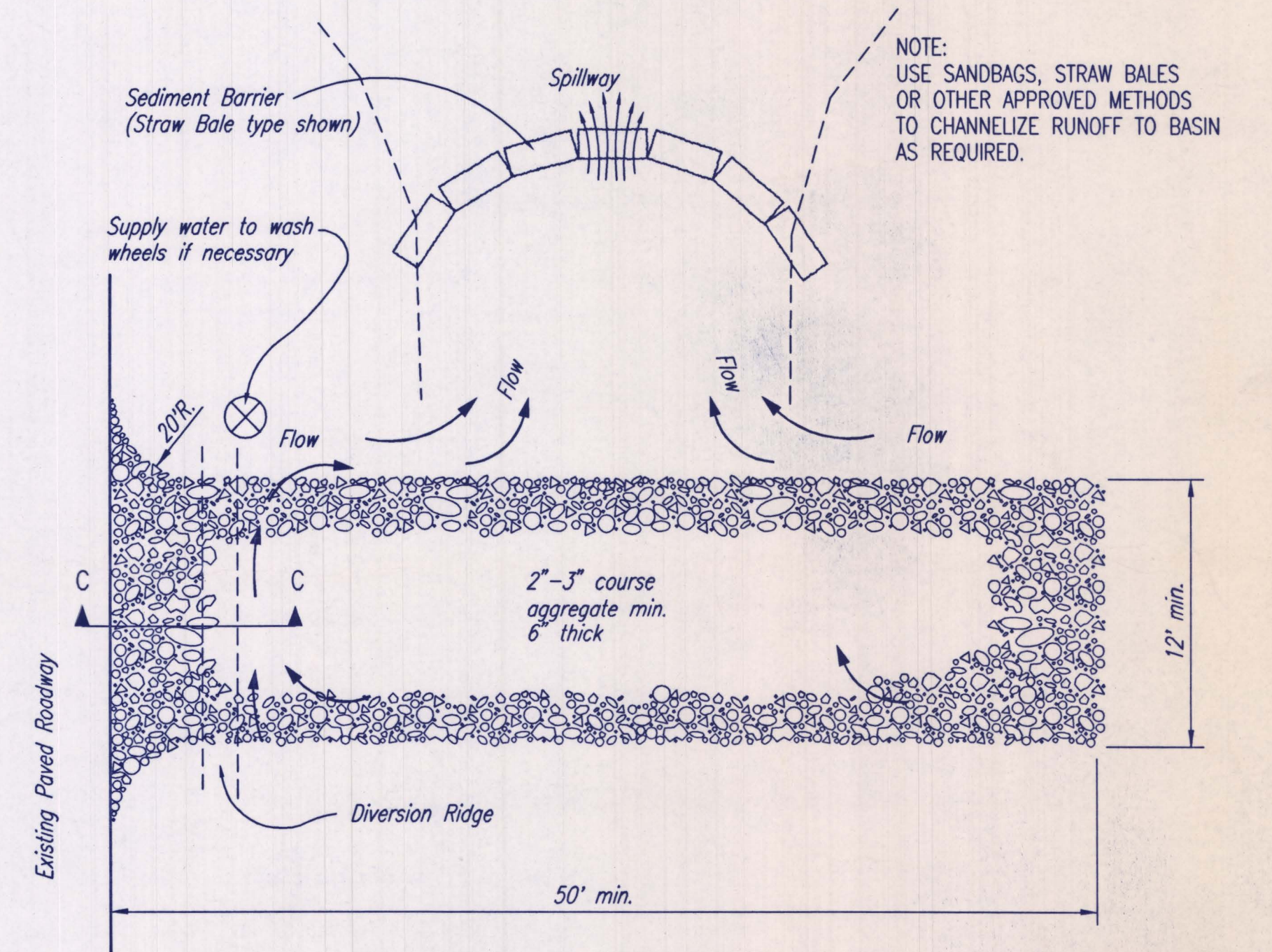
GRADE (%)	SPACING (FEET)
0.5	75
1.0	45
2.0	18
3.0	12
4.0	9
5.0	6

Maintenance:

Collected sediment shall be removed after every runoff event. Bags that are destroyed by vehicular traffic or through natural deterioration are to be immediately replaced.



SECTION C-C



**STABILIZED CONSTRUCTION ENTRANCE**

NOTES:

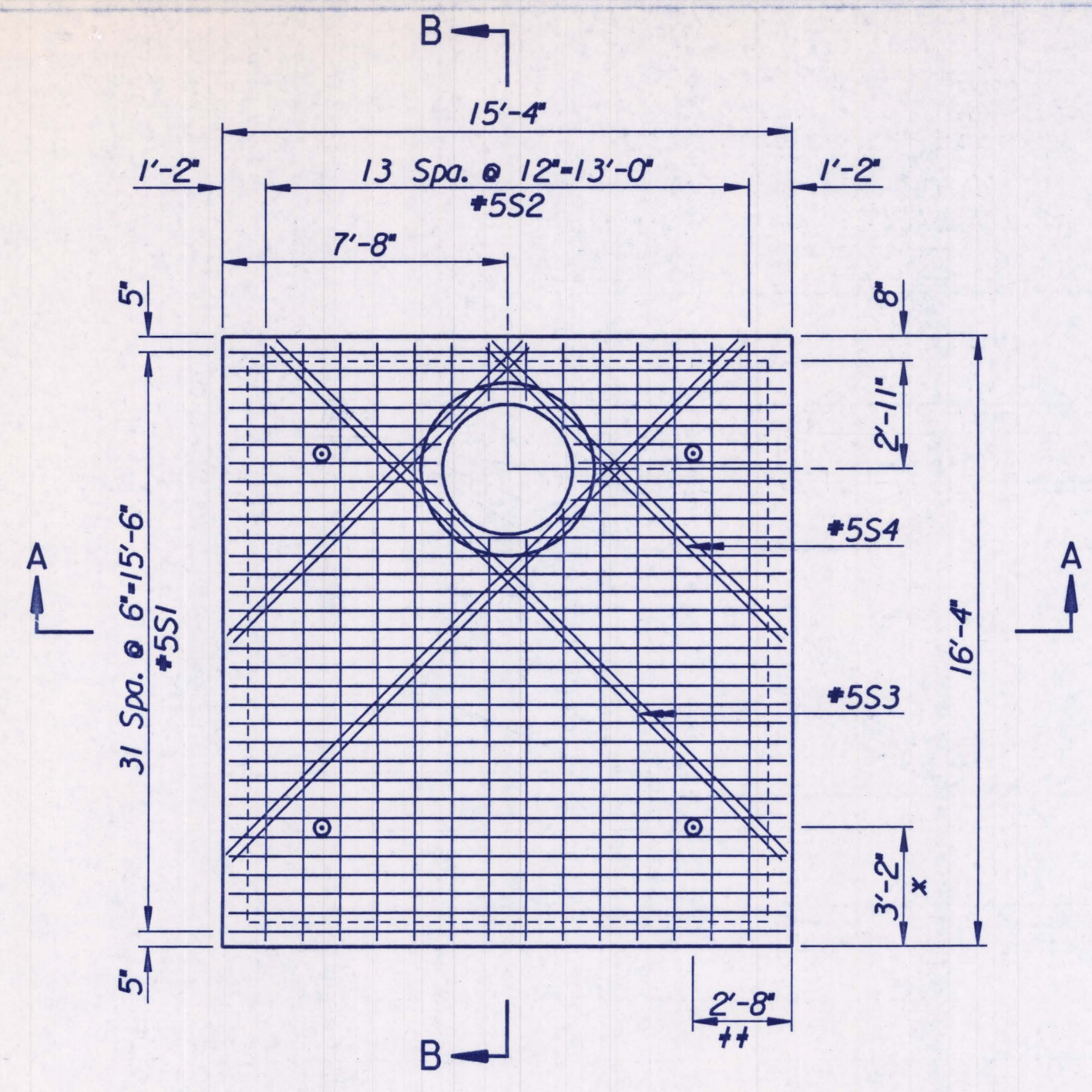
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN, AS SHOWN ABOVE.
4. DRIVE ENTRANCES ONTO RESIDENTIAL LOTS WILL NOT BE REQUIRED TO HAVE THE SEDIMENT BARRIER SHOWN, BUT WHEEL WASHING MAY BE REQUIRED IF STABILIZED ENTRANCE IS NOT SUFFICIENT TO KEEP MUD FROM BEING TRACKED ONTO ADJACENT STREET. ENTRANCE SHALL EXTEND FROM BACK OF CURB TO DWELLING.

**SOIL EROSION  
BMP DETAILS**

CHRISTOPHER M. CARRIER, P.E.  
STORM WATER ENGINEER

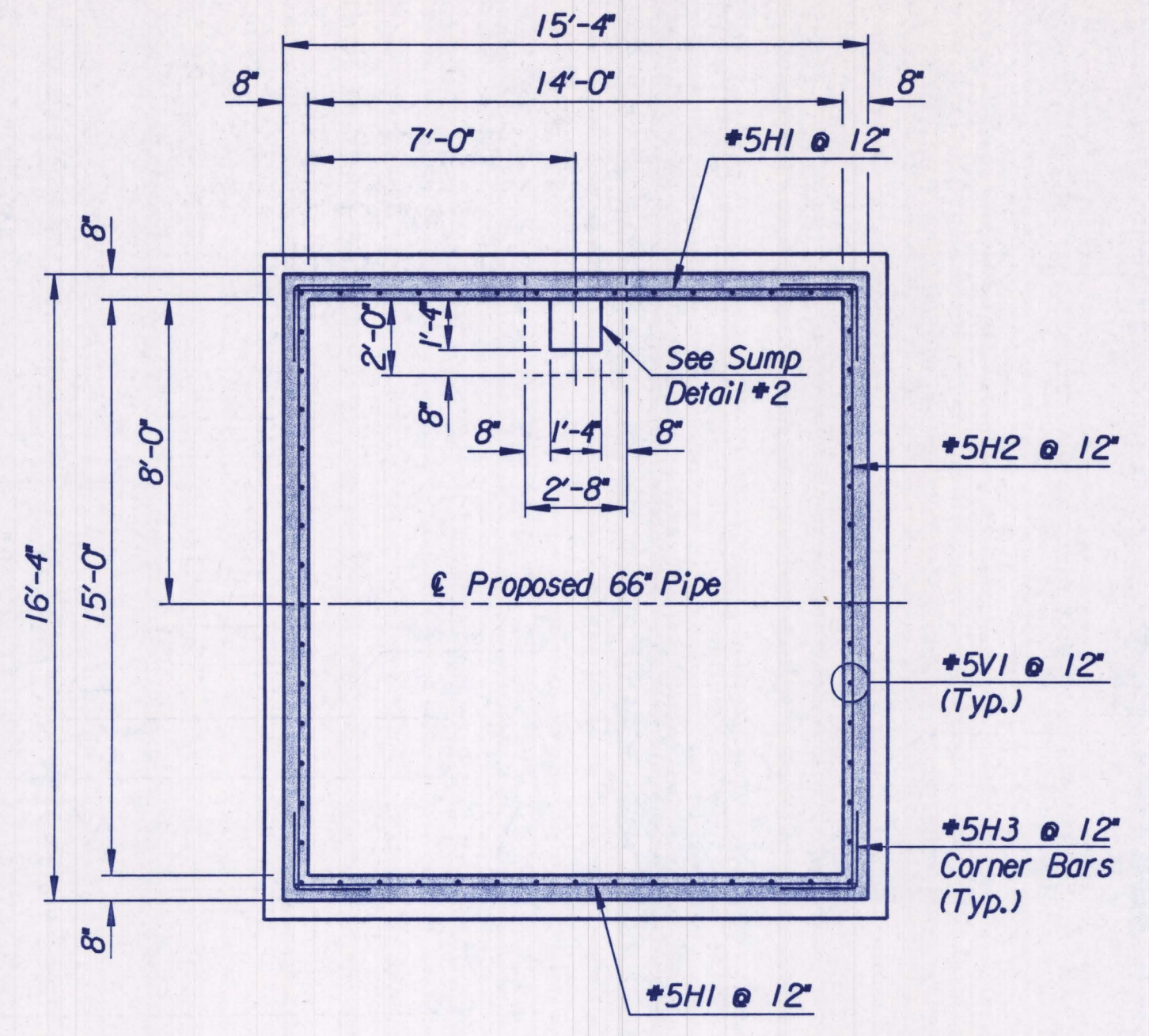
PROJECT NUMBER	OCA NO.
448-89439	633720
DATE	SHEET 21 OF 24
MAY 2001	



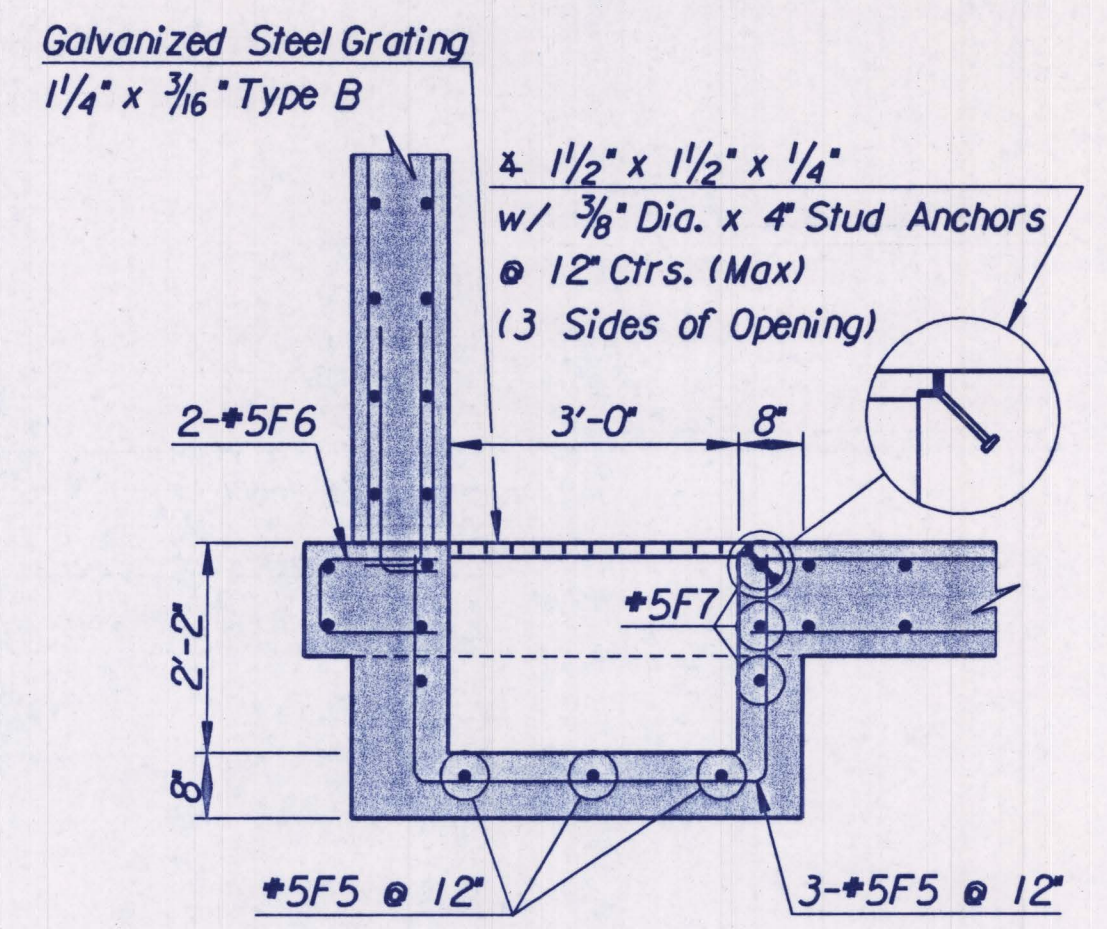


**TOP SLAB PLAN**

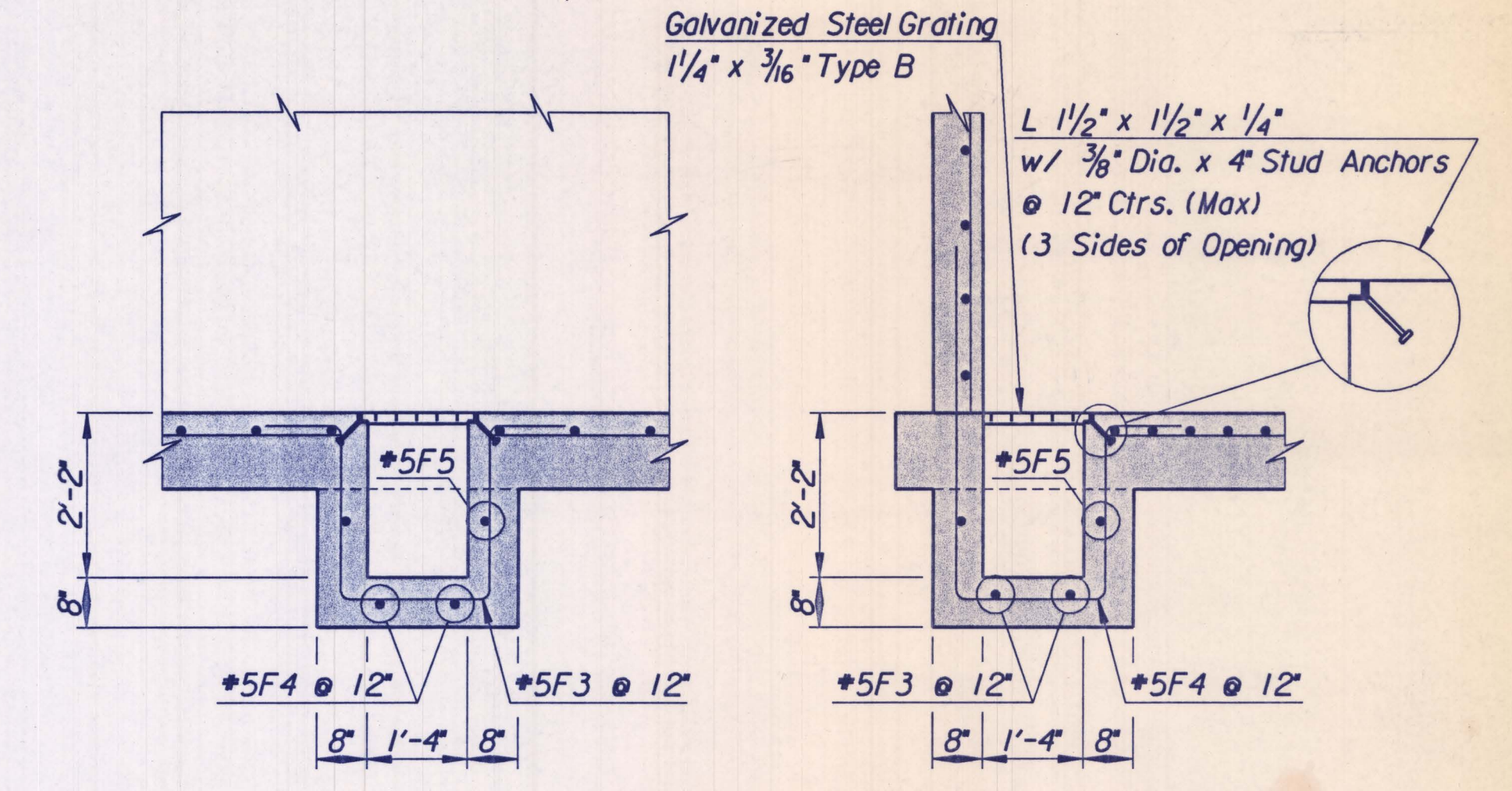
++ 4-Dayton-Superior T-26 (or approved equal) Lifting Plate with 1/4" Dia. Coil Bolts in Single Coil T-1 Insert (or approved equal). Dimensions Typical at all 4 corners



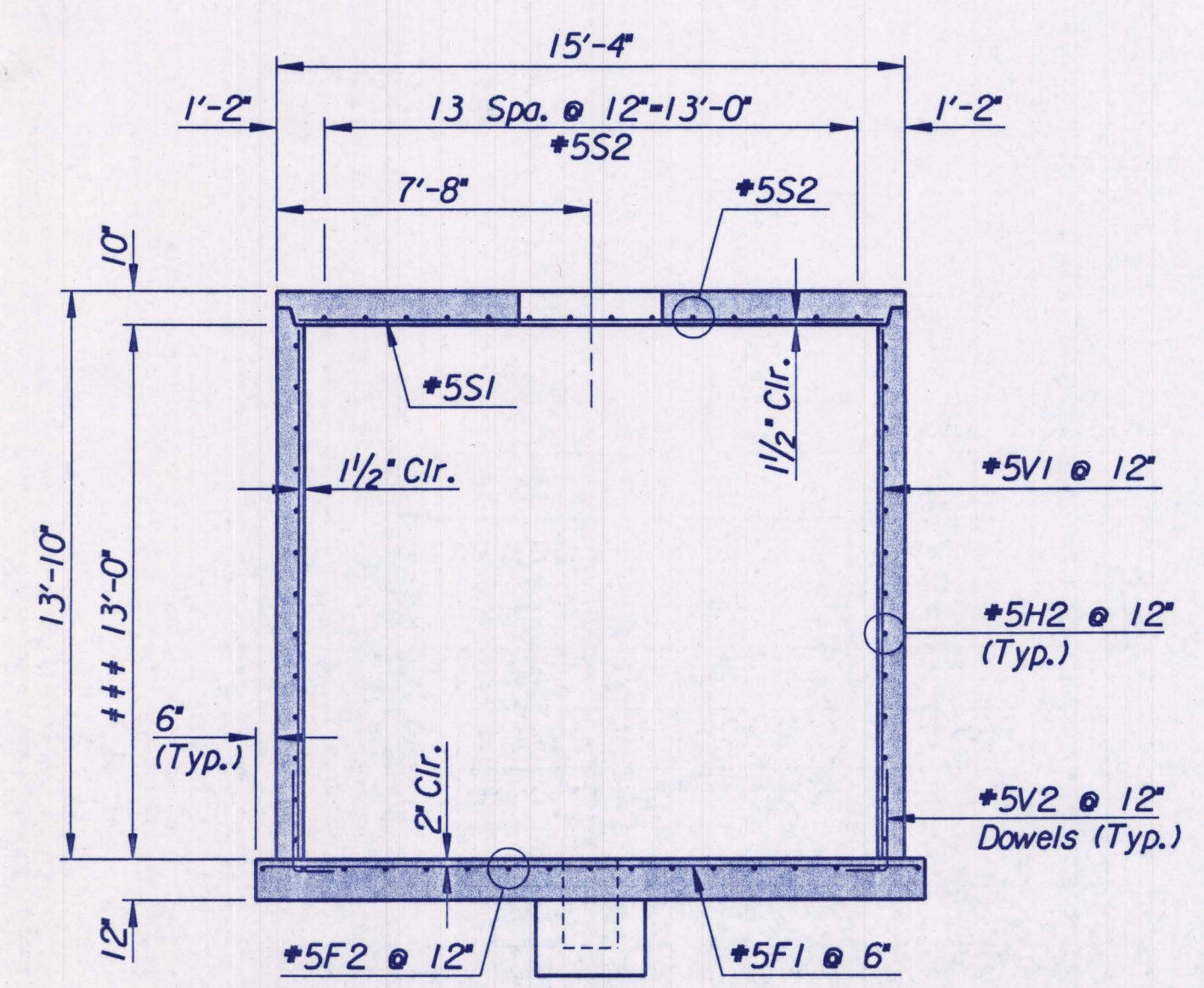
**PLAN SECTION**



**SUMP DETAIL #1**

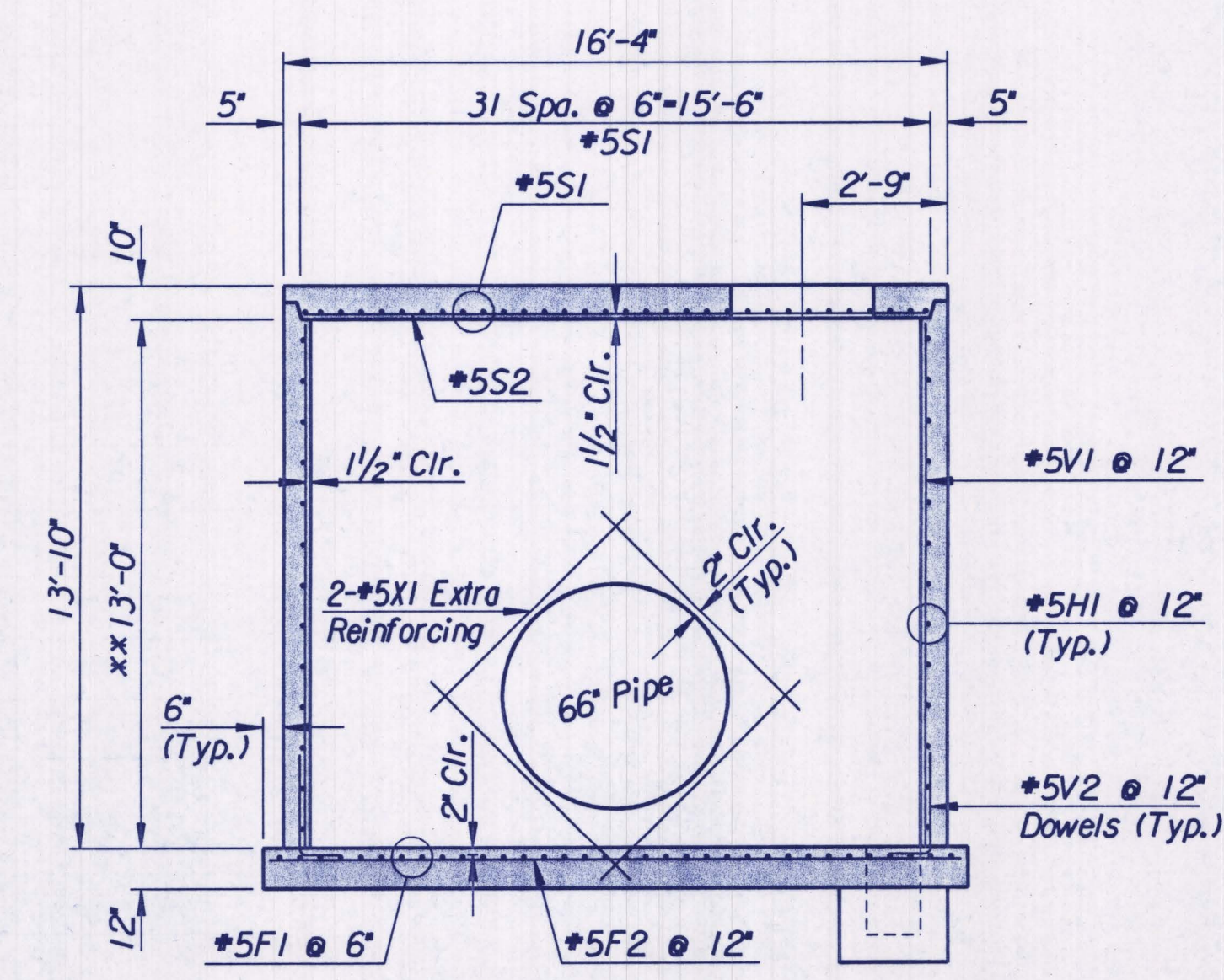


**SUMP DETAIL #2**

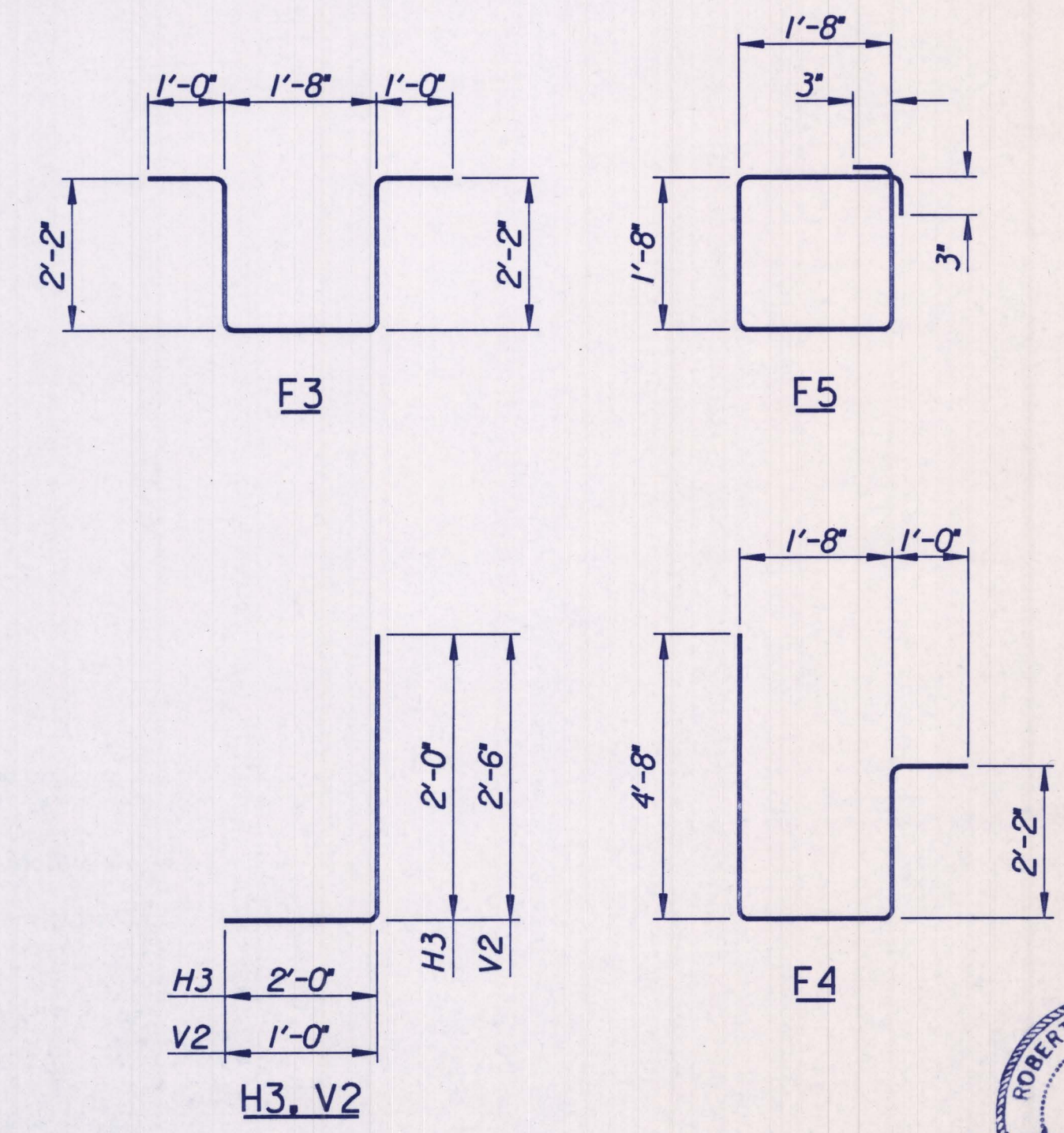


**SECTION A-A**

+++ Verify wall height with size and type of pipe used in this Vault. Wall reinforcement tabulated, is based on wall height as detailed. See Sheet No. 4 for top of 66" Pipe in Vault.



**SECTION B-B**



**BENDING DIAGRAMS**  
All dimensions are out to out of bars.

REINFORCING STEEL							
Straight Bars			Bent Bars				
Mark	Size	Number	Length	Mark	Size	Number	Length
F1	#5	34	16'-0"	F3	#5	2	8'-0"
F2	#5	17	17'-0"	F4	#5	2	9'-6"
				F5	#5	1	7'-2"
H1	#5	26	15'-0"	H3	#5	52	4'-0"
H2	#5	26	16'-0"	V2	#5	60	3'-6"
S1	#5	32	14'-2"				
S2	#5	14	15'-2"				
S3	#5	4	19'-6"				
S4	#5	4	11'-0"				
V1	#5	62	12'-11"				
X1	#5	16	8'-4"				

QUANTITIES		
Item	Quantity	Unit
Concrete	37.7	C.Y.
Reinforcing Steel	3985	Lbs.

For Information Only

No.	Revisions	By	Date

CITY OF WICHITA, KANSAS  
MICHAEL E. LINDEBAK, P.E.-CITY ENGINEER  
66" RAW WATER TRANSMISSION LINE (PHASE 2)

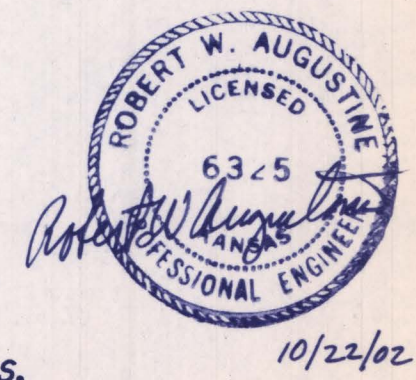
**VALVE BOX-66" PIPE**  
(WL NO. 1 STA. 243+64.00)  
C.O.W. PROJECT NO. 448-89439

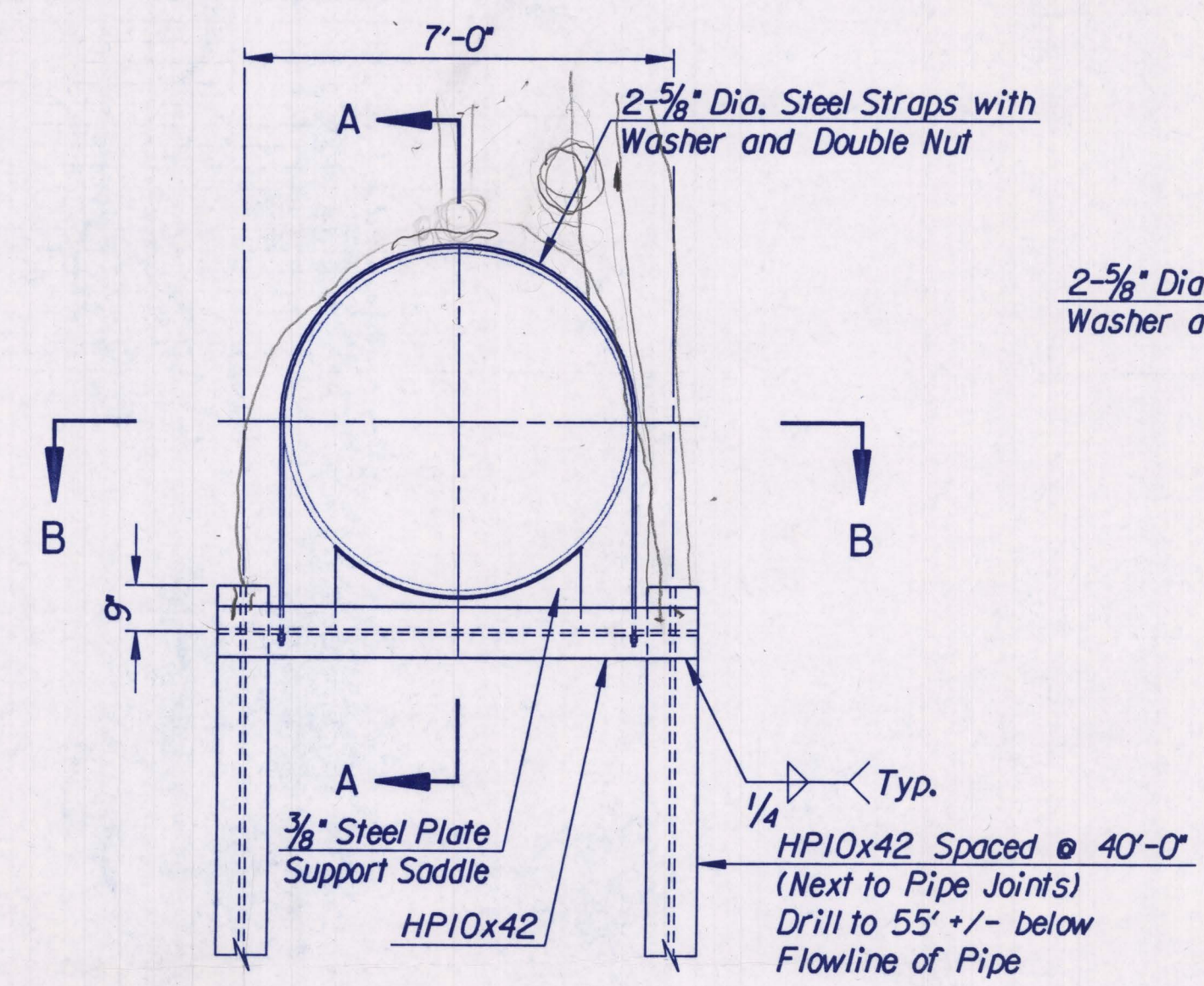
**Professional Engineering Consultants, P.A.**  
303 S. TOPEKA • WICHITA, KANSAS 67202  
316-262-2691 • FAX 316-262-3003

Designed by	R.W.A.	Checked by	R.A.S.
Drawn by	W.L.L.	Date	June 2001

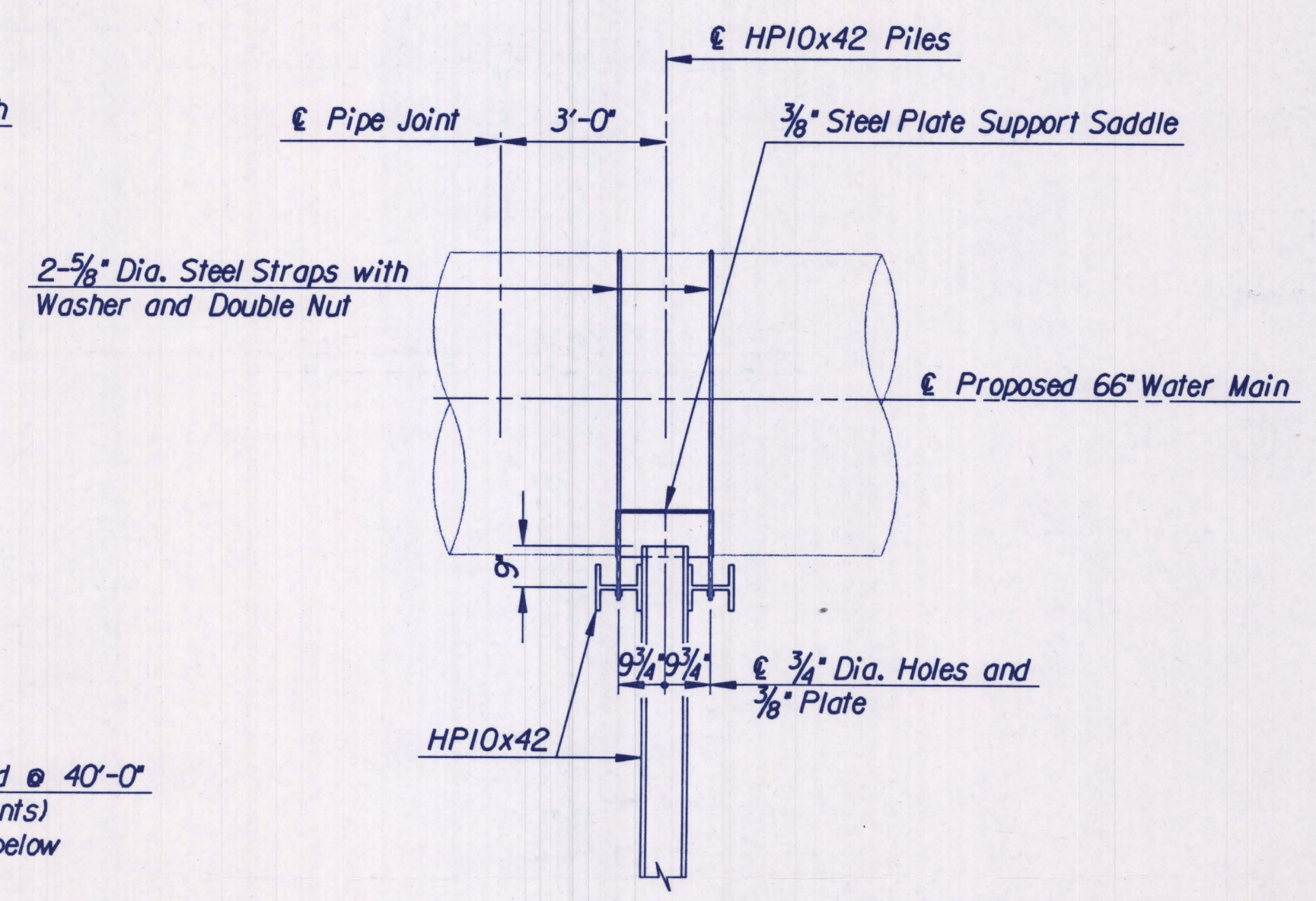
Job No. 00040

1/2000/00040/Bridge/vault2a  
drawn by : will  
Plotted by : will 10-22-2002



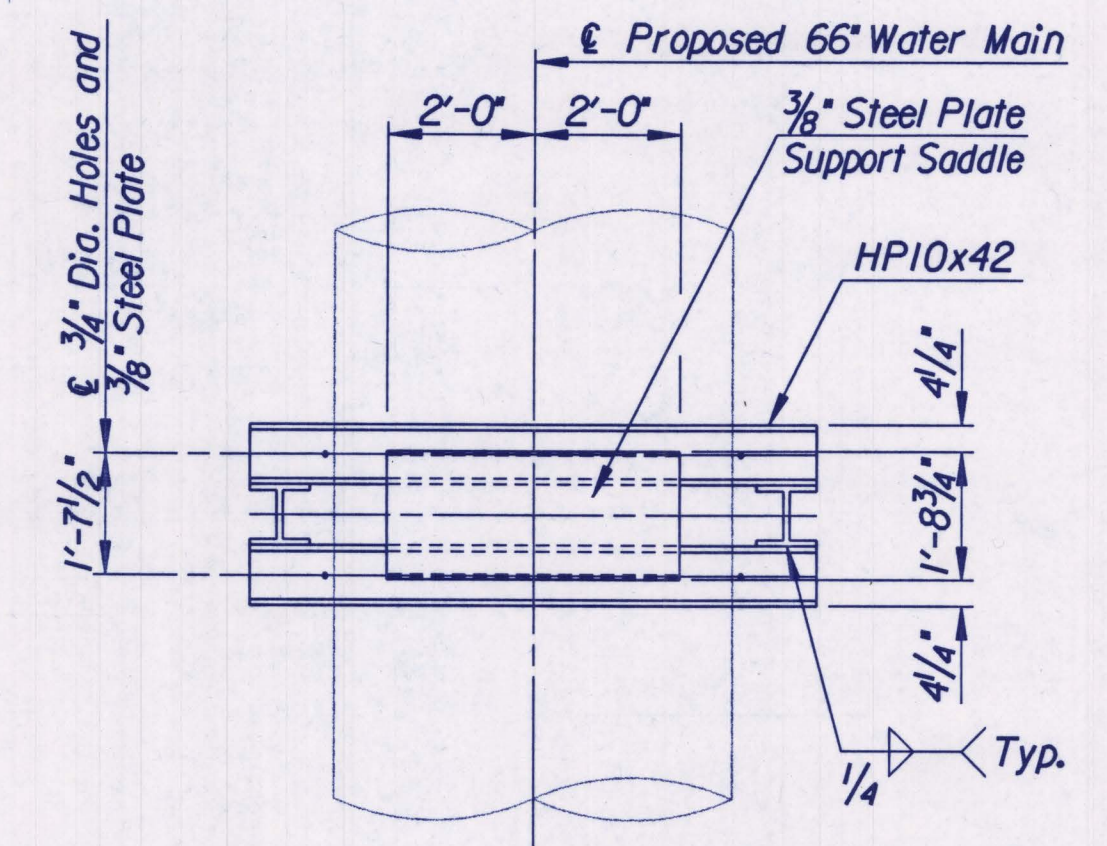


ELEVATION



SECTION A-A


Note:  
See Sheet No. 16 for location of Supports.  
(A Total of 6 to be used) Total Quantity of  
HP10x42 Piles = 660 Ft.



SECTION B-B

i:/2001/00040/Bridge/Pipesup2  
 drawn by : will  
 plotted by : will 10-22-2002



No.	Revisions	By	Date
CITY OF WICHITA, KANSAS NEIL D. CABLE, P.E.-CITY ENGINEER 66" RAW WATER TRANSMISSION LINE (PHASE 2) <b>PIPE SUPPORT DETAILS</b> WATERLINE NO. 1 C.O.W. PROJECT NO. 448-89439			
 <b>Professional Engineering Consultants, P.A.</b> 303 S. TOPEKA • WICHITA, KANSAS 67202 316-262-2591 • FAX 316-262-3003			
Designed by	R.W.A.	Checked by	R.A.S.
Drawn by	W.L.L.	Date	March 2002 Job No. 00040