

Water and Sewer Improvements

Dr. Edmund A. Babler Memorial State Park

Wildwood, Missouri

OWNER: STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

DEPARTMENT OF
NATURAL RESOURCES
DIVISION OF STATE PARKS

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



DESIGNER: CIVIL DESIGN, INC.

PROJECT NUMBER: X2301-01

SITE NUMBER: 5201
ASSET NUMBER: 7815201059

CIVIL DESIGN, INC.
WBE/DBE

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LEGEND

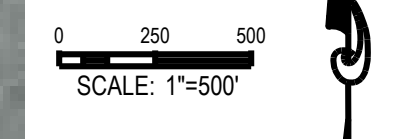
EXISTING		PROPOSED
—2 WM	WATER MAIN	—4 WM
—SRV	WATER SERVICE LINE	—SRV
▲ WV	WATER VALVE	⊕
—	HORIZONTAL BEND	⋄
⌈	CAP WATER MAIN	⌈
◆ FH	FIRE HYDRANT	◆
△	REDUCER	▲
⊕	TEE	⊕
□	PRESSURE REDUCER	■
▲ WM	WATER METER	▲
	TAPPING SLEEVE) (
PP ●	POWER POLE	●
10" ⊕	TREE	⊕
18" ⊕	STUMP	⊕
⊙	SIGN	⊙
— X —	FENCE	— X —
	PAVEMENT REMOVAL	▨
	WATER MAIN ENCASEMENT	■

ABBREVIATIONS

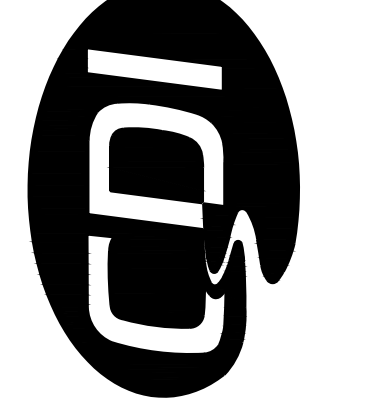
ASPH	ASPHALT
ATG	ADJUST TO GRADE
CONC	CONCRETE
ESMT	EASEMENT
EX	EXISTING
FL	FLOWLINE
LAB	LEFT ASCENDING BANK
MAWC	MISSOURI AMERICAN WATER COMPANY
PL	PROPERTY LINE
PROP	PROPOSED
PVMT	PAVEMENT
RAB	RIGHT ASCENDING BANK
SAN	SANITARY SEWER
STM	STORM SEWER
SWPPP	STORMWATER POLLUTION PREVENTION PLAN
TCE	TEMPORARY CONSTRUCTION EASEMENT
TBR	TO BE REMOVED
TBR&R	TO BE REMOVED AND REPLACED
TBA	TO BE ABANDONED
TBA&F	TO BE ABANDONED AND FILLED
TYP	TYPICAL
UIP	USE IN PLACE

NOTES:

- LOCATIONS OF WATER SERVICE LATERALS ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR. RECONCILE ANY CONFLICTS AS NEEDED.
- UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE RECORDS. THEREFORE, THE LOCATIONS OF ANY UNDERGROUND FACILITIES SHOWN HEREON MUST BE CONSIDERED APPROXIMATE. PRIOR TO BEGINNING WORK ON THE SITE, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE EXACT LOCATION OF THESE FACILITIES ALONG WITH ANY IN EXISTENCES THAT ARE NOT SHOWN, TO VERIFY THEIR LOCATION BOTH HORIZONTALLY AND VERTICALLY (IN ACCORDANCE WITH THE REQUIREMENTS OF THE RESPECTIVE UTILITY/FACILITY OWNER), AND TO VERIFY THAT MINIMUM CLEARANCES AND COVER REQUIREMENTS BETWEEN THE EXISTING FACILITIES AND THE PROPOSED WORK WILL BE MET.
- CONTRACTOR SHALL REMOVE TREES FOR CONSTRUCTION ONLY AS NECESSARY. CONTRACTOR SHALL PROTECT TREES TO THE MAXIMUM EXTENT PRACTICAL.



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DEPARTMENT OF NATURAL
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DIVISION OF STATE PARKS

WATER AND SEWER
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DR. EDMUND A. BABLER
MEMORIAL STATE PARK
800 GUY PARK DRIVE
WILDWOOD, MISSOURI 63005

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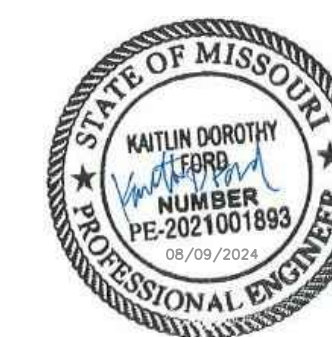
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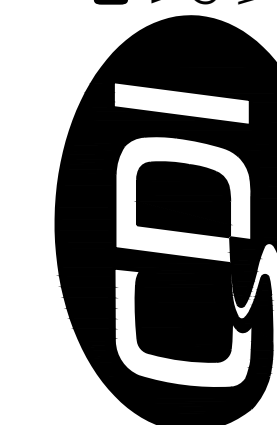
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CHECKED BY: **WMK**
DESIGNED BY: **KDF**

SHEET TITLE:
**OVERALL PLAN
SHEET**

SHEET NUMBER:
C-100
SHEET 2 OF 46
AUGUST 9, 2024



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DESIGNED BY: **KDF**

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SHEET NUMBER:

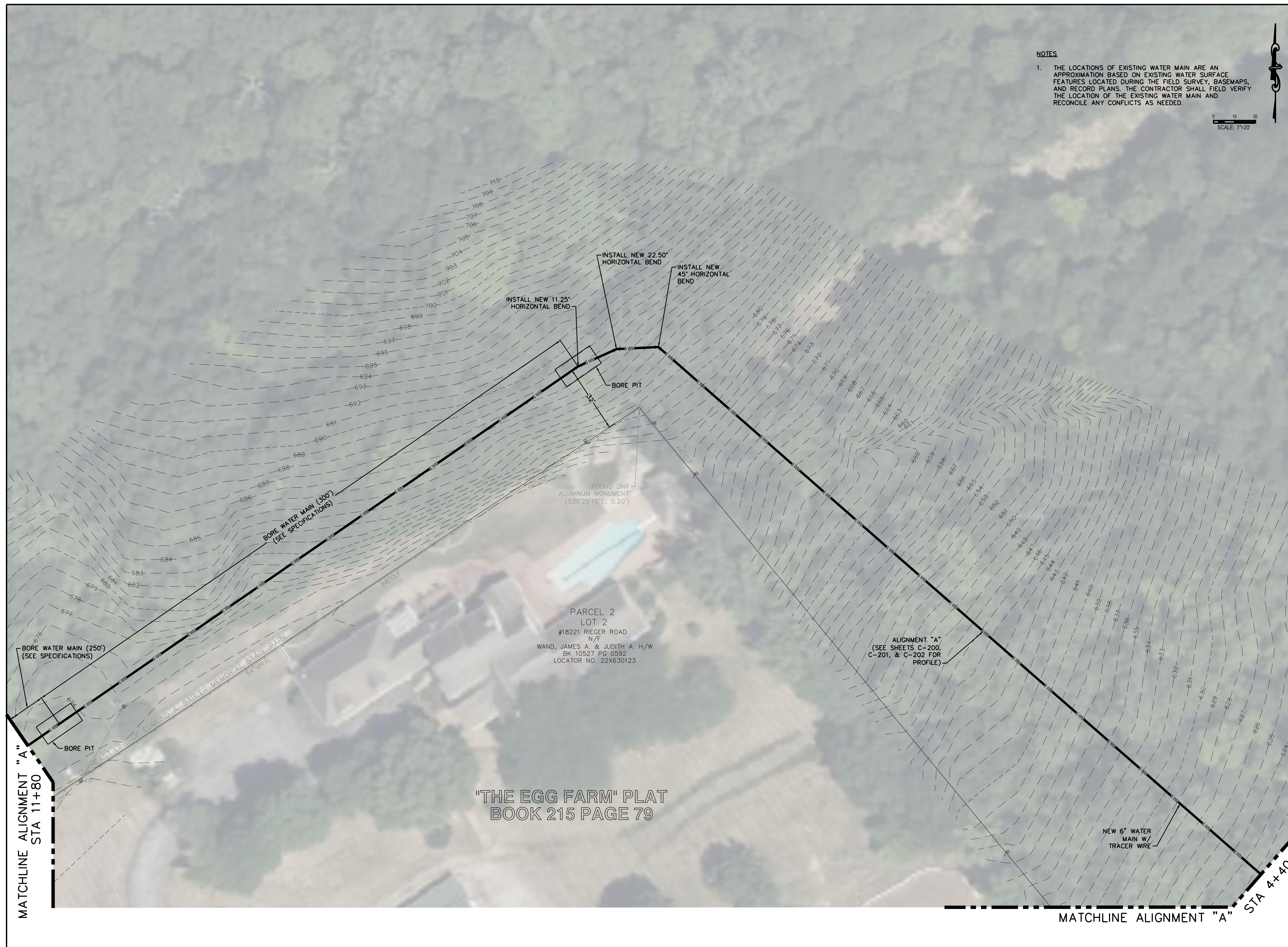
C-102

SHEET 4 OF 46
AUGUST 9, 2024

NOTES

1. THE LOCATIONS OF EXISTING WATER MAIN ARE AN APPROXIMATION BASED ON EXISTING WATER SURFACE FEATURES LOCATED DURING THE FIELD SURVEY, BASEMAPS, AND RECORD PLANS. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF THE EXISTING WATER MAIN AND RECONCILE ANY CONFLICTS AS NEEDED.

SCALE: 1"=20'

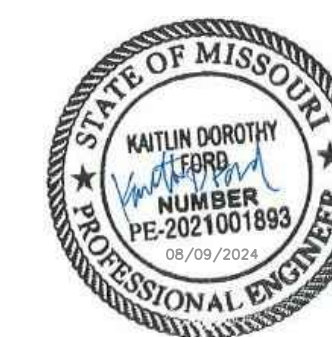


"THE EGG FARM" PLAT
BOOK 215 PAGE 79

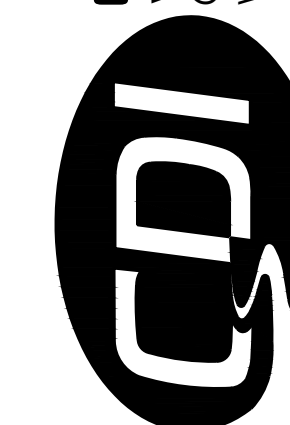
PARCEL 2
LOT 2
#18221 RIEGER ROAD
N/F
WAND, JAMES A. & JUDITH A. H/W
BK 10527 PG 0592
LOCATOR NO. 22X630123

MATCHLINE ALIGNMENT "A"
STA 11+80

MATCHLINE ALIGNMENT "A"
STA 4+40



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ASSET # 7815201059

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

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CHECKED BY: **WMK**
DESIGNED BY: **KDF**

SHEET TITLE:
SITE PLAN

SHEET NUMBER:

C-103

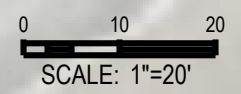
SHEET 5 OF 46
AUGUST 9, 2024

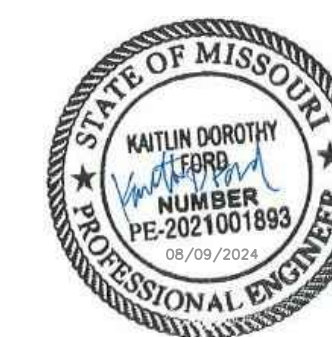


"THE EGG FARM" PLAT
BOOK 215 PAGE 79

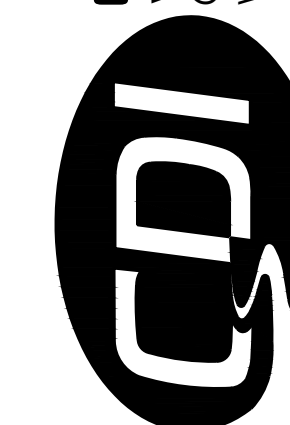
PARCEL 1
LOT 1
#18239 RIEGER ROAD
N/F
WAND, JAMES A. & JUDITH A. H/W
BK 10527 PG 0592
LOCATOR NO. 22X630114

NOTES
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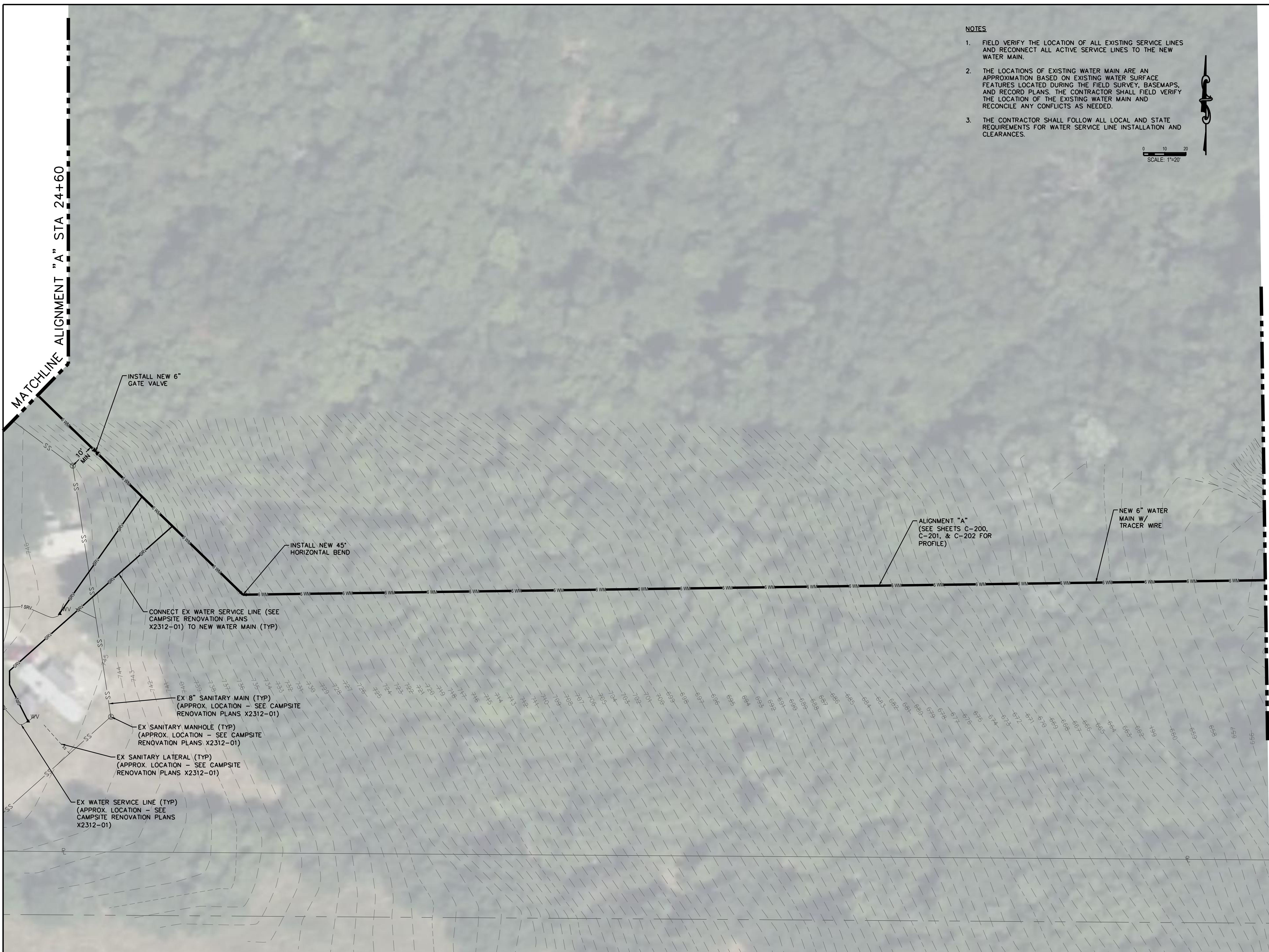
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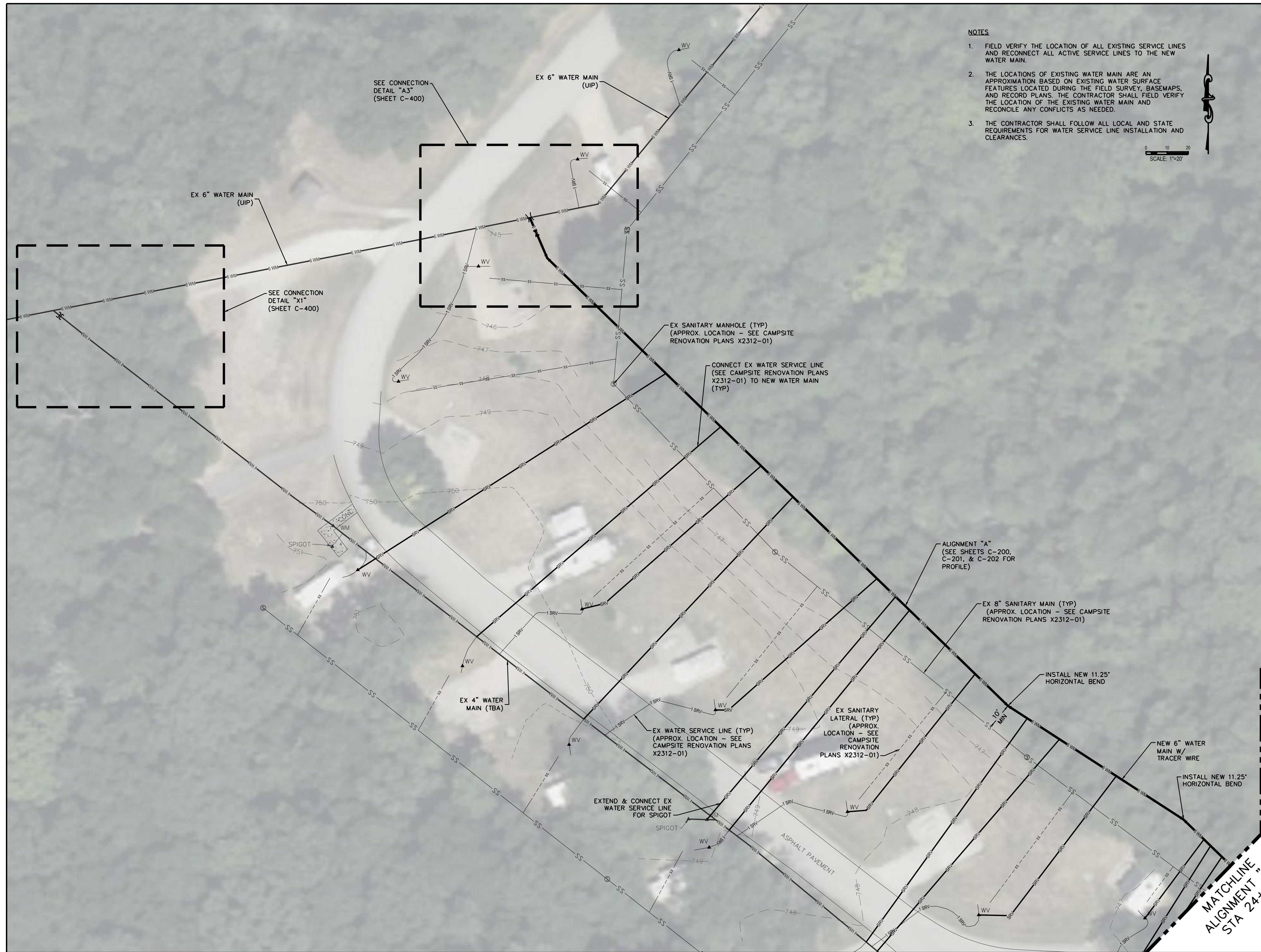
SHEET 6 OF 46
AUGUST 9, 2024

NOTES

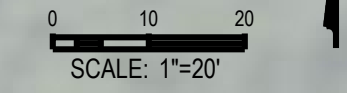
1. FIELD VERIFY THE LOCATION OF ALL EXISTING SERVICE LINES AND RECONNECT ALL ACTIVE SERVICE LINES TO THE NEW WATER MAIN.
2. THE LOCATIONS OF EXISTING WATER MAIN ARE AN APPROXIMATION BASED ON EXISTING WATER SURFACE FEATURES LOCATED DURING THE FIELD SURVEY, BASEMAPS, AND RECORD PLANS. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF THE EXISTING WATER MAIN AND RECONCILE ANY CONFLICTS AS NEEDED.
3. THE CONTRACTOR SHALL FOLLOW ALL LOCAL AND STATE REQUIREMENTS FOR WATER SERVICE LINE INSTALLATION AND CLEARANCES.

0 10 20
SCALE: 1"=20'





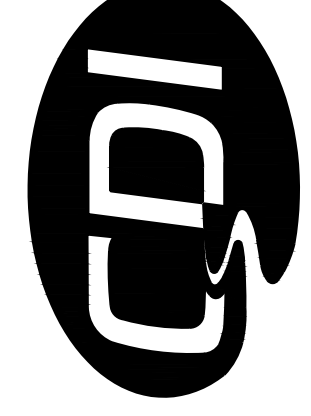
- NOTES**
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ISSUE DATE:	_____

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CHECKED BY: WMK
DESIGNED BY: KDF

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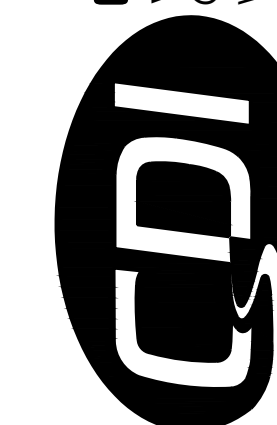
C-105

SHEET 7 OF 46
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MATCHLINE
ALIGNMENT "A"
STA 24+60



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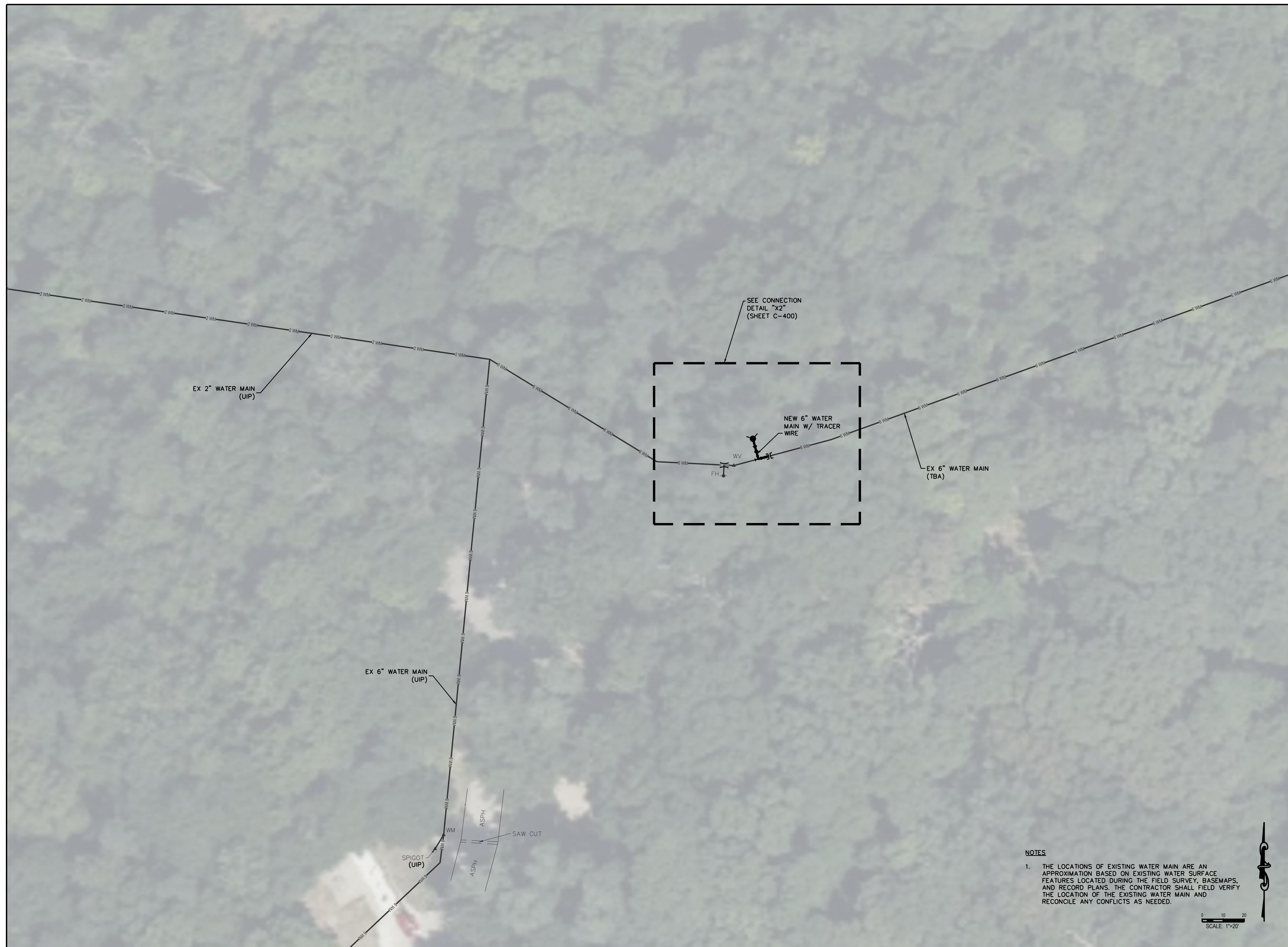
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SITE PLAN

SHEET NUMBER:

C-106

SHEET 8 OF 46
AUGUST 9, 2024



NOTES

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0 10 20
SCALE: 1"=20'



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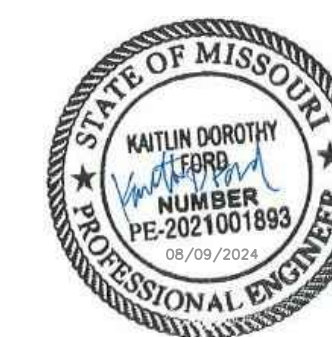
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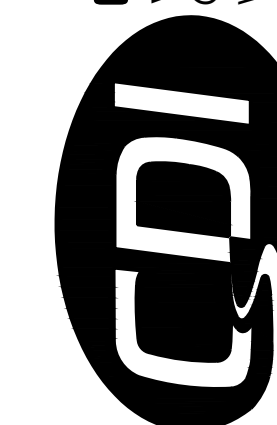
C-107

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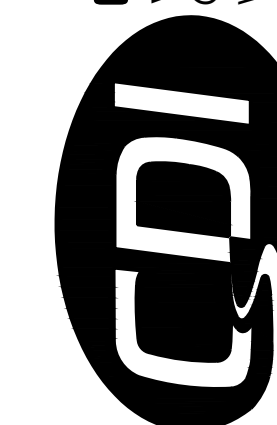
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SHEET 10 OF 46
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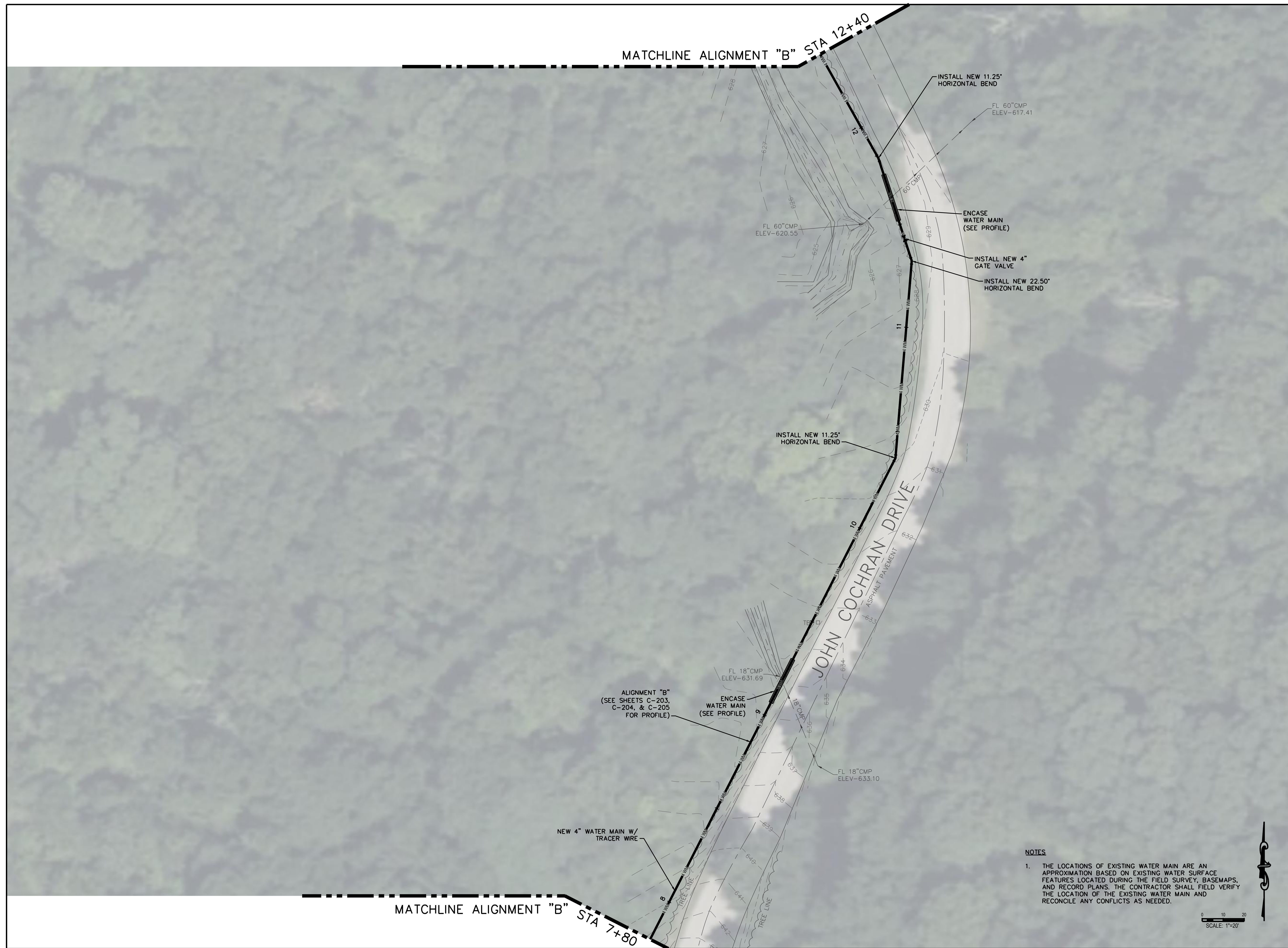
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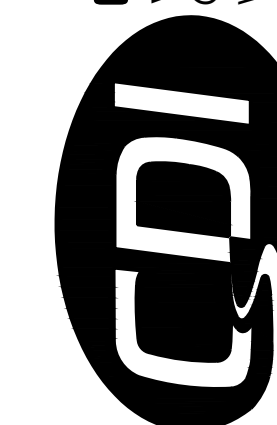
C-109

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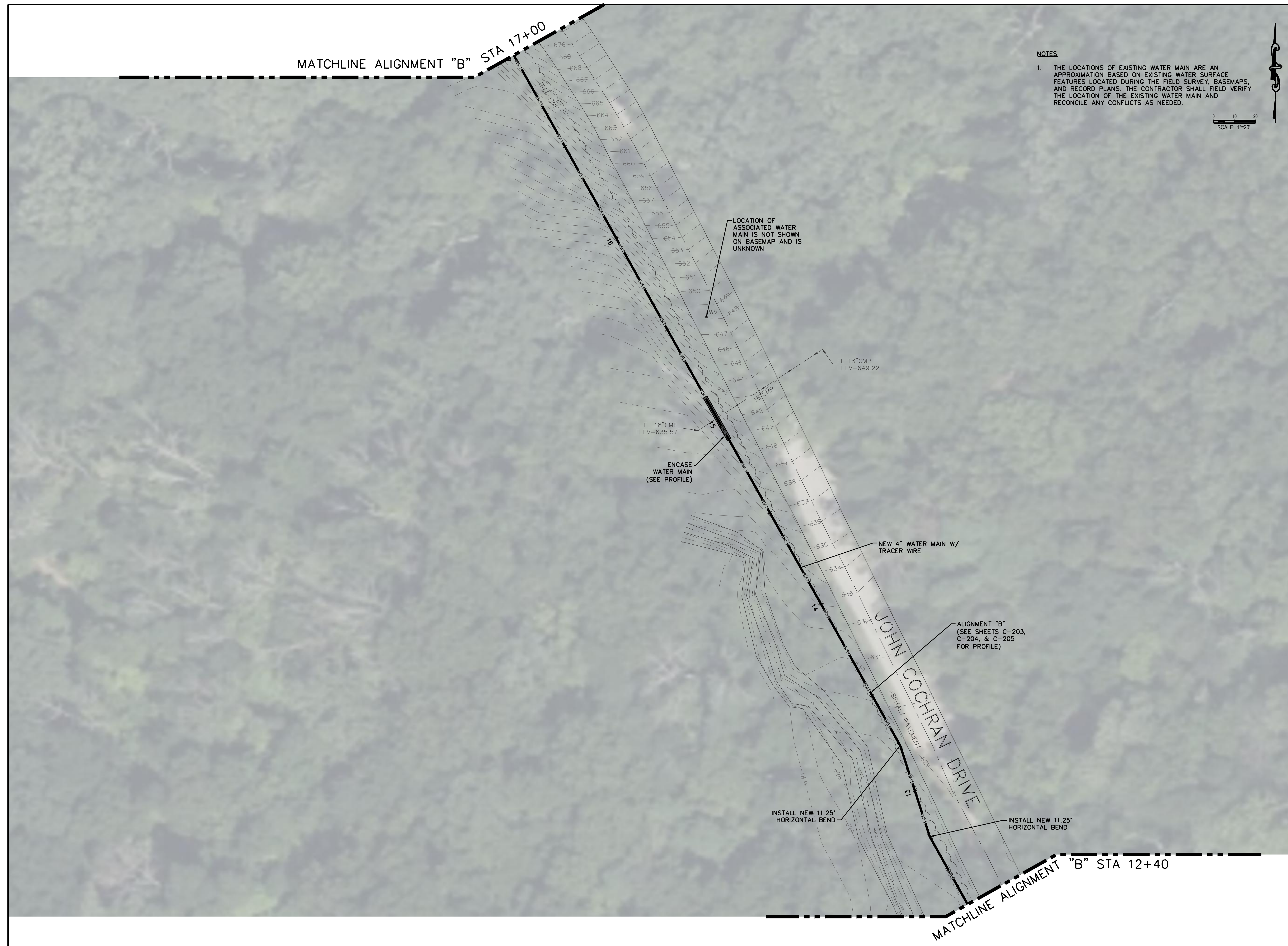
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SITE PLAN

SHEET NUMBER:

C-110

SHEET 12 OF 46
AUGUST 9, 2024



NOTES

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0 10 20
SCALE: 1"=20'

LOCATION OF ASSOCIATED WATER MAIN IS NOT SHOWN ON BASEMAP AND IS UNKNOWN

FL 18" CMP
ELEV-635.57

ENCASE WATER MAIN
(SEE PROFILE)

FL 18" CMP
ELEV-649.22

NEW 4" WATER MAIN W/
TRACER WIRE

ALIGNMENT "B"
(SEE SHEETS C-203,
C-204, & C-205
FOR PROFILE)

INSTALL NEW 11.25'
HORIZONTAL BEND

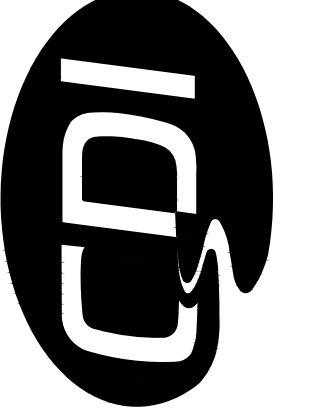
INSTALL NEW 11.25'
HORIZONTAL BEND

MATCHLINE ALIGNMENT "B" STA 17+00

MATCHLINE ALIGNMENT "B" STA 12+40



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DEPARTMENT OF NATURAL
RESOURCES
DIVISION OF STATE PARKS

WATER AND SEWER
IMPROVEMENTS

DR. EDMUND A. BABLER
MEMORIAL STATE PARK
800 GUY PARK DRIVE
WILDWOOD, MISSOURI 63005

PROJECT # X2301-01
CDI PROJECT # 5917

SITE # 5201
ASSET # 7815201059

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

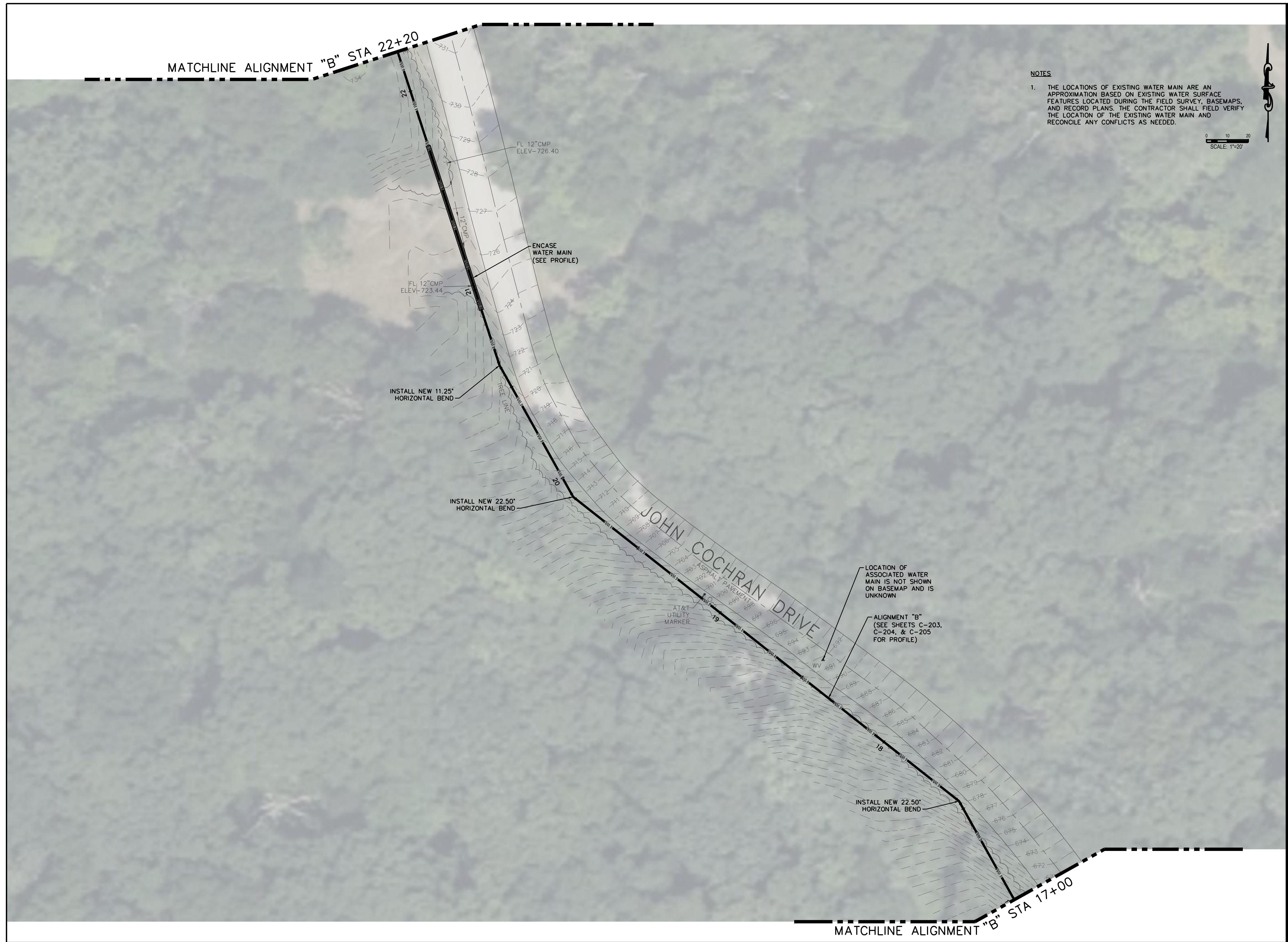
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DRAWN BY: **KDF**
CHECKED BY: **WMK**
DESIGNED BY: **KDF**

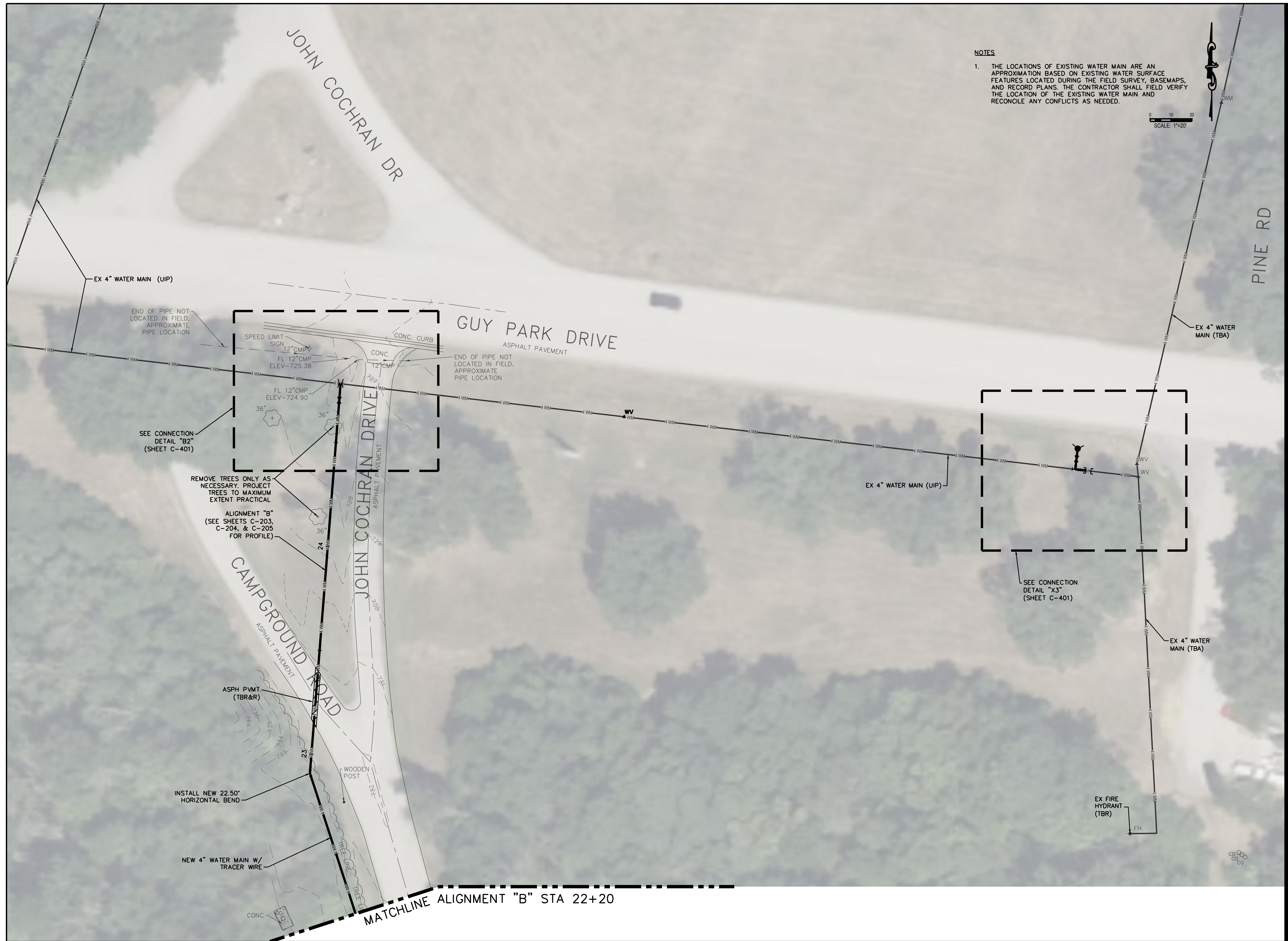
SHEET TITLE:
SITE PLAN

SHEET NUMBER:

C-111

SHEET 13 OF 46
AUGUST 9, 2024





NOTES

1. THE LOCATIONS OF EXISTING WATER MAIN ARE AN APPROXIMATION BASED ON EXISTING WATER SURFACE FEATURES LOCATED DURING THE FIELD SURVEY, BASEMAPS, AND RECORD PLANS. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF THE EXISTING WATER MAIN AND RECONCILE ANY CONFLICTS AS NEEDED.

SCALE: 1"=20'

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR



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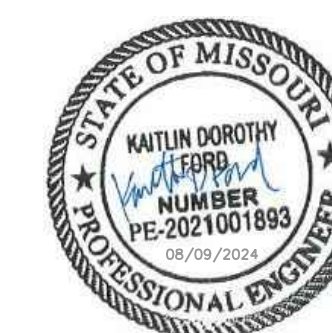
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CHECKED BY: **WMK**
DESIGNED BY: **KDF**

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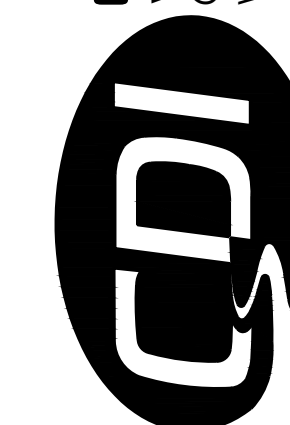
SHEET NUMBER:

C-112

SHEET 14 OF 46
AUGUST 9, 2024



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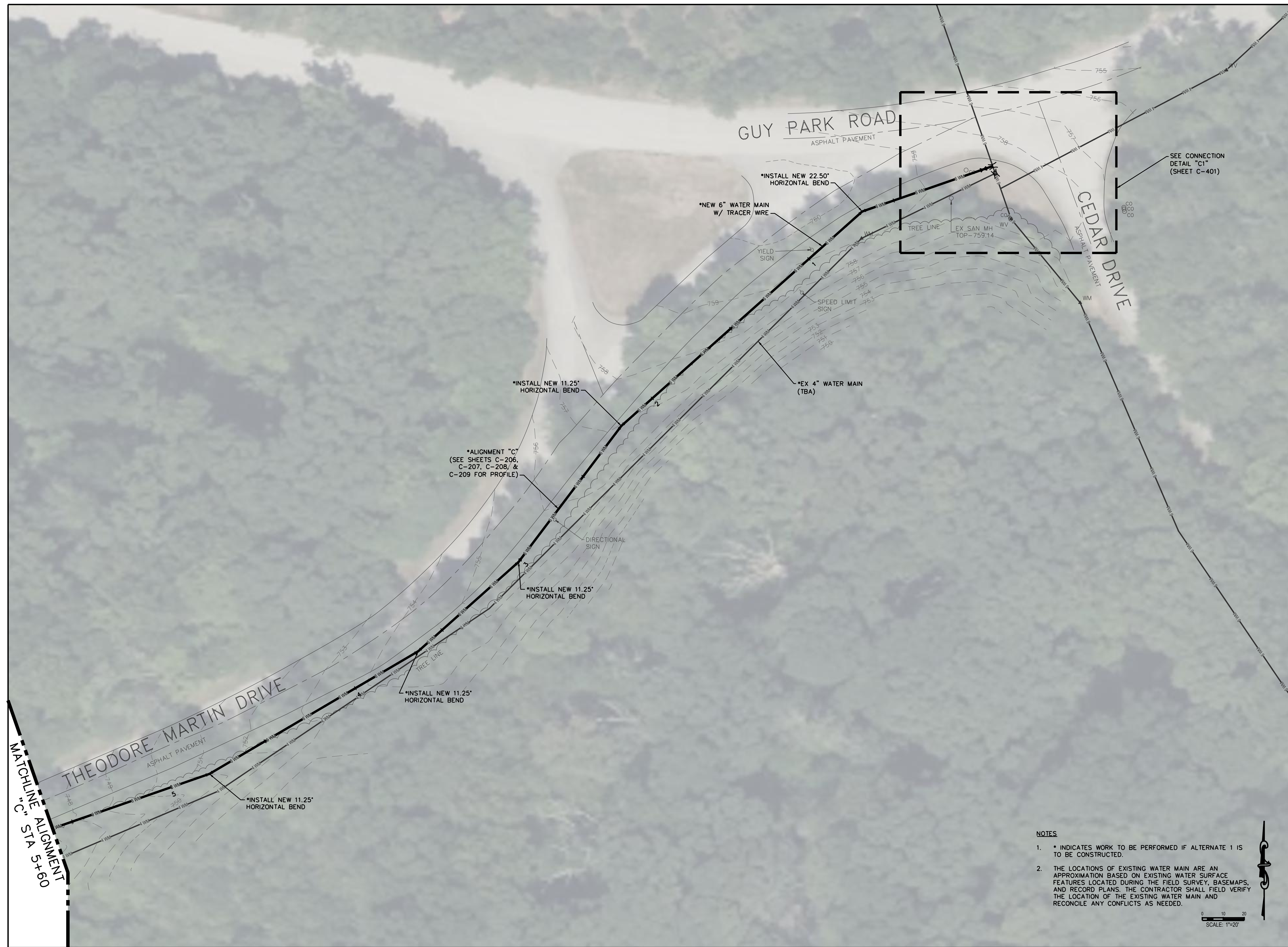
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CHECKED BY: WMK
DESIGNED BY: KDF

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SHEET NUMBER:

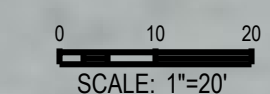
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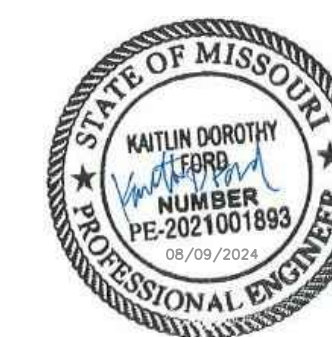
SHEET 15 OF 46
AUGUST 9, 2024



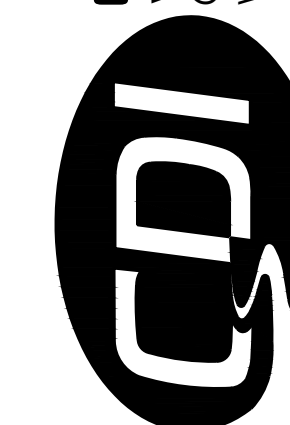
NOTES

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CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:

SITE PLAN

SHEET NUMBER:

C-114

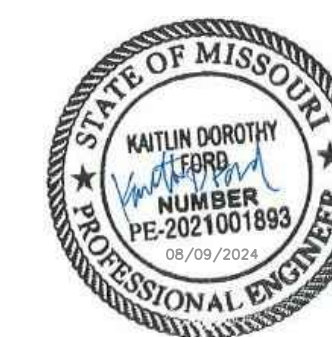
SHEET 16 OF 46
AUGUST 9, 2024



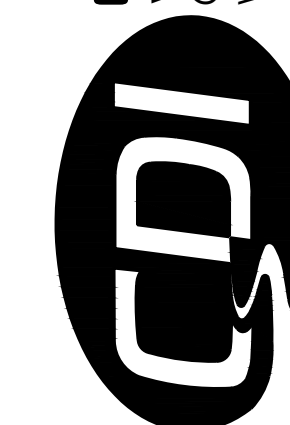
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SCALE: 1"=20'



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DRAWN BY: KDF
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DESIGNED BY: KDF

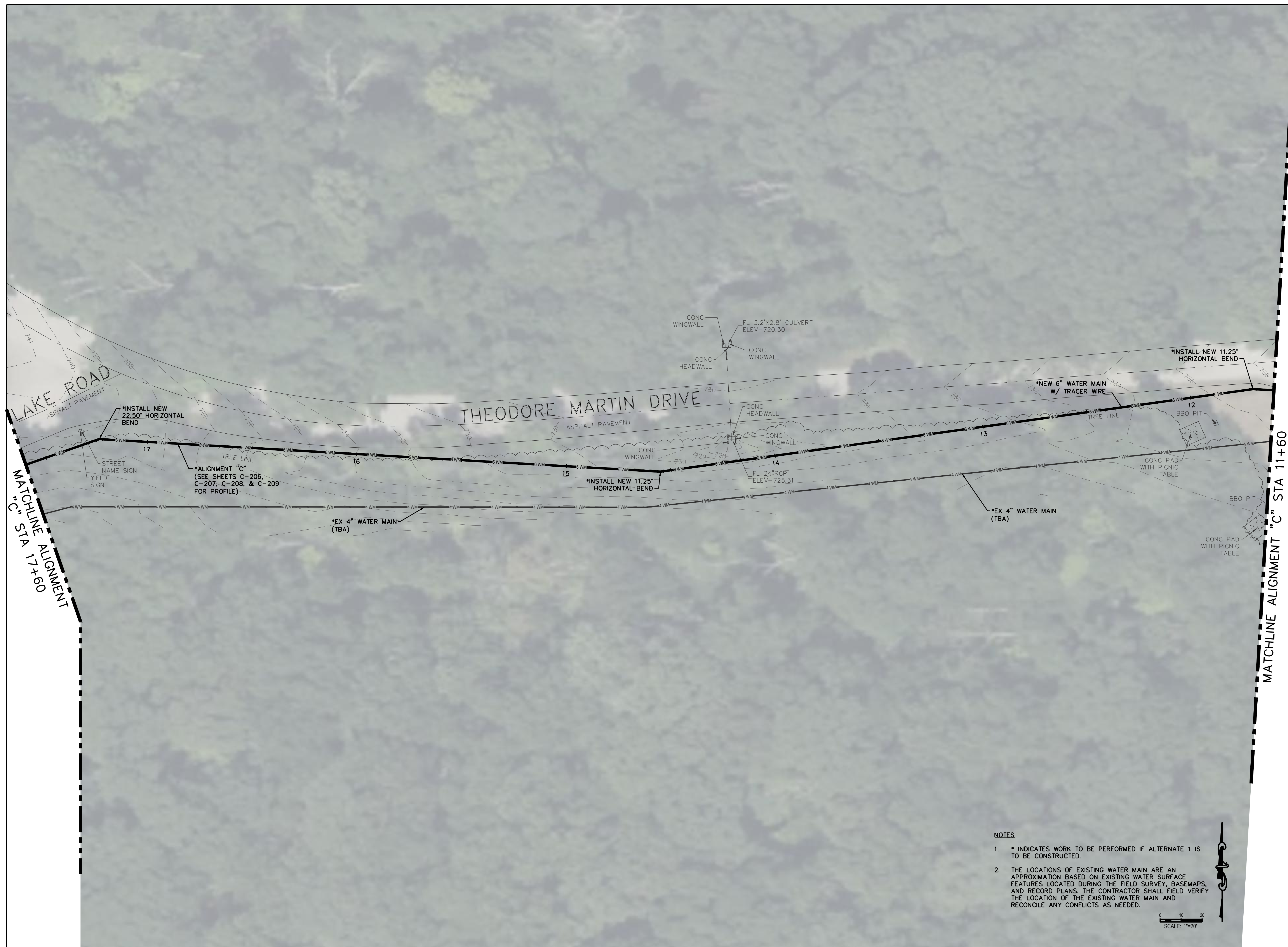
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SHEET NUMBER:

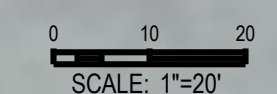
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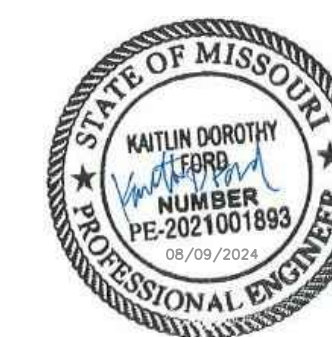
SHEET 17 OF 46
AUGUST 9, 2024



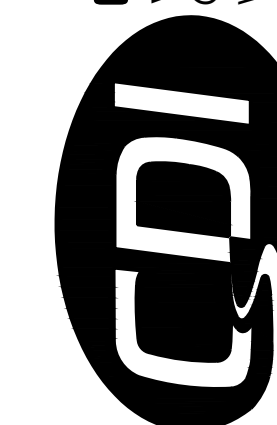
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CAD DWG FILE: X2301 SP C-100.dwg
DRAWN BY: KDF
CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:

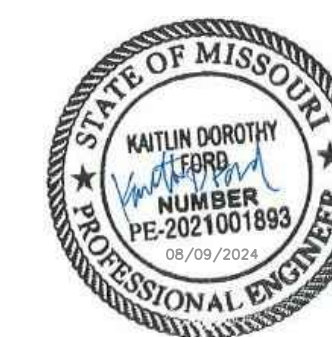
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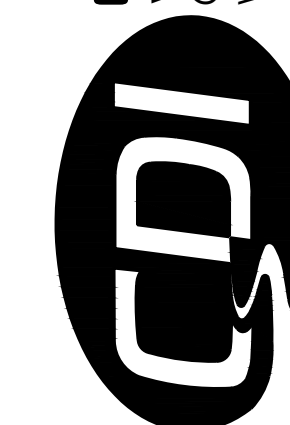
C-116

SHEET 18 OF 46
AUGUST 9, 2024





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CAD DWG FILE: X2301_SP_C-100.dwg
DRAWN BY: **KDF**
CHECKED BY: **WMK**
DESIGNED BY: **KDF**

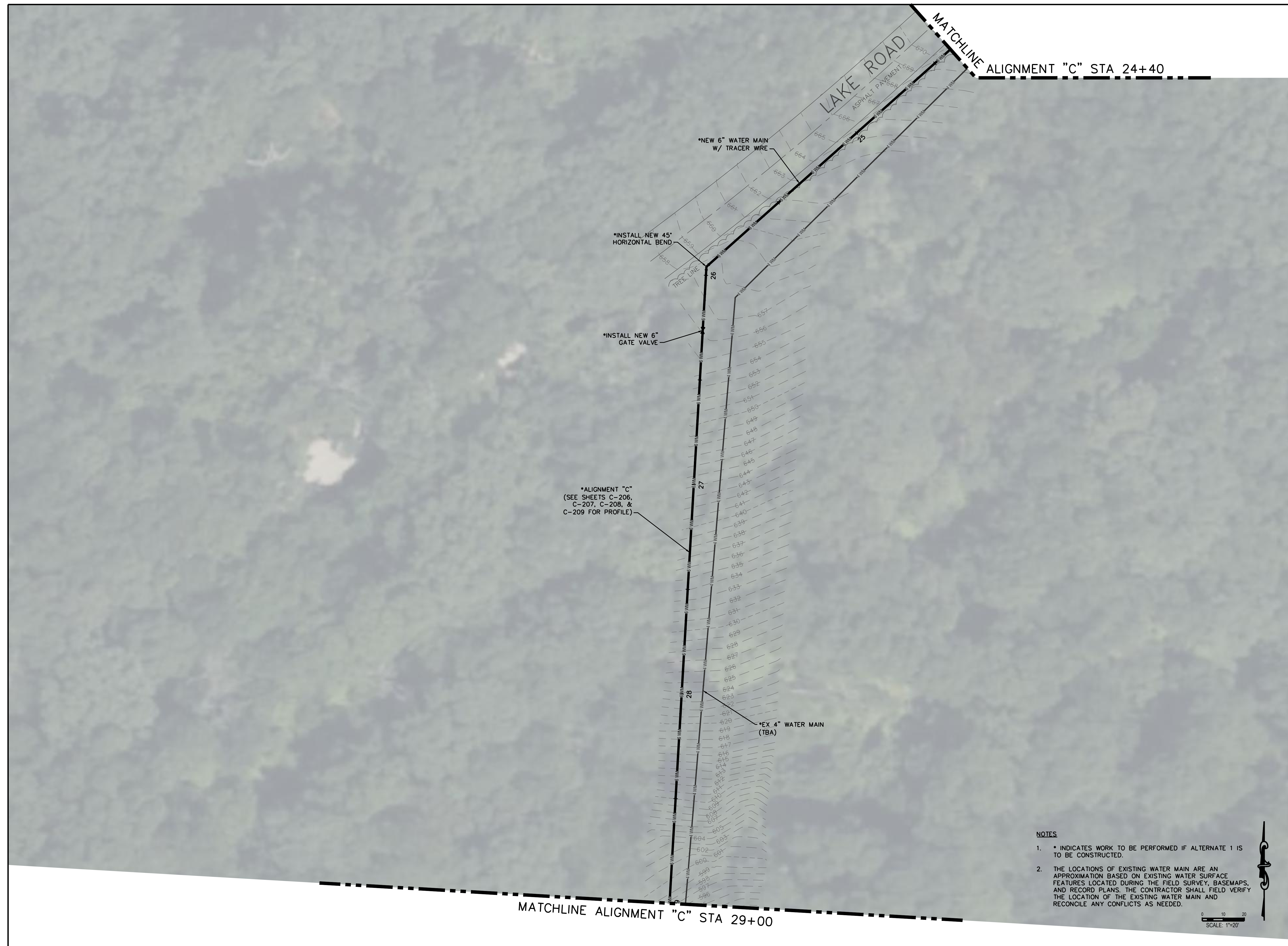
SHEET TITLE:

SITE PLAN

SHEET NUMBER:

C-117

SHEET 19 OF 46
AUGUST 9, 2024



*ALIGNMENT "C"
(SEE SHEETS C-206,
C-207, C-208, &
C-209 FOR PROFILE)

*INSTALL NEW 45°
HORIZONTAL BEND

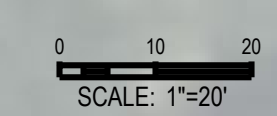
*INSTALL NEW 6"
GATE VALVE

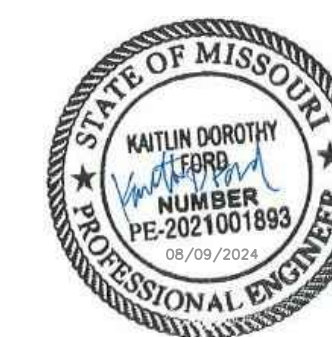
*NEW 6" WATER MAIN
W/ TRACER WIRE

*EX. 4" WATER MAIN
(TBA)

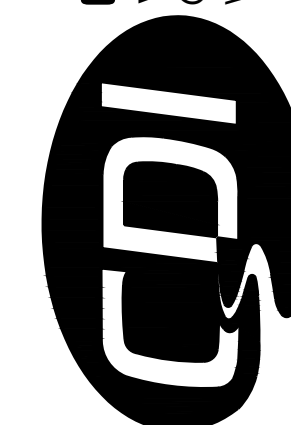
NOTES

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PROJECT # X2301-01
CDI PROJECT # 5917

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ASSET # 7815201059

REVISION: _____
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ISSUE DATE: _____

CAD DWG FILE: X2301 SP C-100.dwg
DRAWN BY: **KDF**
CHECKED BY: **WMK**
DESIGNED BY: **KDF**

SHEET TITLE:

SITE PLAN

SHEET NUMBER:

C-118

SHEET 20 OF 46
AUGUST 9, 2024

MATCHLINE ALIGNMENT "C" STA 29+00

*NEW 6" WATER MAIN W/ TRACER WIRE
*EX 4" WATER MAIN (TBA)

*ALIGNMENT "C"
(SEE SHEETS C-206,
C-207, C-208, &
C-209 FOR PROFILE)

SEE CONNECTION
DETAIL "C2"
(SHEET C-401)

EX FIRE HYDRANT
(TBR)

EX FIRE HYDRANT
(TBR)

EX 4" WATER MAIN
(TBA)

FL 72" CMP
ELEV=558.50

SEE CONNECTION
DETAIL "C3"
(SHEET C-401)

FL 72" CMP
ELEV=562.89

NOTES

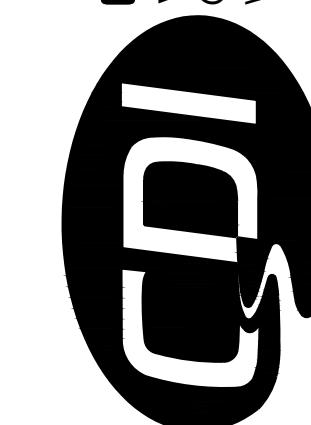
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0 10 20
SCALE: 1"=20'





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CAD DWG FILE: X2301_SP_C-100.dwg
DRAWN BY: **KDF**
CHECKED BY: **WMK**
DESIGNED BY: **KDF**

SHEET TITLE:

SITE PLAN

SHEET NUMBER:

C-119

SHEET 21 OF 46
AUGUST 9, 2024



NOTES

1. THE WELL SHALL BE DISCONNECTED FROM THE EXISTING WATER DISTRIBUTION SYSTEM AND SHALL BE ABANDONED AND CLOSED PER THE STANDARDS AND PRACTICES OF THE MISSOURI DEPARTMENT OF NATURAL RESOURCES. SEE PROJECT SPECIFICATIONS.
2. THE WELL HOUSE SHALL BE DECOMMISSIONED (ALTERNATE 2). THE PHYSICAL STRUCTURE OF THE WELL HOUSE STRUCTURE/BUILDING SHALL BE PROTECTED AND REMAIN IN PLACE.
3. THE LOCATIONS OF EXISTING WATER MAIN ARE AN APPROXIMATION BASED ON EXISTING WATER SURFACE FEATURES LOCATED DURING THE FIELD SURVEY, BASEMAPS, AND RECORD PLANS. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF THE EXISTING WATER MAIN AND RECONCILE ANY CONFLICTS AS NEEDED.

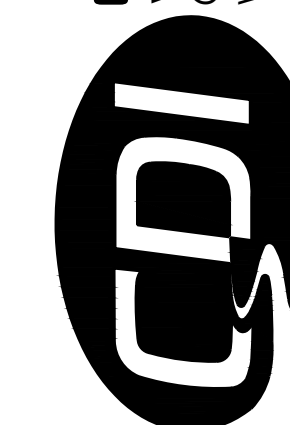
SEE CONNECTION
DETAIL "X4"
(SHEET C-401)

SEE CONNECTION
DETAIL "D1"
(SHEET C-402)



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DRAWN BY: **KDF**
CHECKED BY: **WMK**
DESIGNED BY: **KDF**

SHEET TITLE:

SITE PLAN

SHEET NUMBER:

C-120

SHEET 22 OF 46
AUGUST 9, 2024



NOTES

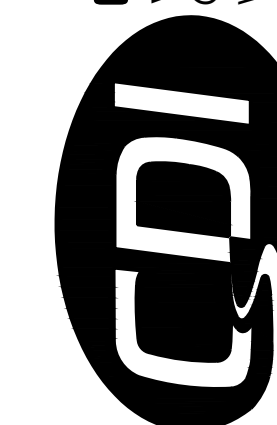
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DRAWN BY: **KDF**
CHECKED BY: **WMK**
DESIGNED BY: **KDF**

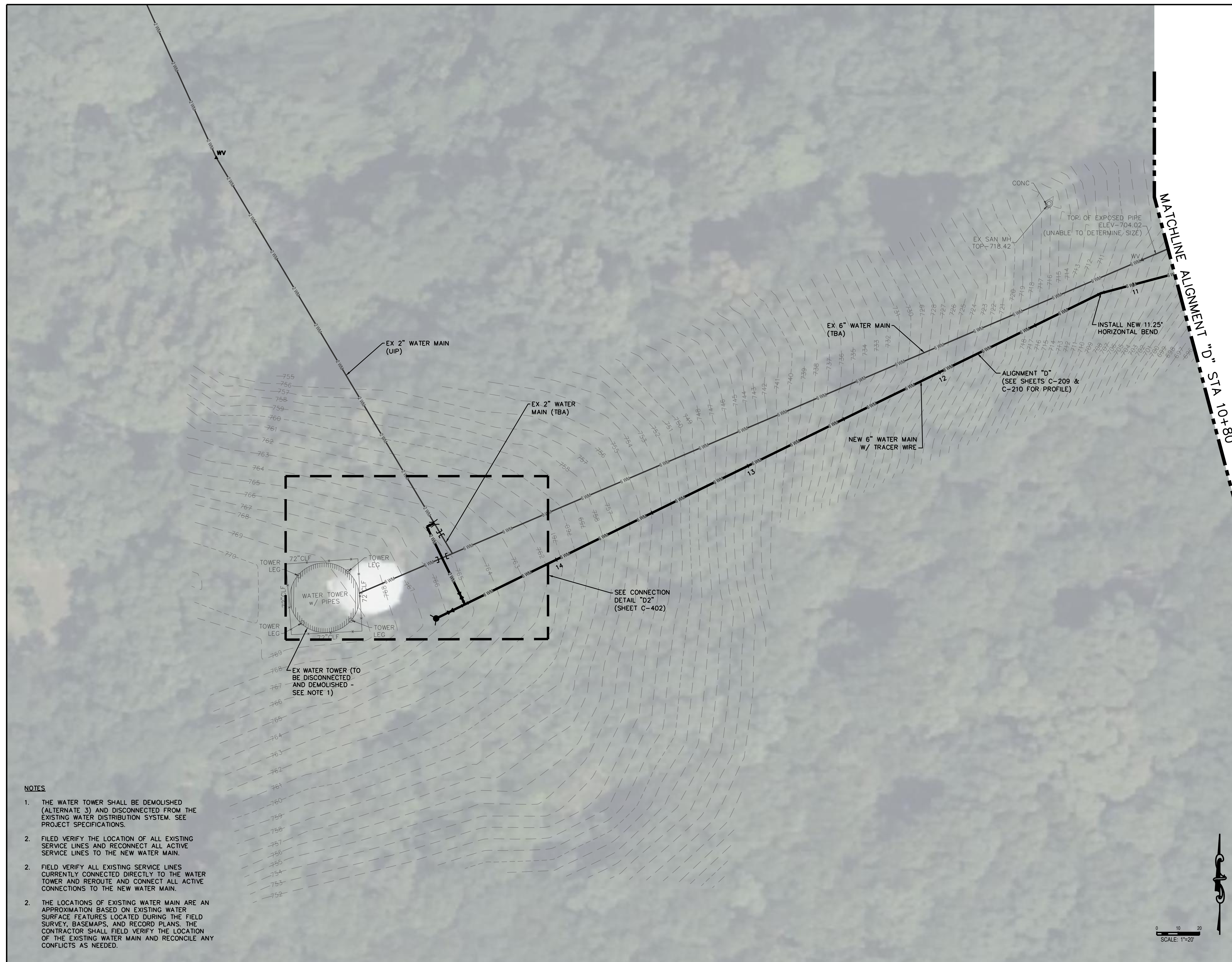
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SITE PLAN

SHEET NUMBER:

C-121

SHEET 23 OF 46
AUGUST 9, 2024



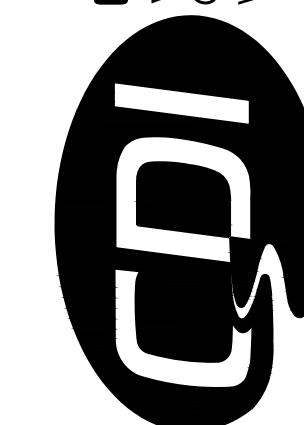
NOTES

1. THE WATER TOWER SHALL BE DEMOLISHED (ALTERNATE 3) AND DISCONNECTED FROM THE EXISTING WATER DISTRIBUTION SYSTEM. SEE PROJECT SPECIFICATIONS.
2. FILED VERIFY THE LOCATION OF ALL EXISTING SERVICE LINES AND RECONNECT ALL ACTIVE SERVICE LINES TO THE NEW WATER MAIN.
2. FIELD VERIFY ALL EXISTING SERVICE LINES CURRENTLY CONNECTED DIRECTLY TO THE WATER TOWER AND REROUTE AND CONNECT ALL ACTIVE CONNECTIONS TO THE NEW WATER MAIN.
2. THE LOCATIONS OF EXISTING WATER MAIN ARE AN APPROXIMATION BASED ON EXISTING WATER SURFACE FEATURES LOCATED DURING THE FIELD SURVEY, BASEMAPS, AND RECORD PLANS. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF THE EXISTING WATER MAIN AND RECONCILE ANY CONFLICTS AS NEEDED.

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DRAWN BY: KDF
CHECKED BY: WMK
DESIGNED BY: KDF

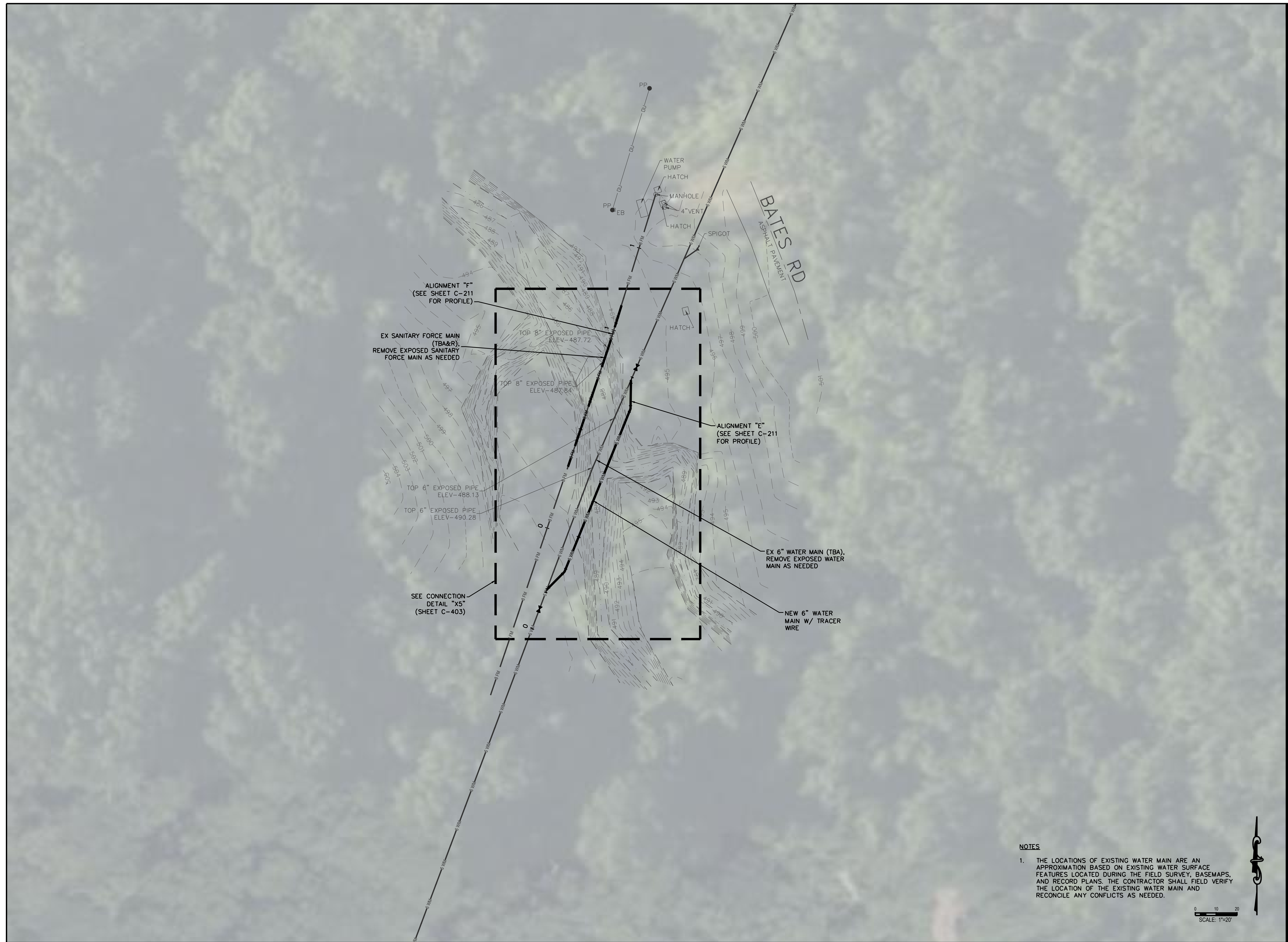
SHEET TITLE:

SITE PLAN

SHEET NUMBER:

C-122

SHEET 24 OF 46
AUGUST 9, 2024



NOTES

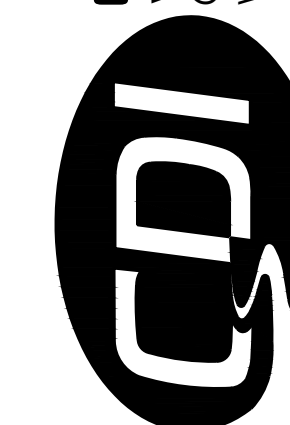
- THE LOCATIONS OF EXISTING WATER MAIN ARE AN APPROXIMATION BASED ON EXISTING WATER SURFACE FEATURES LOCATED DURING THE FIELD SURVEY, BASEMAPS, AND RECORD PLANS. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF THE EXISTING WATER MAIN AND RECONCILE ANY CONFLICTS AS NEEDED.

SCALE: 1"=20'





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WATER AND SEWER
IMPROVEMENTS

DR. EDMUND A. BABLER
MEMORIAL STATE PARK
800 GUY PARK DRIVE
WILDWOOD, MISSOURI 63005

PROJECT # X2301-01
CDI PROJECT # 5917

SITE # 5201
ASSET # 7815201059

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

CAD DWG FILE: X2301_SP_C-100.dwg
DRAWN BY: KDF
CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:

SITE PLAN

SHEET NUMBER:

C-123

SHEET 25 OF 46
AUGUST 9, 2024



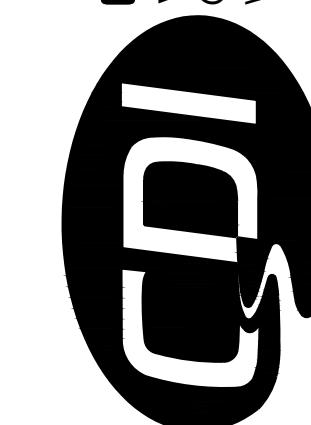
NOTES

1. THE LOCATIONS OF EXISTING WATER MAIN ARE AN APPROXIMATION BASED ON EXISTING WATER SURFACE FEATURES LOCATED DURING THE FIELD SURVEY, BASEMAPS, AND RECORD PLANS. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF THE EXISTING WATER MAIN AND RECONCILE ANY CONFLICTS AS NEEDED.

0 10 20
SCALE: 1"=20'



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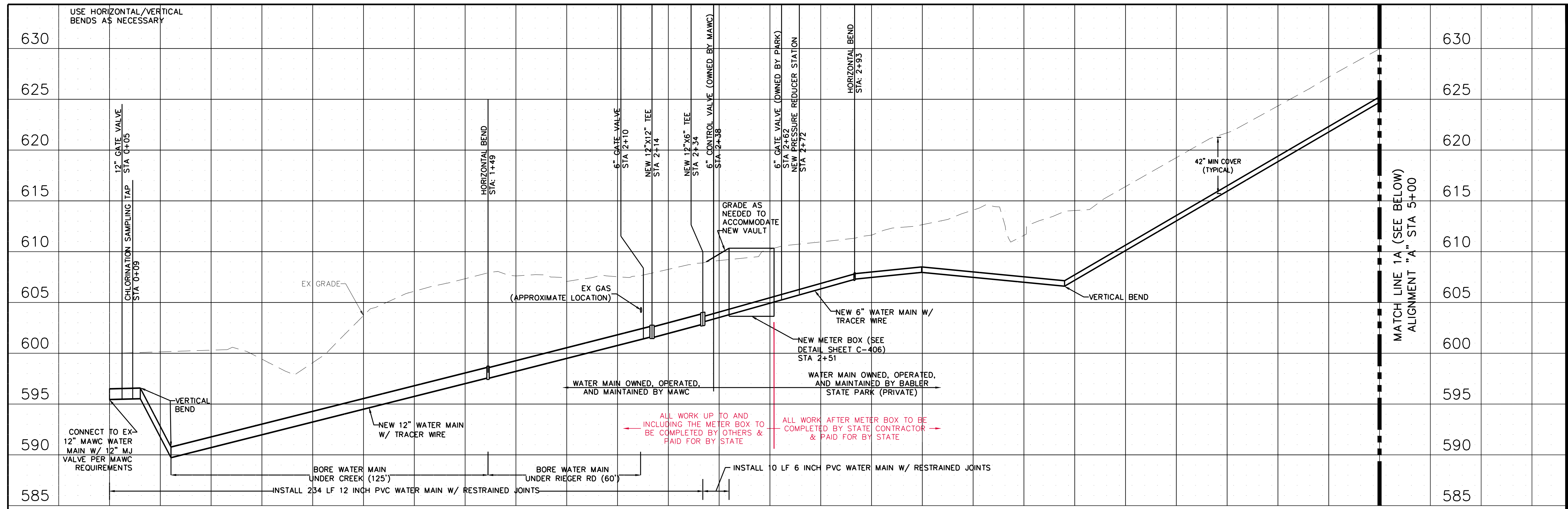
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CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:
**WATER MAIN
PROFILE**

SHEET NUMBER:

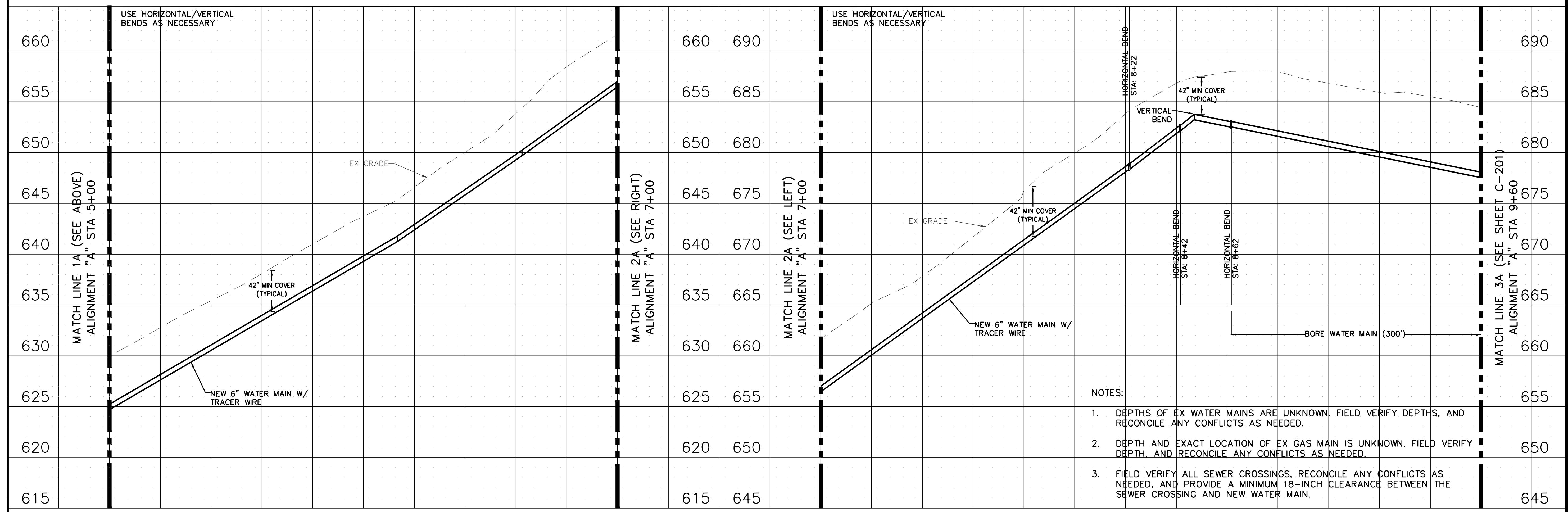
C-200

SHEET 26 OF 46
AUGUST 9, 2024



ALIGNMENT "A" (CONNECTION TO MISSOURI AMERICAN WATER)

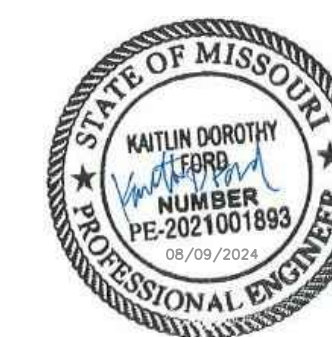
SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL



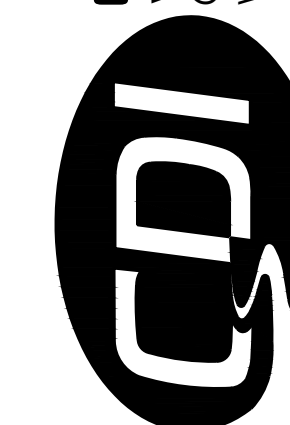
ALIGNMENT "A" (CONNECTION TO MISSOURI AMERICAN WATER)

SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL

- NOTES:
1. DEPTHS OF EX WATER MAINS ARE UNKNOWN. FIELD VERIFY DEPTHS, AND RECONCILE ANY CONFLICTS AS NEEDED.
 2. DEPTH AND EXACT LOCATION OF EX GAS MAIN IS UNKNOWN. FIELD VERIFY DEPTH, AND RECONCILE ANY CONFLICTS AS NEEDED.
 3. FIELD VERIFY ALL SEWER CROSSINGS, RECONCILE ANY CONFLICTS AS NEEDED, AND PROVIDE A MINIMUM 18-INCH CLEARANCE BETWEEN THE SEWER CROSSING AND NEW WATER MAIN.



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CDI PROJECT # 5917

SITE # 5201
ASSET # 7815201059

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

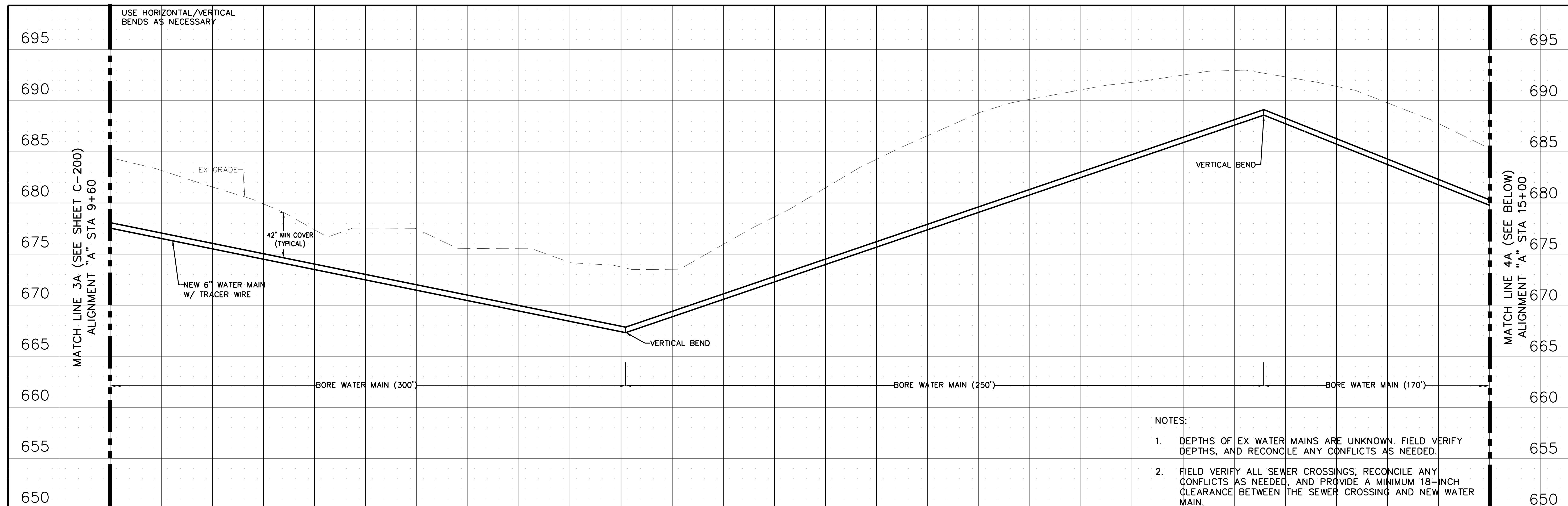
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DRAWN BY: KDF
CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:
**WATER MAIN
PROFILE**

SHEET NUMBER:

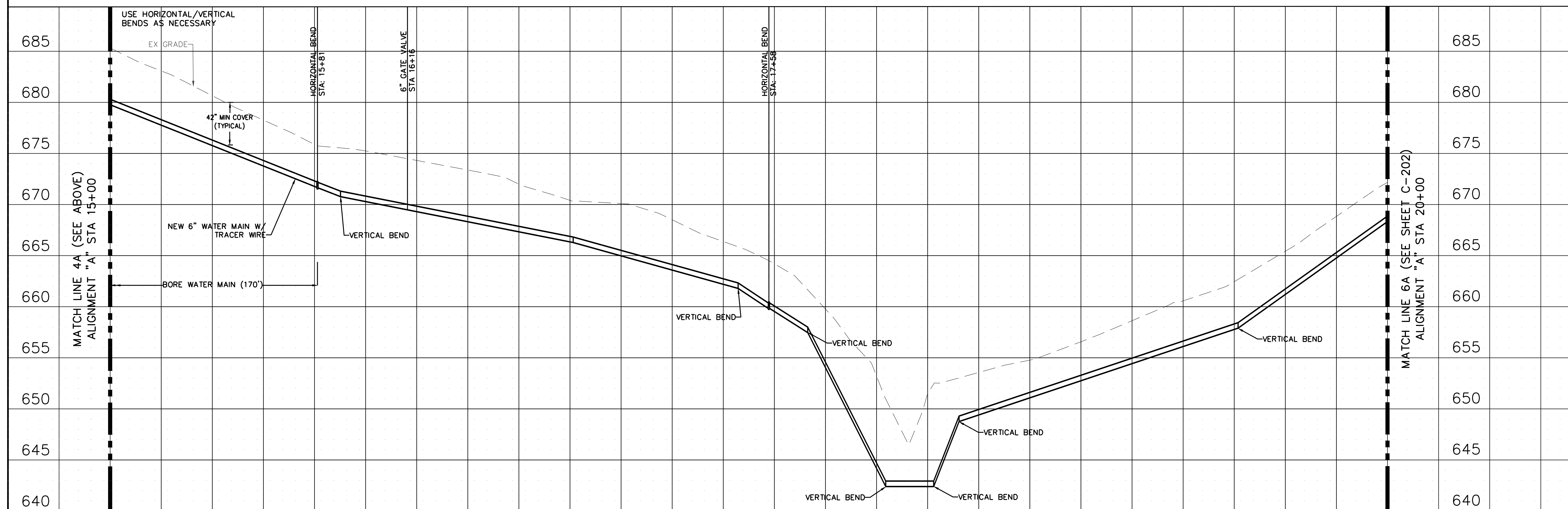
C-201

SHEET 27 OF 46
AUGUST 9, 2024

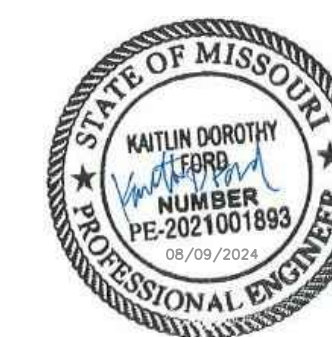


- NOTES:
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 2. FIELD VERIFY ALL SEWER CROSSINGS, RECONCILE ANY CONFLICTS AS NEEDED, AND PROVIDE A MINIMUM 18-INCH CLEARANCE BETWEEN THE SEWER CROSSING AND NEW WATER MAIN.

10+00 11+00 12+00 13+00 14+00 15+00
ALIGNMENT "A" (CONNECTION TO MISSOURI AMERICAN WATER)
SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL



15+00 16+00 17+00 18+00 19+00 20+00
ALIGNMENT "A" (CONNECTION TO MISSOURI AMERICAN WATER)
SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL



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DATE: _____
ISSUE DATE: _____

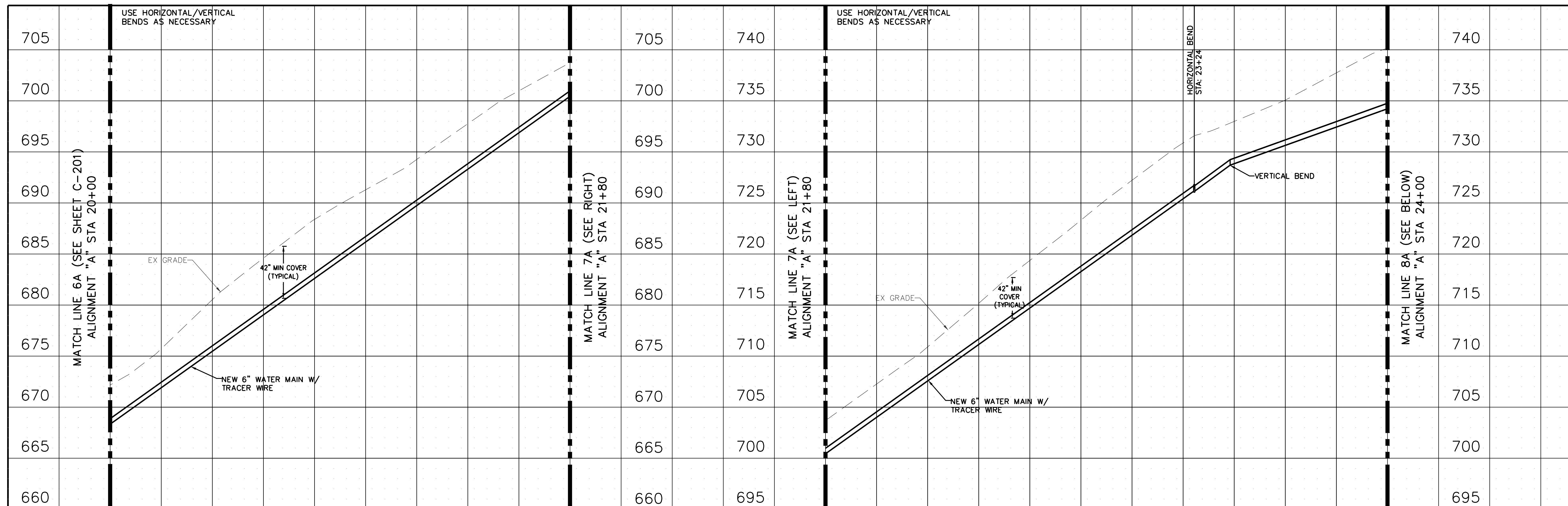
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CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:
**WATER MAIN
PROFILE**

SHEET NUMBER:

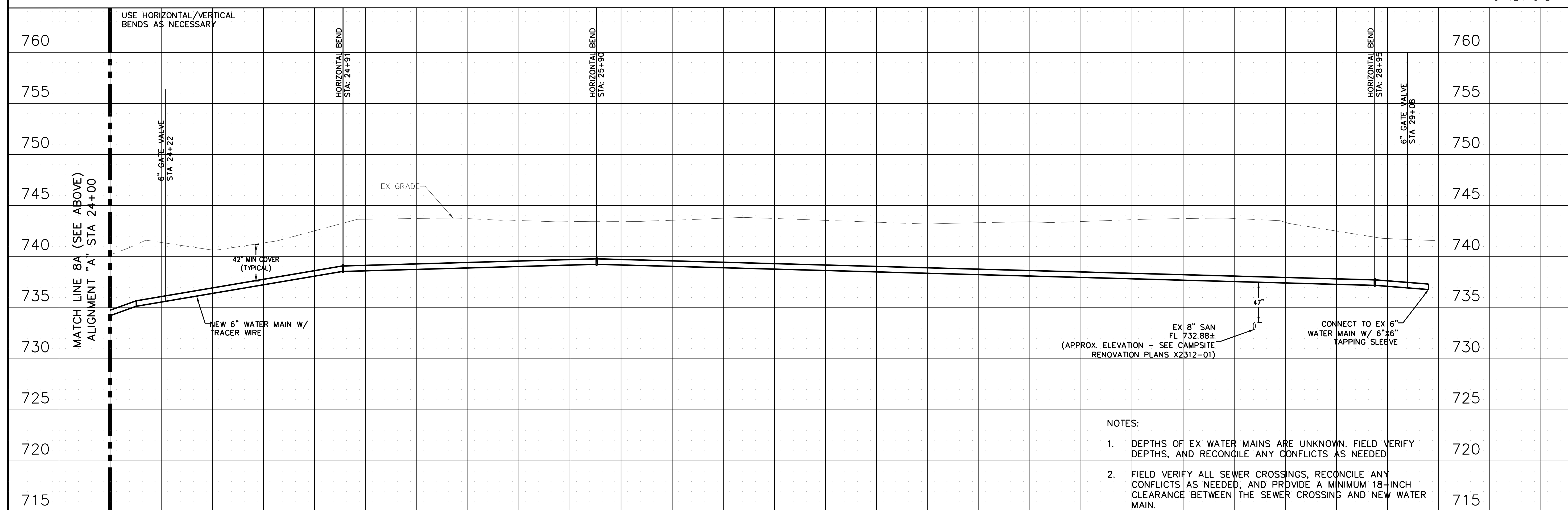
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SHEET 28 OF 46
AUGUST 9, 2024



20+00 21+00 22+00 23+00 24+00
ALIGNMENT "A" (CONNECTION TO MISSOURI AMERICAN WATER)

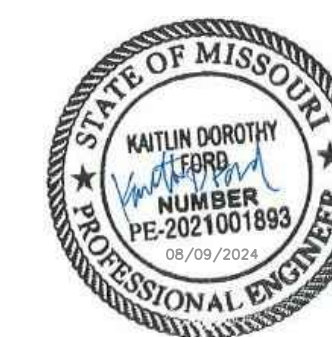
SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL



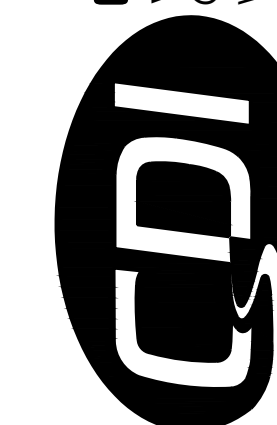
24+00 25+00 26+00 27+00 28+00 29+00
ALIGNMENT "A" (CONNECTION TO MISSOURI AMERICAN WATER)

SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL

- NOTES:
1. DEPTHS OF EX WATER MAINS ARE UNKNOWN. FIELD VERIFY DEPTHS, AND RECONCILE ANY CONFLICTS AS NEEDED.
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PROJECT # X2301-01
CDI PROJECT # 5917

SITE # 5201
ASSET # 7815201059

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

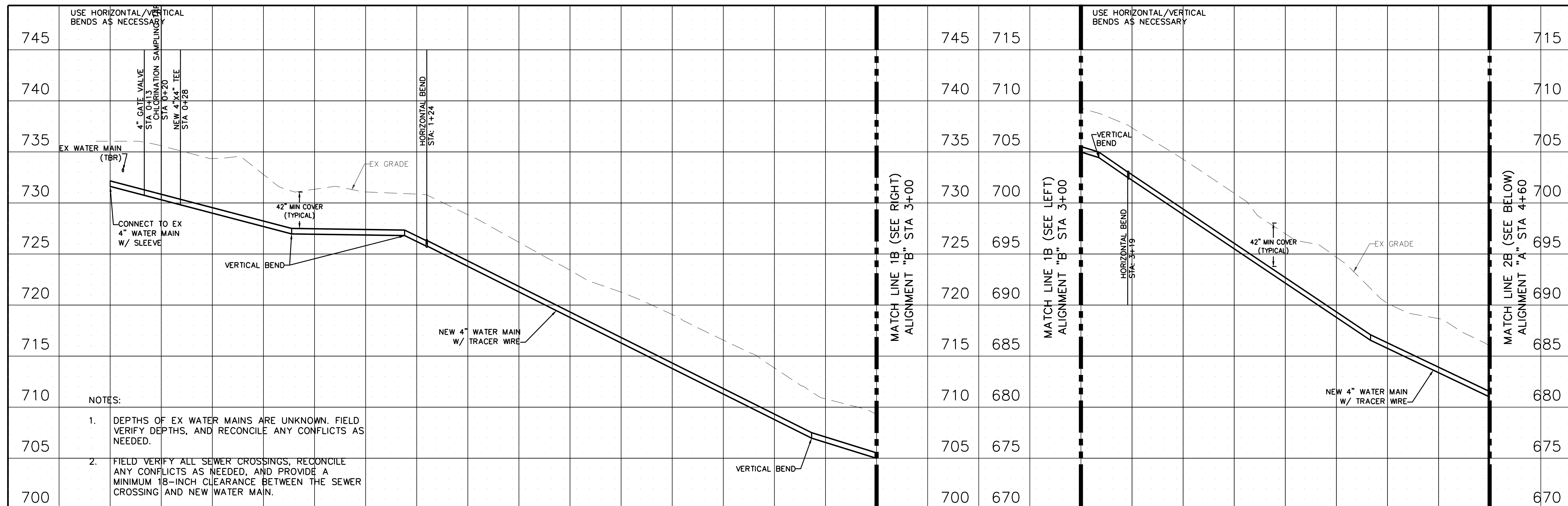
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CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:
**WATER MAIN
PROFILE**

SHEET NUMBER:

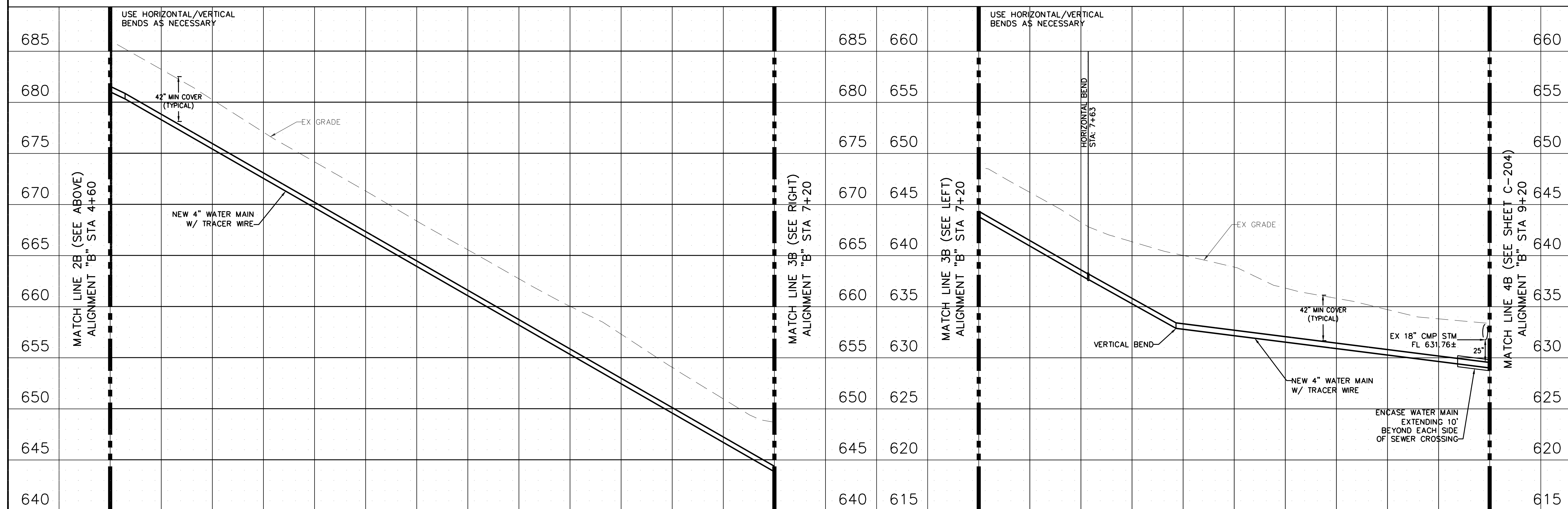
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SHEET 29 OF 46
AUGUST 9, 2024



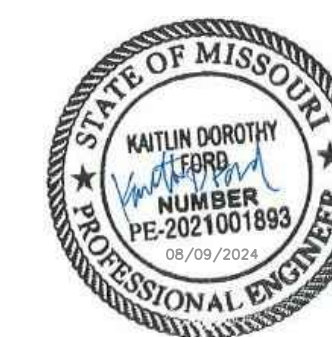
ALIGNMENT "B" (NEW CONNECTION LOOP ALONG JOHN COCHRAN DR)

SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL



ALIGNMENT "B" (NEW CONNECTION LOOP ALONG JOHN COCHRAN DR)

SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL



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PROJECT # X2301-01
CDI PROJECT # 5917

SITE # 5201
ASSET # 7815201059

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

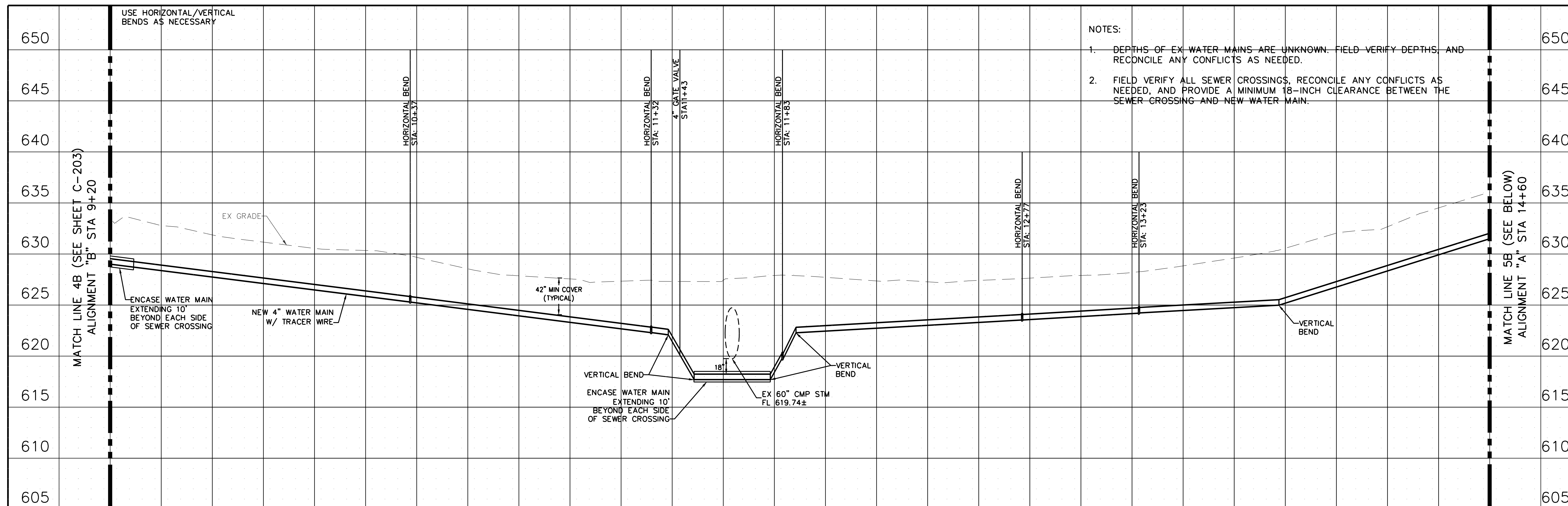
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DRAWN BY: KDF
CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:
**WATER MAIN
PROFILE**

SHEET NUMBER:

C-204

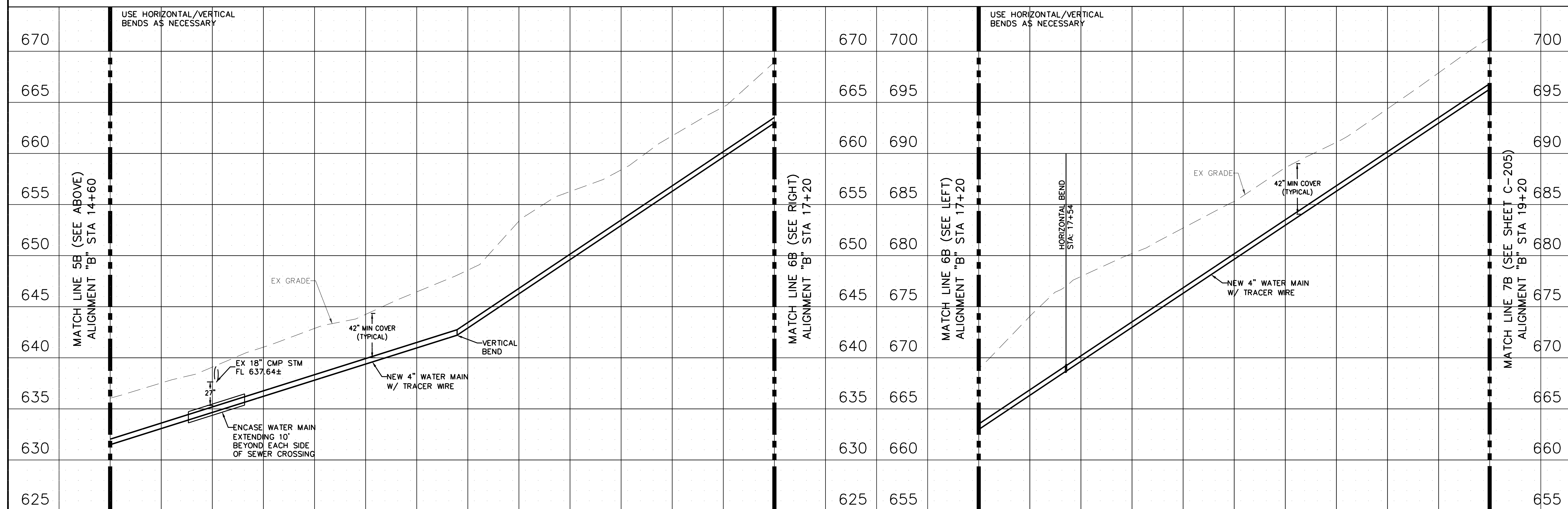
SHEET 30 OF 46
AUGUST 9, 2024



- NOTES:
1. DEPTHS OF EX WATER MAINS ARE UNKNOWN. FIELD VERIFY DEPTHS, AND RECONCILE ANY CONFLICTS AS NEEDED.
 2. FIELD VERIFY ALL SEWER CROSSINGS, RECONCILE ANY CONFLICTS AS NEEDED, AND PROVIDE A MINIMUM 18-INCH CLEARANCE BETWEEN THE SEWER CROSSING AND NEW WATER MAIN.

ALIGNMENT "B" (NEW CONNECTION LOOP ALONG JOHN COCHRAN DR)

SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL

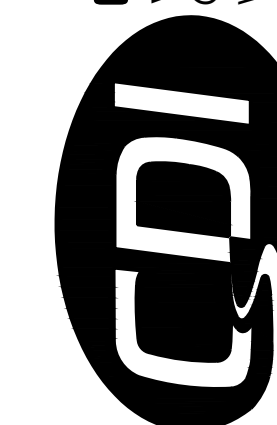


ALIGNMENT "B" (NEW CONNECTION LOOP ALONG JOHN COCHRAN DR)

SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL



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PROJECT # X2301-01
CDI PROJECT # 5917

SITE # 5201
ASSET # 7815201059

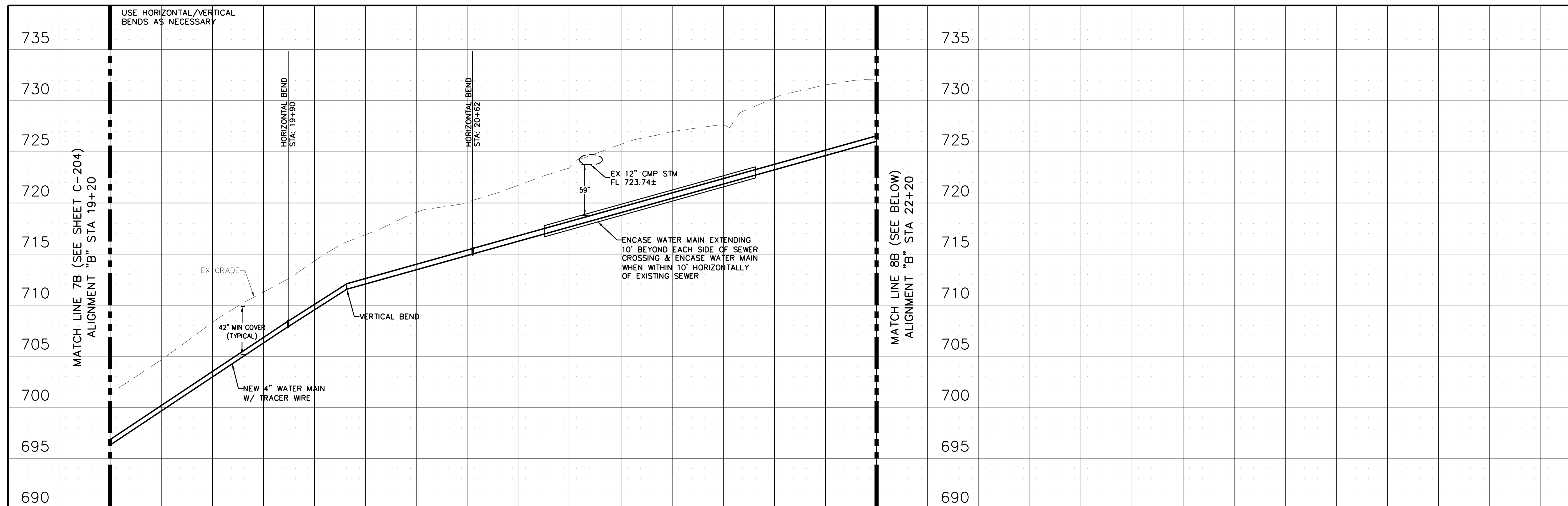
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DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: _____

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DRAWN BY: KDF
CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:
**WATER MAIN
PROFILE**

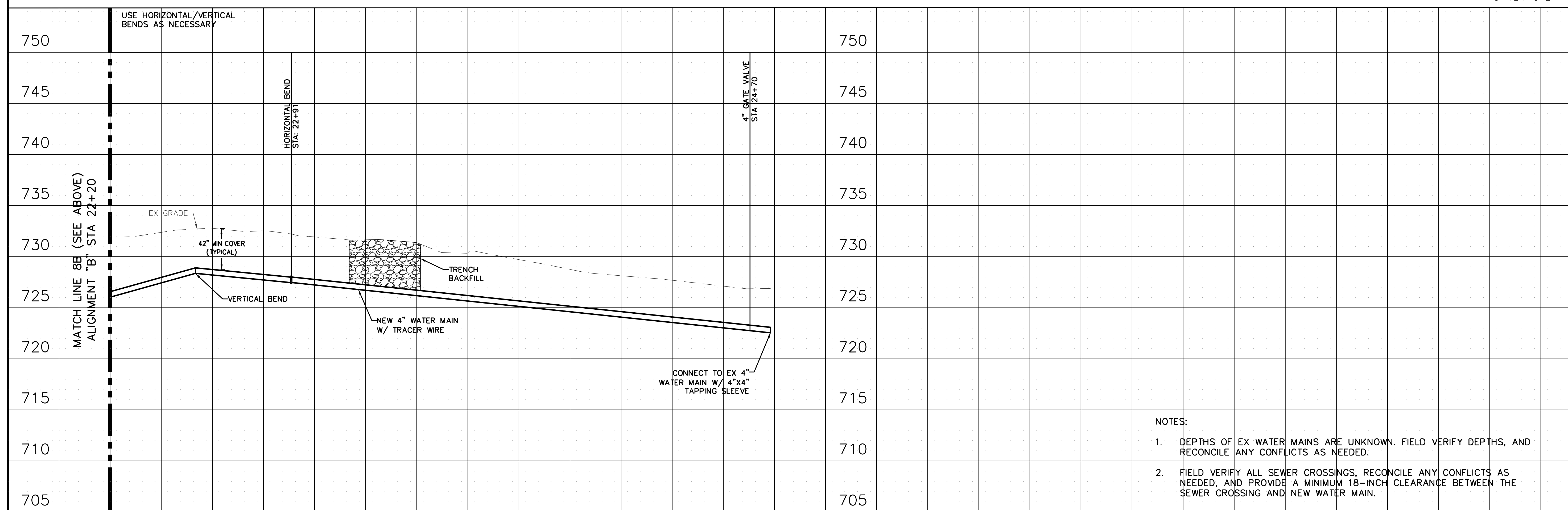
SHEET NUMBER:

C-205
SHEET 31 OF 46
AUGUST 9, 2024



ALIGNMENT "B" (NEW CONNECTION LOOP ALONG JOHN COCHRAN DR)

SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL

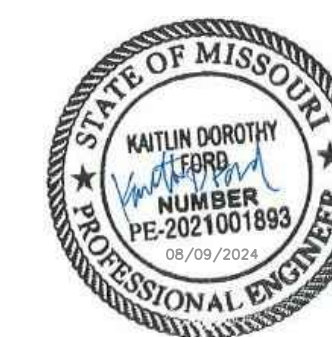


ALIGNMENT "B" (NEW CONNECTION LOOP ALONG JOHN COCHRAN DR)

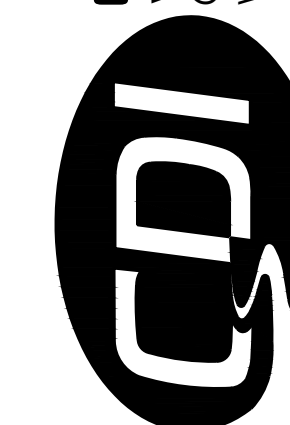
SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL

NOTES:

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PROJECT # X2301-01
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SITE # 5201
ASSET # 7815201059

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

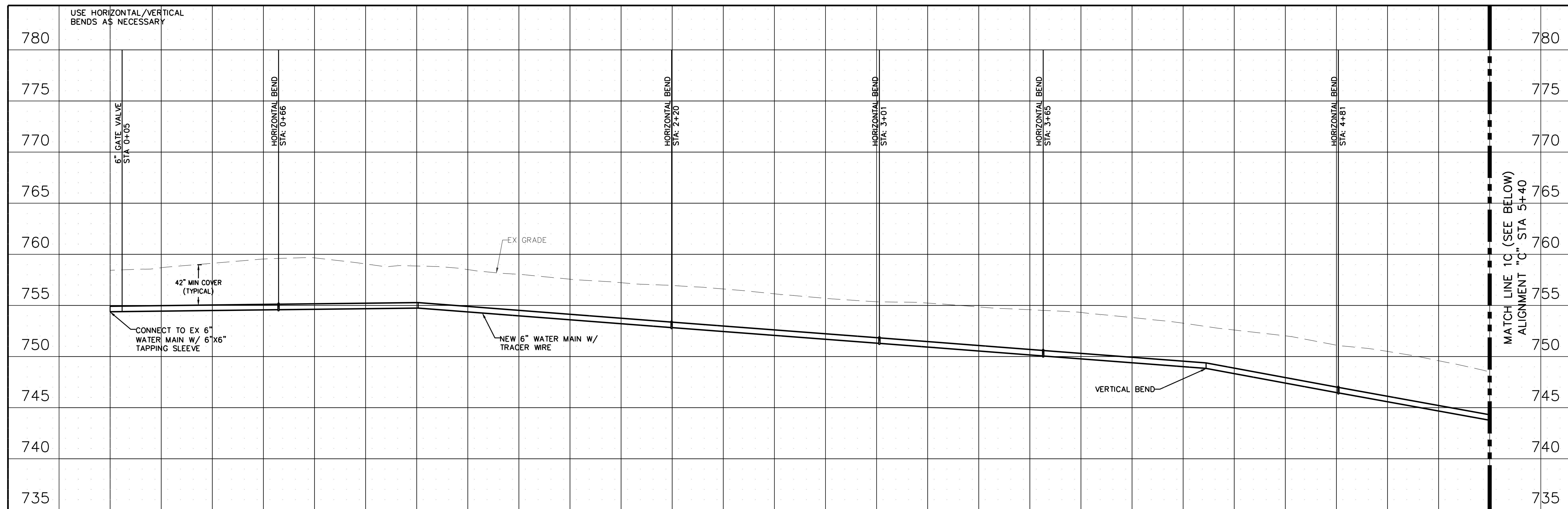
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DRAWN BY: KDF
CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:
**WATER MAIN
PROFILE**

SHEET NUMBER:

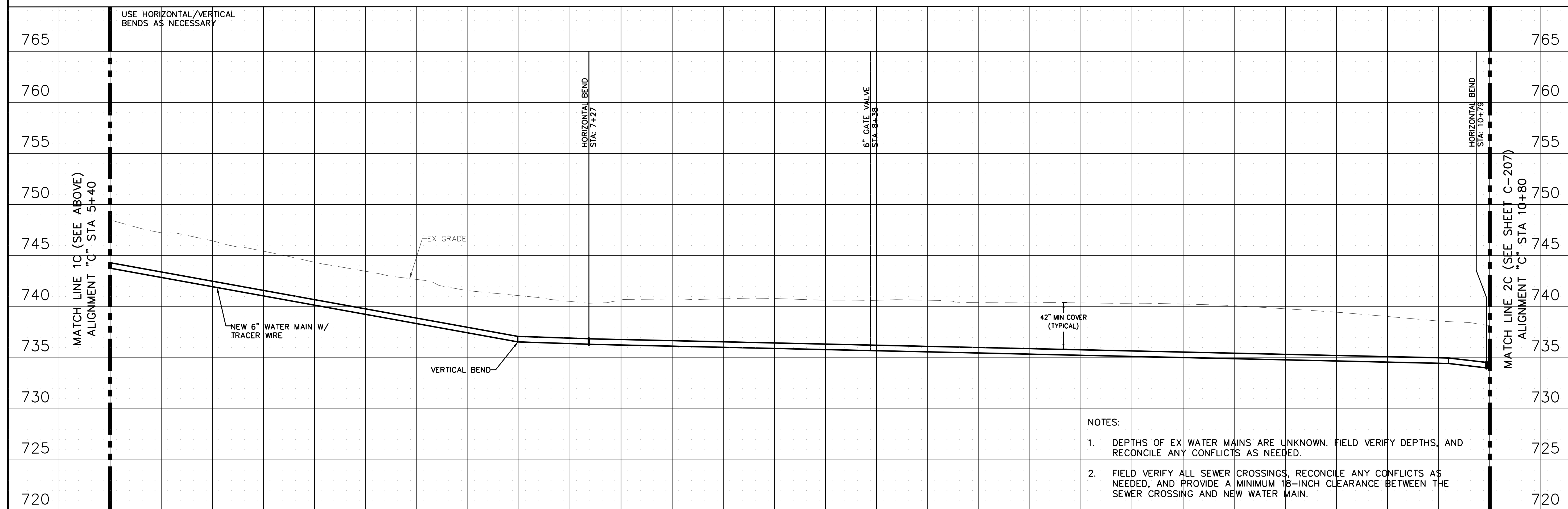
C-206

SHEET 32 OF 46
AUGUST 9, 2024



ALIGNMENT "C" (CONNECTION TO VALVE AT LOW POINT IN PARK)

SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL

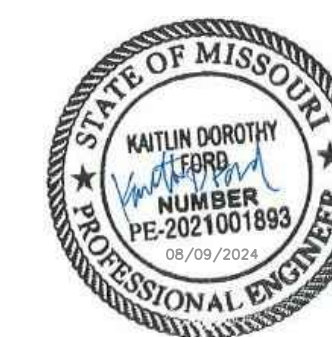


ALIGNMENT "C" (CONNECTION TO VALVE AT LOW POINT IN PARK)

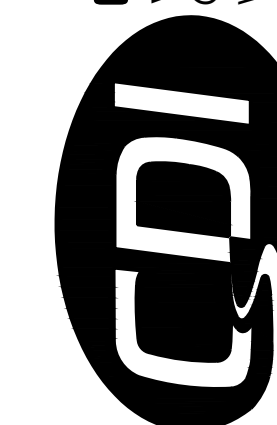
SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL

NOTES:

1. DEPTHS OF EX. WATER MAINS ARE UNKNOWN. FIELD VERIFY DEPTHS, AND RECONCILE ANY CONFLICTS AS NEEDED.
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ASSET # 7815201059

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ISSUE DATE: _____

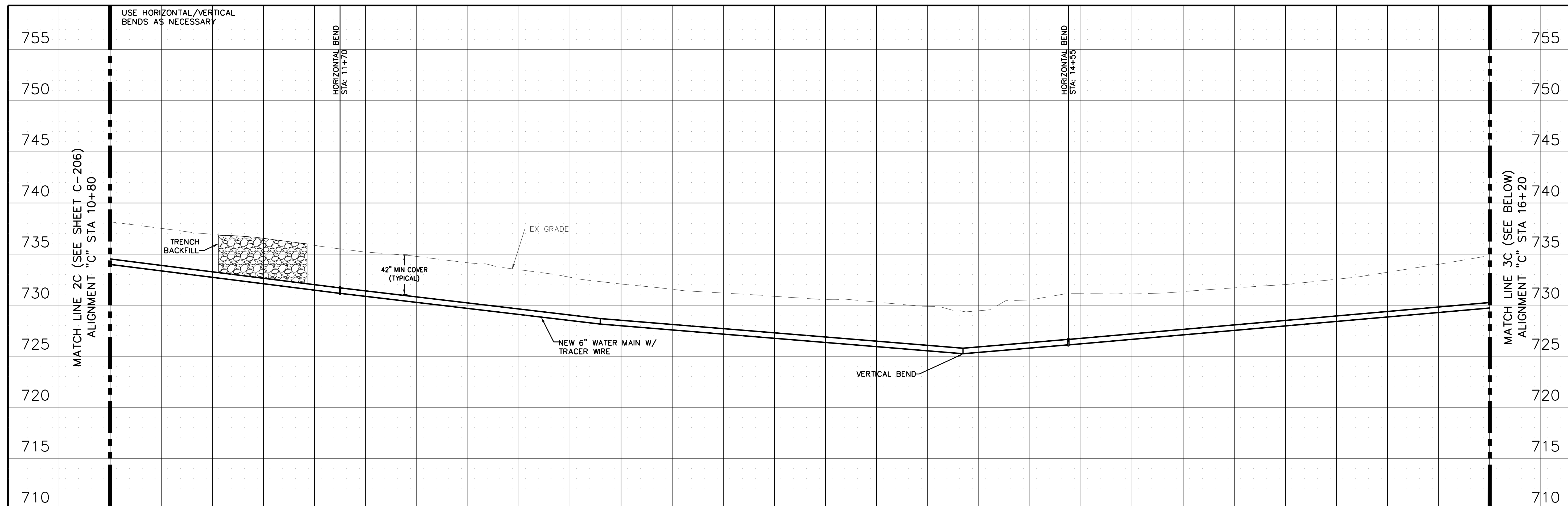
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DRAWN BY: KDF
CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:
**WATER MAIN
PROFILE**

SHEET NUMBER:

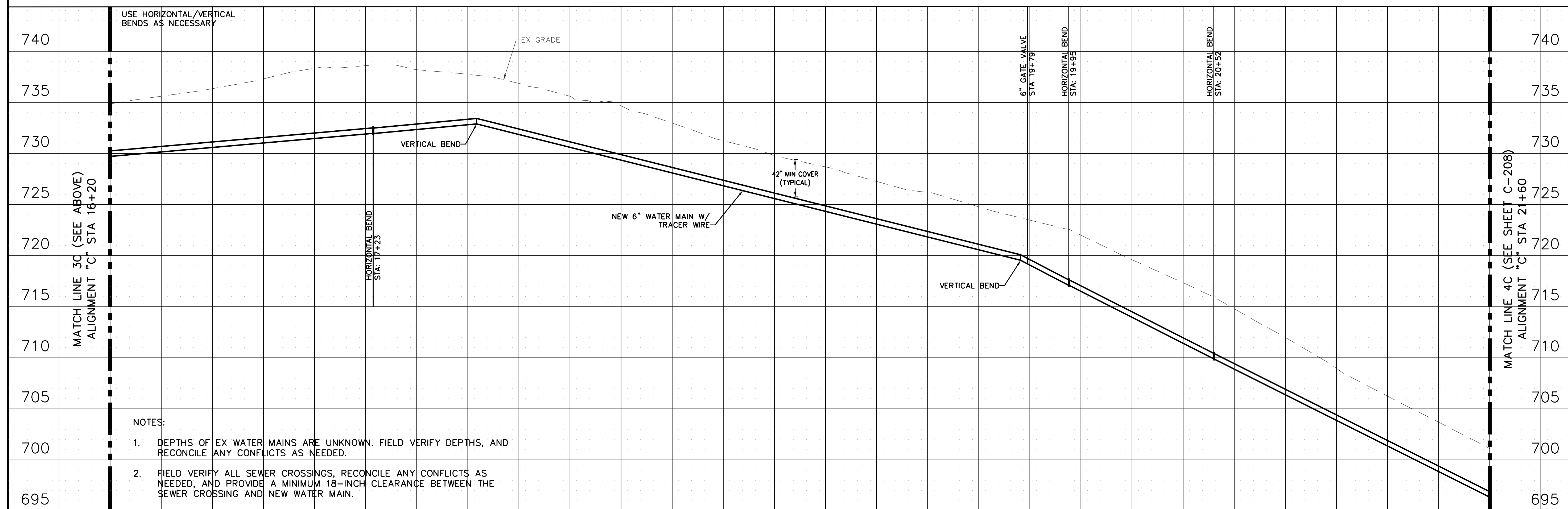
C-207

SHEET 33 OF 46
AUGUST 9, 2024



11+00 12+00 13+00 14+00 15+00 16+00
ALIGNMENT "C" (CONNECTION TO VALVE AT LOW POINT IN PARK)

SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL



17+00 18+00 19+00 20+00 21+00
ALIGNMENT "C" (CONNECTION TO VALVE AT LOW POINT IN PARK)

SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL

USE HORIZONTAL/VERTICAL
BENDS AS NECESSARY

TRENCH
BACKFILL

HORIZONTAL BEND
STA. 11+70

42" MIN COVER
(TYPICAL)

EX. GRADE

NEW 6" WATER MAIN W/
TRACER WIRE

VERTICAL BEND

HORIZONTAL BEND
STA. 14+55

MATCH LINE 3C (SEE BELOW)
ALIGNMENT "C" STA 16+20

MATCH LINE 2C (SEE SHEET C-206)
ALIGNMENT "C" STA 10+80

MATCH LINE 3C (SEE ABOVE)
ALIGNMENT "C" STA 16+20

MATCH LINE 4C (SEE SHEET C-208)
ALIGNMENT "C" STA 21+60

NOTES:

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HORIZONTAL BEND
STA. 17+23

VERTICAL BEND

NEW 6" WATER MAIN W/
TRACER WIRE

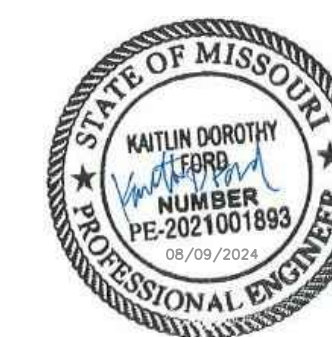
42" MIN COVER
(TYPICAL)

VERTICAL BEND

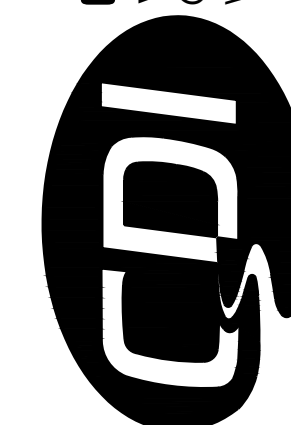
6" GATE VALVE
STA. 19+79

HORIZONTAL BEND
STA. 19+95

HORIZONTAL BEND
STA. 20+52



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PROJECT # X2301-01
CDI PROJECT # 5917

SITE # 5201
ASSET # 7815201059

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

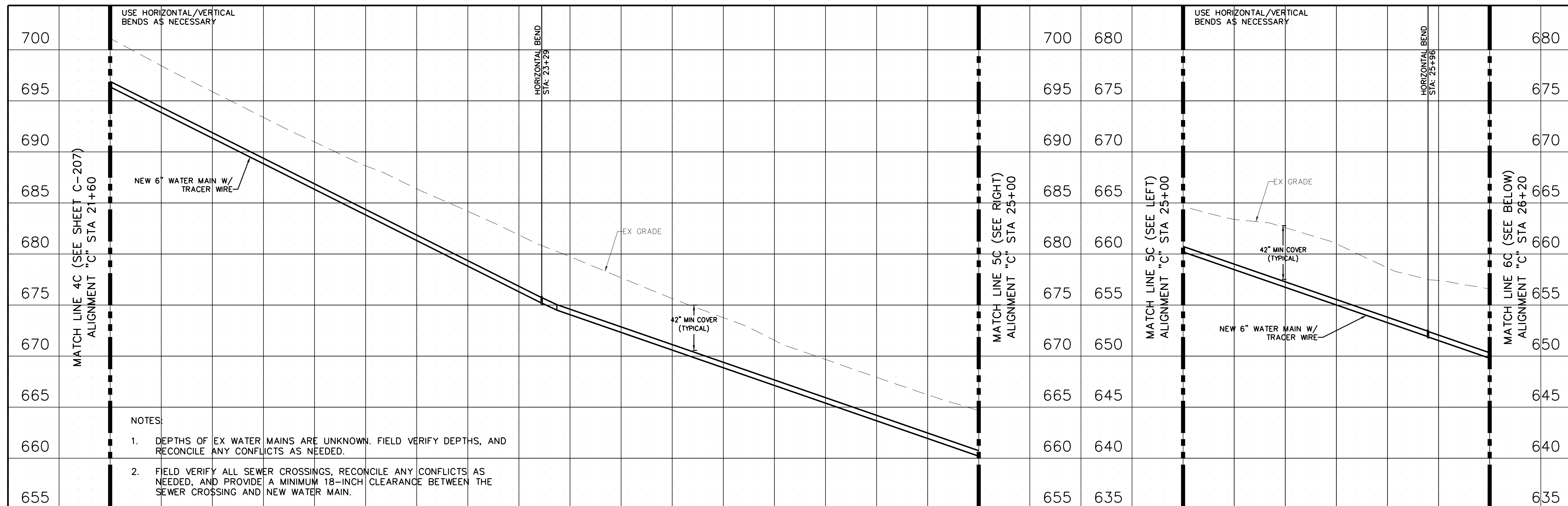
CAD DWG FILE: X2301_EL_C-200.dwg
DRAWN BY: KDF
CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:
**WATER MAIN
PROFILE**

SHEET NUMBER:

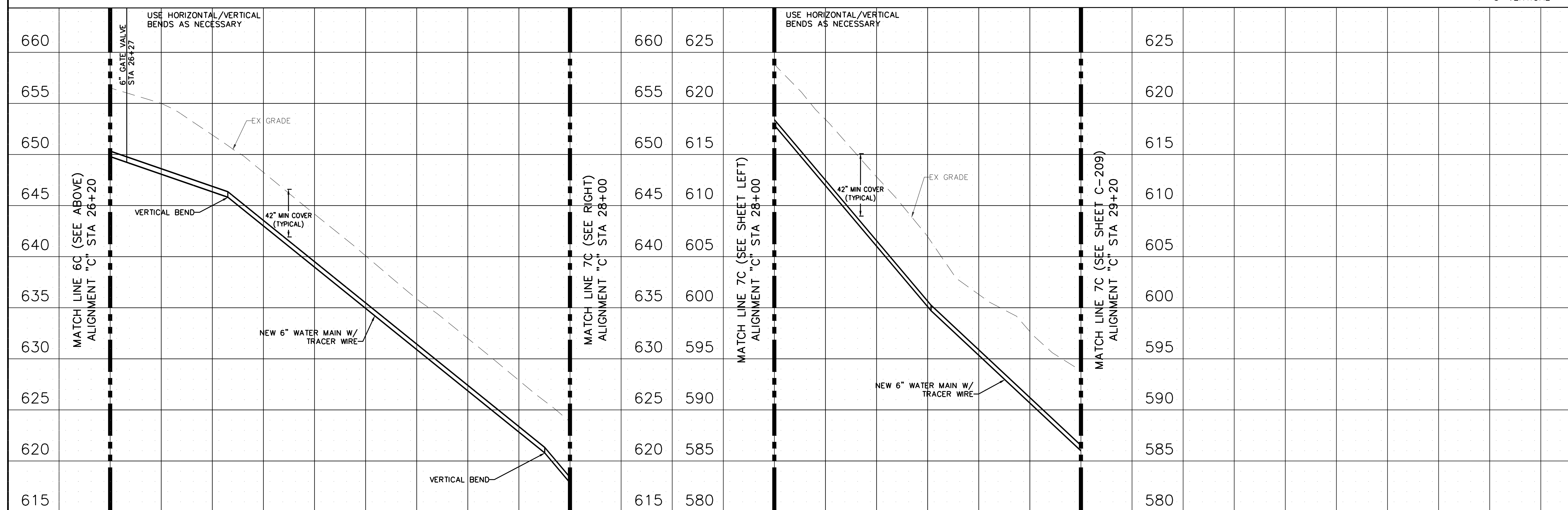
C-208

SHEET 34 OF 46
AUGUST 9, 2024



22+00 23+00 24+00 25+00 26+00
ALIGNMENT "C" (CONNECTION TO VALVE AT LOW POINT IN PARK)

SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL



27+00 28+00 28+00 29+00
ALIGNMENT "C" (CONNECTION TO VALVE AT LOW POINT IN PARK)

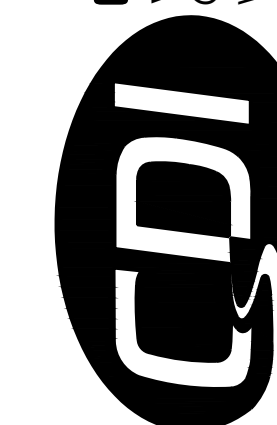
SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL

NOTES:

1. DEPTHS OF EX WATER MAINS ARE UNKNOWN. FIELD VERIFY DEPTHS, AND RECONCILE ANY CONFLICTS AS NEEDED.
2. FIELD VERIFY ALL SEWER CROSSINGS, RECONCILE ANY CONFLICTS AS NEEDED, AND PROVIDE A MINIMUM 18-INCH CLEARANCE BETWEEN THE SEWER CROSSING AND NEW WATER MAIN.



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WATER AND SEWER
IMPROVEMENTS

DR. EDMUND A. BABLER
MEMORIAL STATE PARK
800 GUY PARK DRIVE
WILDWOOD, MISSOURI 63005

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CDI PROJECT # 5917

SITE # 5201
ASSET # 7815201059

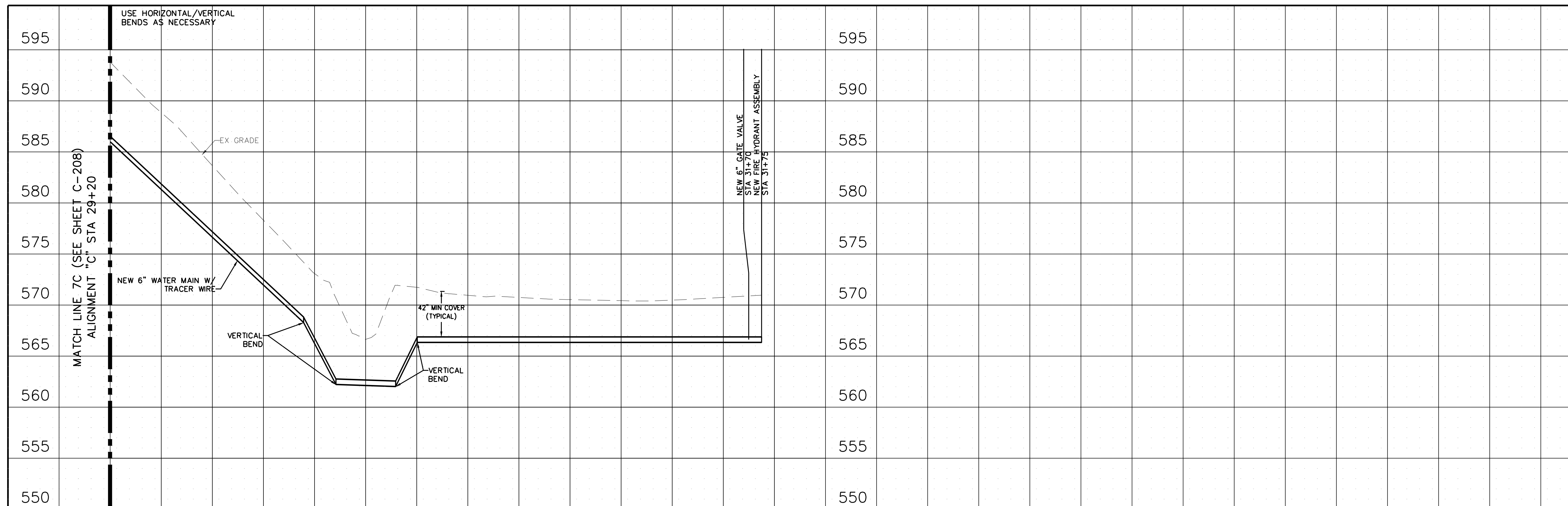
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DATE: _____
ISSUE DATE: _____

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DESIGNED BY: KDF

SHEET TITLE:
**WATER MAIN
PROFILE**

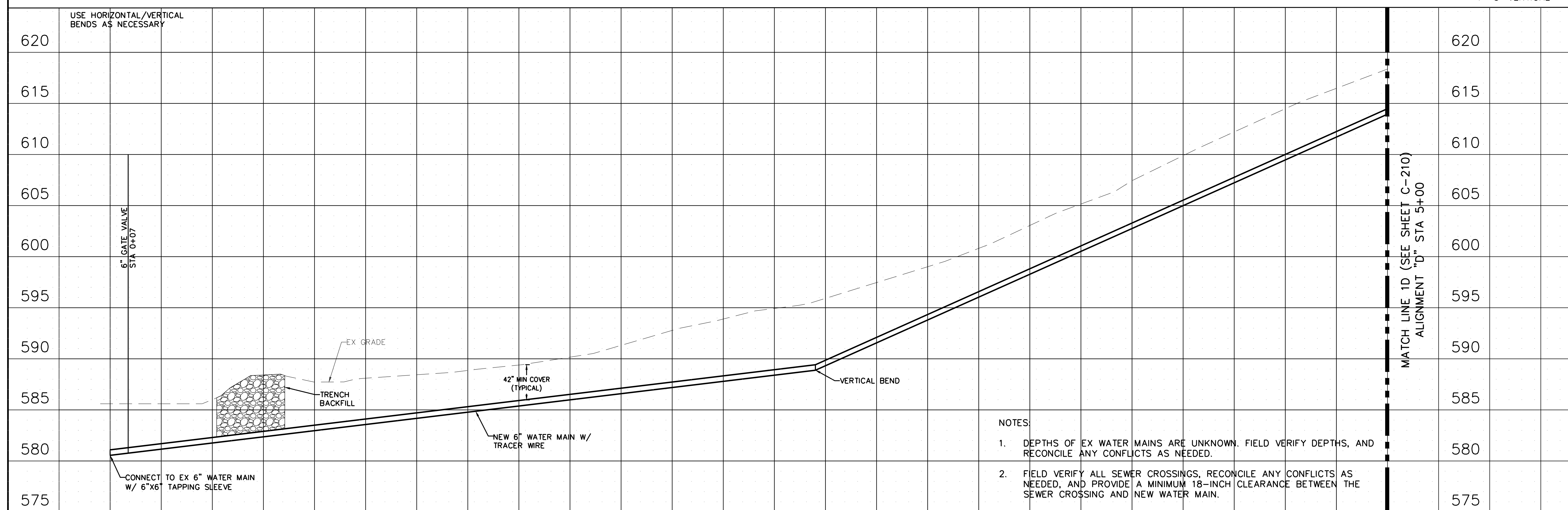
SHEET NUMBER:

C-209
SHEET 35 OF 46
AUGUST 9, 2024



ALIGNMENT "C" (CONNECTION TO VALVE AT LOW POINT IN PARK)

SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL



ALIGNMENT "D" (CONNECTION TO WATER TOWER)

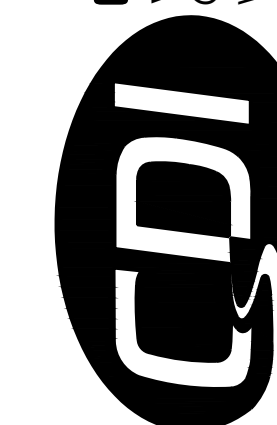
SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL

NOTES:

1. DEPTHS OF EX WATER MAINS ARE UNKNOWN. FIELD VERIFY DEPTHS, AND RECONCILE ANY CONFLICTS AS NEEDED.
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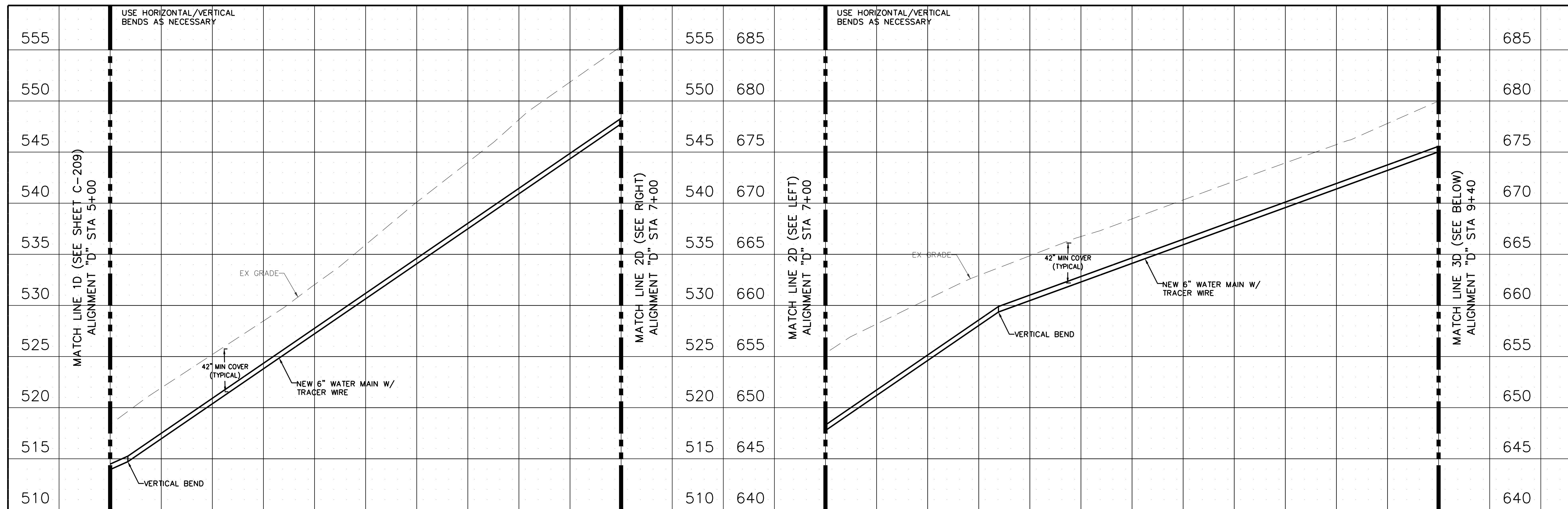
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SHEET TITLE:
**WATER MAIN
PROFILE**

SHEET NUMBER:

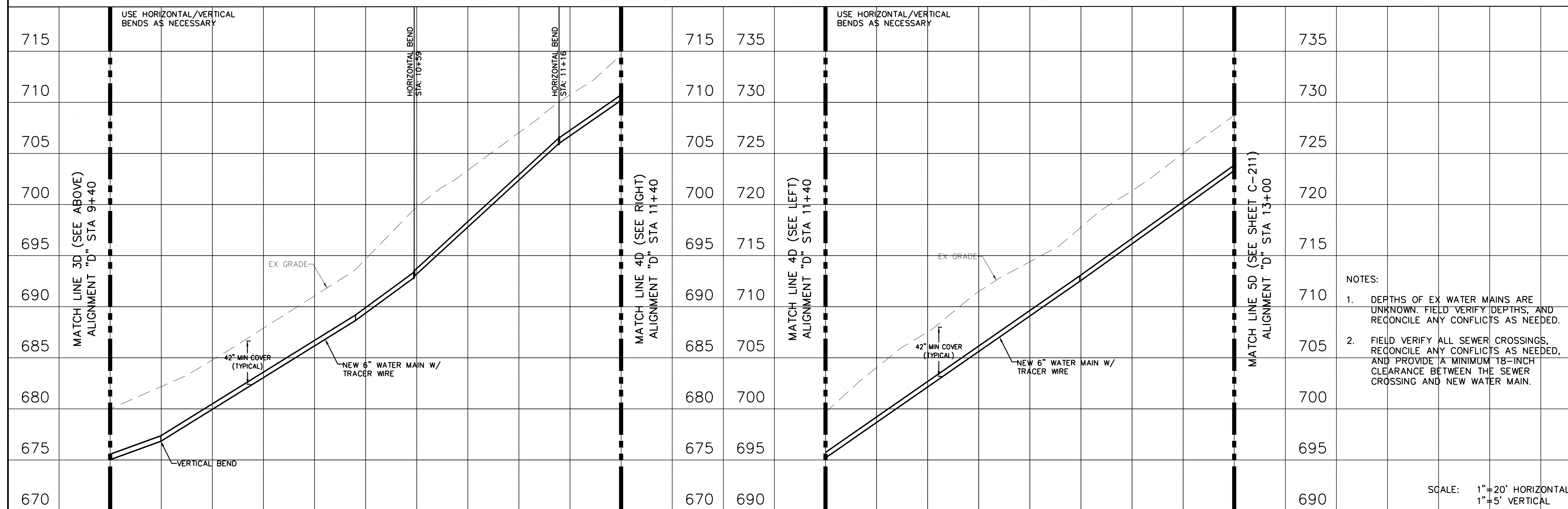
C-210

SHEET 36 OF 46
AUGUST 9, 2024



ALIGNMENT "D" (CONNECTION TO WATER TOWER)

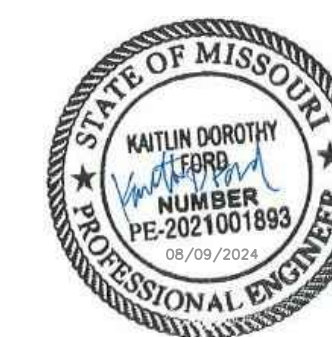
SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL



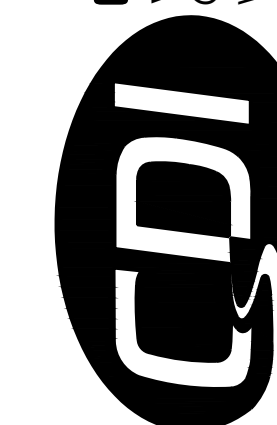
ALIGNMENT "D" (CONNECTION TO WATER TOWER)

SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL

- NOTES:
1. DEPTHS OF EX WATER MAINS ARE UNKNOWN. FIELD VERIFY DEPTHS, AND RECONCILE ANY CONFLICTS AS NEEDED.
 2. FIELD VERIFY ALL SEWER CROSSINGS, RECONCILE ANY CONFLICTS AS NEEDED, AND PROVIDE A MINIMUM 18-INCH CLEARANCE BETWEEN THE SEWER CROSSING AND NEW WATER MAIN.



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PROJECT # X2301-01
CDI PROJECT # 5917

SITE # 5201
ASSET # 7815201059

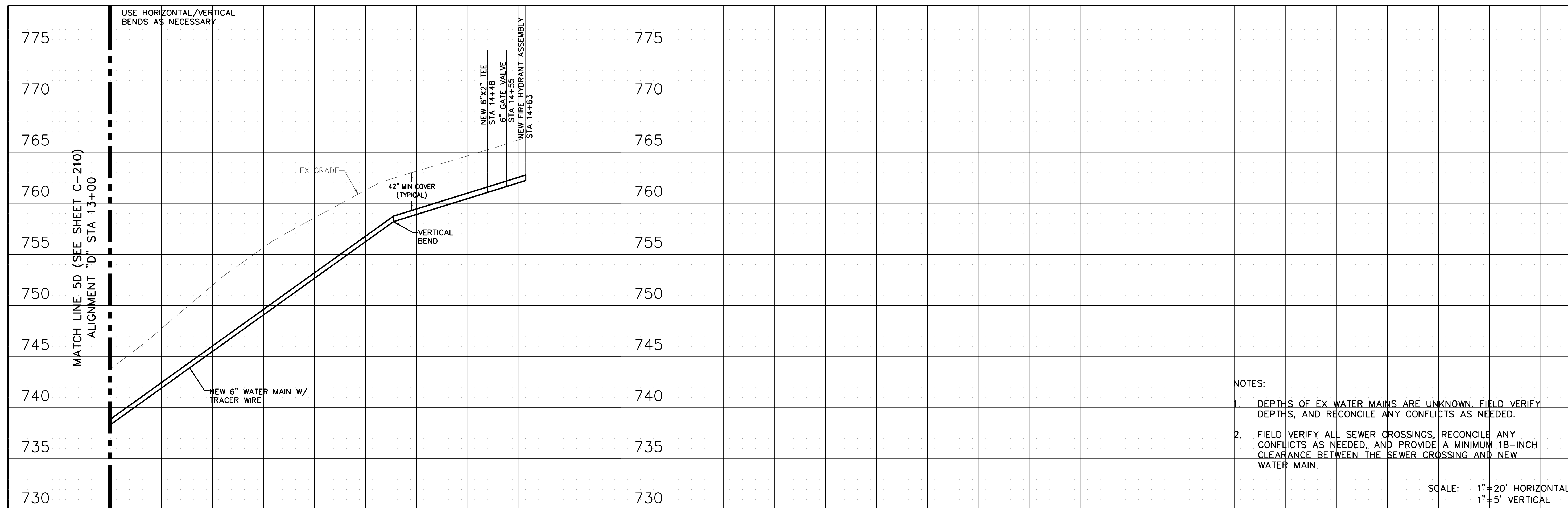
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DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: _____

CAD DWG FILE: X2301_EL_C-200.dwg
DRAWN BY: KDF
CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:
**WATER MAIN &
SANITARY FORCE
MAIN PROFILE**

SHEET NUMBER:

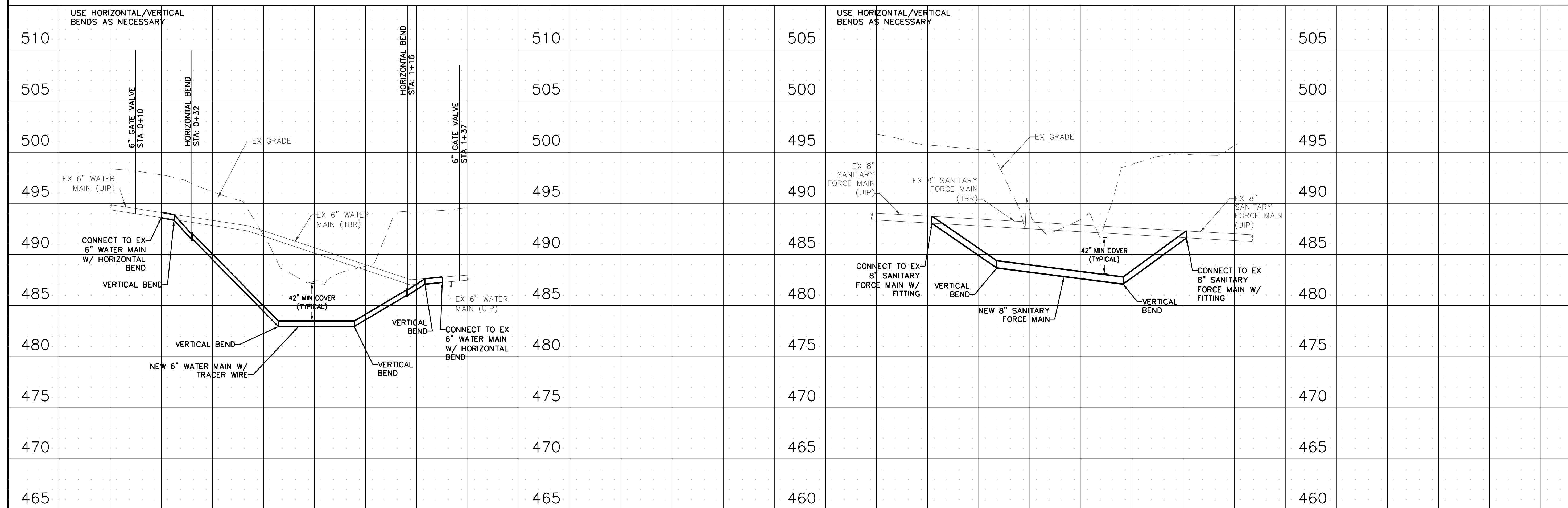
C-211
SHEET 37 OF 46
AUGUST 9, 2024



- NOTES:
1. DEPTHS OF EX WATER MAINS ARE UNKNOWN. FIELD VERIFY DEPTHS, AND RECONCILE ANY CONFLICTS AS NEEDED.
 2. FIELD VERIFY ALL SEWER CROSSINGS, RECONCILE ANY CONFLICTS AS NEEDED, AND PROVIDE A MINIMUM 18-INCH CLEARANCE BETWEEN THE SEWER CROSSING AND NEW WATER MAIN.

SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL

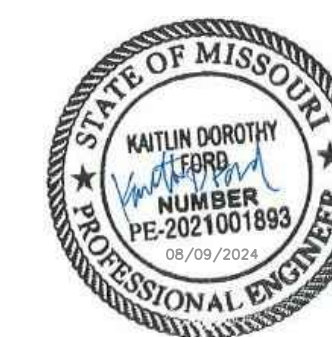
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ALIGNMENT "D" (CONNECTION TO WATER TOWER)



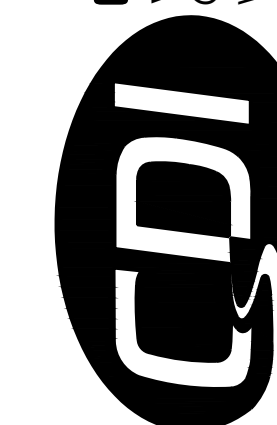
0+00 1+00
ALIGNMENT "E" (WATER MAIN - CREEK REHABILITATION)

0+00 1+00
ALIGNMENT "F" (SANITARY FORCE MAIN - CREEK REHABILITATION)

SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL



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ASSET # 7815201059

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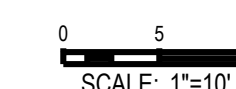
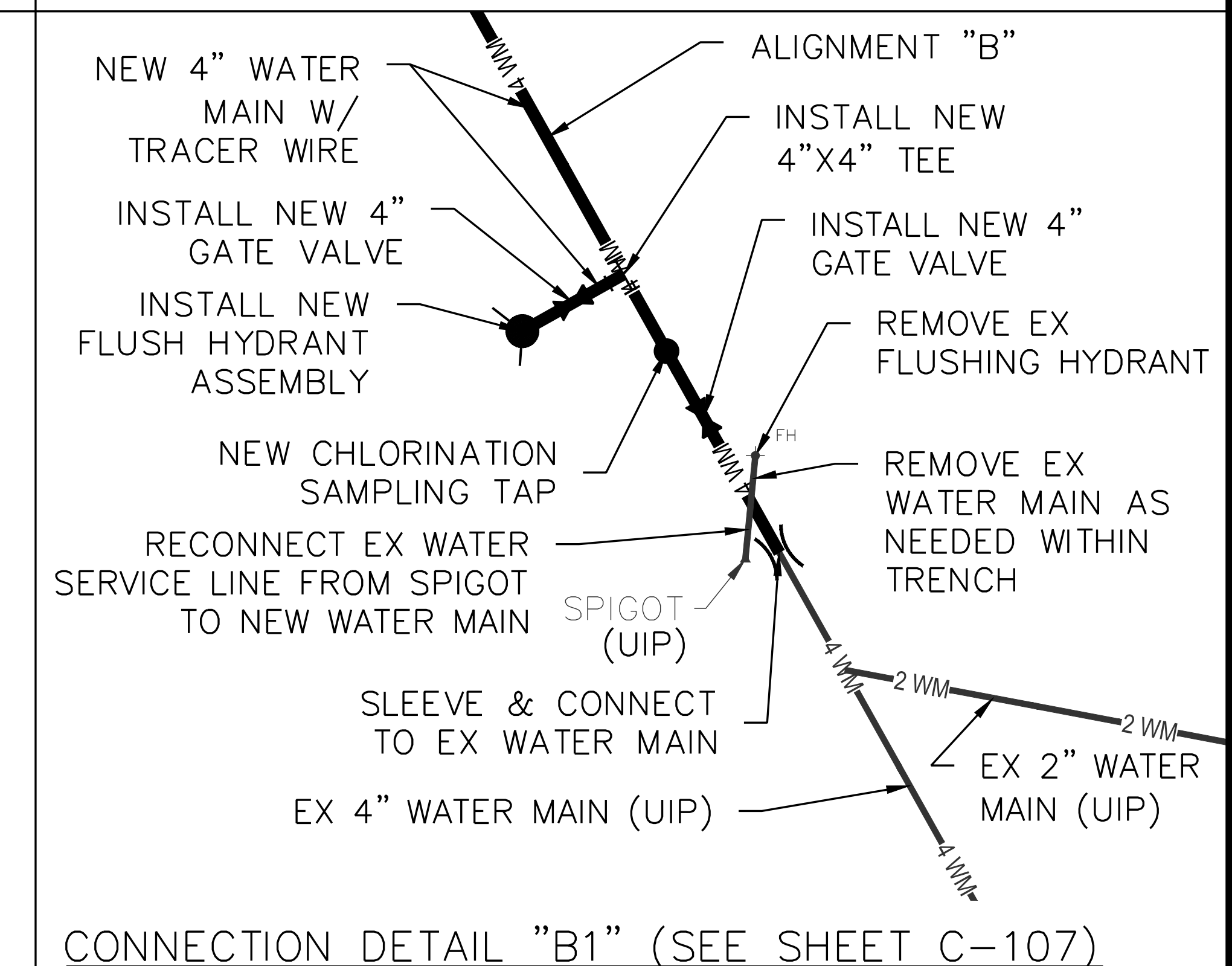
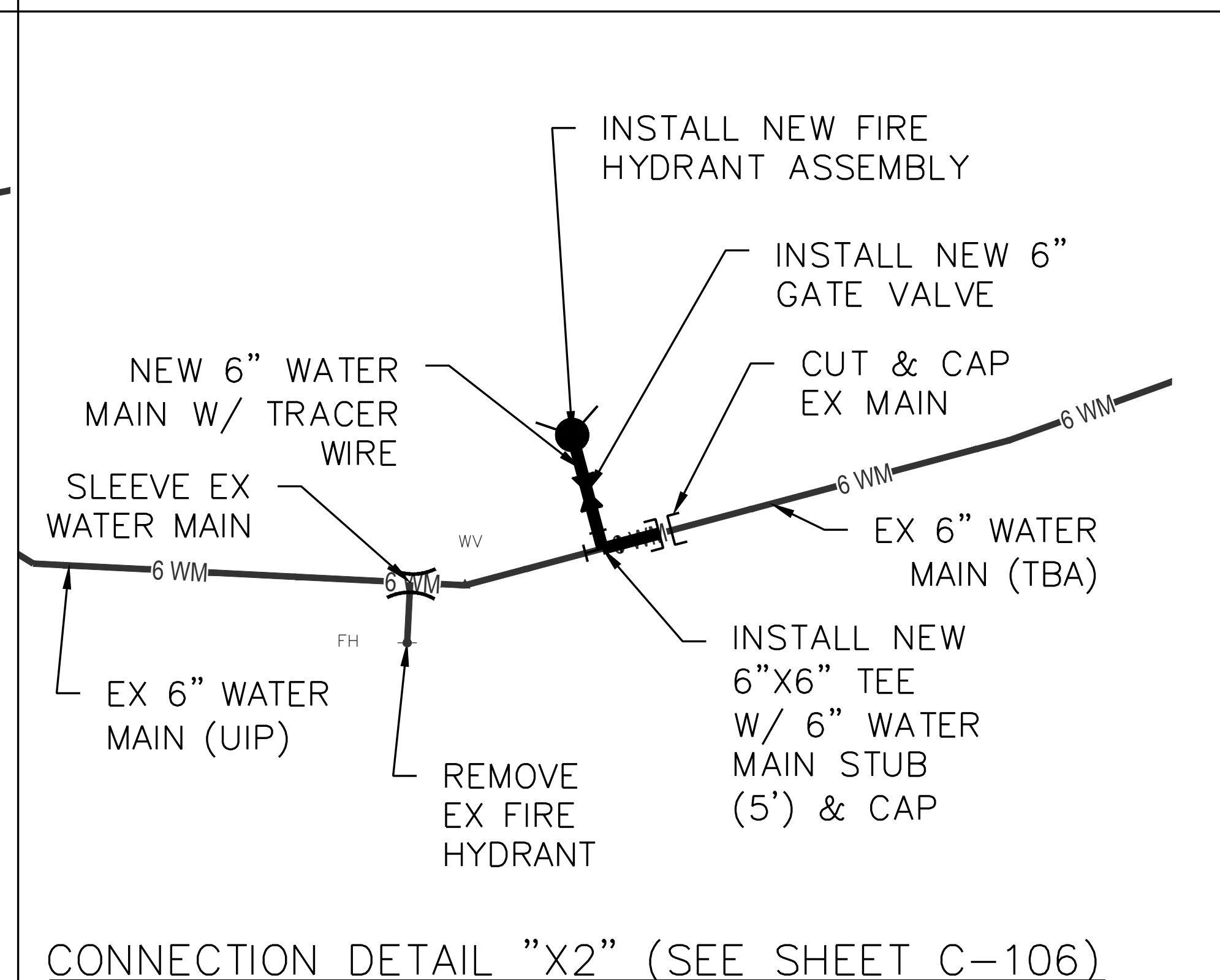
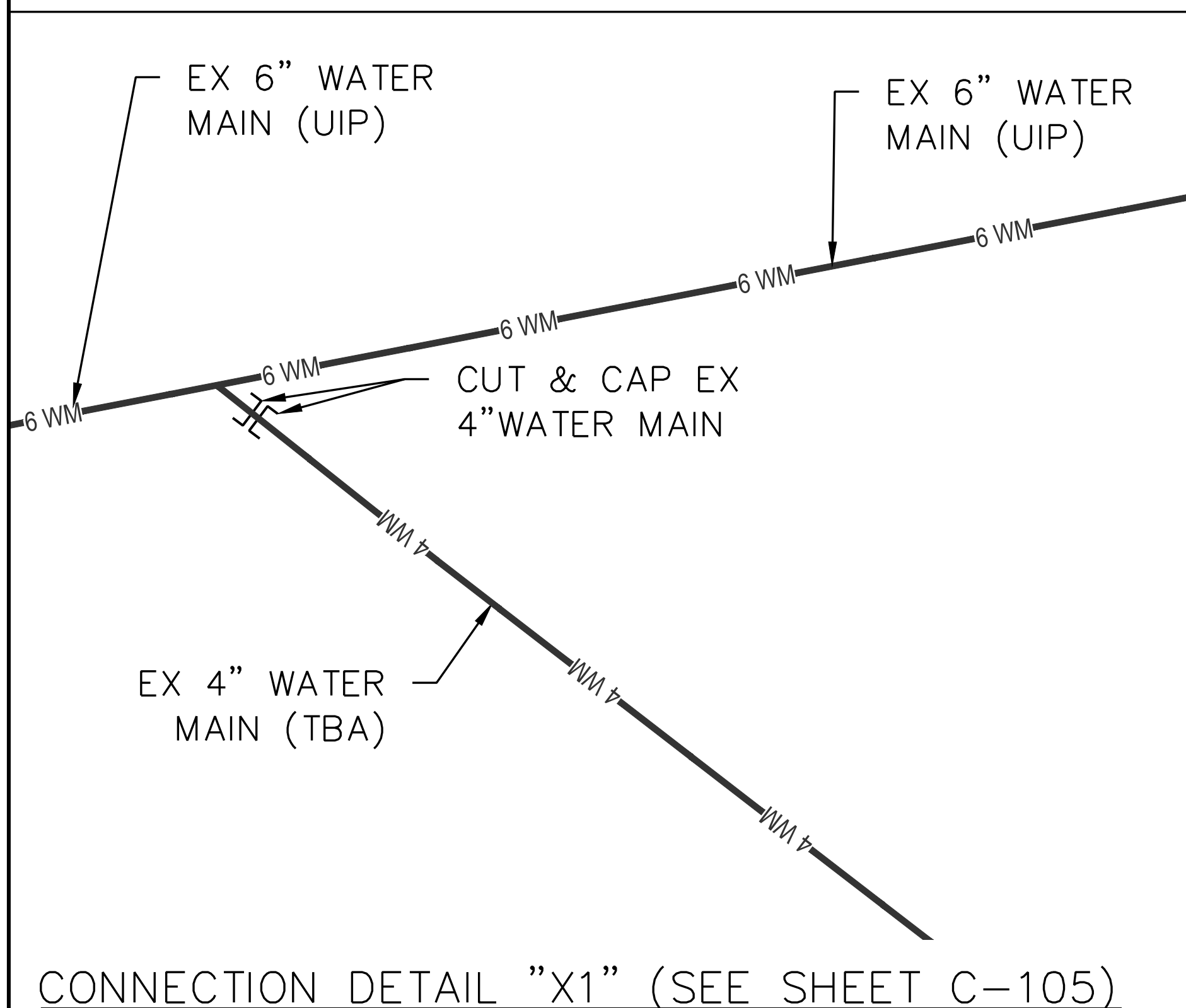
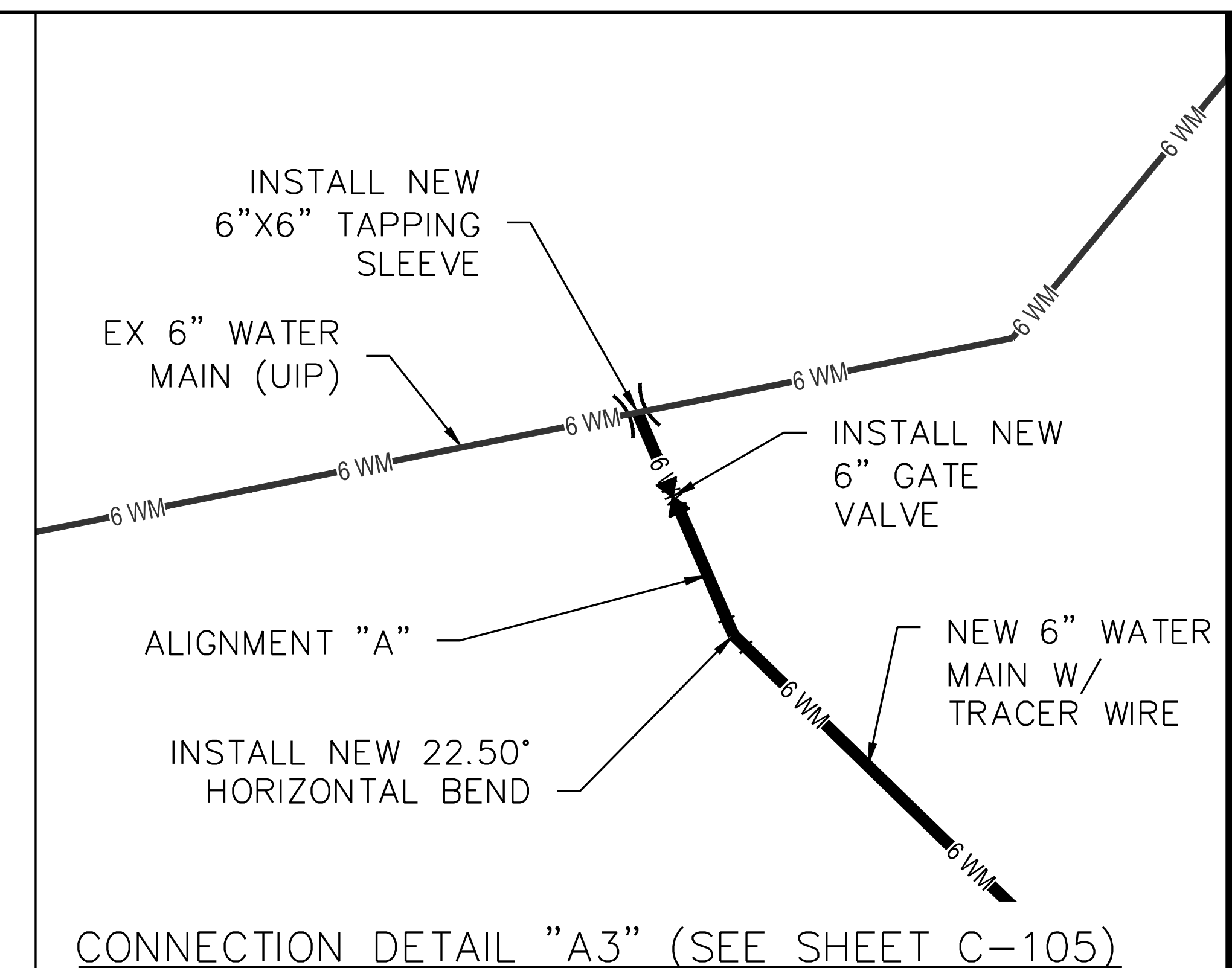
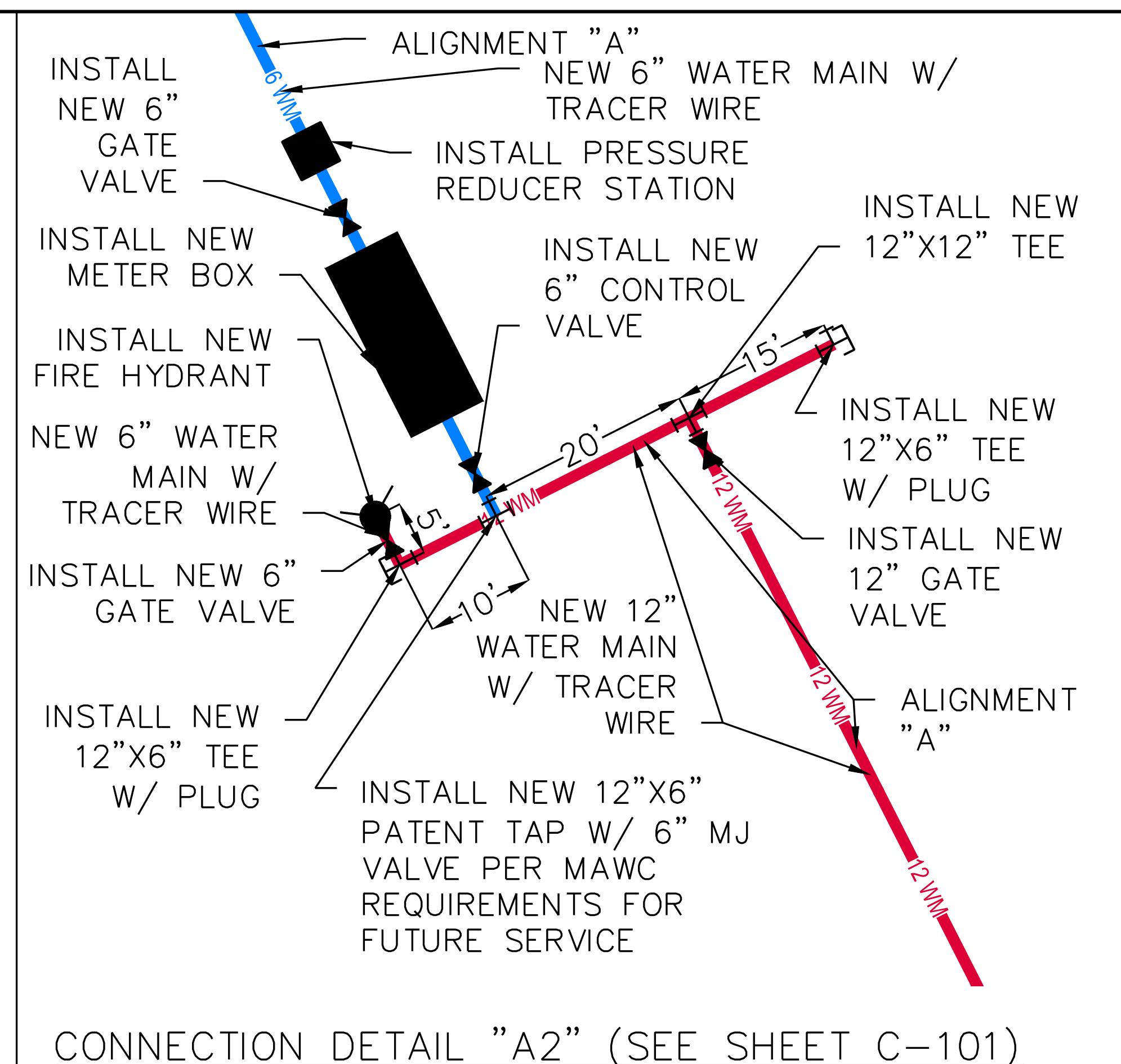
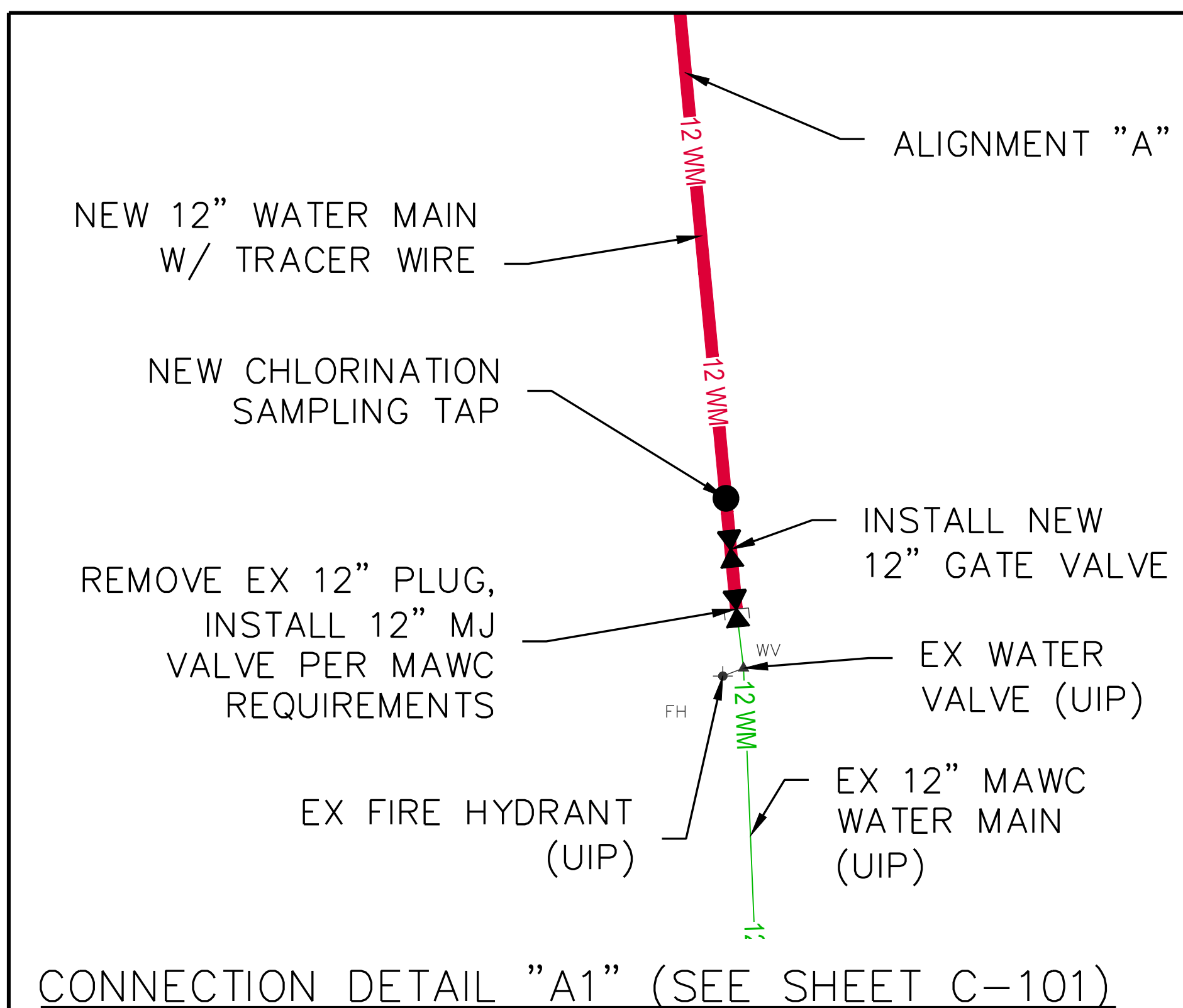
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CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:
**CONNECTION
DETAILS**

SHEET NUMBER:

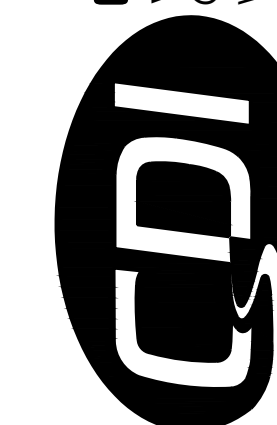
C-400

SHEET 38 OF 46
AUGUST 9, 2024





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SITE # 5201
ASSET # 7815201059

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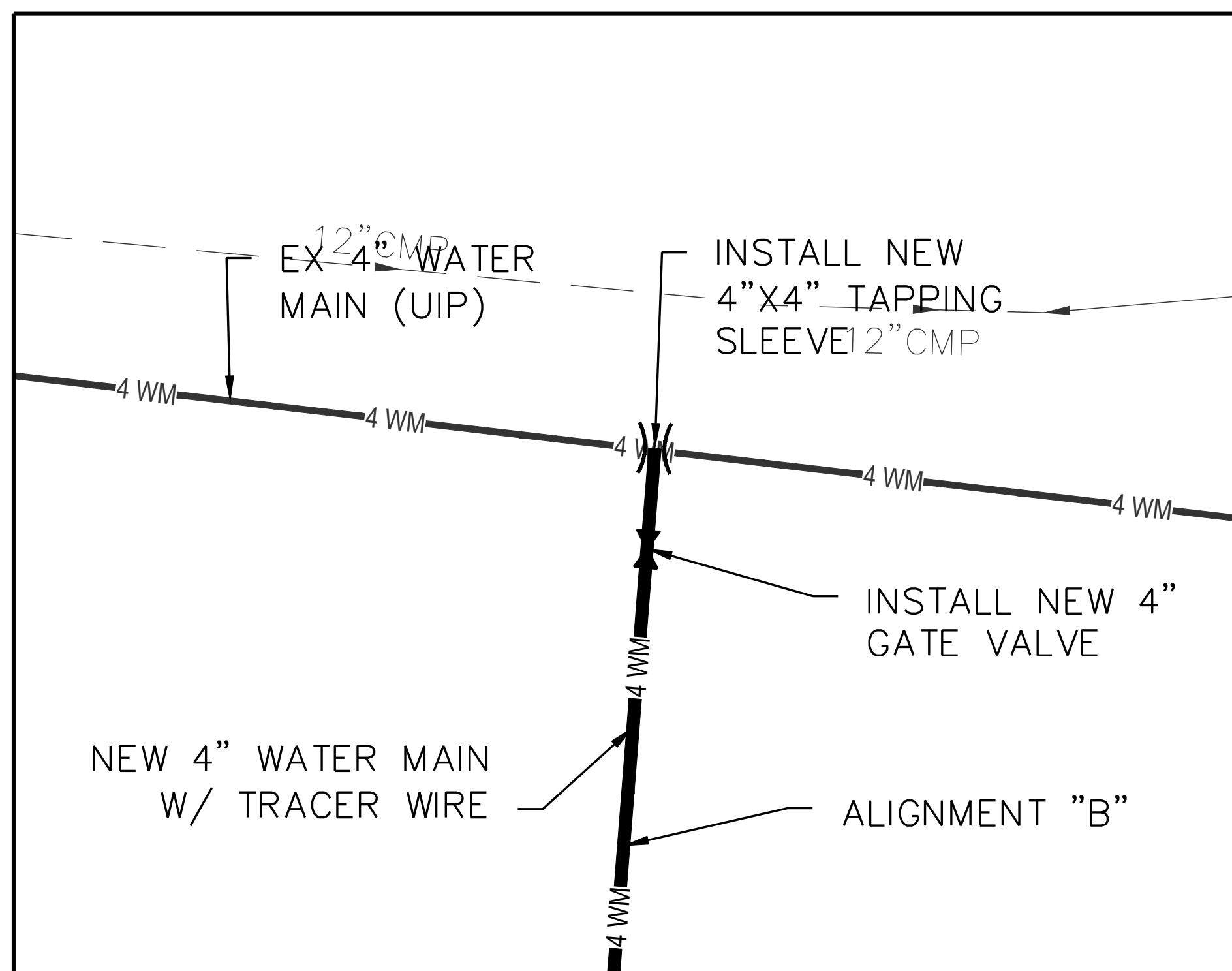
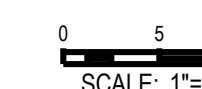
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DRAWN BY: KDF
CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:
**CONNECTION
DETAILS**

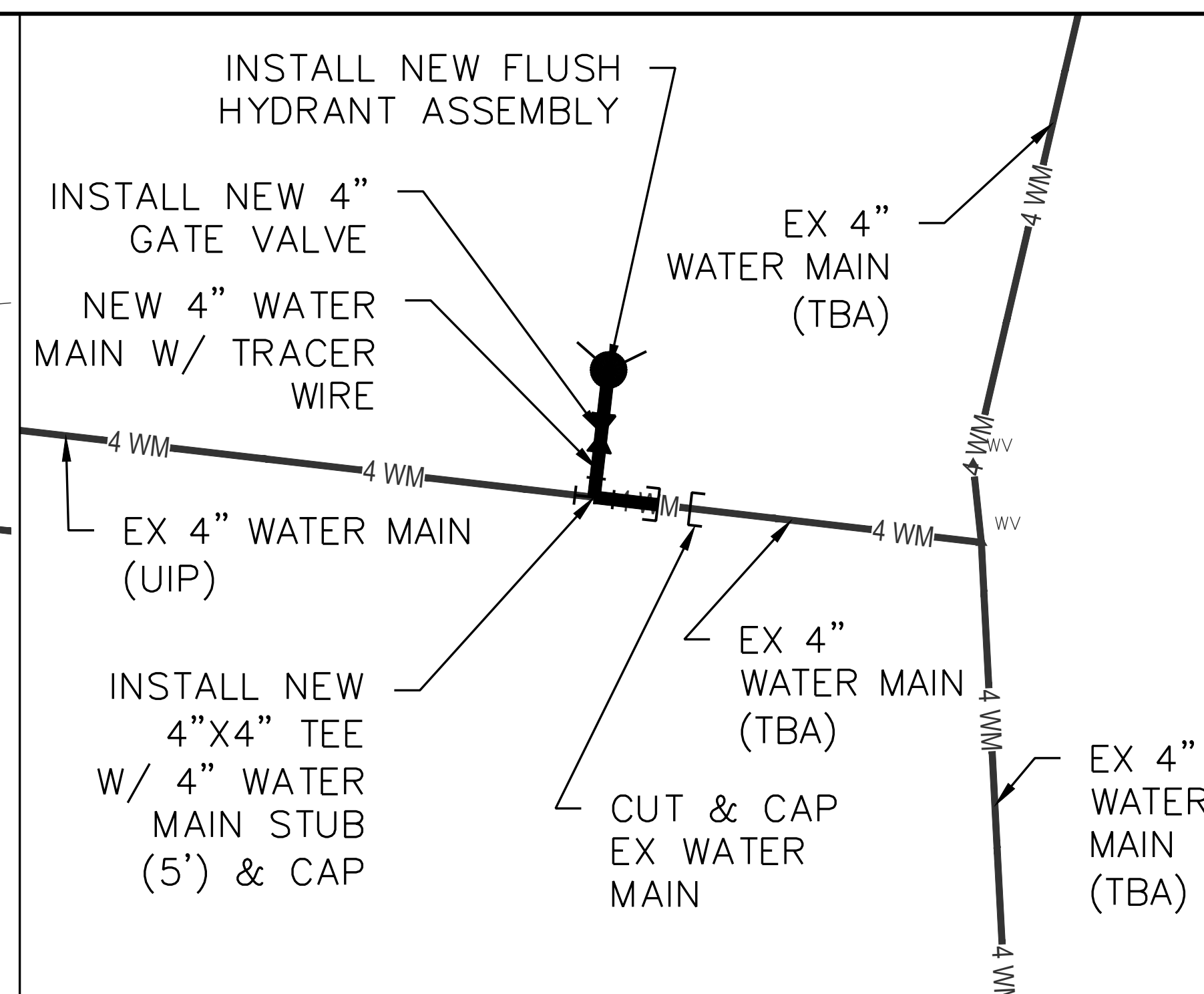
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C-401

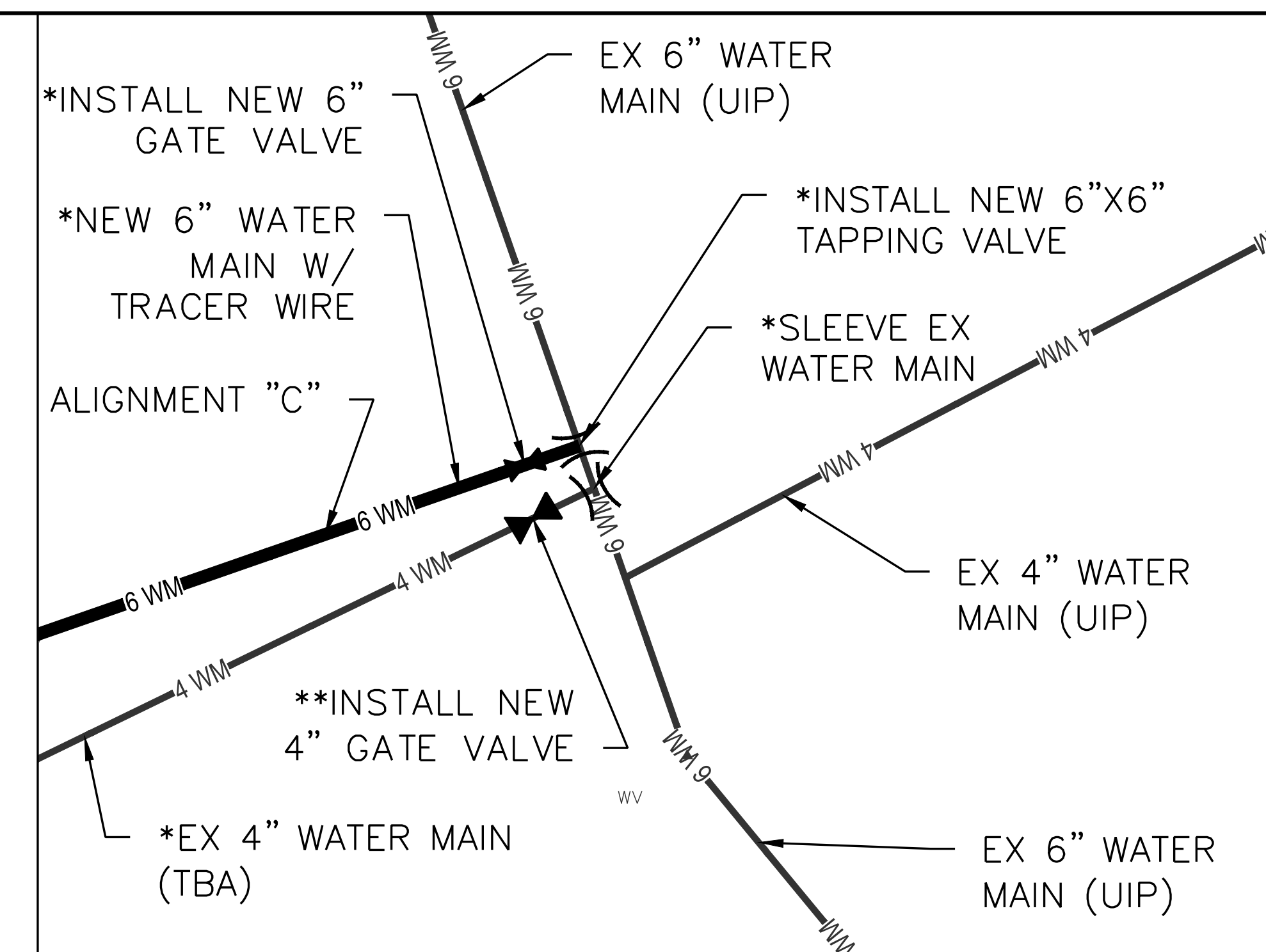
SHEET 39 OF 46
AUGUST 9, 2024



CONNECTION DETAIL "B2" (SEE SHEET C-112)

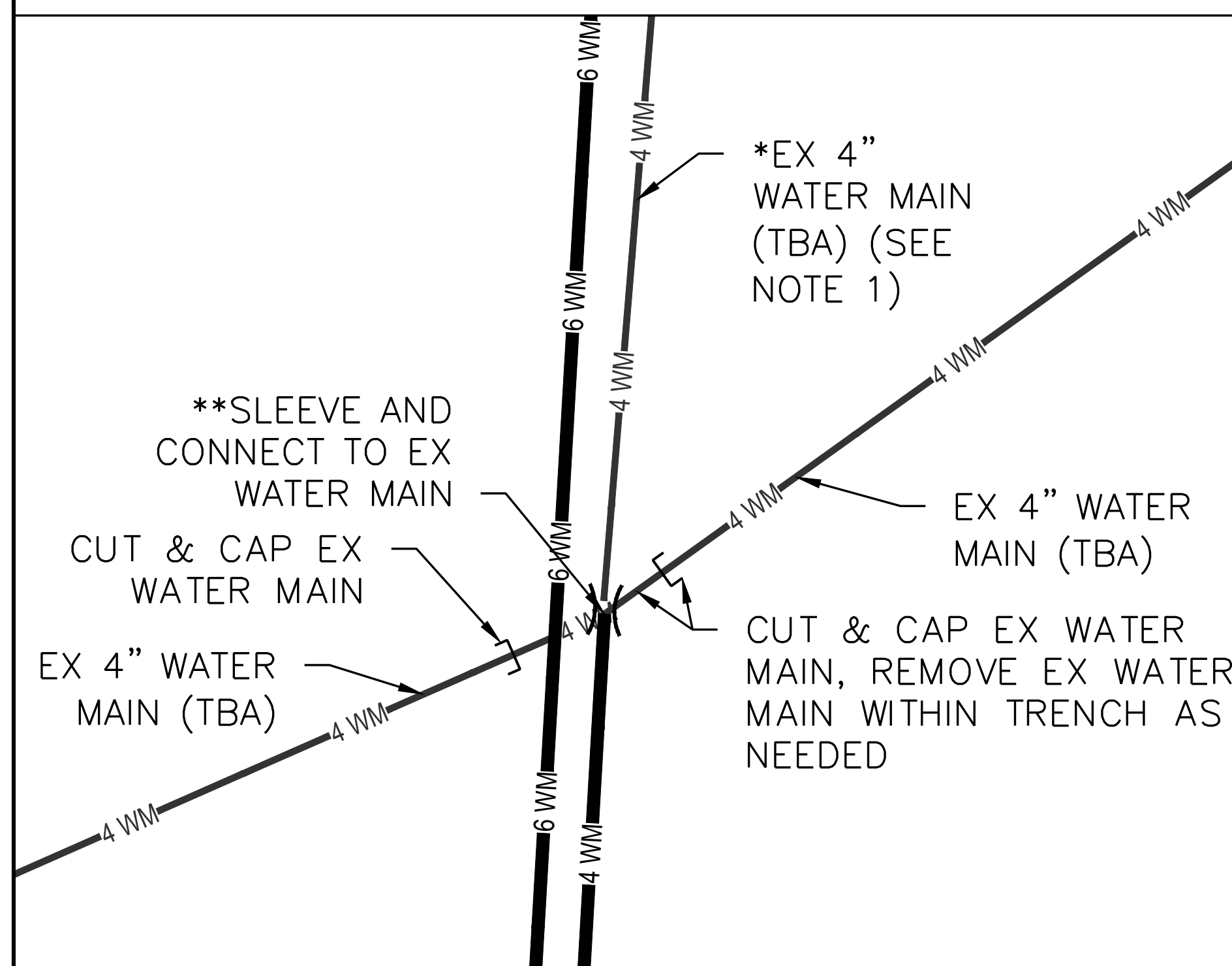


CONNECTION DETAIL "X3" (SEE SHEET C-112)



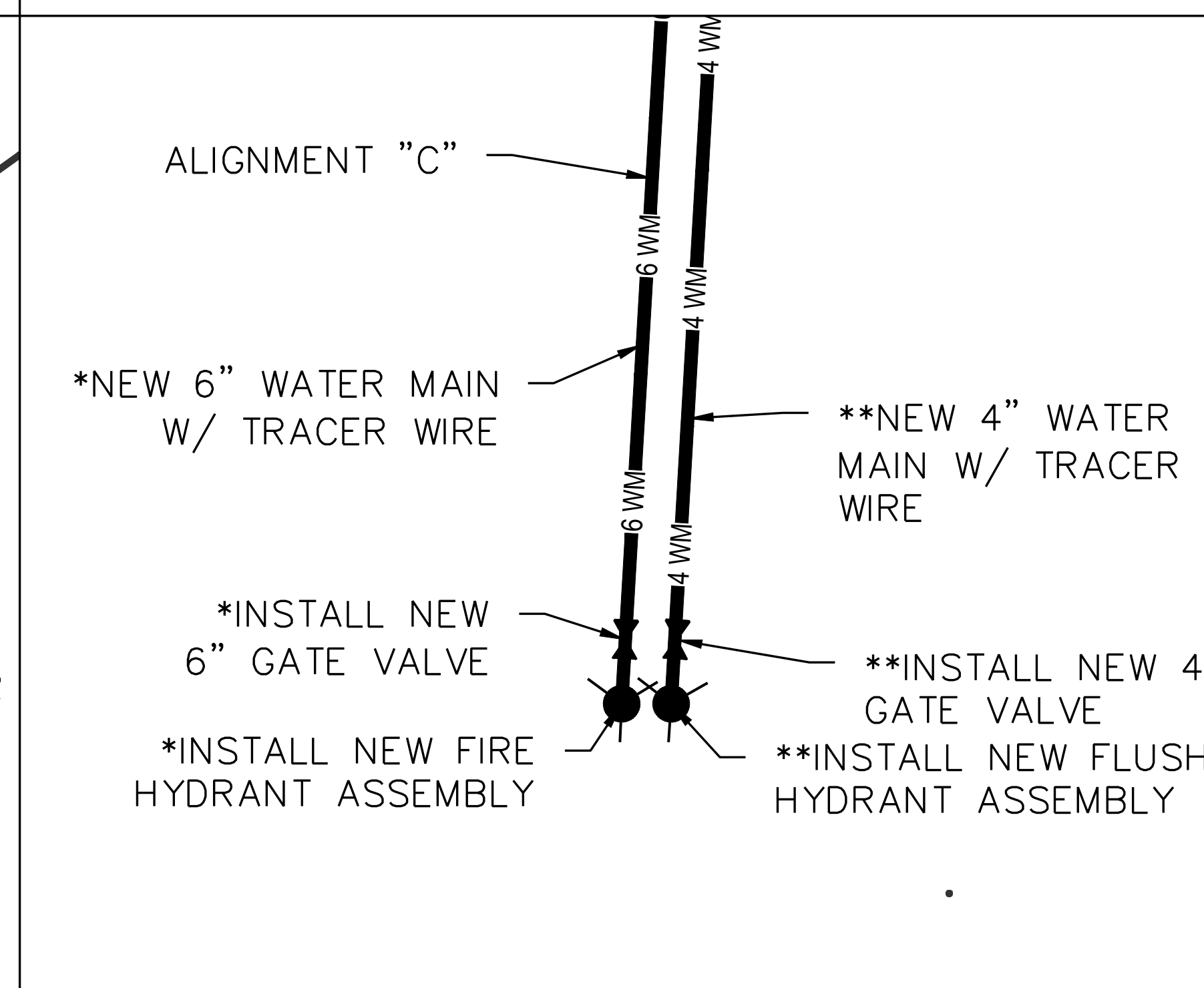
CONNECTION DETAIL "C1" (SEE SHEET C-113)

NOTES:
* INDICATES WORK TO BE PERFORMED IF ALTERNATE 1 IS TO BE CONSTRUCTED.
** INDICATES WORK TO BE PERFORMED ONLY IF ALTERNATE 1 IS NOT TO BE CONSTRUCTED.



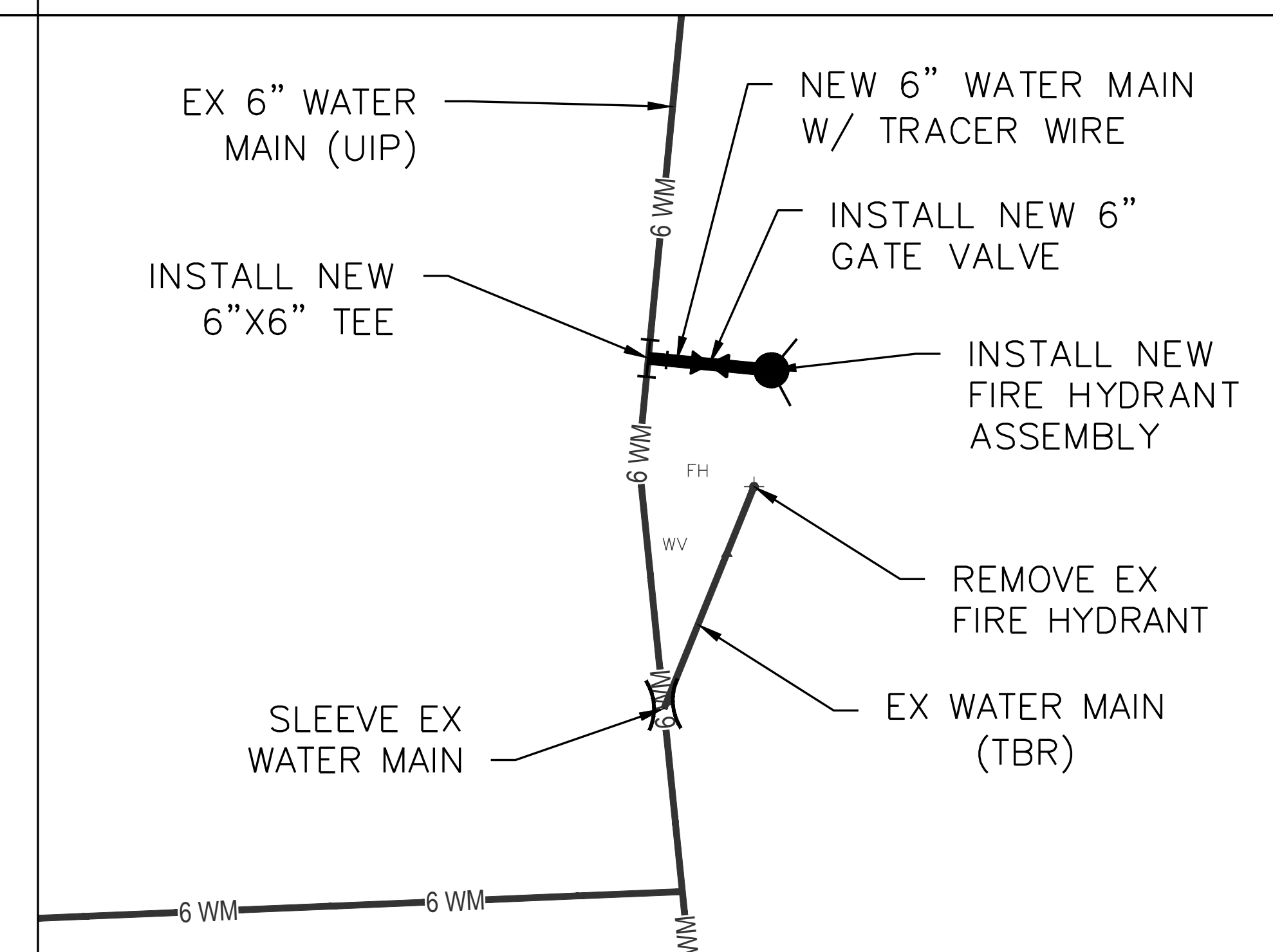
CONNECTION DETAIL "C2" (SEE SHEET C-118)

NOTES:
1 IF ALTERNATE 1 IS NOT TO BE CONSTRUCTED, EX 4" WATER MAIN SHALL BE USED IN PLACE..
* INDICATES WORK TO BE PERFORMED IF ALTERNATE 1 IS TO BE CONSTRUCTED.
** INDICATES WORK TO BE PERFORMED ONLY IF ALTERNATE 1 IS NOT TO BE CONSTRUCTED.



CONNECTION DETAIL "C3" (SEE SHEET C-118)

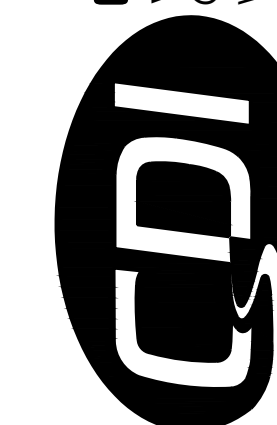
NOTES:
1 IF ALTERNATE 1 IS NOT TO BE CONSTRUCTED, EX 4" WATER MAIN SHALL BE USED IN PLACE..
* INDICATES WORK TO BE PERFORMED IF ALTERNATE 1 IS TO BE CONSTRUCTED.
** INDICATES WORK TO BE PERFORMED ONLY IF ALTERNATE 1 IS NOT TO BE CONSTRUCTED.



CONNECTION DETAIL "X4" (SEE SHEET C-119)



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SITE # 5201
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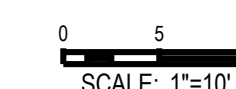
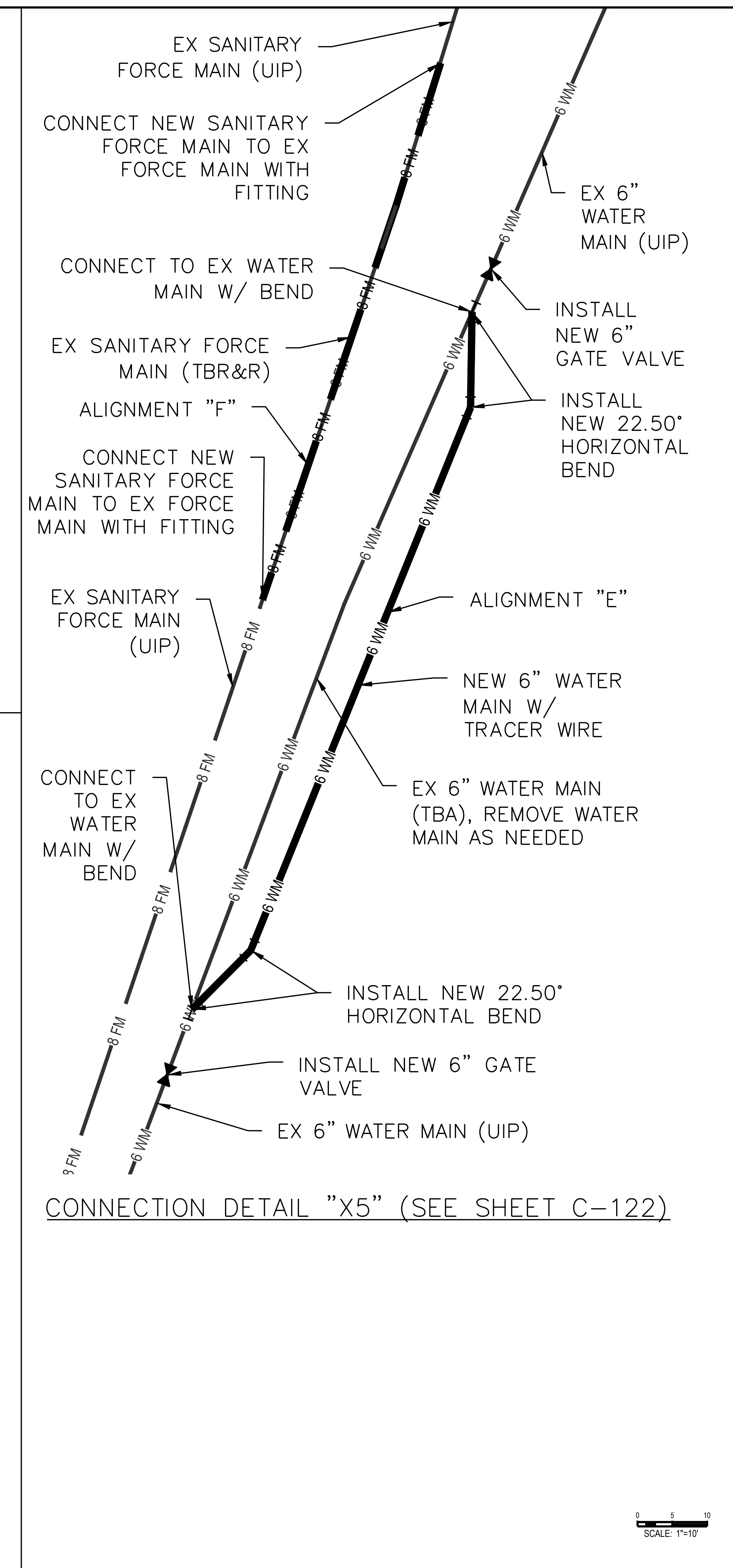
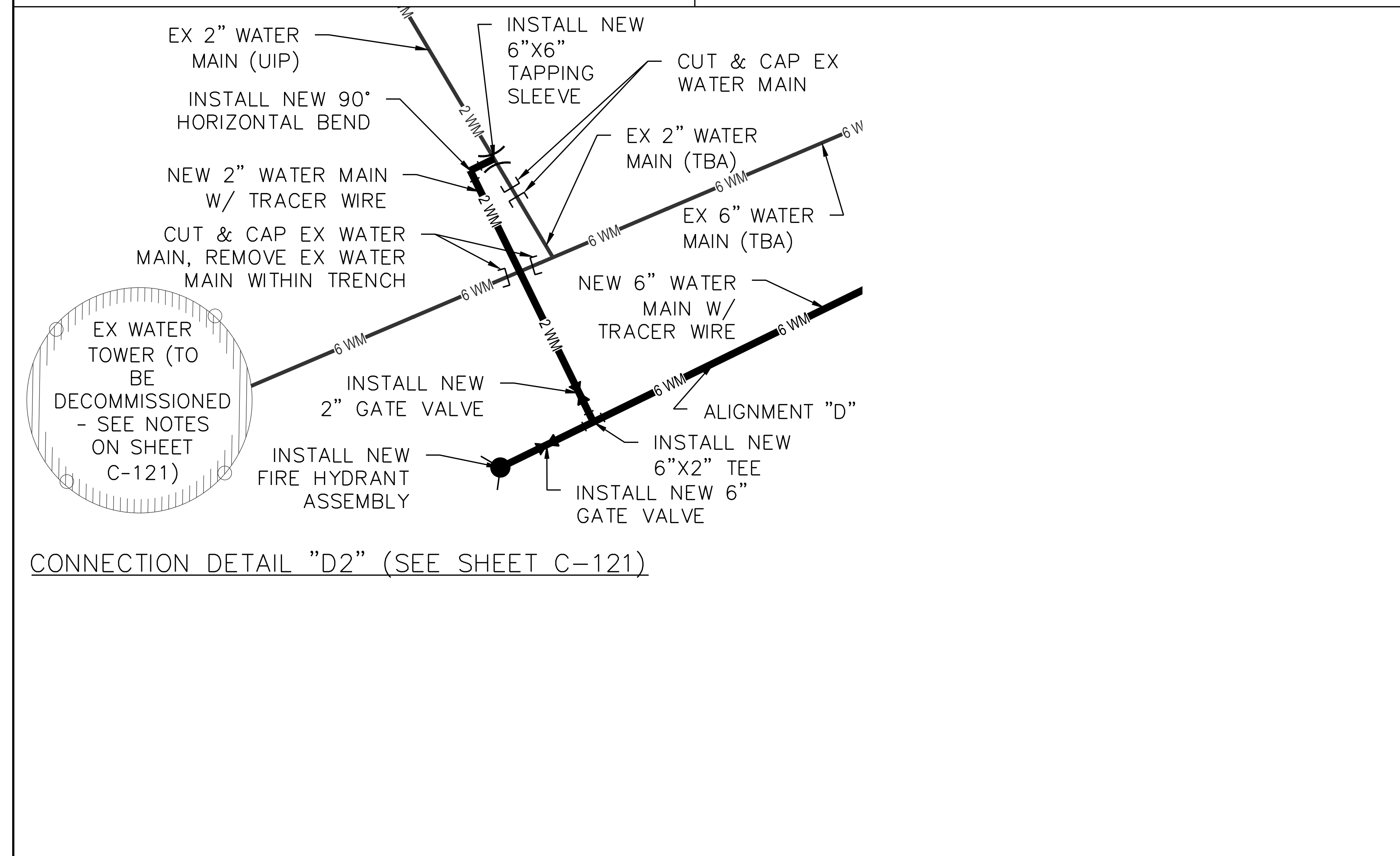
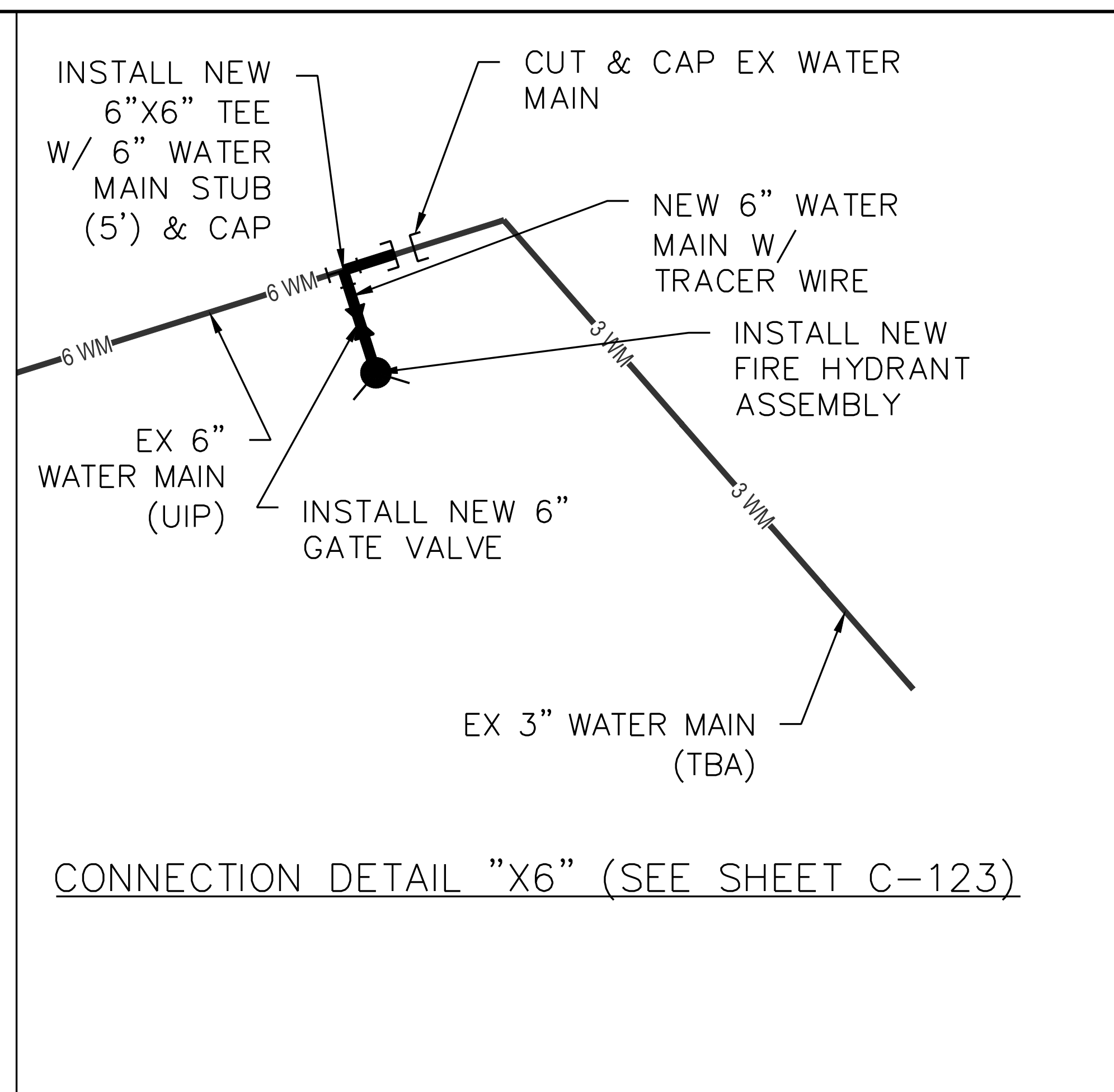
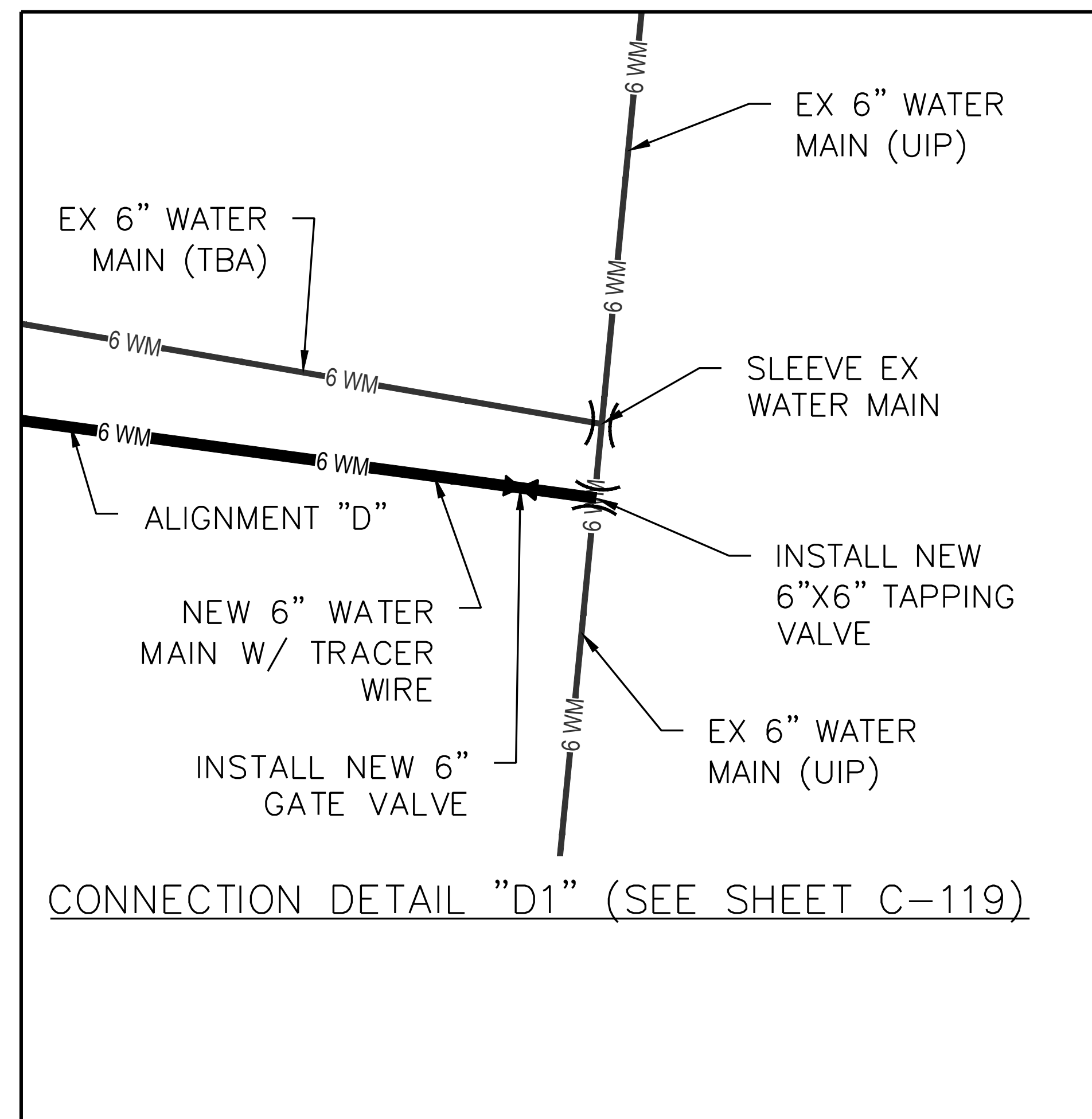
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DESIGNED BY: KDF

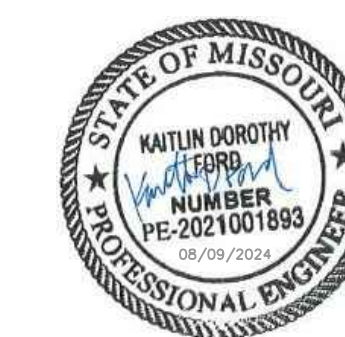
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DETAILS**

SHEET NUMBER:

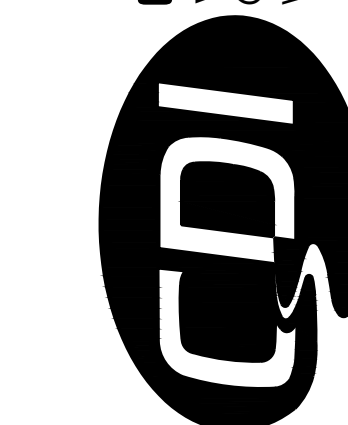
C-402

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AUGUST 9, 2024





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CAD DWG FILE: X2301_DT-C-400.dwg
DRAWN BY: KDF
CHECKED BY: WMK
DESIGNED BY: KDF

SHEET TITLE:
**STANDARD
DETAILS**

SHEET NUMBER:

C-403

SHEET 41 OF 46
AUGUST 9, 2024

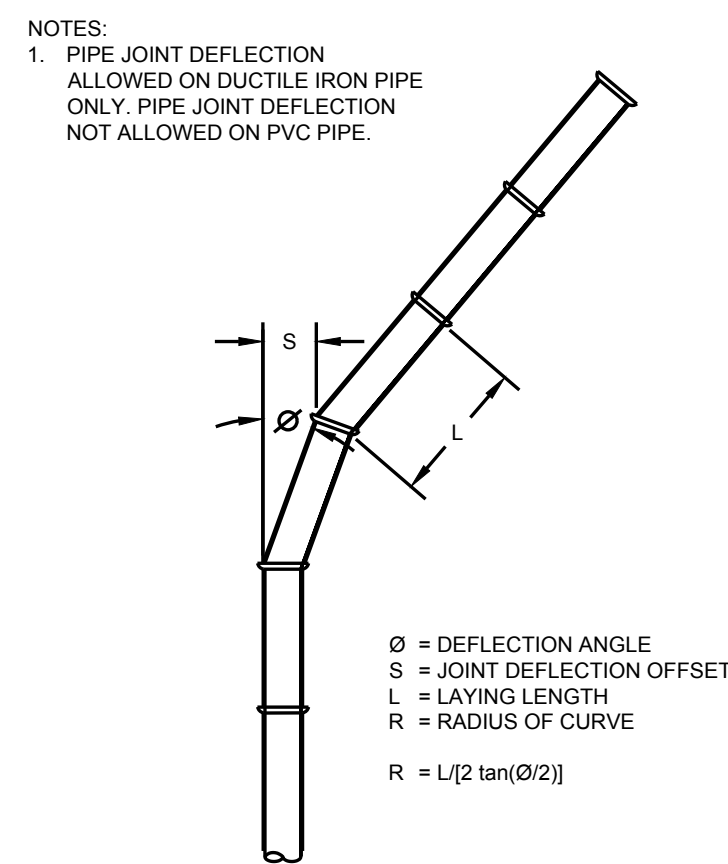
MAXIMUM JOINT DEFLECTION
FULL-LENGTH PIPE-PUSH ON TYPE JOINT PIPE

NOMINAL PIPE SIZE INCHES	DEFLECTION ANGLE DEGREES	MAX OFFSET - S INCHES		APPROXIMATE RADIUS OF CURVATURE - R FEET	
		L=18 FT	L=20 FT	L=18 FT	L=20 FT
3	4	15	17	256	285
4	4	15	17	256	285
6	4	15	17	256	285
8	4	15	17	256	285
10	4	15	17	256	285
12	4	15	17	256	285
14	4	9	10	256	285
16	2.5	9	10	429	476
18	2.5	9	10	429	476
20	2.5	9	10	429	476
24	2.5	9	10	429	476

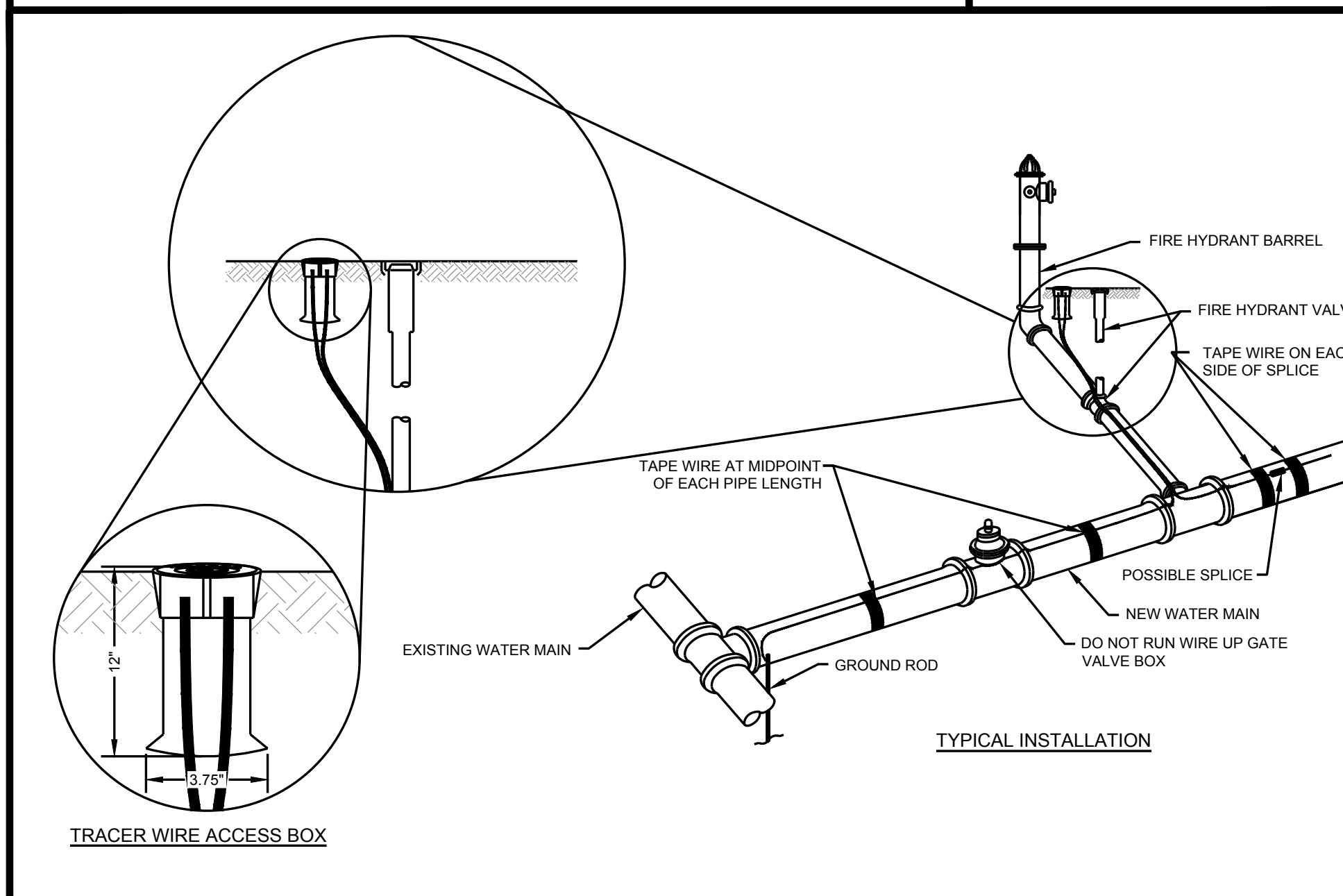
MAXIMUM JOINT DEFLECTION DUCTILE IRON PUSH ON PIPE

NOMINAL PIPE SIZE INCHES	DEFLECTION ANGLE DEGREES	MAX OFFSET - S INCHES		APPROXIMATE RADIUS OF CURVATURE - R FEET	
		L=18 FT	L=20 FT	L=18 FT	L=20 FT
3	4	15	17	256	285
4	4	15	17	256	285
6	4	15	17	256	285
8	4	15	17	256	285
10	4	15	17	256	285
12	4	15	17	256	285
14	4	9	10	256	285
16	2.5	9	10	429	476
18	2.5	9	10	429	476
20	2.5	9	10	429	476
24	2.5	9	10	429	476

*L-STANDARD LENGTH OF PIPE SECTION.



PIPE CURVE GEOMETRY DETAIL



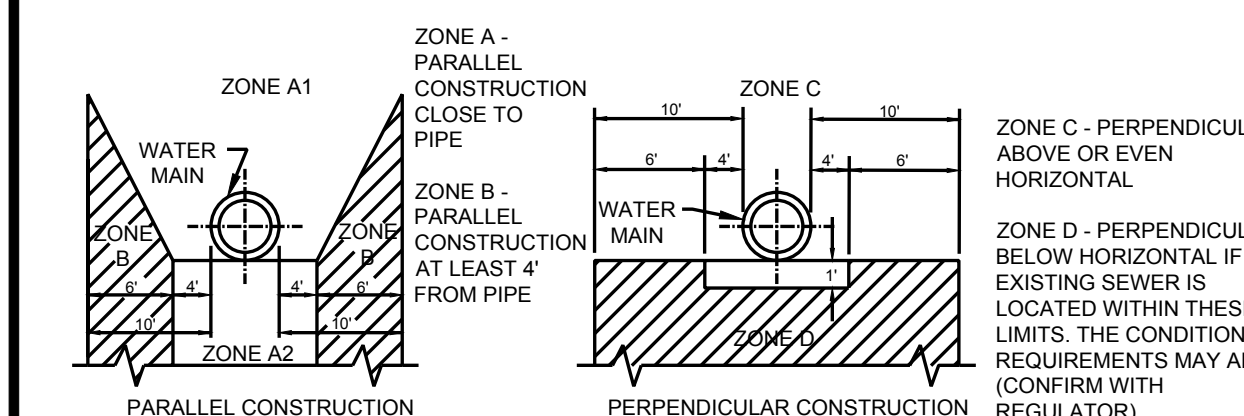
TYPICAL INSTALLATION

- NOTES:
- EXTEND TRACER WIRE UP FIRE HYDRANT VALVE TO INTERNAL TERMINALS OF TRACER WIRE STATION AND BACK DOWN.
 - CLAMP TRACER WIRE TO GROUND ROD AT SYSTEM TERMINATION POINTS.

TRACER SYSTEM DETAIL

SPECIAL CONSTRUCTION REQUIREMENTS

WHERE REQUIRED WATER MAIN SEPARATION FROM SEWER CANNOT BE MAINTAINED

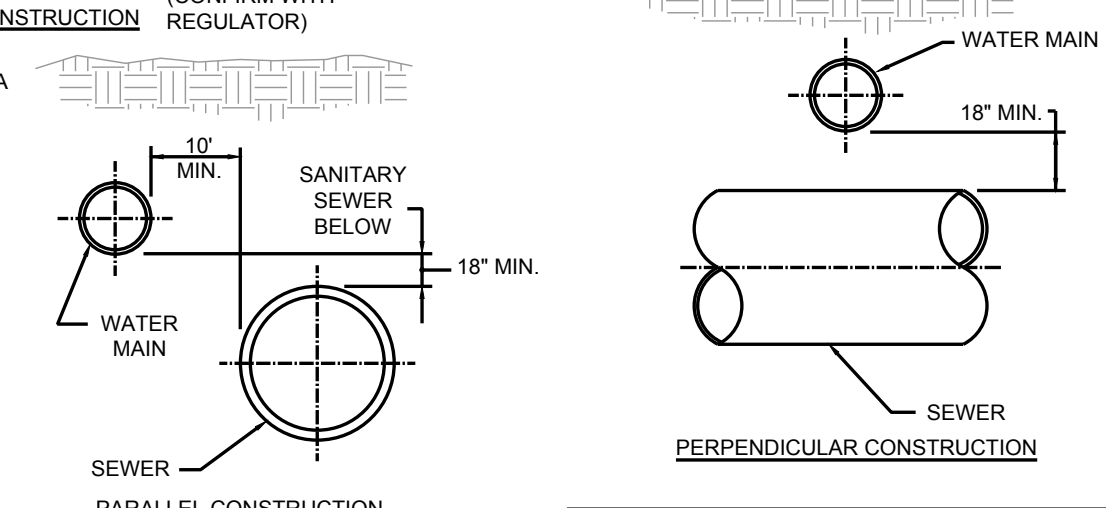


IF AN EXISTING SEWER IS LOCATED WITHIN ZONES A1, A2, B, C, OR D OF A PROPOSED WATER MAIN, THE FOLLOWING SPECIAL REQUIREMENTS APPLY:

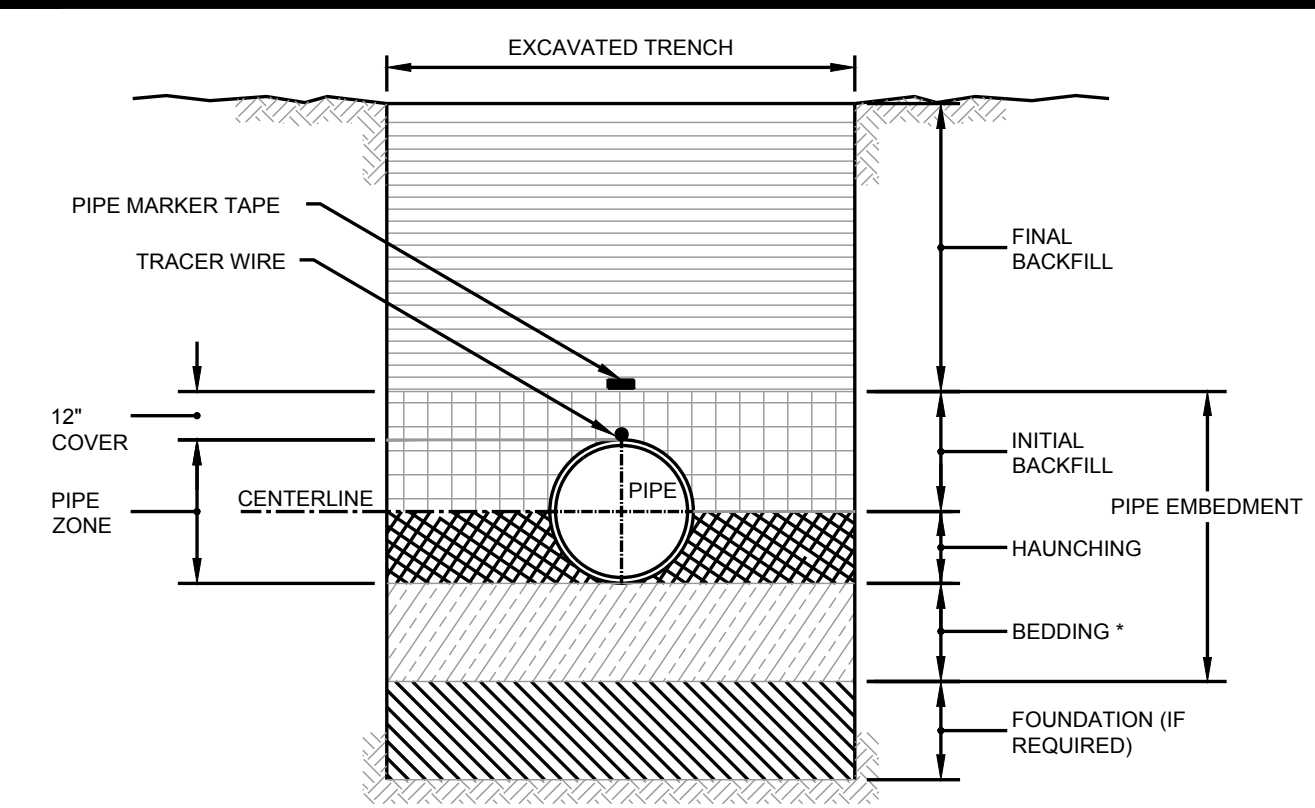
- ZONE
- NO WATER MAINS SHALL BE CONSTRUCTED WITHOUT SPECIAL PERMISSION FROM THE APPROPRIATE HEALTH OR ENVIRONMENTAL REGULATOR.
 - IF THE SEWER DOES NOT MEET ZONE B REQUIREMENTS, THE WATER MAIN SHALL BE OF PRESSURE CLASS 200 PIPE FOR PVC AND CLASS 350 F.O.D.I. PIPE. SEWER SHALL BE CONSTRUCTED EQUAL TO WATER PIPE AND TESTED FOR WATER TIGHTNESS.
 - NO WATER MAINS SHALL BE CONSTRUCTED WITHOUT SPECIAL PERMISSION FROM THE HEALTH REGULATOR. IF PERMISSION IS GRANTED, THE SEWER PIPE SHALL BE ENCASED AND/OR REPLACED WITH WATER MAIN GRADE PIPE AND THE WATER MAIN SHALL BE OF CLASS 200 PIPE OR EQUIVALENT.

REQUIRED SEPARATION BETWEEN WATER MAINS AND SANITARY SEWERS

BASIC SEPARATION REQUIREMENTS:
WATER MAINS AND SEWERS SHOULD BE SEPARATED AS FAR AS IS REASONABLE IN BOTH THE HORIZONTAL AND VERTICAL DIRECTIONS WITH SEWERS LOWER THAN WATER MAINS.
PARALLEL CONSTRUCTION: THE HORIZONTAL DISTANCE BETWEEN PRESSURE WATER MAINS AND SEWERS SHALL BE AT LEAST 10 FEET.
PERPENDICULAR CONSTRUCTION (CROSSING): PRESSURE WATER MAINS SHALL BE AT LEAST 18" ABOVE SANITARY SEWERS WHERE THESE LINES MUST CROSS.



SPECIAL REQUIREMENTS FOR WATER MAIN DETAIL



TRENCH TERMINOLOGY

FOUNDATION: A FOUNDATION IS NECESSARY ONLY WHEN NATIVE SOILS ARE UNSTABLE. FOR SUCH CONDITIONS, THE TRENCH IS OVER-EXCAVATED AND A LAYER OF SUPPORTIVE MATERIAL IS PLACED AND COMPACTED TO PROVIDE A FIRM FOUNDATION FOR THE SUBSEQUENT PIPE EMBEDMENT MATERIALS.
EMBEDMENT: THIS ZONE IS THE MOST IMPORTANT IN TERMS OF PIPE PERFORMANCE. IT IS DIVIDED INTO THE FOLLOWING SUB ZONES:
• BEDDING: TYPICALLY SIX INCHES OF SUPPORTIVE, COMPACTED MATERIAL. THIS ZONE PROVIDES EVEN SUPPORT FOR THE PIPE AND BRINGS IT TO GRADE.
• HAUNCHING: EXTENDS FROM THE BOTTOM OF THE PIPE TO THE CENTERLINE OF THE PIPE. IT PROVIDES THE MOST RESISTANCE TO PIPE DEFLECTION. SPECIFYING PROPER MATERIALS AND COMPACTION ARE MOST IMPORTANT FOR THIS ZONE. IN MOST CASES NATIVE MATERIAL IS ACCEPTABLE. MATERIAL SHALL BE FREE OF ROCKS AND BE PLACED BY HAND TO PROTECT POLYETHYLENE ENCASING.
• INITIAL BACKFILL: EXTENDS FROM THE SPRINGLINE TO A POINT ABOVE THE TOP OF THE PIPE. THIS ZONE PROVIDES SOME PIPE SUPPORT AND HELPS TO PREVENT DAMAGE TO THE PIPE DURING PLACEMENT OF THE FINAL BACKFILL. THE COVER EXTENDS FROM THE TOP OF THE PIPE TO THE TOP OF THE INITIAL BACKFILL. THE DEPTH OF COVER SHOULD BE AS MUCH AS NECESSARY TO PROTECT THE PIPE DURING PLACEMENT OF THE FINAL BACKFILL. TWELVE INCHES IS A COMMON DEPTH OF COVER.
FINAL BACKFILL: THIS ZONE EXTENDS FROM THE TOP OF THE INITIAL BACKFILL TO THE TOP OF THE TRENCH. THIS ZONE HAS LITTLE INFLUENCE ON PIPE PERFORMANCE, BUT CAN BE IMPORTANT TO THE INTEGRITY OF ROADS AND STRUCTURES.

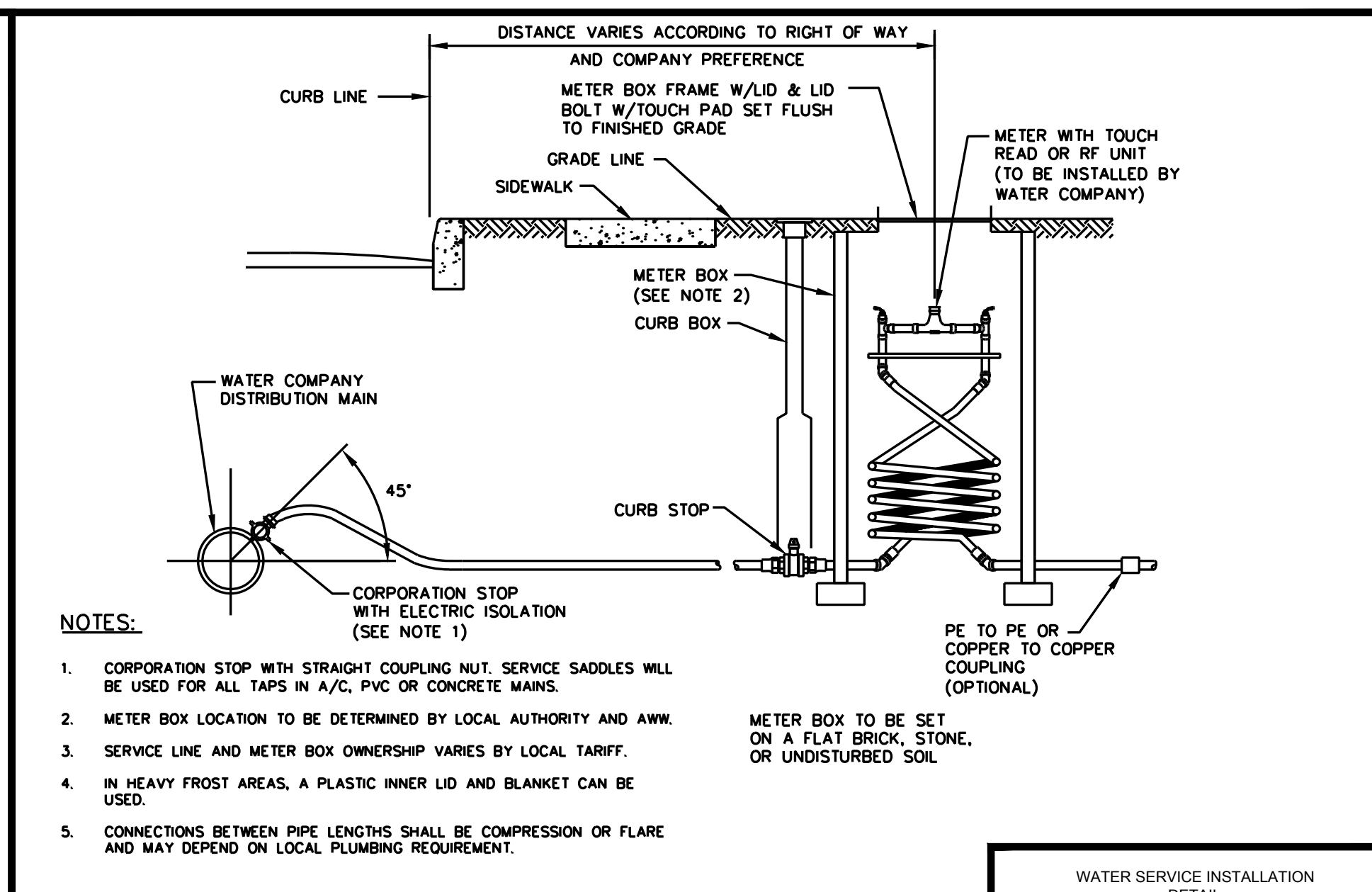
* UNLESS OTHERWISE DIRECTED BY COMPANY, OR FIELD CONDITIONS REQUIRE, BEDDING IS NOT REQUIRED FOR DUCTILE IRON MAIN. CONTRACTOR SHALL SCARIFY 2" BELOW BOTTOM OF PIPE.

PIPE TRENCH TERMINOLOGY DETAIL

RESTRAINED JOINT TABLE FOR PVC PIPE

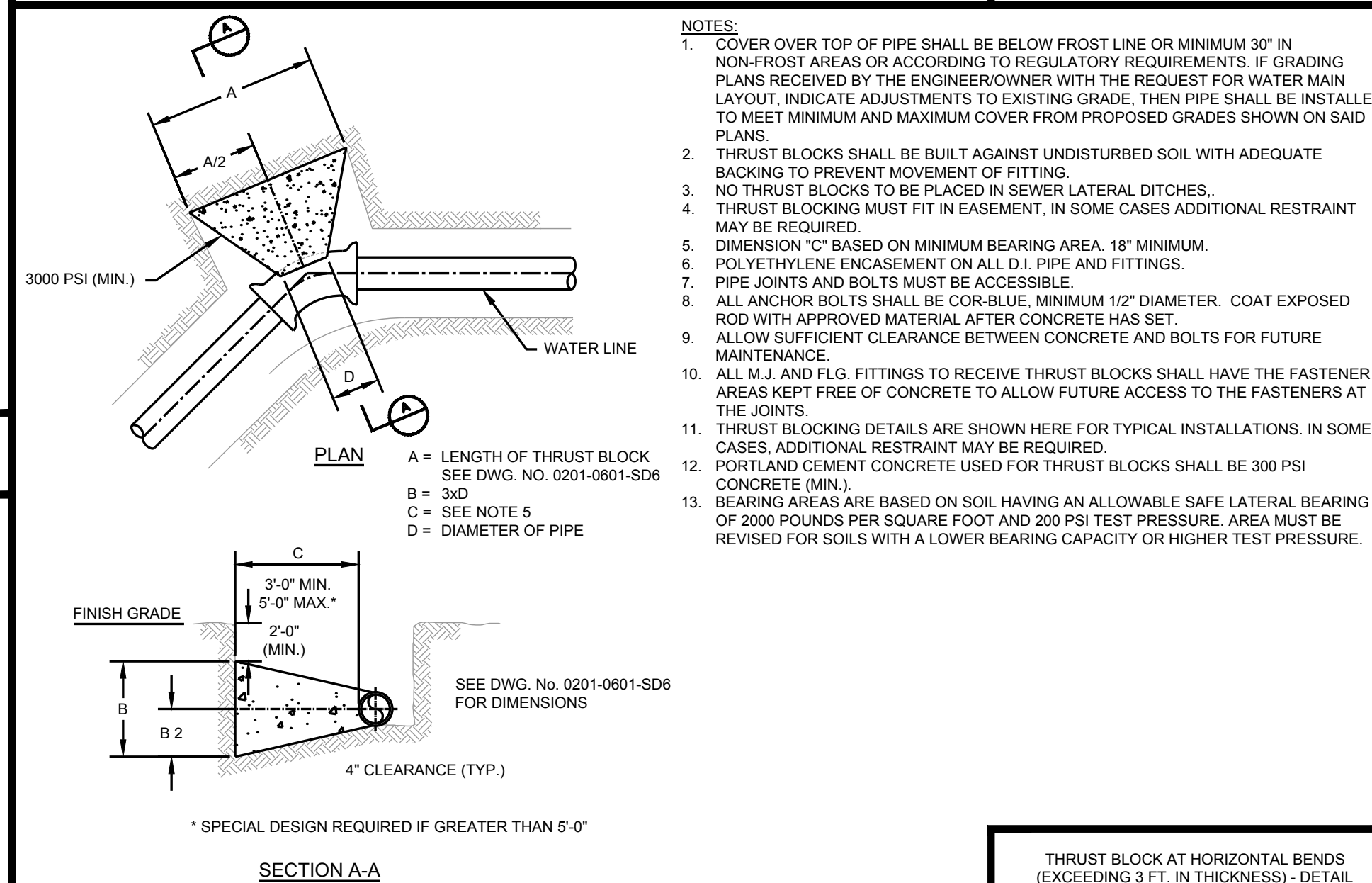
FITTINGS	REQUIRED RESTRAINED LENGTH (FT) OF PVC PIPE BY DEPTH OF COVER									
	3 FT	4 FT	5 FT	6 FT	7 FT	8 FT	9 FT	10 FT	11 FT	12 FT
HORIZONTAL BENDS	3	4	5	6	7	8	9	10	11	12
11.25 DEG	2	2	2	1	1	1	1	1	1	1
22.5 DEG	4	3	3	3	2	2	2	2	2	2
45 DEG	7	6	5	5	4	4	4	4	3	3
90 DEG	16	14	12	11	10	9	8	7	6	5
VERTICAL DOWN BENDS	3	4	5	6	7	8	9	10	11	12
11.25 DEG	6	5	4	4	3	3	3	3	3	3
22.5 DEG	12	10	8	7	6	6	5	5	5	5
45 DEG	24	20	17	15	13	12	11	10	9	8
VERTICAL UP BENDS	3	4	5	6	7	8	9	10	11	12
11.25 DEG	2	2	2	1	1	1	1	1	1	1
22.5 DEG	4	3	3	3	2	2	2	2	2	2
45 DEG	7	6	5	5	4	4	4	4	3	3
DEAD ENDS/VALVES	3	4	5	6	7	8	9	10	11	12
	45	38	33	29	27	24	22	20	18	16

- NOTES:
- RESTRAINED LENGTH IS MEASURED AS FOLLOWS:
A. HORIZONTAL/VERTICAL BENDS: ALONG EACH SIDE OF BEND.
B. HORIZONTAL/VERTICAL BENDS - OFFSET: ALONG THE OUTER SIDE OF EACH BEND. ALL PIPES BETWEEN THE TWO BENDS SHALL BE RESTRAINED JOINT.
C. DEAD ENDS: ALONG PIPE FROM THE PLUG.
D. VALVES: ALONG THE PIPE IN EACH DIRECTION FROM THE VALVE.
E. REDUCERS: ALONG THE LARGER PIPE.
F. TEES: ALONG THE BRANCH PIPE FROM THE TEE.
 - WHEN IT IS NOT POSSIBLE TO INSTALL THE RESTRAINED LENGTHS AS NOTED BY THIS TABLE, CONTRACTOR SHALL INSTALL THE APPROPRIATE CONCRETE THRUST RESTRAINTS.



- NOTES:
- CORPORATION STOP WITH STRAIGHT COUPLING NUT. SERVICE SADDLES WILL BE USED FOR ALL TAPS IN A/C, PVC OR CONCRETE MAINS.
 - METER BOX LOCATION TO BE DETERMINED BY LOCAL AUTHORITY AND AWW.
 - SERVICE LINE AND METER BOX OWNERSHIP VARIES BY LOCAL TARIFF.
 - IN HEAVY FROST AREAS, A PLASTIC INNER LID AND BLANKET CAN BE USED.
 - CONNECTIONS BETWEEN PIPE LENGTHS SHALL BE COMPRESSION OR FLARE AND MAY DEPEND ON LOCAL PLUMBING REQUIREMENT.

WATER SERVICE INSTALLATION DETAIL



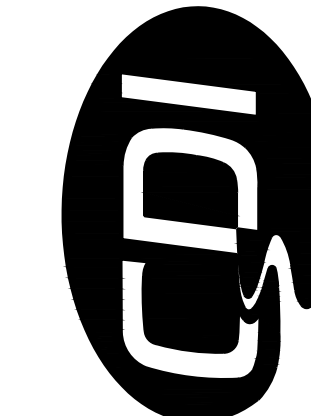
SECTION A-A
N.T.S.

THRUST BLOCK AT HORIZONTAL BENDS (EXCEEDING 3 FT. IN THICKNESS) - DETAIL

RESTRAINT JOINT TABLE



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WILDWOOD, MISSOURI 63005

PROJECT # X2301-01
CDI PROJECT # 5917

SITE # 5201
ASSET # 7815201059

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

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DRAWN BY: KDF
CHECKED BY: WMK
DESIGNED BY: KDF

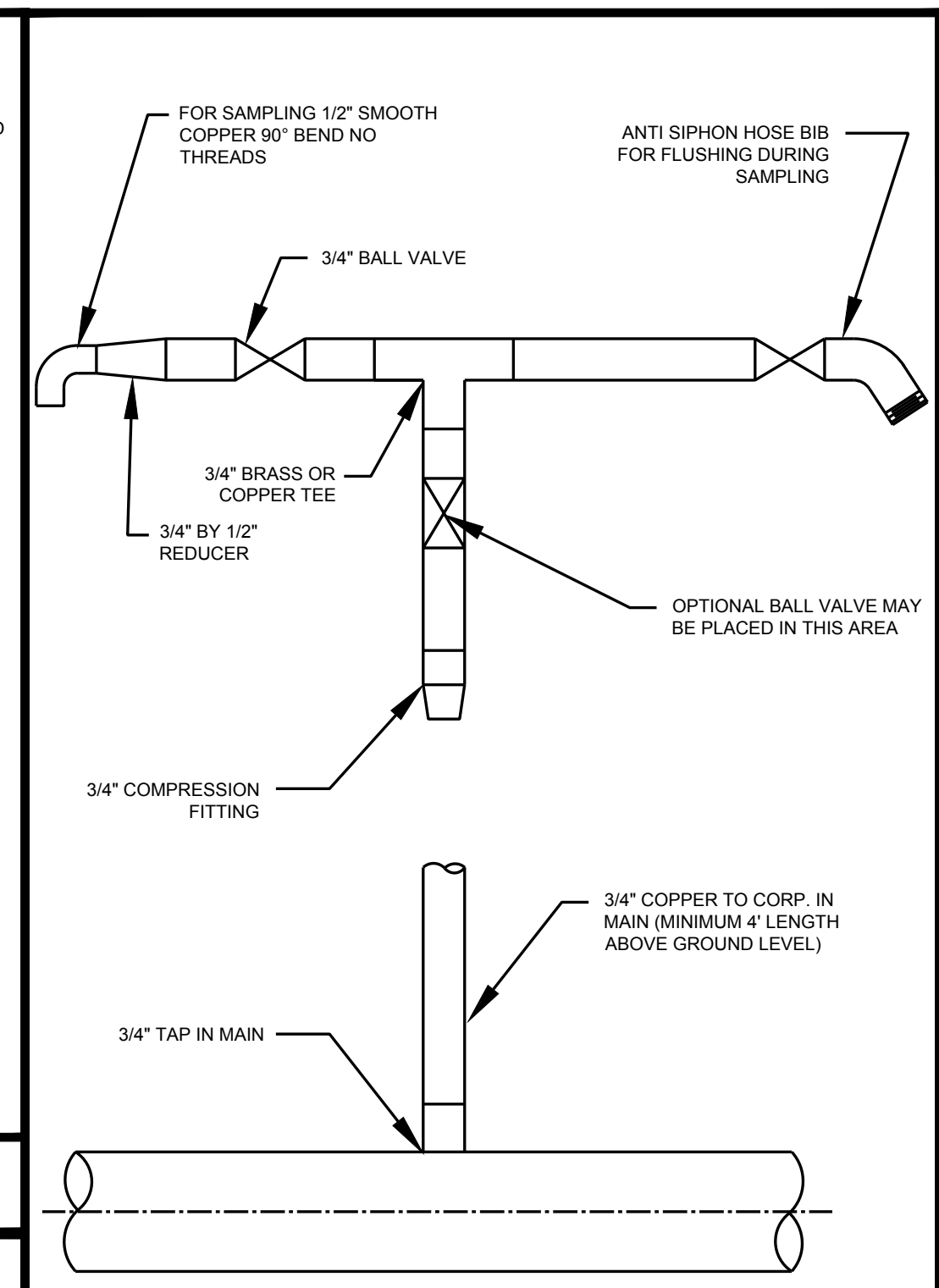
SHEET TITLE:

STANDARD
DETAILS

SHEET NUMBER:

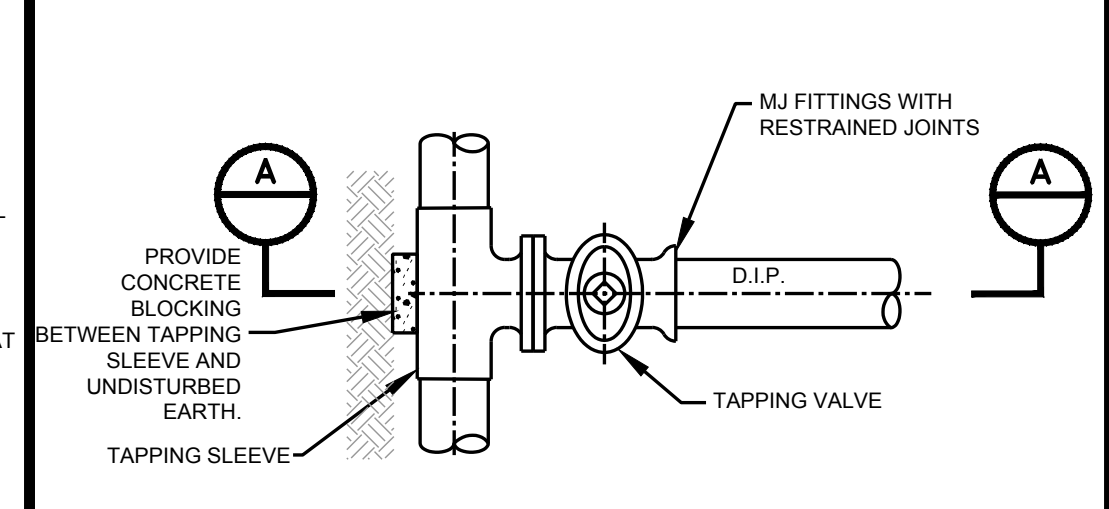
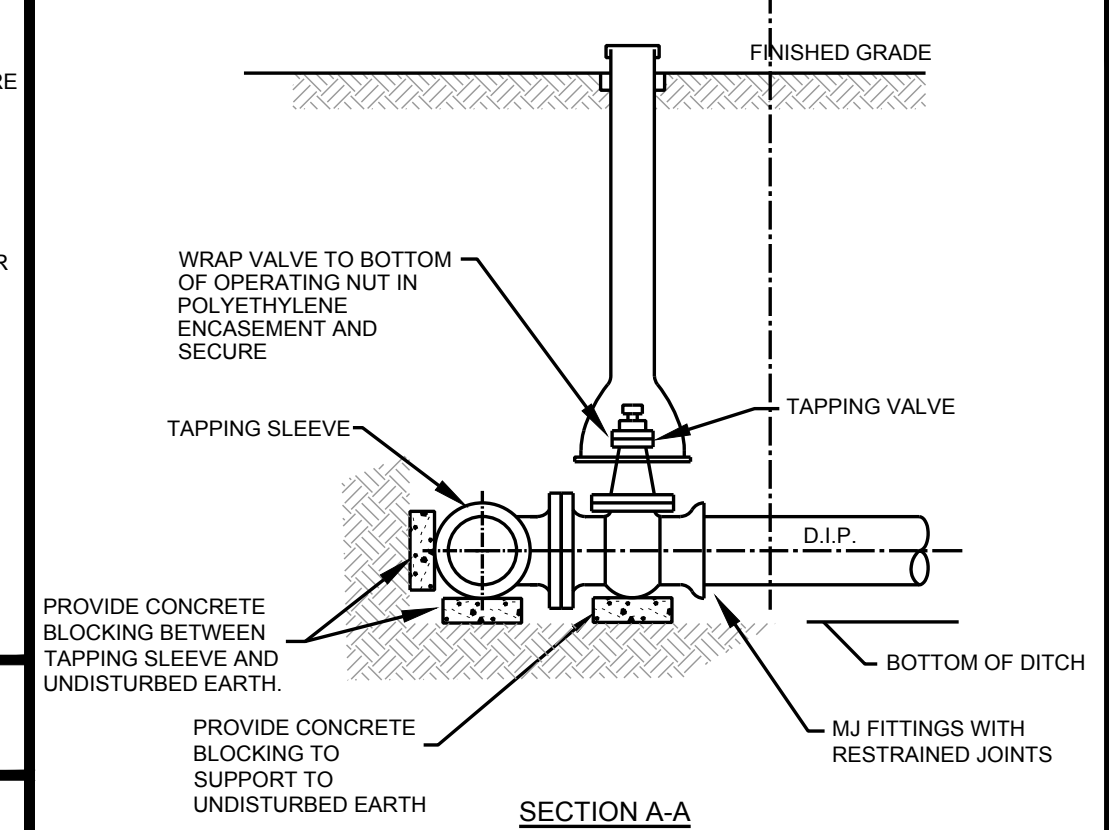
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SHEET 42 OF 46
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NOTES:
1. PREFERRED SAMPLE DEVICE FOR NEW MAINS. LOCAL OFFICE MAY ALLOW AN APPROVED ALTERNATIVE.

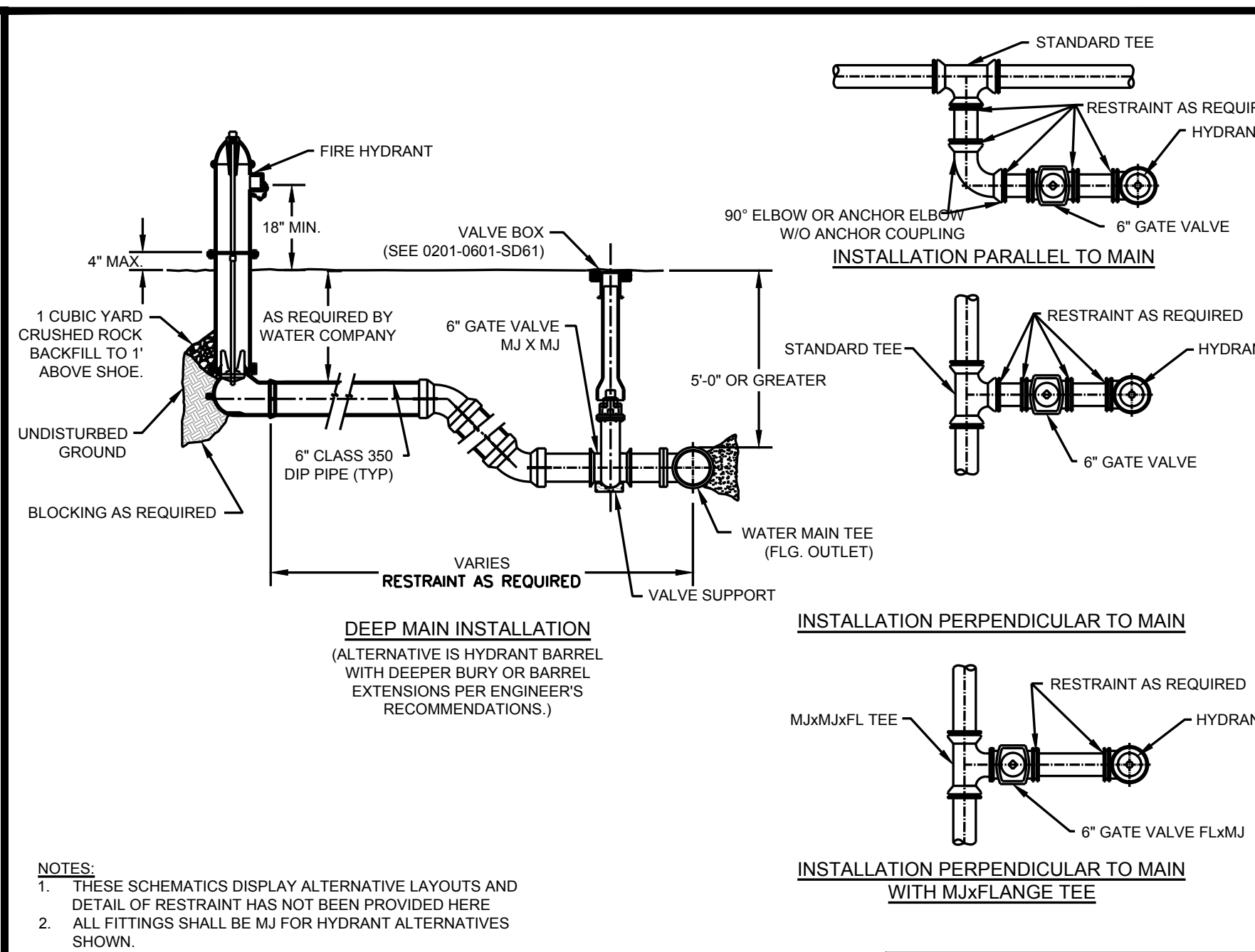
SAMPLING DETAIL



TAPPING SLEEVE AND VALVE DETAIL-STANDARD
N.T.S.

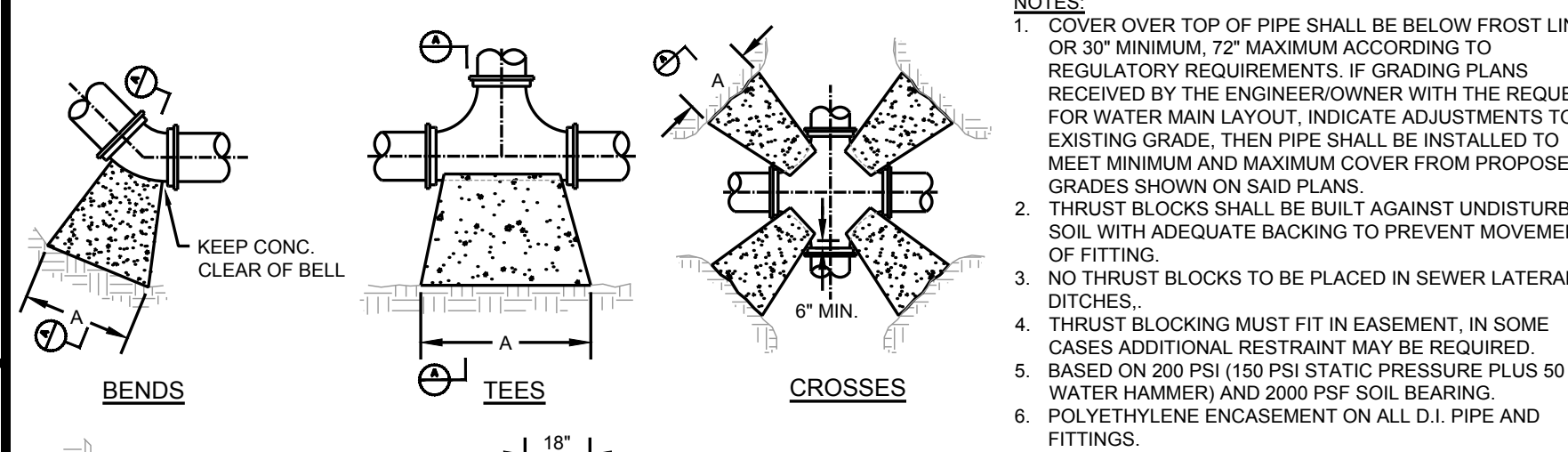
NOTES:
1. CONTRACTOR TO SUBMIT RESTRAINED DESIGN.
2. SEE CONCRETE DETAILS.

TAPPING SLEEVE AND VALVE DETAIL



NOTES:
1. THESE SCHEMATICS DISPLAY ALTERNATIVE LAYOUTS AND DETAIL OF RESTRAINT HAS NOT BEEN PROVIDED HERE.
2. ALL FITTINGS SHALL BE MJ FOR HYDRANT ALTERNATIVES SHOWN.

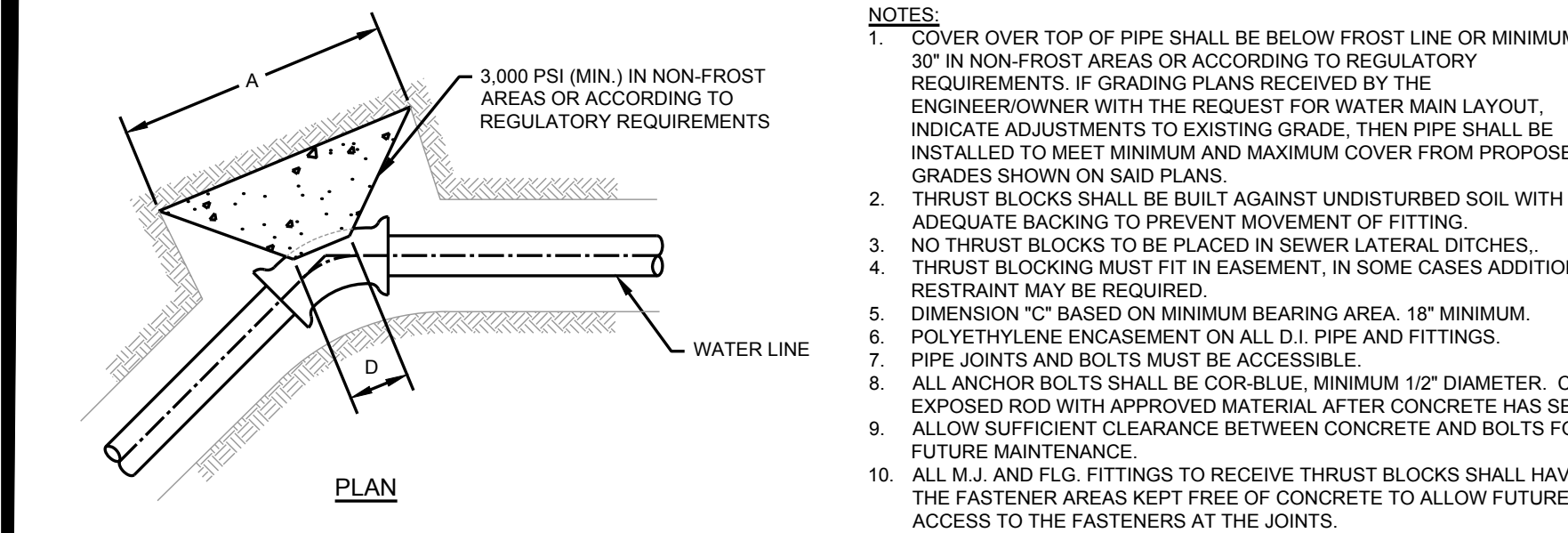
FIRE HYDRANT LAYOUT - ALTERNATIVES DETAIL



NOTES:
1. COVER OVER TOP OF PIPE SHALL BE BELOW FROST LINE OR 30" MINIMUM, 72" MAXIMUM ACCORDING TO REGULATORY REQUIREMENTS. IF GRADING PLANS RECEIVED BY THE ENGINEER/OWNER WITH THE REQUEST FOR WATER MAIN LAYOUT, INDICATE ADJUSTMENTS TO EXISTING GRADE. THEN PIPE SHALL BE INSTALLED TO MEET MINIMUM AND MAXIMUM COVER FROM PROPOSED GRADES SHOWN ON SAID PLANS.
2. THRUST BLOCKS SHALL BE BUILT AGAINST UNDISTURBED SOIL WITH ADEQUATE BACKING TO PREVENT MOVEMENT OF FITTING.
3. NO THRUST BLOCKS TO BE PLACED IN SEWER LATERAL DITCHES.
4. THRUST BLOCKING MUST FIT IN EASEMENT, IN SOME CASES ADDITIONAL RESTRAINT MAY BE REQUIRED.
5. BASED ON 200 PSI (150 PSI STATIC PRESSURE PLUS 50 PSI WATER HAMMER) AND 2000 PSF SOIL BEARING.
6. POLYETHYLENE ENCASEMENT ON ALL D.I. PIPE AND FITTINGS.
7. PIPE JOINTS AND BOLTS MUST BE ACCESSIBLE.
8. ALLOW SUFFICIENT CLEARANCE BETWEEN CONCRETE AND BOLTS FOR FUTURE MAINTENANCE.
9. ALL ANCHOR BOLTS SHALL BE COR-BLUE, MINIMUM 1/2" DIAMETER. COAT EXPOSED ROD WITH APPROVED MATERIAL AFTER CONCRETE HAS SET.
10. ALL MJ AND FLG FITTINGS TO RECEIVE THRUST BLOCKS SHALL HAVE THE FASTENER AREAS FELT WRAPPED AND TAPED PRIOR TO THE CONCRETE POUR TO ALLOW FUTURE ACCESS TO THE FASTENERS AT THE JOINTS.
11. THRUST BLOCKING DETAILS ARE SHOWN HERE FOR TYPICAL INSTALLATIONS. IN SOME CASES, ADDITIONAL RESTRAINT MAY BE REQUIRED.
12. PORTLAND CEMENT CONCRETE USED FOR THRUST BLOCKS SHALL BE MIN 3000 PSI CONCRETE.
13. FOR UNSTABLE SOIL CONDITIONS, CHECK WITH ENGINEER FOR THRUST BLOCK DIMENSIONS.
14. FOR MAIN SIZES GREATER THAN 16", SEE ENGINEER FOR THRUST BLOCK DIMENSIONS.

PIPE SIZE (IN.)	90 DEGREE BENDS			45 DEGREE BENDS			11.25 DEGREE BENDS			22.5 DEGREE BENDS			TEES/PLUGS		
	A"	B"	AREA (SQ. FT.)	A"	B"	AREA (SQ. FT.)	A"	B"	AREA (SQ. FT.)	A"	B"	AREA (SQ. FT.)	A"	B"	AREA (SQ. FT.)
6	3.3	4.3	1.8	2.9	2.3	1.8	2.7	6"	1.5	12"	1.8	6.4	3"	30"	1.8
8	4.2	5.5	2.4	3.7	3.0	2.4	3.6	8"	2.0	16"	2.4	8.4	4"	36"	2.4
10	5.1	6.6	3.0	4.5	3.6	3.0	4.5	10"	2.5	20"	3.0	10.8	5"	48"	3.0
12	6.0	7.8	3.6	5.4	4.2	3.6	5.4	12"	3.0	24"	3.6	13.8	6"	60"	3.6
14	7.0	9.0	4.2	6.3	4.8	4.2	6.3	14"	3.5	28"	4.2	16.8	7"	84"	4.2
16	8.1	10.5	4.8	7.2	5.4	4.8	7.2	16"	4.0	32"	4.8	19.2	8"	96"	4.8

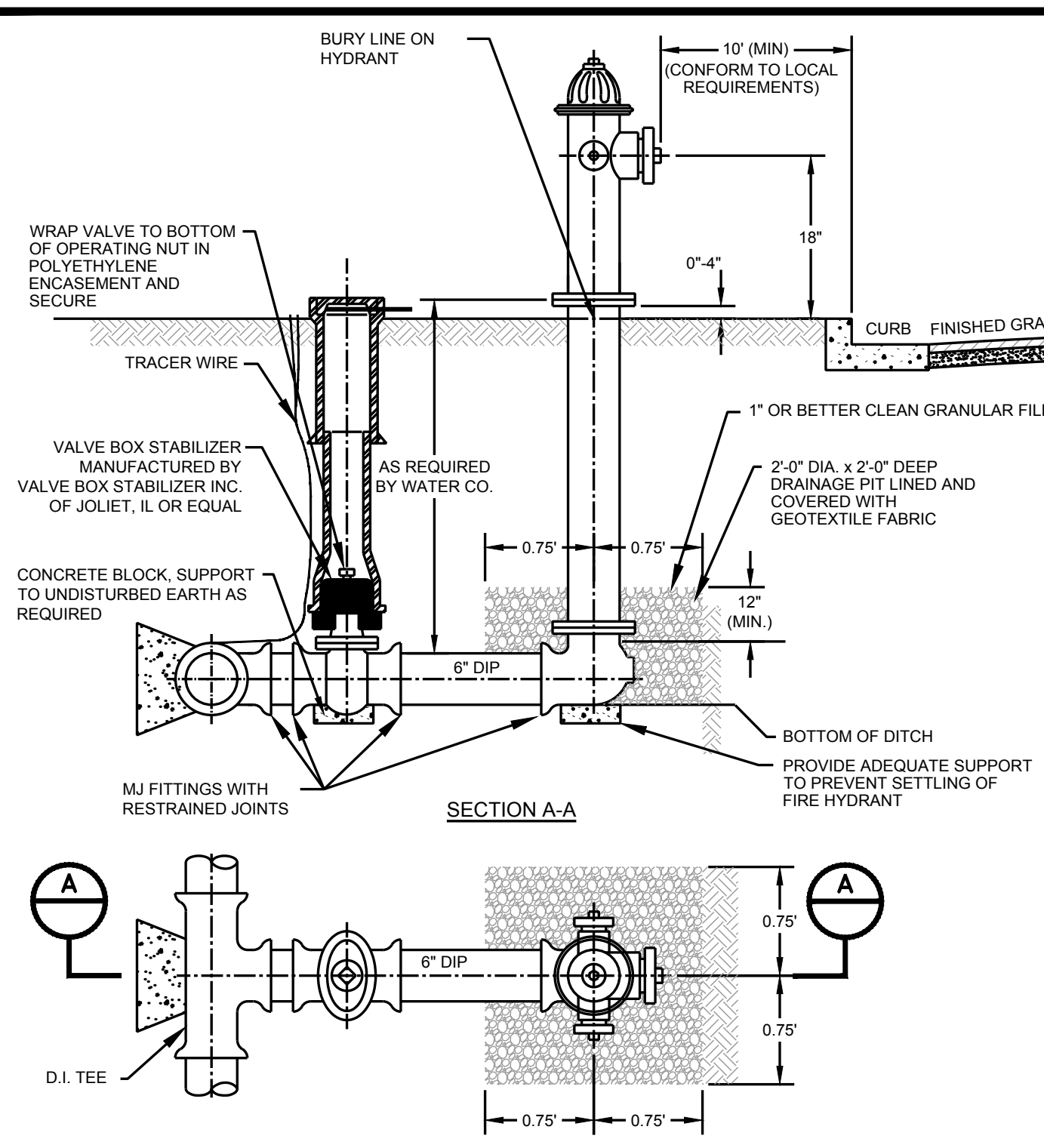
Area in square feet "A" and "B" in inches.
Bearing table area is based on 200 psi maximum with soil bearing capacity of 2000 lbs/square foot.
For higher water pressures or lower soil pressures, consult Engineer for adjustments.
Bearing table area does not include a safety factor.
A safety factor and additional bearing area may be required as directed by the Engineer.



THRUST BLOCK AT HORIZONTAL BENDS (LESS THAN 3 FEET IN THICKNESS) - DETAIL

NOTES:
1. COVER OVER TOP OF PIPE SHALL BE BELOW FROST LINE OR MINIMUM 30" IN NON-FROST AREAS OR ACCORDING TO REGULATORY REQUIREMENTS. IF GRADING PLANS RECEIVED BY THE ENGINEER/OWNER WITH THE REQUEST FOR WATER MAIN LAYOUT, INDICATE ADJUSTMENTS TO EXISTING GRADE. THEN PIPE SHALL BE INSTALLED TO MEET MINIMUM AND MAXIMUM COVER FROM PROPOSED GRADES SHOWN ON SAID PLANS.
2. THRUST BLOCKS SHALL BE BUILT AGAINST UNDISTURBED SOIL WITH ADEQUATE BACKING TO PREVENT MOVEMENT OF FITTING.
3. NO THRUST BLOCKS TO BE PLACED IN SEWER LATERAL DITCHES.
4. THRUST BLOCKING MUST FIT IN EASEMENT, IN SOME CASES ADDITIONAL RESTRAINT MAY BE REQUIRED.
5. DIMENSION "C" BASED ON MINIMUM BEARING AREA. 18" MINIMUM.
6. POLYETHYLENE ENCASEMENT ON ALL D.I. PIPE AND FITTINGS.
7. PIPE JOINTS AND BOLTS MUST BE ACCESSIBLE.
8. ALL ANCHOR BOLTS SHALL BE COR-BLUE, MINIMUM 1/2" DIAMETER. COAT EXPOSED ROD WITH APPROVED MATERIAL AFTER CONCRETE HAS SET.
9. ALLOW SUFFICIENT CLEARANCE BETWEEN CONCRETE AND BOLTS FOR FUTURE MAINTENANCE.
10. ALL MJ AND FLG FITTINGS TO RECEIVE THRUST BLOCKS SHALL HAVE THE FASTENER AREAS FREE OF CONCRETE TO ALLOW FUTURE ACCESS TO THE FASTENERS AT THE JOINTS.
11. THRUST BLOCKING DETAILS ARE SHOWN HERE FOR TYPICAL INSTALLATIONS. IN SOME CASES, ADDITIONAL RESTRAINT MAY BE REQUIRED.
12. PORTLAND CEMENT CONCRETE USED FOR THRUST BLOCKS SHALL BE 3000 PSI CONCRETE (MIN.).
13. BEARING AREAS ARE BASED ON SOIL HAVING AN ALLOWABLE SAFE LATERAL BEARING OF 2000 POUNDS PER SQUARE FOOT AND 200 PSI TEST PRESSURE. AREA MUST BE REVISED FOR SOILS WITH A LOWER BEARING CAPACITY OR HIGHER TEST PRESSURE.

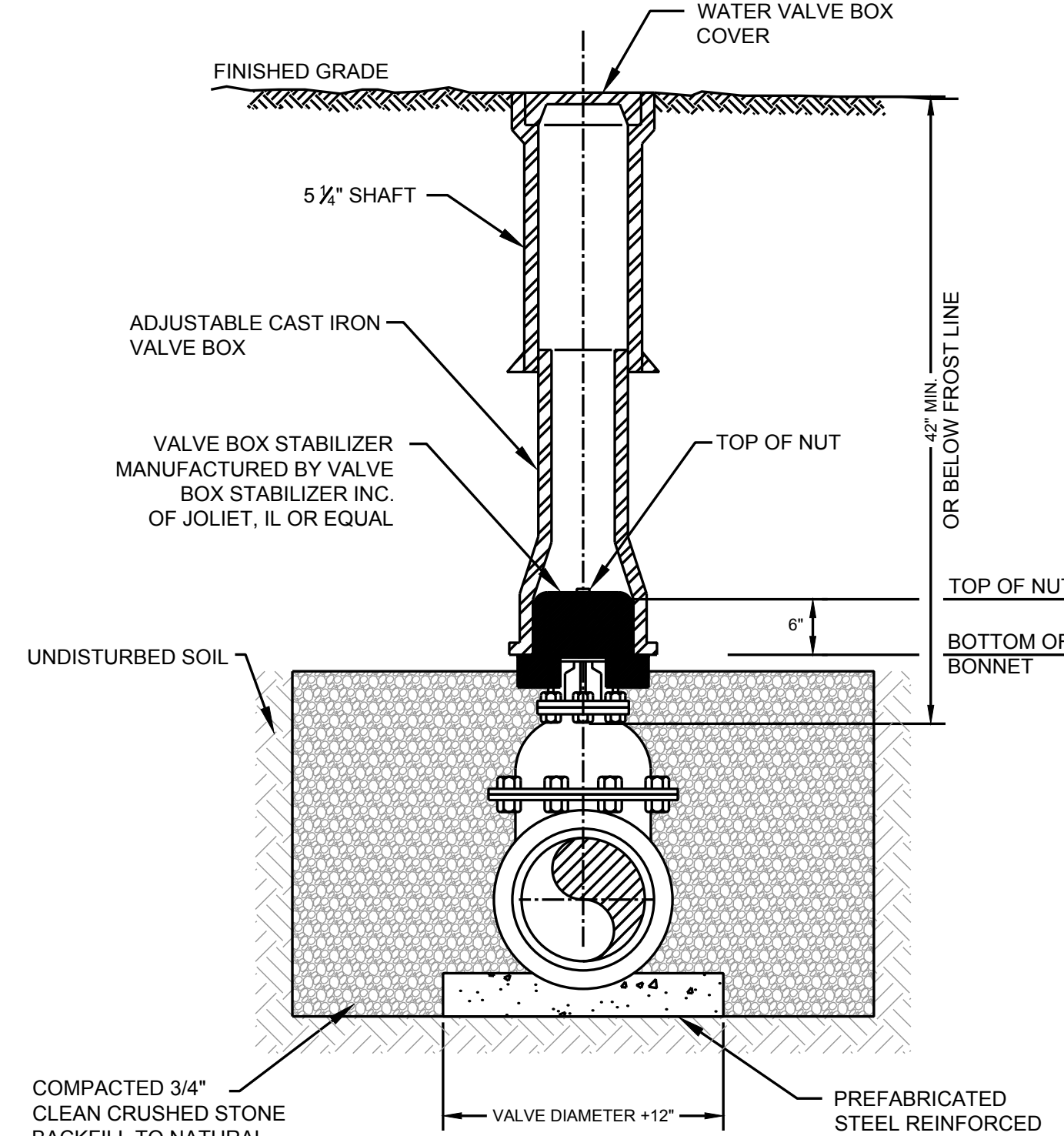
THRUST BLOCK AT HORIZONTAL BENDS (LESS THAN 3 FEET IN THICKNESS) - DETAIL



FIRE HYDRANT DETAIL-STANDARD
N.T.S.

NOTES:
1. CONTRACTOR TO SUBMIT RESTRAINED DESIGN.
2. PAINT HYDRANT TO BURY LINE (AND CAN BE DONE PRIOR TO INSTALLATION).
3. APPLY TOUCH UP PAINT AS REQUIRED AFTER INSTALLATION.
4. OPTION IS TO USE DI MJ SWIVEL TEE TO CONNECT DIRECTLY TO MJ 6" HYDRANT VALVE.
5. DI TEE AND VALVE CAN BE REPLACED WITH A TAPPING SLEEVE AND VALVE.
6. THE USE OF AN ANCHOR TEE IS ACCEPTABLE.

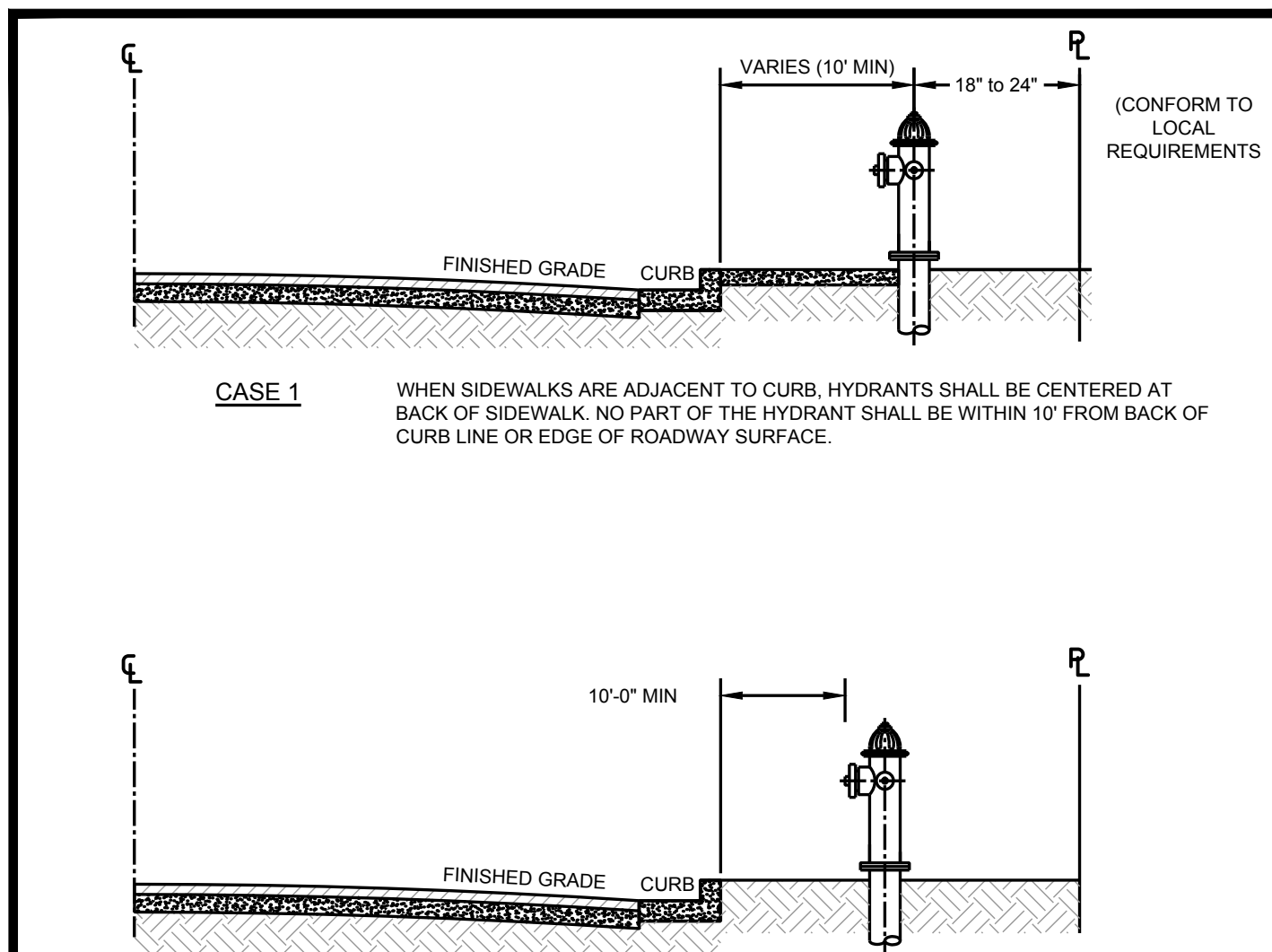
DRY BARREL FIRE HYDRANT DETAIL



VALVE BOX INSTALLATION FOR FROST AREAS DETAIL

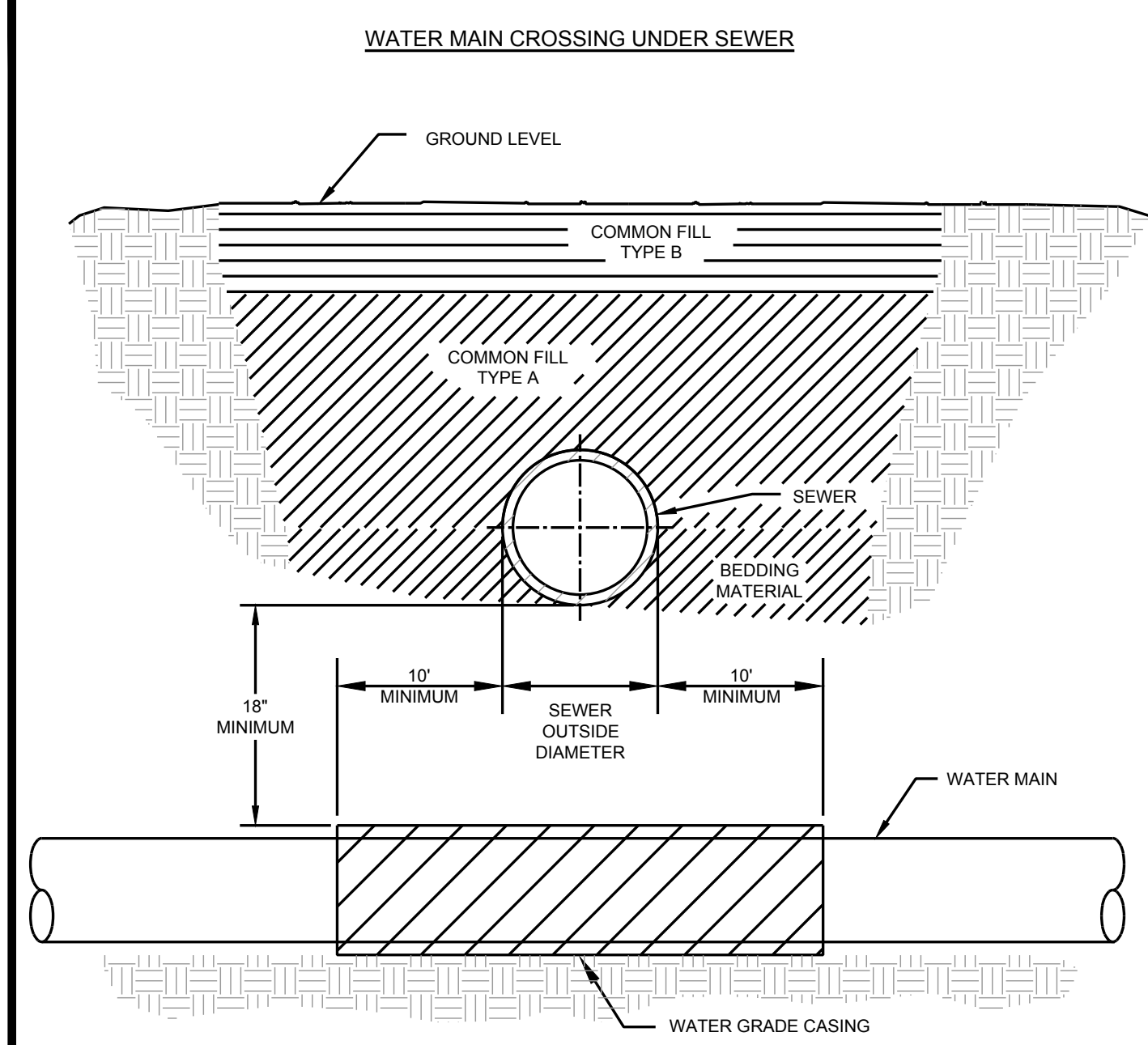
NOTE:
6"x6" WOOD BLOCK MAY BE USED AS VALVE PAD WHERE APPROVED BY ENGINEER.

VALVE BOX INSTALLATION FOR FROST AREAS DETAIL



FIRE HYDRANT LOCATION DETAIL

NOTES:
1. REQUIREMENTS OF LOCAL AUTHORITY HAVING JURISDICTION SHALL PREVAIL. IN THEIR ABSENCE, THE INSTALLATIONS SHOWN MAY BE USED.
2. EXACT HYDRANT LOCATION TO BE FIELD DETERMINED BY LOCAL AUTHORITY HAVING JURISDICTION.



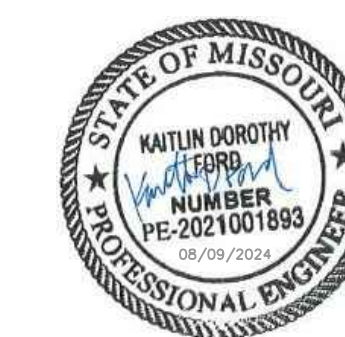
WATER MAIN CROSSING UNDER SEWER DETAIL

OPTION A - PRESSURE CLASS SEWER MAIN
1. REPLACE EXISTING SEWER WITH A PRESSURE CLASS MAIN IN LIEU OF CASING THE WATER MAIN.
2. THE SEWER SHALL BE REPLACED A MINIMUM OF 10' EACH SIDE OF THE WATERMAIN.

OPTION B - WATER MAIN CASING INSTALLATION
1. PROVIDE ADEQUATE SUPPORT FOR THE EXISTING SEWER TO PREVENT DAMAGE DUE TO SETTLEMENT.

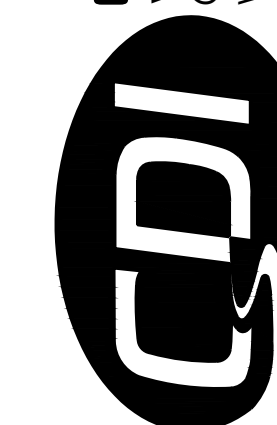
NOTES:
1. FOLLOW TRENCH MATERIAL DETAIL WHEN BACK-FILLING WATER MAIN.
2. THE SELECTED OPTION MUST BE APPROVED BY A REPRESENTATIVE OF THE OWNER.

WATER MAIN CROSSING UNDER SEWER DETAIL



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CDI PROJECT # 5917

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ASSET # 7815201059

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CHECKED BY: WMK
DESIGNED BY: KDF

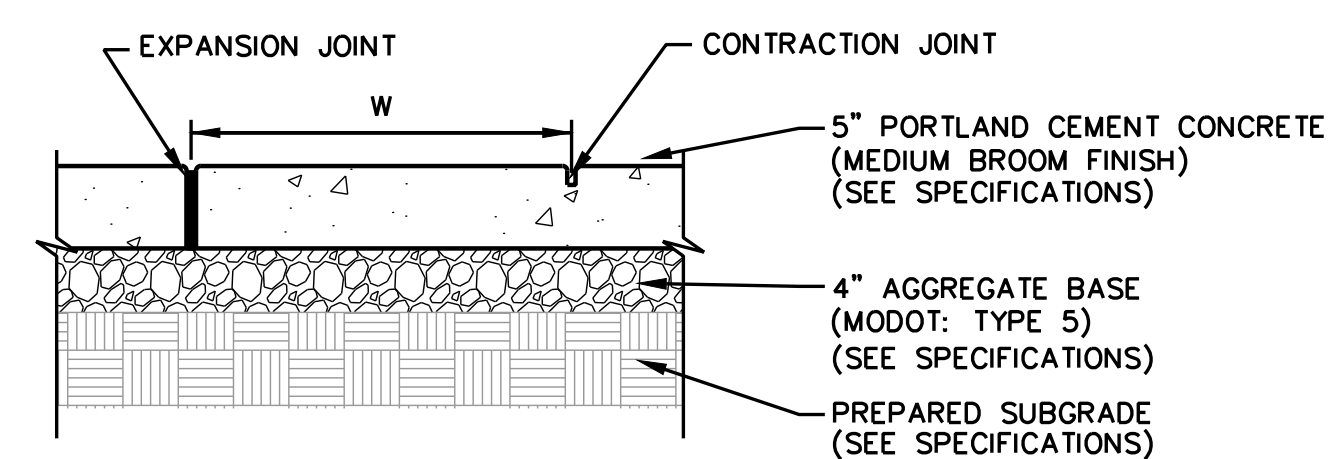
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**STANDARD
DETAILS**

SHEET NUMBER:

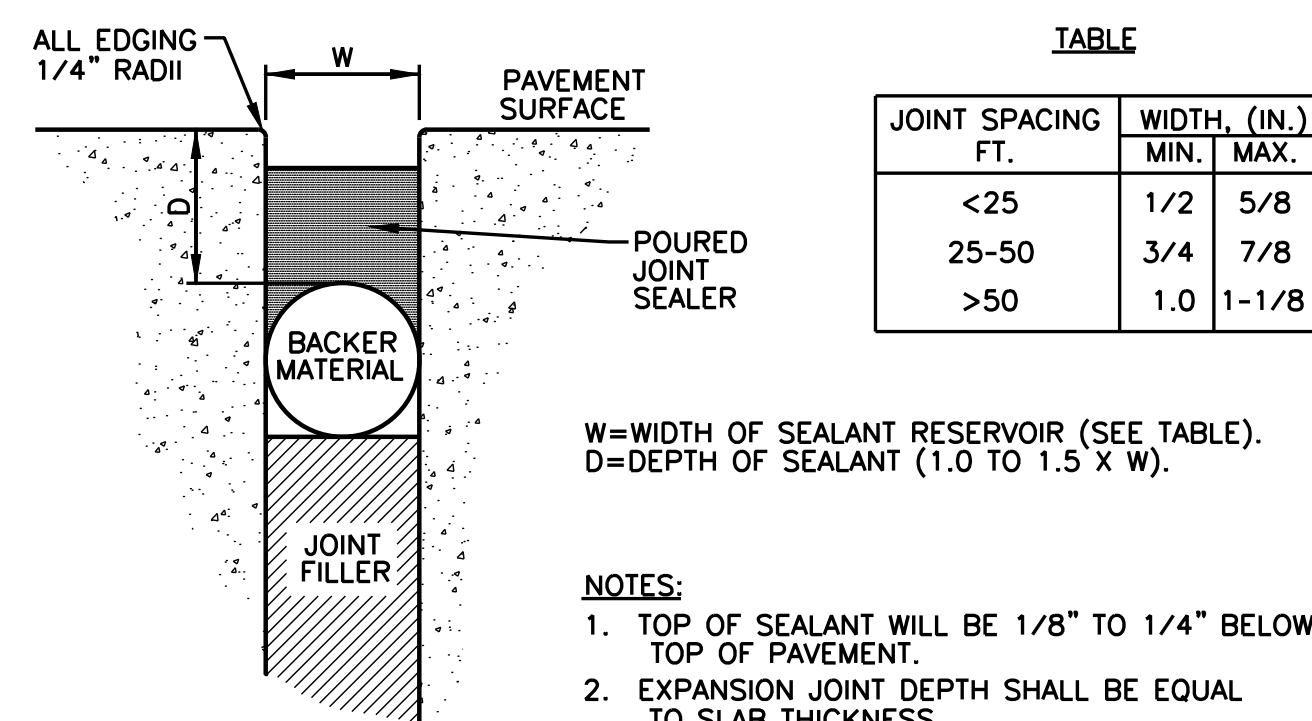
C-405

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AUGUST 9, 2024



- NOTES:
1. W=WIDTH OF SIDEWALK ; VARIES-SEE PLANS
 2. SPACE CONTRACTION JOINTS AT W WHERE APPLICABLE- SEE PLAN. PLACE EXPANSION JOINTS AT 3xW.
 3. EXPANSION JOINT SHALL BE PLACED THROUGH THE FULL DEPTH OF THE SIDEWALK.

A CONCRETE PAVEMENT-PEDESTRIAN
NOT TO SCALE



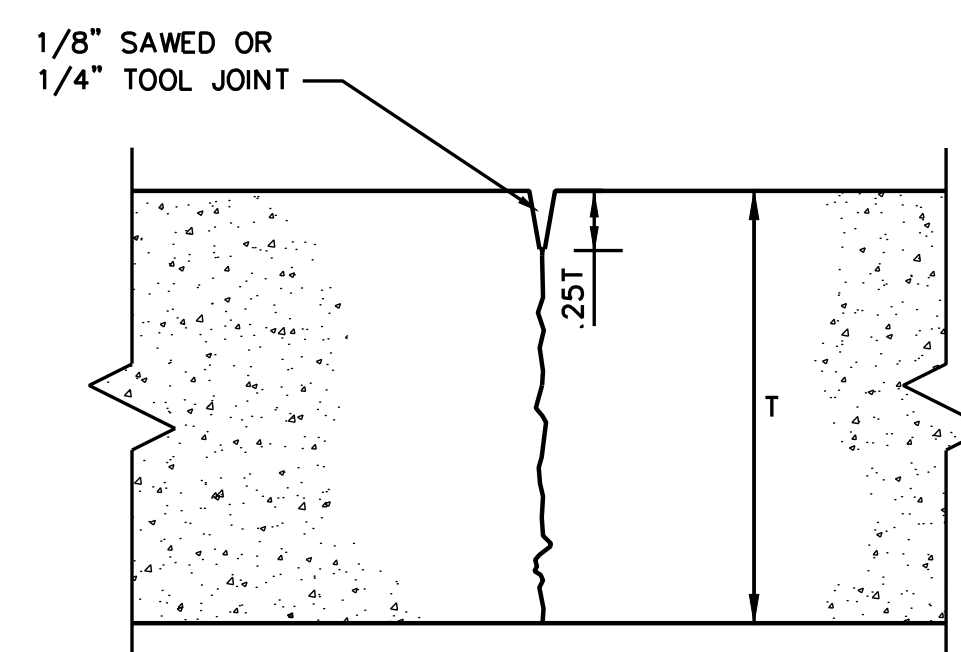
TABLE

JOINT SPACING FT.	WIDTH, (IN.)	
	MIN.	MAX.
<25	1/2	5/8
25-50	3/4	7/8
>50	1.0	1-1/8

W=WIDTH OF SEALANT RESERVOIR (SEE TABLE).
D=DEPTH OF SEALANT (1.0 TO 1.5 X W).

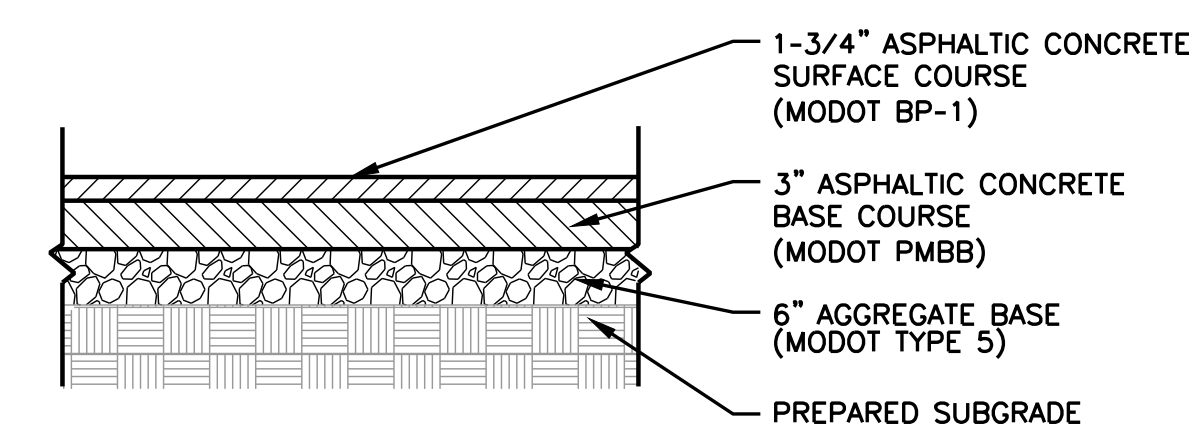
- NOTES:
1. TOP OF SEALANT WILL BE 1/8" TO 1/4" BELOW TOP OF PAVEMENT.
 2. EXPANSION JOINT DEPTH SHALL BE EQUAL TO SLAB THICKNESS.

B EXPANSION JOINT
NOT TO SCALE

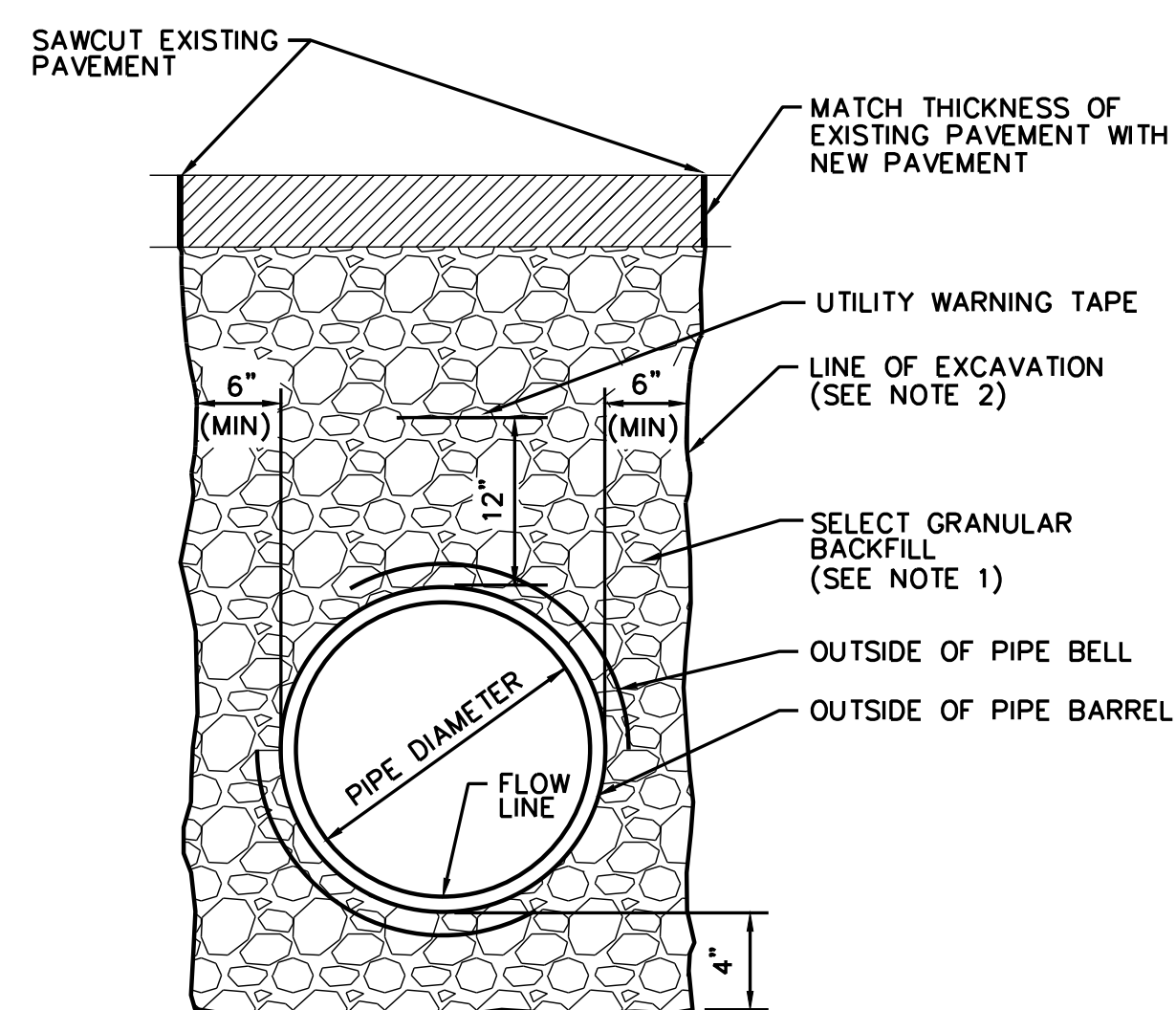


- NOTES:
1. "T" DENOTES CONCRETE THICKNESS (SEE PAVEMENT SECTIONS)
 2. SAWCUT JOINTS WITHIN 16 HOURS OF PLACEMENT.
 3. USE ONLY IN CONCRETE WALKS.

C CONTRACTION JOINT
NOT TO SCALE

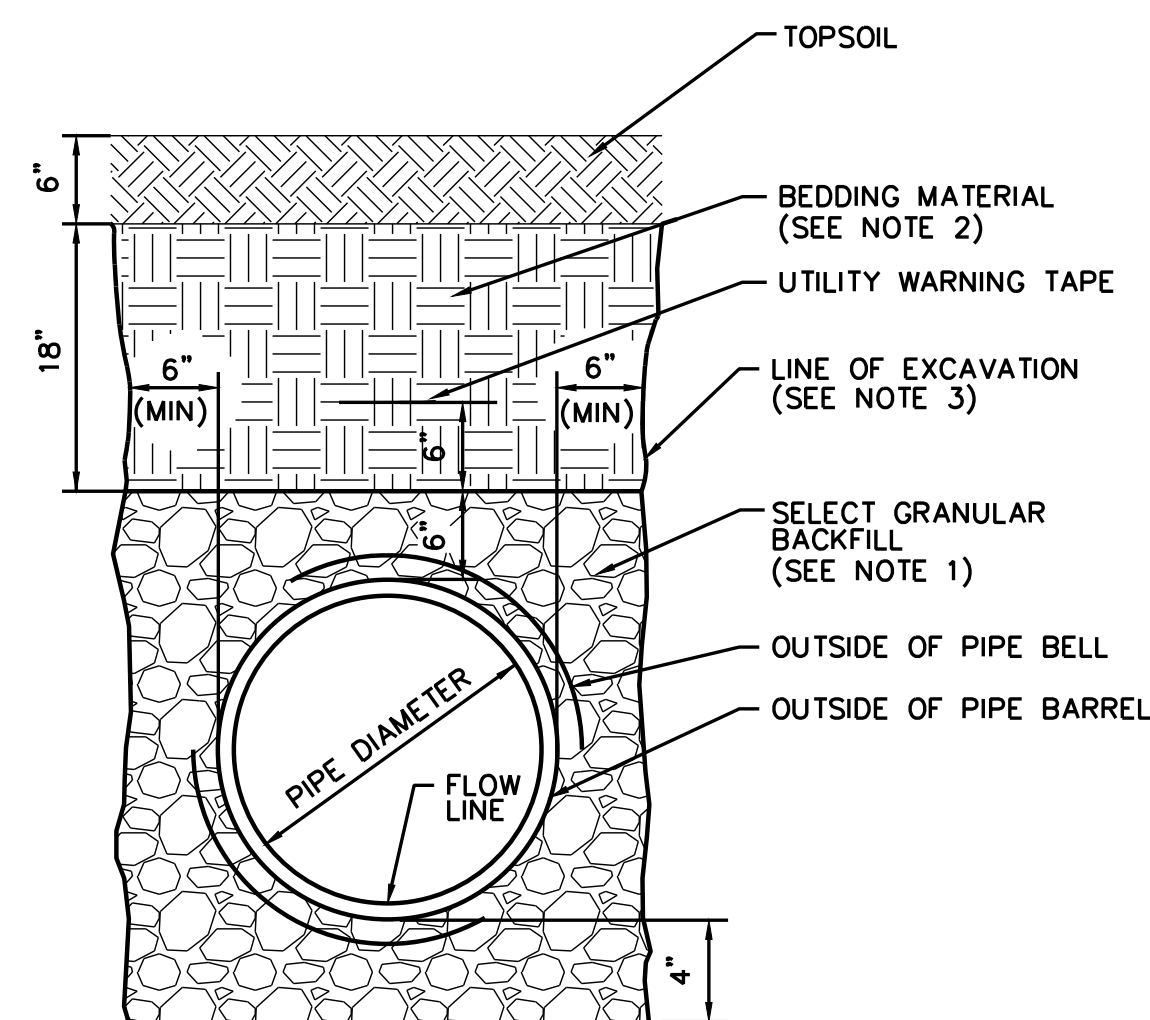


D ASPHALT PAVEMENT
NOT TO SCALE



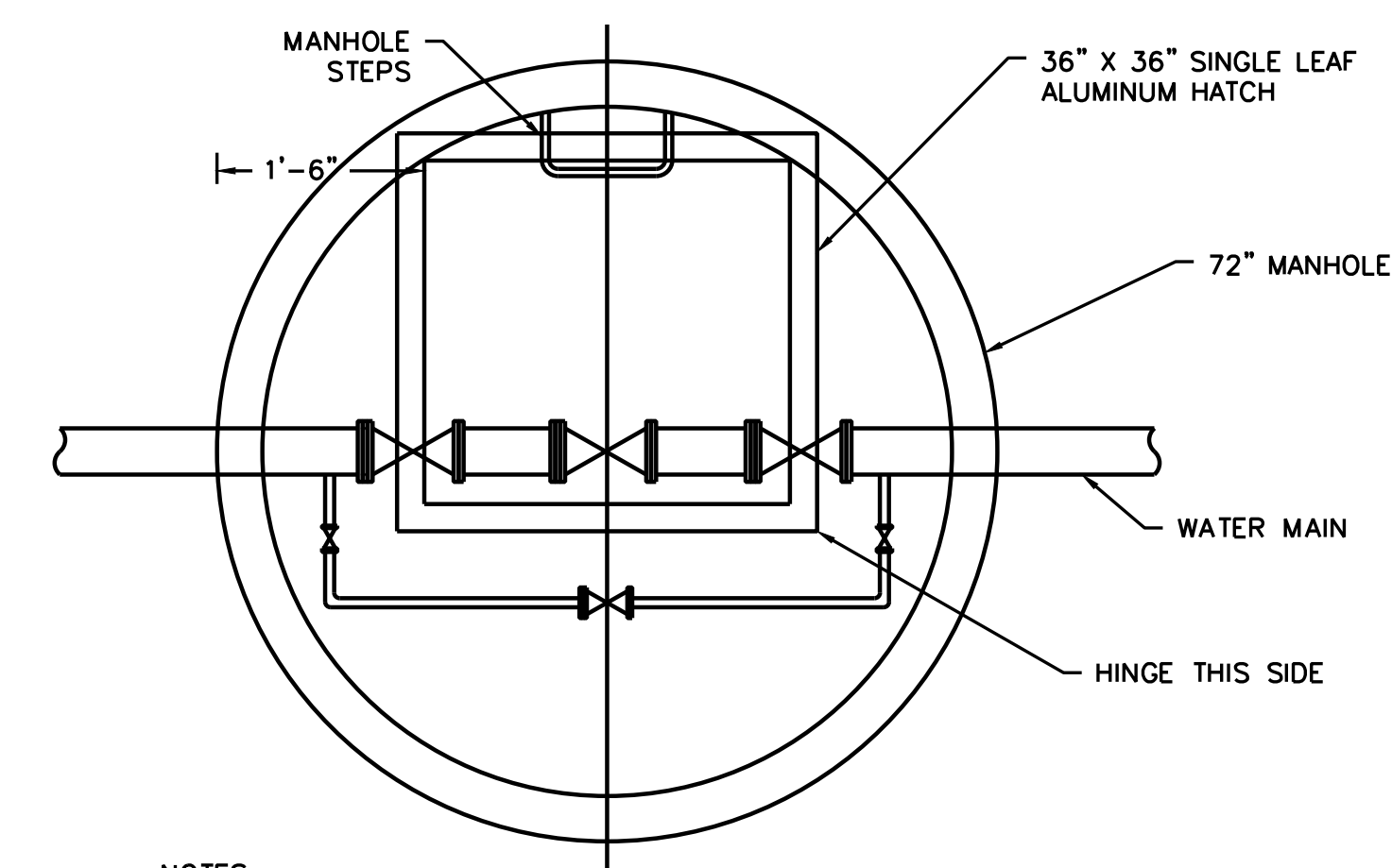
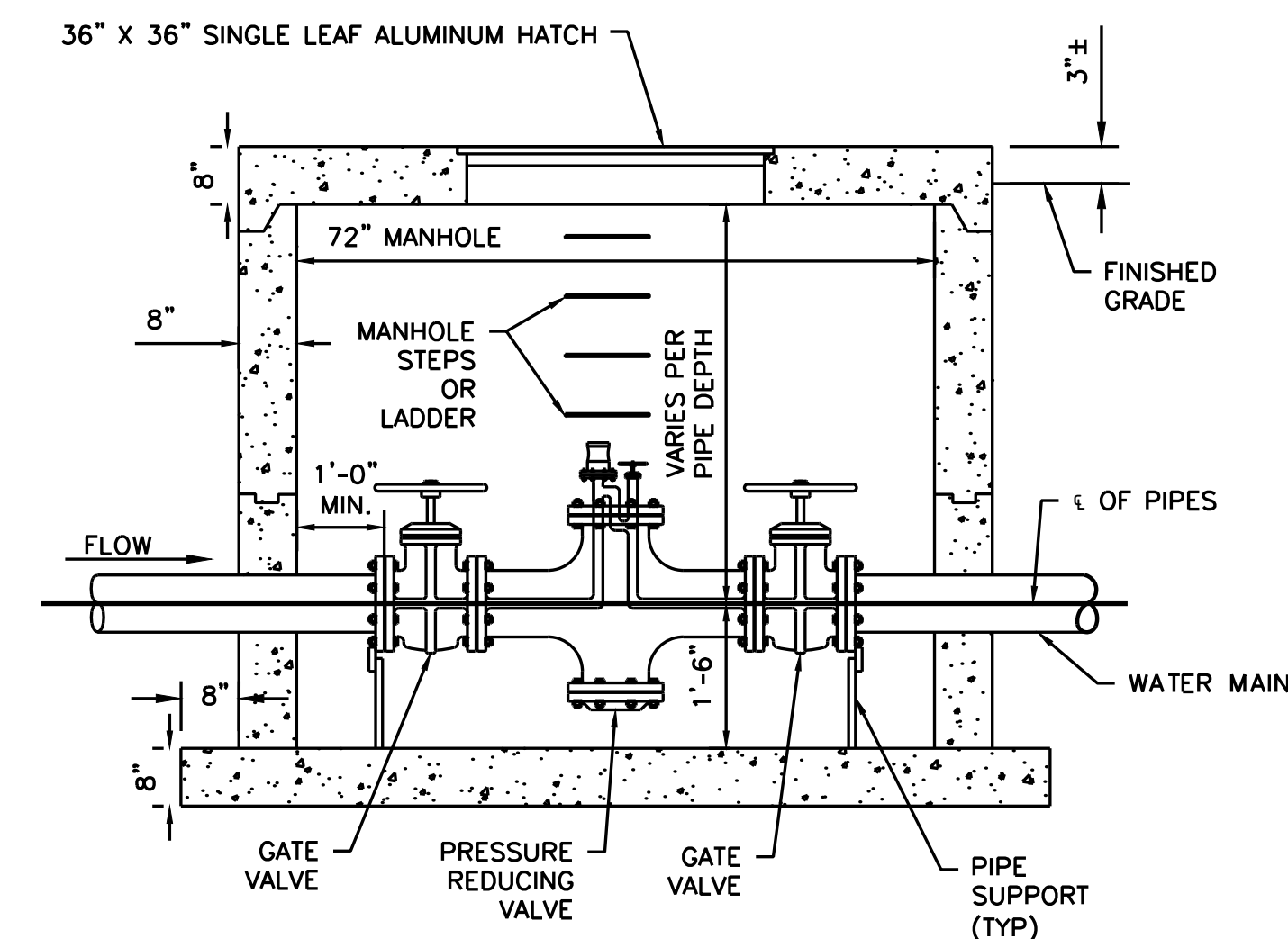
- NOTES:
1. SELECT GRANULAR BACKFILL SHALL CONSIST OF CRUSHED LIMESTONE AND SCREENINGS. COMPACT BACKFILL TO 95% MAXIMUM DENSITY AS DETERMINED BY THE MODIFIED PROCTOR COMPACTION TEST. (ASTM D 1557)
 2. CONTRACTOR SHALL BE RESPONSIBLE FOR SHORING AND BENCHING TRENCH EXCAVATIONS IN ACCORDANCE WITH ALL LOCAL, STATE, FEDERAL AND OSHA REQUIREMENTS.

E UTILITY TRENCH - UNDER PAVEMENT
NOT TO SCALE



- NOTES:
1. SELECT GRANULAR BACKFILL SHALL CONSIST OF CRUSHED LIMESTONE AND SCREENINGS. COMPACT BACKFILL TO 95% MAXIMUM DENSITY AS DETERMINED BY THE MODIFIED PROCTOR COMPACTION TEST. (ASTM D 1557)
 2. COMPACT BEDDING MATERIAL UNDER LAWNS TO 85% MAXIMUM DENSITY AS DETERMINED BY THE MODIFIED PROCTOR COMPACTION TEST. (ASTM D 1557)
 3. CONTRACTOR SHALL BE RESPONSIBLE FOR SHORING AND BENCHING TRENCH EXCAVATIONS IN ACCORDANCE WITH ALL LOCAL, STATE, FEDERAL AND OSHA REQUIREMENTS.

F UTILITY TRENCH - UNDER LAWN
NOT TO SCALE

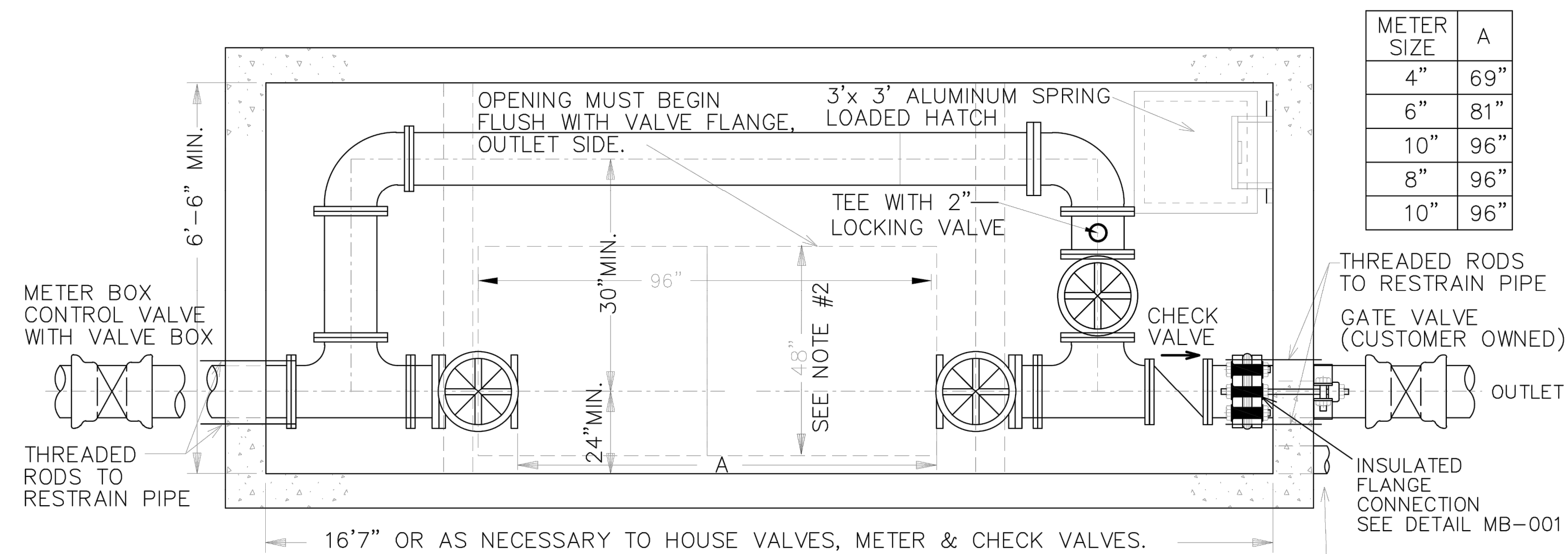


- NOTES:
1. CONTRACTOR SHALL FOLLOW MANUFACTURER SPECIFICATIONS FOR THE INSTALLATION OF PRESSURE REDUCER VALVE AND OTHER APPURTENANCES. THIS INCLUDES BUT NOT LIMITED TO ANY ADDITIONAL COUPLINGS, SEALANTS, BALL VALVES, BLOWDOWN VALVES, AIR VALVES, AND SUMP DRAINS.

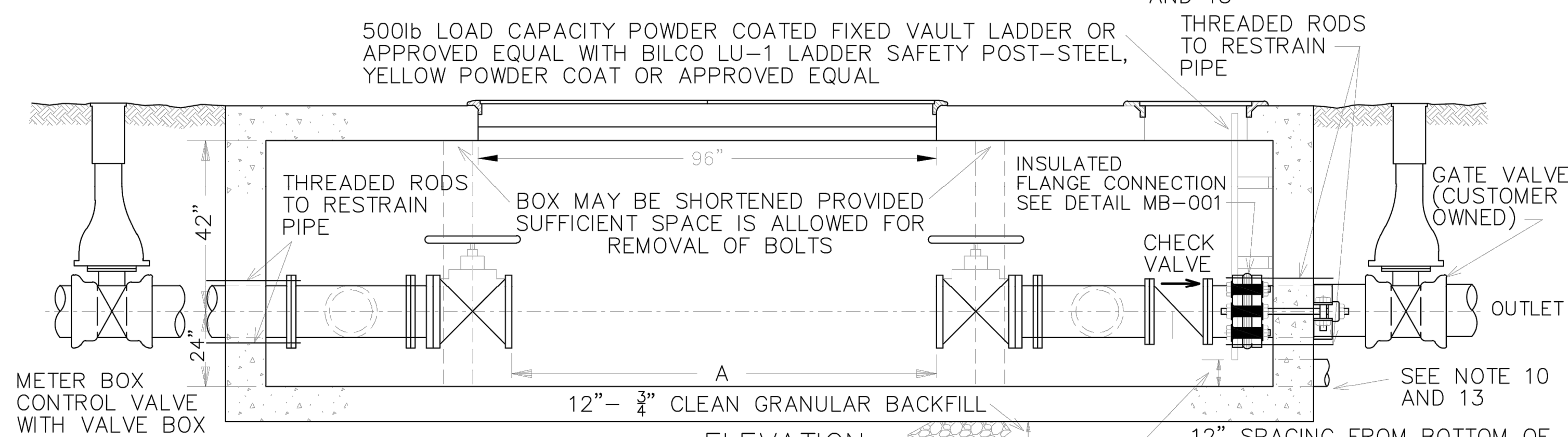
G PRESSURE REDUCER STATION & VAULT
NOT TO SCALE



FILE NO. _____
 INDEX NO. _____
 ISSUED DATE 07-2022
 AMENDED DATE 10-25-2023



PLAN



ELEVATION

1. VAULT WALLS AND ROOF TO BE OF CONCRETE.
2. LIDS AND FRAMES OF OPENING TO BE SET IN PLACE, NOT IN CONCRETE. LIDS SHALL BE MADE OF ALUMINUM & SPRING LOADED. OPENING WILL REQ. DOUBLE DOORS FOR ALL METER SIZES WITH AN OPENING OF 96"x 48" TO ALLOW UNRESTRICTED ACCESS OF OPENING TO BE FLUSH WITH OUTLET VALVE FLANGE.
3. VALVING MUST HAVE FLANGED ENDS, BE IN ALIGNMENT, AND BE ADEQUATELY SECURED TO WITHSTAND WATER THRUST WITH METER REMOVED.
4. CLASS 52 D.I. PIPING THROUGH BOX AND EXTENDED MIN. 6' OUTSIDE BOX. (ZINC COATED DI PIPE WITH V-BIO POLYWRAP OPTIONAL IN HIGHLY CORROSIVE SOIL AREAS)
5. OWNER SUBJECT TO SUBSIDY COST FOR METER.
6. METER BOX CONTROL VALVES TO BE LOCATED AS NEAR TO METER BOX AS PRACTICAL.
7. CONNECTION TO PUBLIC WATER MAIN WILL NOT BE MADE BEFORE METER PIT AND PIPING ARE COMPLETE AND PROPERTY LINE VALVE INSTALLED, UNLESS APPROVED BY AUTHORIZED COMPANY REPRESENTATIVE.
8. ANY DEVIATION FROM PIPE DEPTH SHOWN MUST BE APPROVED BY AUTHORIZED COMPANY REPRESENTATIVE PRIOR TO CONSTRUCTION.
9. BOX TO BE SET WITH TOP OF BOX AT FINISHED GRADE WITH NO EXTENSION ALLOWED.
10. DRAINAGE FACILITIES MUST BE PROVIDED, OR BOX OTHERWISE KEPT FREE OF WATER. NO FRENCH DRAINS ALLOWED UNLESS APPROVED BY AUTHORIZED COMPANY REPRESENTATIVE.
11. BY-PASS SIZE SAME AS METER SIZE.
12. CHECK VALVES REQUIRED FOR EACH METER BOX INSTALLATION AND SHALL BE RATED AT 250 PSI AND SHALL HAVE A RESILIENT SEAT.
13. DRAIN NEEDS TO BE GRADED TO ALLOW WATER DRAINAGE AWAY AND OUT FROM VAULT
14. ALL STEEL BOLTS INCLUDING THE NUTS, WASHERS, LUGS, CLAMPS, AND BRACKETS USED FOR BOLT ACCESSORIES SHALL CONFORM TO AWWA C111 STANDARDS AND SHALL BE FACTORY COATED WITH AN APPROVED PTFE FLUOROPOLYMER COATING. THREADED RODS INCLUDING THE NUTS AND STANDARD WASHERS USED FOR THREADED ROD ACCESSORIES SHALL MEET ASTM F1554 GRADE 55 OR GRADE 105 WITH HEAVY HEX DH NUTS AND SHALL BE COATED WITH PTFE FLUOROPOLYMER COATING. APPROVED PTFE FLUOROPOLYMER COATING PRODUCTS INCLUDE FLUOROKOTE #1™, OR XYLAN™, SERIES 1420, 1421, 1424, OR APPROVED EQUAL. PTFE FLUOROPOLYMER COATINGS SHALL BE BAKED ON OR THERMALLY SET BY THE COATING MANUFACTURER.

A TEMPORARY FLANGED DUCTILE IRON SPOOL PIECE MUST BE INSTALLED IN THE PLACE OF THE METER LOCATION(S), 3" AND LARGER, TO ENSURE PIPE ALIGNMENT. MAWC PERSONNEL WILL REMOVE SPOOL PIECE AT TIME OF METER INSTALLATION AND WILL LEAVE IN METER VAULT FOR CONTRACTOR TO ACQUIRE FOR FUTURE USE.

DRG. #MB-FFS

WATER SERVICES SUBJECT TO REVISION WITHOUT NOTICE 10-25-2023

PRINT AND READ DISCLAIMER WITH ALL MAWC DRAWINGS

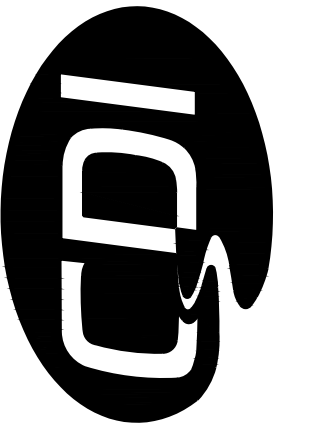
METER BOX FOR FIRE FLOW METER SERVICE

CAD /DISTRIB/DETAILS/METERBOX/METERBOX_20200821.DWG

STATE OF MISSOURI
 MICHAEL L. PARSON,
 GOVERNOR



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WATER AND SEWER
 IMPROVEMENTS

DR. EDMUND A. BABLER
 MEMORIAL STATE PARK
 800 GUY PARK DRIVE
 WILDWOOD, MISSOURI 63005

PROJECT # X2301-01
 CDI PROJECT # 5917

SITE # 5201
 ASSET # 7815201059

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

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 DRAWN BY: KDF
 CHECKED BY: WMK
 DESIGNED BY: KDF

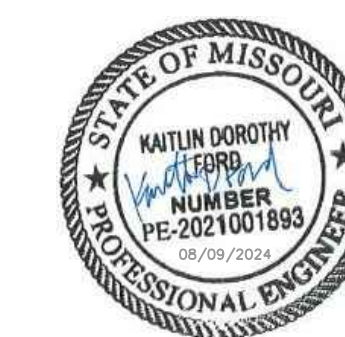
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STANDARD
 DETAILS

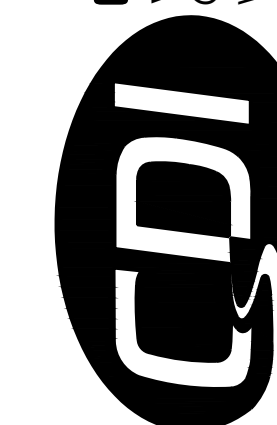
SHEET NUMBER:

C-406

SHEET 44 OF 46
 AUGUST 9, 2024



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CDI PROJECT # 5917

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ASSET # 7815201059

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DATE: _____
REVISION: _____
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DATE: _____
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DRAWN BY: KDF
CHECKED BY: WMK
DESIGNED BY: KDF

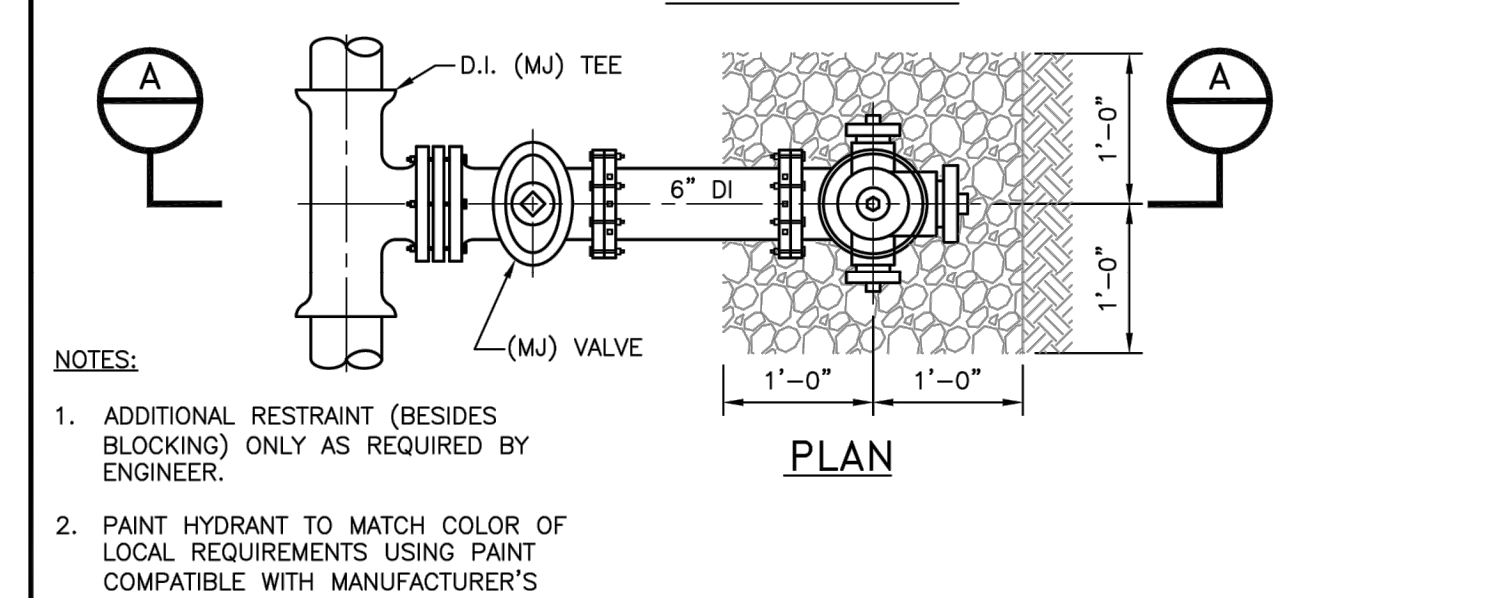
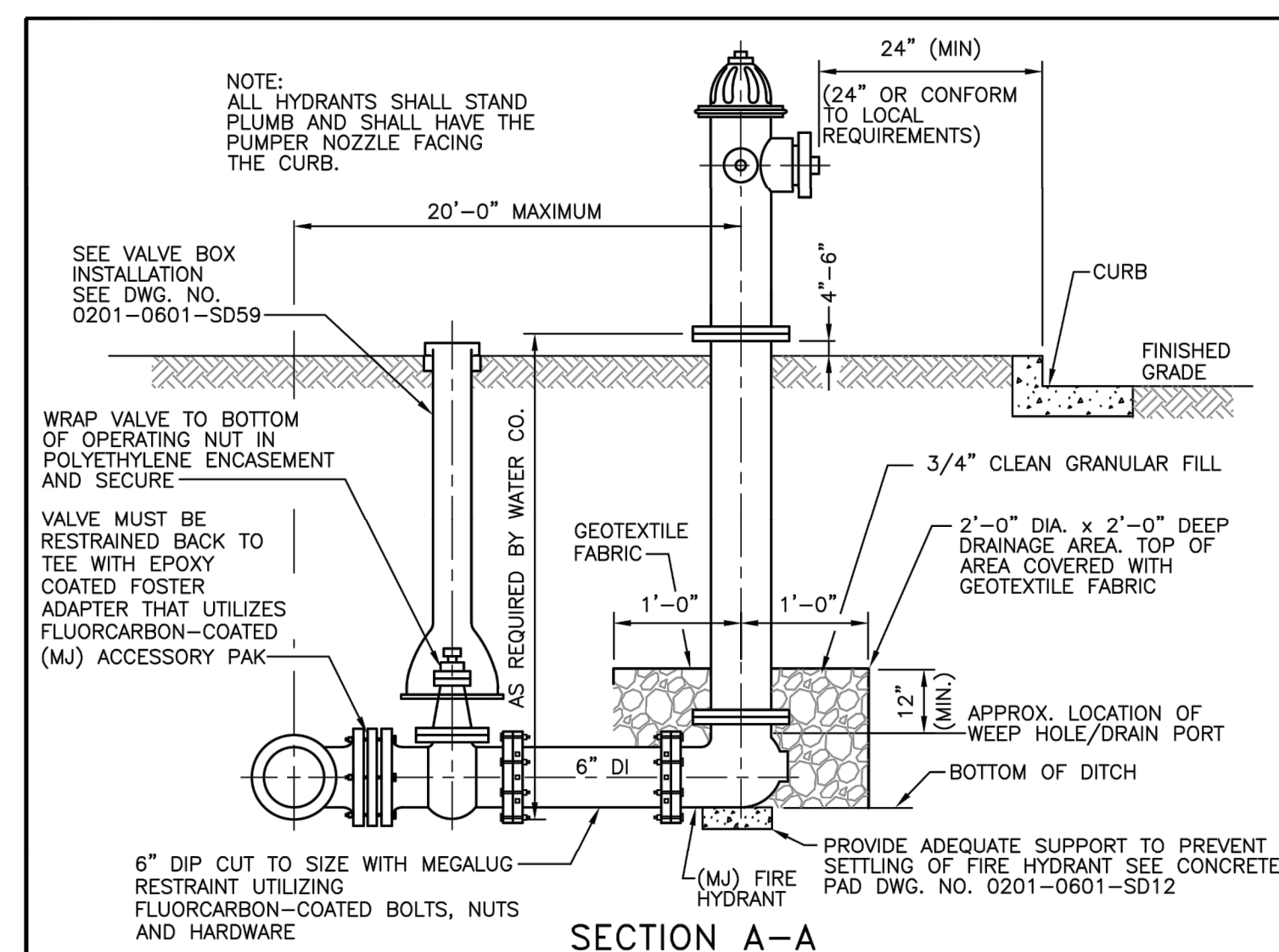
SHEET TITLE:

MO AMERICAN
WATER COMPANY
STANDARD DETAILS

SHEET NUMBER:

C-407

SHEET 45 OF 46
AUGUST 9, 2024



REVISIONS

MISSOURI AMERICAN WATER STANDARD
CIVIL
FIRE HYDRANT
DETAIL

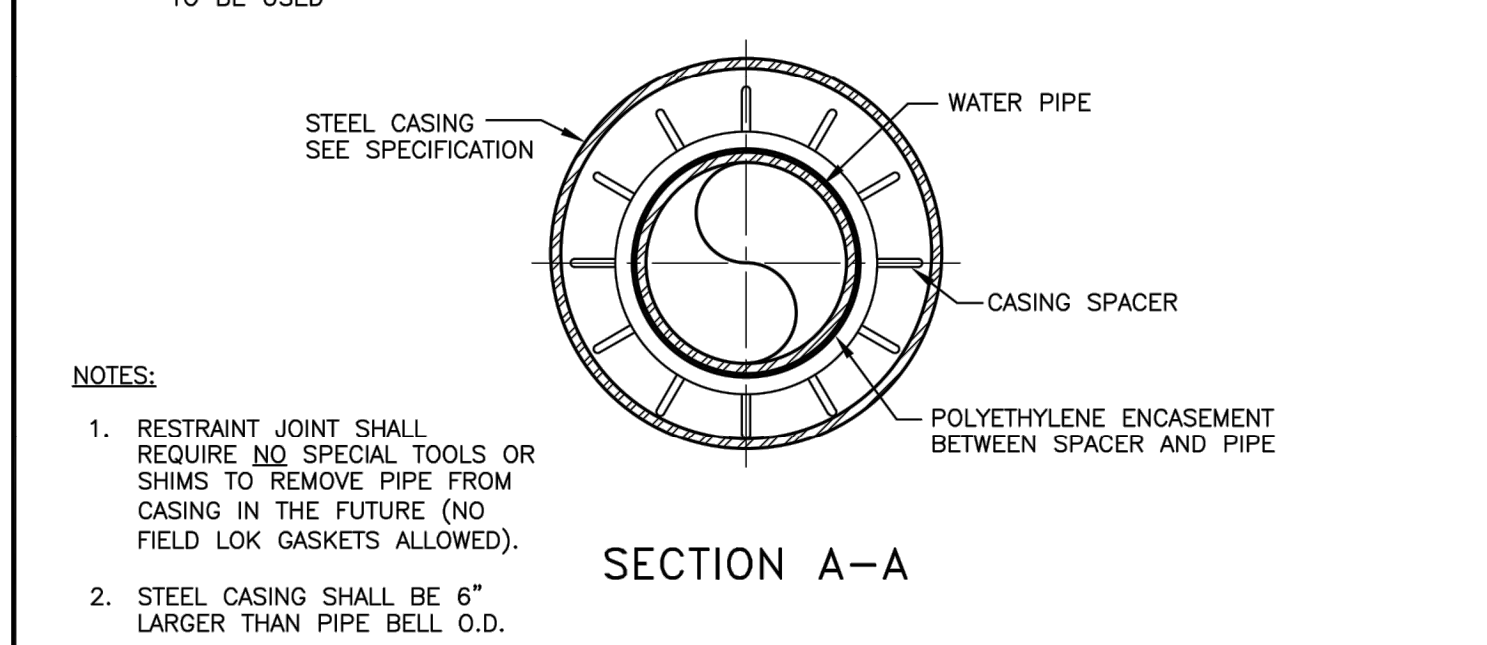
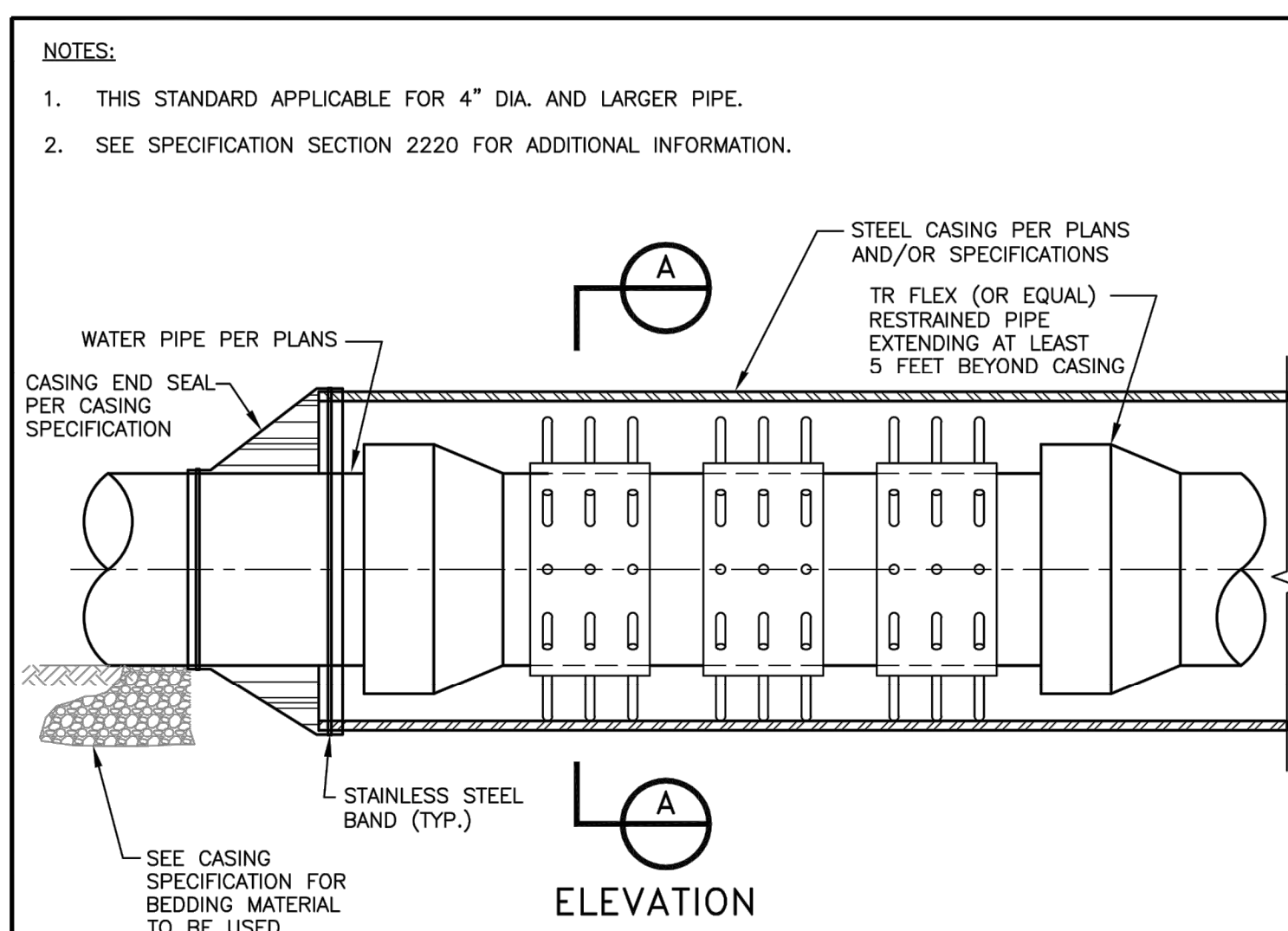
MISSOURI AMERICAN WATER
ST. LOUIS, MO. 63141

MISSOURI AMERICAN WATER ENGINEERING
727 GRAND ROAD
ST. LOUIS, MO. 63141

AMERICAN WATER

DATE 05-27-09
PROJECT # 0201-0601-SD35

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REVISIONS

MISSOURI AMERICAN WATER STANDARD
CIVIL
CASING INSTALLATION
DETAIL

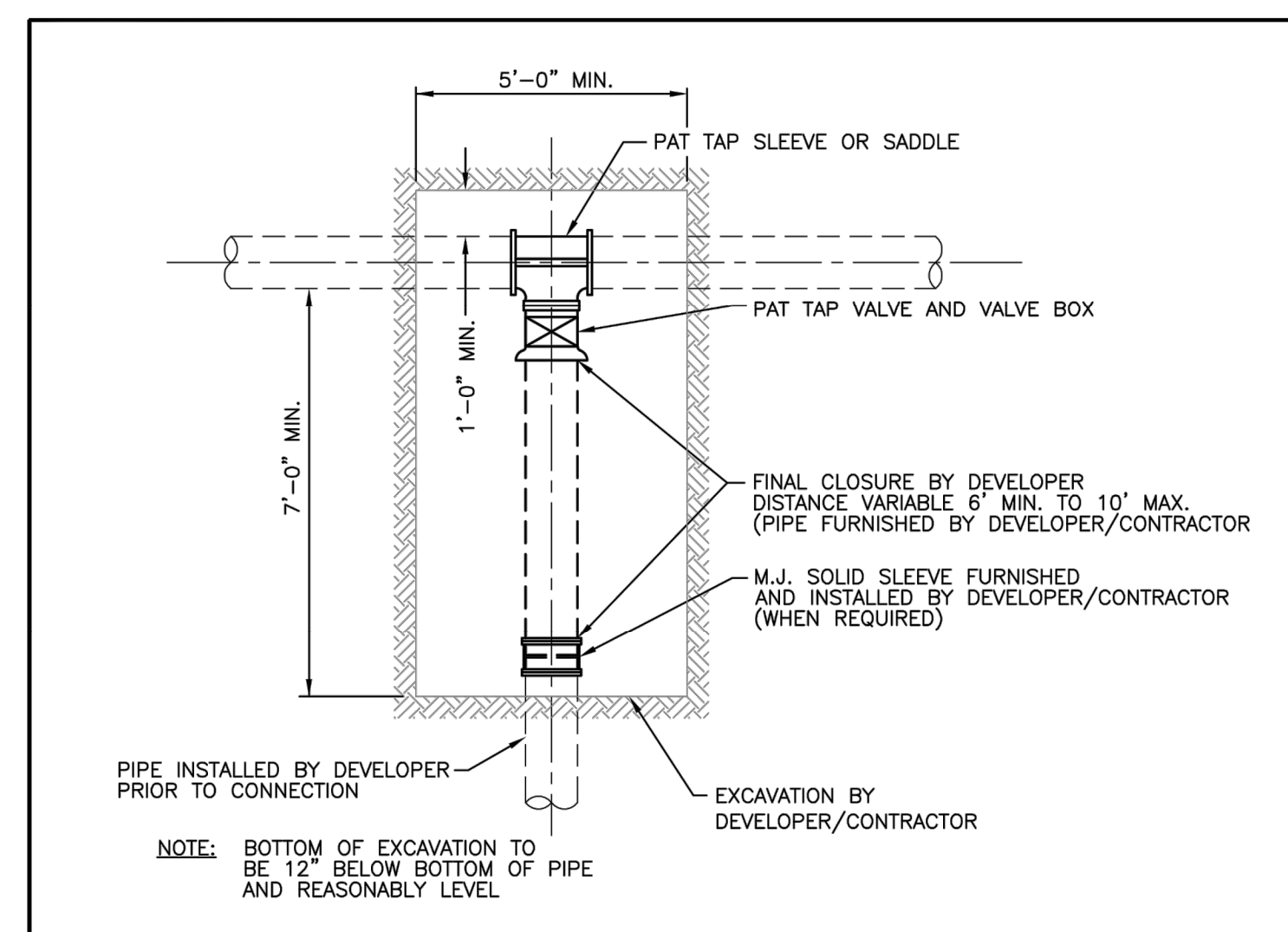
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AMERICAN WATER

DATE 11-13-08
PROJECT # 0201-0601-SD45

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- NOTES:
- TAP CONNECTIONS TO AC (TRANSITE PIPE) 4" AND LARGER REQUIRE AN EXCAVATION 5 FT. IN WIDTH. (MAIN SIZE IS VARIABLE).
 - ALL EXCAVATIONS SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS FOR PROTECTION OF WORKERS.
 - IF PIPE BELL IS EXPOSED IN TAP HOLE OR OTHER OBSTACLES ENCOUNTERED, CONTACT LOCAL WATER COMPANY DISTRICT PERSONNEL FOR FIELD REVIEW BEFORE COMPLETING EXCAVATION.
 - TAP HOLE SHOULD BE FREE OF WATER AND MUD TO ALLOW SAFE HANDLING OF HEAVY SLEEVES AND TAPPING MACHINE.
 - BLOCKING BEHIND TAP TO BE PER REQUIREMENTS ON DWG. NO. 0201-0601-SD6.

REVISIONS

MISSOURI AMERICAN WATER STANDARD
CIVIL
PATENT TAP EXCAVATION
REQUIREMENTS DETAIL

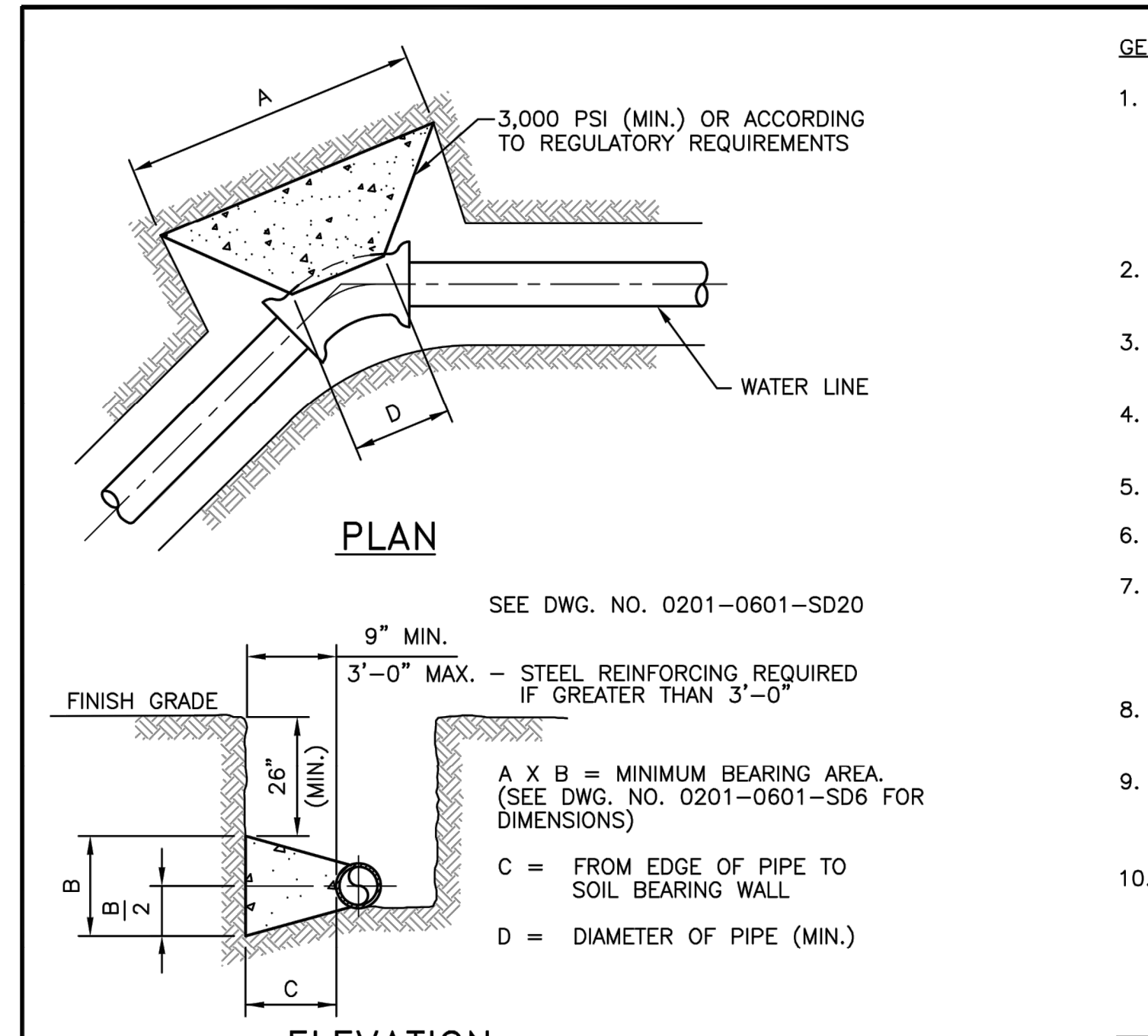
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AMERICAN WATER

DATE 11-13-08
PROJECT # 0201-0601-SD52

USE APPROVED DRAWINGS ONLY FOR CONSTRUCTION PURPOSES



- GENERAL NOTES:
- COVER OVER TOP OF PIPE SHALL BE A MINIMUM OF 42". IF GRADING PLANS RECEIVED BY THE ENGINEER/OWNER WITH THE REQUEST FOR WATER MAIN LAYOUT, INDICATE ADJUSTMENTS TO EXISTING GRADE, THEN PIPE SHALL BE INSTALLED TO MEET MINIMUM AND MAXIMUM COVER FROM PROPOSED GRADES SHOWN ON SAID PLANS.
 - THRUST BLOCKS SHALL BE BUILT AGAINST UNDISTURBED SOIL WITH ADEQUATE BACKING TO PREVENT MOVEMENT OF FITTING.
 - NO THRUST BLOCKS TO BE PLACED IN SEWER LATERAL DITCHES OR OTHER UTILITY TRENCHES.
 - THRUST BLOCKING MUST FIT IN EASEMENT, IN SOME CASES ADDITIONAL RESTRAINT MAY BE REQUIRED.
 - POLYETHYLENE ENCASUREMENT ON ALL D.I. PIPE AND FITTINGS.
 - PIPE JOINTS AND BOLTS MUST BE ACCESSIBLE.
 - ALL BOLTS SHALL BE PTFE POLYMER COATED BOLTS (EX. XLYAN, FLUOROKOTE #1), MINIMUM 1/2" DIAMETER. COAT EXPOSED ROD WITH APPROVED MATERIAL AFTER CONCRETE HAS SET.
 - ALLOW SUFFICIENT CLEARANCE BETWEEN CONCRETE AND BOLTS FOR FUTURE MAINTENANCE.
 - THRUST BLOCKING DETAILS ARE SHOWN HERE FOR TYPICAL INSTALLATIONS. IN SOME CASES, ADDITIONAL RESTRAINT MAY BE REQUIRED.
 - PORTLAND CEMENT CONCRETE USED FOR THRUST BLOCKS SHALL BE 3000 PSI CONCRETE (MIN.).

REVISIONS

MISSOURI AMERICAN WATER STANDARD
CIVIL
THRUST BLOCK AT HORIZONTAL BENDS
(LESS THAN 3 FEET IN THICKNESS)-DETAIL

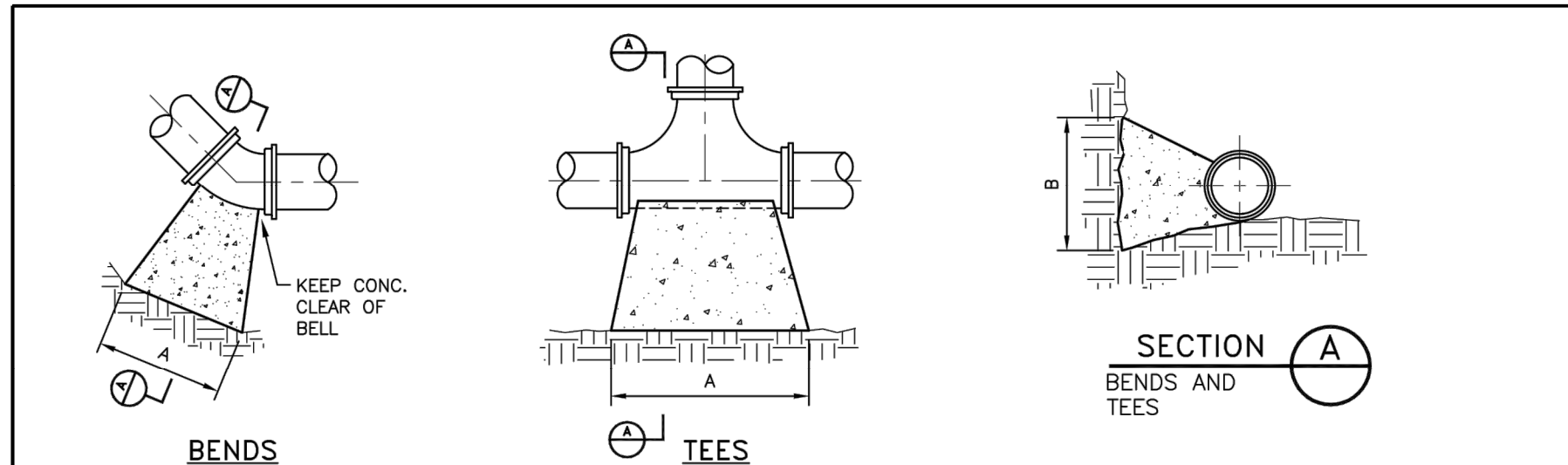
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ST. LOUIS, MO. 63141

AMERICAN WATER

DATE 08-18-11
PROJECT # 0201-0601-SD19

USE APPROVED DRAWINGS ONLY FOR CONSTRUCTION PURPOSES



REQUIRED MINIMUM BEARING AREA ON UNDISTURBED SOIL

PIPE SIZE	90 DEGREE BENDS	45 DEGREE BENDS	22.5 DEGREE BENDS	11.25 DEGREE BENDS	TEES/PLUGS
	AREA (SQ. FT.)	AREA (SQ. FT.)	AREA (SQ. FT.)	AREA (SQ. FT.)	AREA (SQ. FT.)
6	8.0	4.5	2.0	1.0	6.0
8	14.0	7.5	4.0	2.0	10.0
10	20.5	11.0	6.0	3.0	14.5
12	29.0	16.0	8.0	4.0	20.5

- NOTES:
- BEARING TABLE AREA IS BASED ON 200 PSI MAXIMUM WITH SOIL BEARING CAPACITY OF 2000 LBS/SQUARE FOOT WITH A 1.5 SAFETY FACTOR.
 - FOR HIGHER WATER PRESSURES OR LOWER SOIL PRESSURES, CONSULT ENGINEER FOR ADJUSTMENTS.
 - A SAFETY FACTOR AND ADDITIONAL BEARING AREA MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.
 - FOR DEVELOPER LAY PROJECTS, THE DEVELOPER SHALL VERIFY SOIL BEARING CAPACITIES.
 - SEE DWG. NO. 0201-0601-SD19 AND DWG. NO. 0201-0601-SD20 FOR ADDITIONAL BLOCKING INFORMATION.

REVISIONS

MISSOURI AMERICAN WATER STANDARD
CIVIL
THRUST BLOCK
DETAILS

MISSOURI AMERICAN WATER
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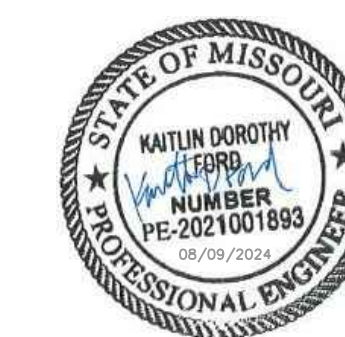
AMERICAN WATER

DATE 08-18-11
PROJECT # 0201-0601-SD6

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0201-0601-SD19

* BEARING AREAS ARE BASED ON SOIL HAVING AN ALLOWABLE SAFE LATERAL BEARING OF 2000 POUNDS PER SQUARE FOOT AND 200 PSI TEST PRESSURE AND A 1.5 FACTOR OF SAFETY. AREA MUST BE REVISED FOR SOILS WITH A LOWER BEARING CAPACITY OR HIGHER TEST PRESSURE.



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CDI PROJECT # 5917

SITE # 5201
ASSET # 7815201059

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DRAWN BY: **KDF**
CHECKED BY: **WMK**
DESIGNED BY: **KDF**

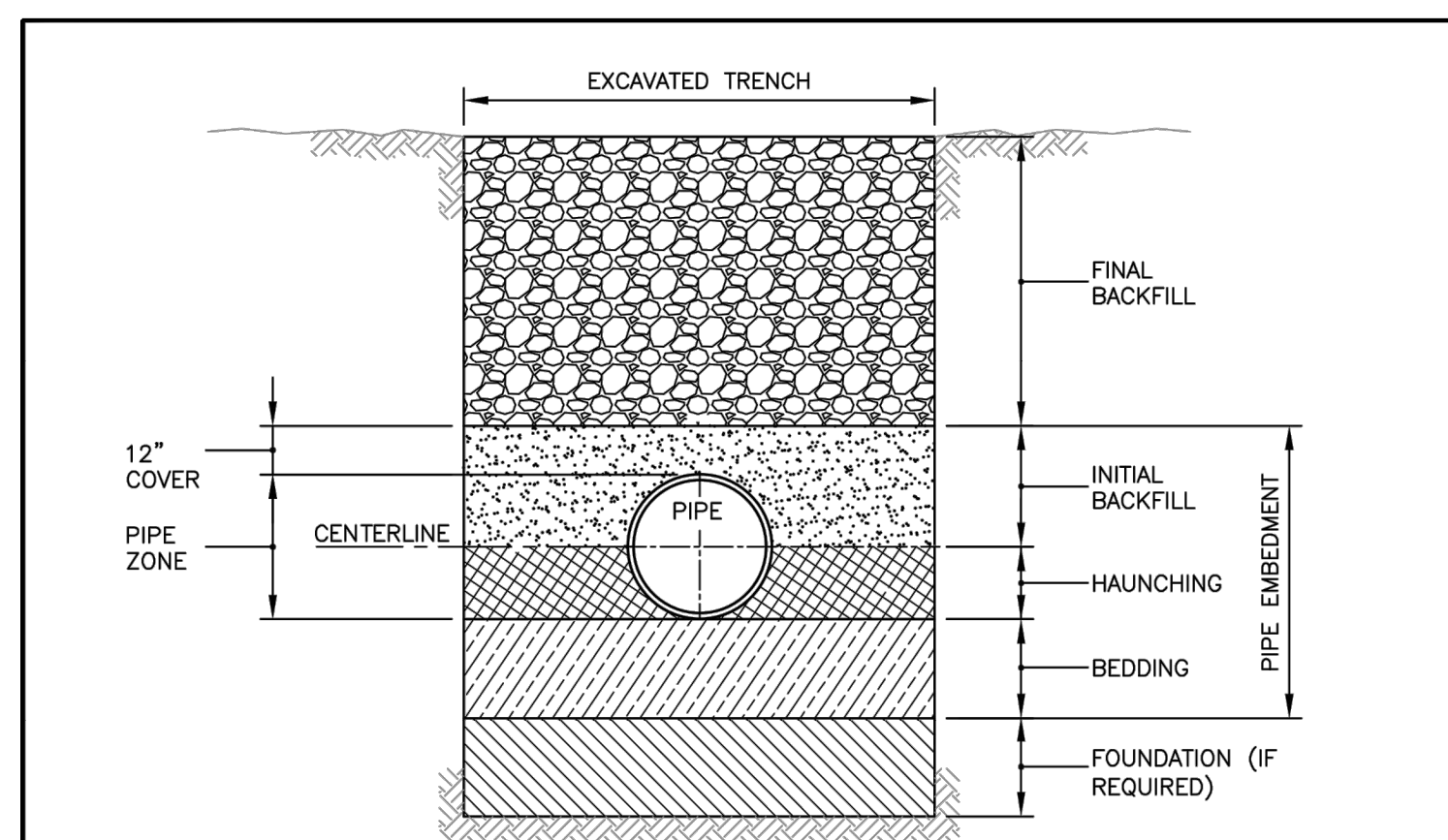
SHEET TITLE:

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WATER COMPANY
STANDARD DETAILS**

SHEET NUMBER:

C-408

SHEET 46 OF 46
AUGUST 9, 2024



TRENCH TERMINOLOGY

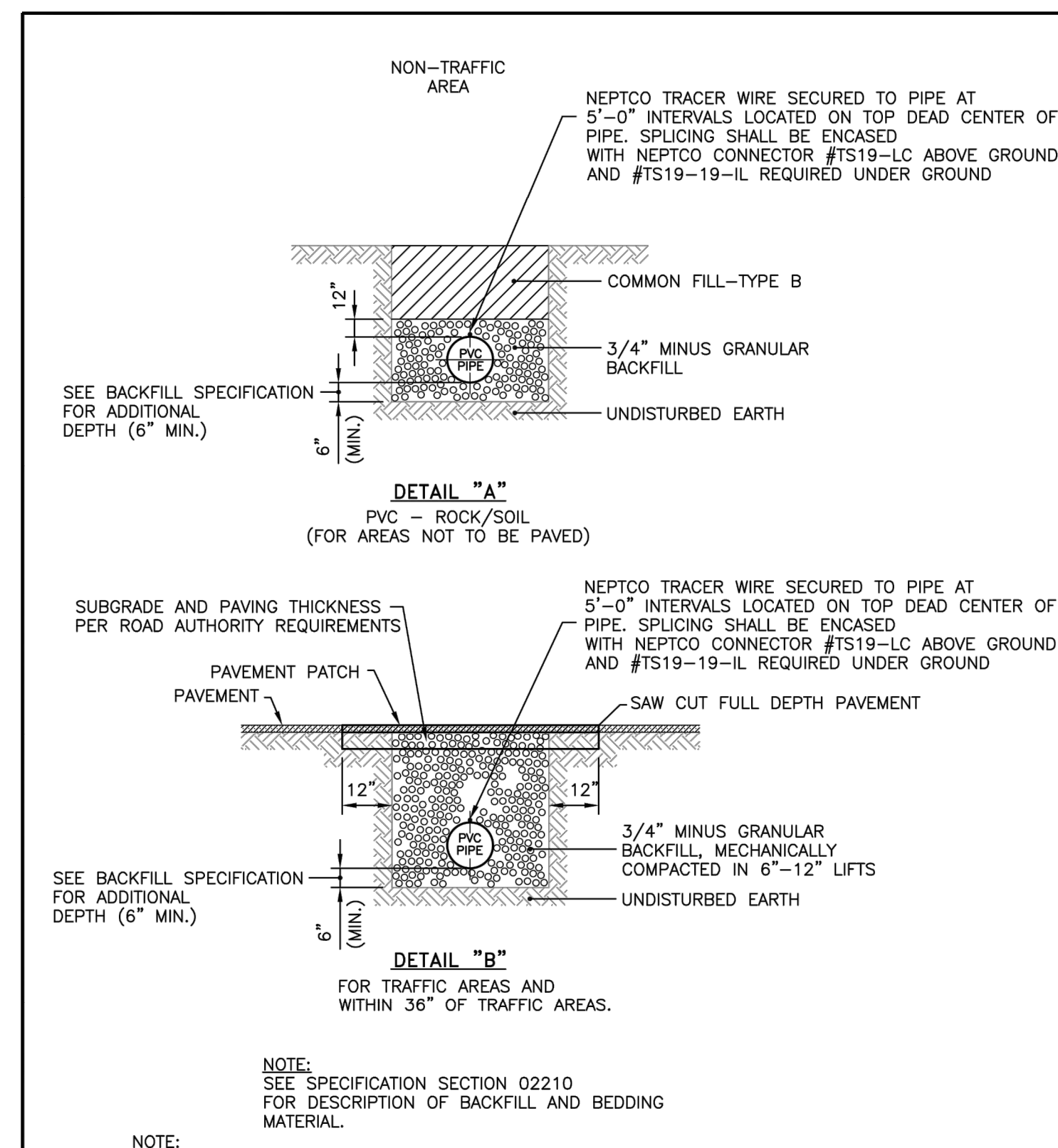
FOUNDATION: A FOUNDATION IS NECESSARY ONLY WHEN NATIVE SOILS ARE UNSTABLE. FOR SUCH CONDITIONS, THE TRENCH IS OVER-EXCAVATED AND A LAYER OF SUPPORTIVE MATERIAL IS PLACED AND COMPACTED TO PROVIDE A FIRM FOUNDATION FOR THE SUBSEQUENT PIPE EMBEDMENT MATERIALS. MUST BE APPROVED BY THE ENGINEER PRIOR TO OVER-DIG.

EMBEDMENT: THIS ZONE IS THE MOST IMPORTANT IN TERMS OF PIPE PERFORMANCE. IT IS DIVIDED INTO THE FOLLOWING SUB ZONES:

- BEDDING: TYPICALLY SIX INCHES OF SUPPORTIVE, COMPACTED MATERIAL. THIS ZONE PROVIDES EVEN SUPPORT FOR THE PIPE AND BRINGS IT TO GRADE.
- HAUNCHING: EXTENDS FROM THE BOTTOM OF THE PIPE TO THE CENTERLINE OF THE PIPE. IT PROVIDES THE MOST RESISTANCE TO PIPE DEFLECTION. SPECIFYING PROPER MATERIALS AND COMPACTION ARE MOST IMPORTANT FOR THIS ZONE.
- INITIAL BACKFILL: EXTENDS FROM THE SPRINGLINE TO A POINT ABOVE THE TOP OF THE PIPE. THIS ZONE PROVIDES SOME PIPE SUPPORT AND HELPS TO PREVENT DAMAGE TO THE PIPE DURING PLACEMENT OF THE FINAL BACKFILL. THE COVER EXTENDS FROM THE TOP OF THE PIPE TO THE TOP OF THE INITIAL BACKFILL. THE DEPTH OF COVER SHOULD BE AS MUCH AS NECESSARY TO PROTECT THE PIPE DURING PLACEMENT OF THE FINAL BACKFILL. TWELVE INCHES IS A COMMON DEPTH OF COVER.

FINAL BACKFILL: THIS ZONE EXTENDS FROM THE TOP OF THE INITIAL BACKFILL TO THE TOP OF THE TRENCH. THIS ZONE HAS LITTLE INFLUENCE ON PIPE PERFORMANCE, BUT CAN BE IMPORTANT TO THE INTEGRITY OF ROADS AND STRUCTURES. SEE SPECIFICATION SECTION 2210 FOR DESCRIPTION OF BACKFILL AND BEDDING MATERIAL.

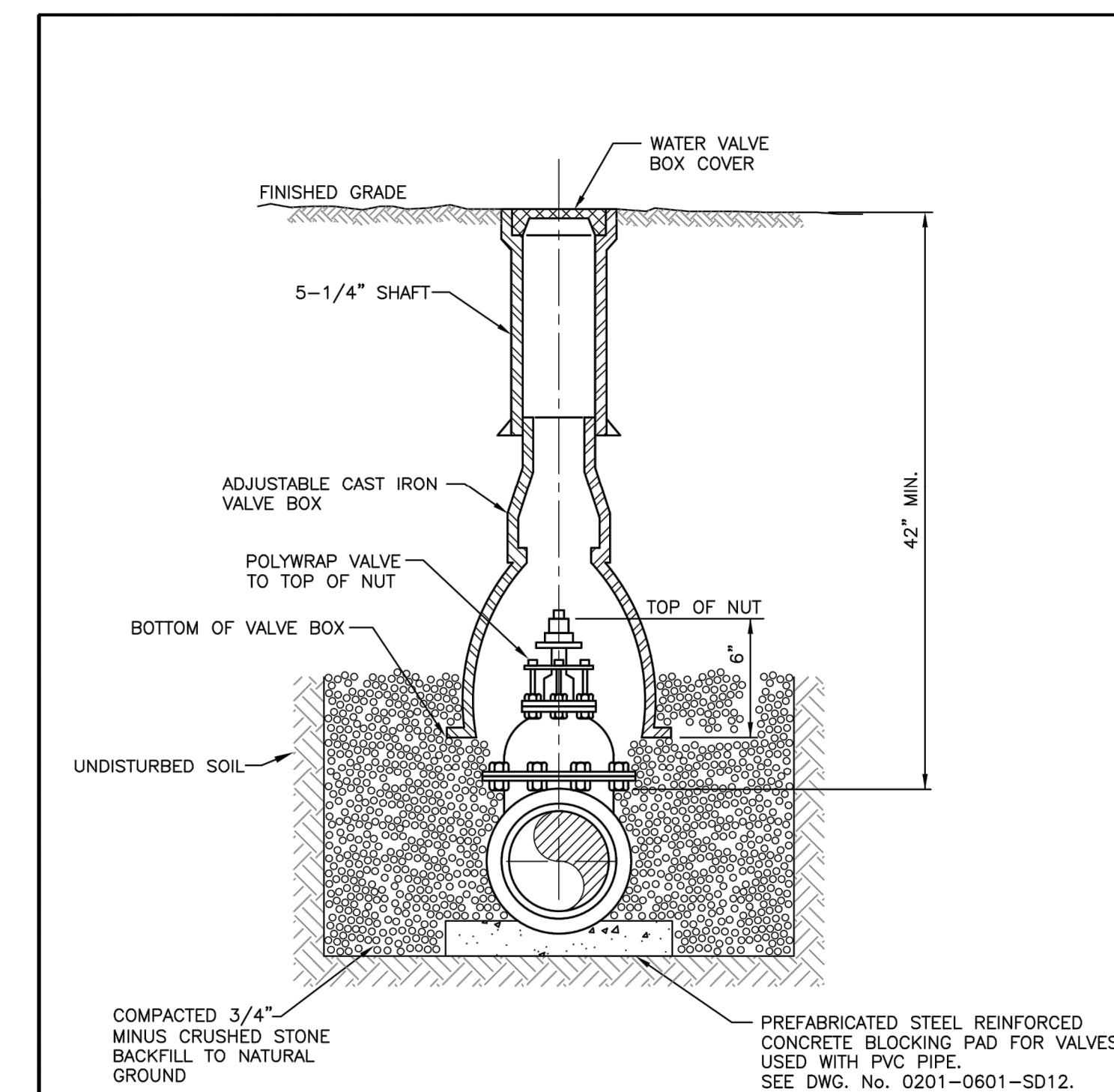
REVISIONS	MISSOURI AMERICAN WATER STANDARD CIVIL PIPE TRENCH TERMINOLOGY DETAIL
	MISSOURI AMERICAN WATER ST. LOUIS, MO. 63141
	MISSOURI AMERICAN WATER ENGINEERING 727 CHAD ROAD ST. LOUIS, MO. 63141
	AMERICAN WATER
DRAWN BY KDM PROJECT ENGINEER	DATE 11-13-08 PROJECT # USE DIMENSIONS ONLY SCALE N.T.S.
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NOTE:
SEE SPECIFICATION SECTION 02210 FOR DESCRIPTION OF BACKFILL AND BEDDING MATERIAL.

- NOTE:
1. CAUTION MUST BE EXERCISED TO ENSURE PROPER PLACEMENT OF EMBEDMENT MATERIAL UNDER THE HAUNCHES OF THE PIPE.

REVISIONS	MISSOURI AMERICAN WATER STANDARD CIVIL TYPICAL INSTALLATION - PVC PIPE IN ROCK/SOIL DETAIL
	MISSOURI AMERICAN WATER ST. LOUIS, MO. 63141
	MISSOURI AMERICAN WATER ENGINEERING 727 CHAD ROAD ST. LOUIS, MO. 63141
	AMERICAN WATER
DRAWN BY MED PROJECT ENGINEER	DATE 11-20-18 PROJECT # USE DIMENSIONS ONLY SCALE N.T.S.
USE APPROVED DIMENSIONS ONLY FOR CONSTRUCTION PURPOSES	0201-0601-SD54



REVISIONS	MISSOURI AMERICAN WATER STANDARD CIVIL VALVE BOX INSTALLATION DETAIL
	MISSOURI AMERICAN WATER ST. LOUIS, MO. 63141
	MISSOURI AMERICAN WATER ENGINEERING 727 CHAD ROAD ST. LOUIS, MO. 63141
	AMERICAN WATER
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