



**CITY OF SEWARD
City Council
Regular Meeting
Agenda**

Tuesday, March 18, 2025

7:00 PM

Municipal Building Council Chambers

NOTICE IS HEREBY GIVEN that a meeting of the City Council of the City of Seward, Nebraska will be held at 7:00 PM on Tuesday, March 18, 2025, in the Council Chambers, 142 N 7th Street, Seward, Nebraska in which the meeting will be open to the public. The Mayor and City Council reserve the right to adjourn into Closed Session as per Section 84-1410 of the Nebraska Revised Statutes. An Agenda for such meeting, kept continually current, is available at the Office of the City Clerk, 537 Main Street, Seward, Nebraska, during normal business hours. Individuals requiring physical or sensory accommodations, who desire to attend or participate, please contact the City Clerk's Office at 402.643.2928 no later than 3:30 PM on the Friday preceding the Council Meeting. City financial claims and related invoices will be available for Council member review, audit, and voluntary signatures at the meeting location beginning 30 minutes prior to the scheduled meeting time.

CALL TO ORDER

PLEDGE OF ALLEGIANCE

DISCLOSURE OF OPEN MEETINGS ACT & OTHER NOTIFICATIONS

This is an Open Meeting of the Seward Nebraska Governing Body. The City of Seward abides by the Nebraska Open Meetings Act in conducting business. A copy of the Nebraska Open Meetings Act is displayed on the north wall of this meeting room facility as required. Disclosure of meeting recording processes is posted in the Meeting Room. Any citizen may address the Council regarding items included on the meeting agenda and are asked to complete and submit a Speaker Card to the Clerk prior to the meeting. The Mayor will call speakers to the podium when the item is being considered. Presenters shall approach the podium, state their name & address for the Clerk's record and are asked to limit remarks to five minutes. All remarks shall be directed to the Mayor who shall determine by whom any appropriate response shall be made. The City of Seward reserves the right to adjust the order of items on this Agenda if necessary and may elect to take action on any of the items listed.

ROLL CALL

CONSENT AGENDA

1. City Codes Director Report

CURRENT YEAR: February 2025

Permits	Quantity	Permit Fee	Valuation
NEW CONST.	1	\$ 2,972.40	\$ 700,000.00
REMODEL/ADDIT.	8	\$ 1,123.95	\$ 300,977.22
ACCESSORY	3	\$ 722.40	\$ 216,356.81
RELOCATE	1	\$ 50.00	\$ 20,780.05
ELECTRIC			
PLUMBING	11	\$ 1,220.00	
MECHANICAL	6	\$ 450.00	
SEWER TAP	1	\$ 50.00	
TEMP. WATER	1	\$ 120.00	
WATER TAP	1	\$ 838.00	
TEMP. ELEC.	1	\$ 50.00	
ELECTRIC SER.	1	\$ 200.00	
TOTALS	35	\$ 7,796.75	\$ 1,238,114.08

LAST YEAR: February 2024

Permits	Quantity	Permit Fee	Valuation
NEW CONST.	4	\$ 1,779.85	\$ 709,314.36
REMODEL/ADDIT.	12	\$ 2,343.70	\$ 652,577.57
ACCESSORY	7	\$ 297.06	\$ 35,900.00
RELOCATE	8	\$ 2,552.00	\$ 1,391,660.58
ELECTRIC		\$ -	\$ -
PLUMBING	8	\$ 830.00	\$ -
MECHANICAL	9	\$ 875.00	\$ -
SEWER TAP	0	\$ -	\$ -
TEMP. WATER	0	\$ -	\$ -
WATER TAP	0	\$ -	\$ -
TEMP. ELEC.	0	\$ -	\$ -
ELECTRIC SER.	0	\$ -	\$ -
TOTALS	48	\$ 8,677.61	\$ 2,789,452.51

YEAR TO DATE January to December 2025

Permits	Quantity	Permit Fee	Valuation
NEW CONST.	5	\$ 12,289.41	\$ 2,096,452.18
REMODEL/ADDIT.	16	\$ 1,809.35	\$ 431,701.80
ACCESSORY	7	\$ 832.00	\$ 222,456.81
RELOCATE	4	\$ 50.00	\$ 20,780.05
ELECTRIC		\$ -	\$ -
PLUMBING	17	\$ 1,545.00	\$ -
MECHANICAL	11	\$ 775.00	\$ -
SEWER TAP	5	\$ 1,050.00	\$ -
TEMP. WATER	5	\$ 600.00	\$ -
WATER TAP	5	\$ 4,190.00	\$ -
TEMP. ELEC.	5	\$ 250.00	\$ -
ELECTRIC SER.	5	\$ 1,000.00	\$ -
TOTALS	85	\$ 24,390.76	\$ 2,771,390.84

YEAR TO DATE January to December 2024

Permits	Quantity	Permit Fee	Valuation
NEW CONST.	4	\$ 6,400.25	\$ 1,342,653.56
REMODEL/ADDIT.	16	\$ 2,667.00	\$ 712,673.64
ACCESSORY	14	\$ 422.86	\$ 46,092.00
RELOCATE	9	\$ 2,602.00	\$ 1,430,416.56
ELECTRIC		\$ -	\$ -
PLUMBING	16	\$ 1,380.00	\$ -
MECHANICAL	15	\$ 1,500.00	\$ -
SEWER TAP	2	\$ 500.00	\$ -
TEMP. WATER	2	\$ 240.00	\$ -
WATER TAP	2	\$ 1,676.00	\$ -
TEMP. ELEC.	2	\$ 100.00	\$ -
ELECTRIC SER.	2	\$ 400.00	\$ -
TOTALS	84	\$ 17,888.11	\$ 3,531,835.76

OPEN Property Maintenance Code Violation Report

					3/13/2025
Property Address	Violation Type	Deadline	Owner Information	Delivery Type	Status
2025					
416 N 1st	Trash/Junk	3/12/2025	Robert Schwamlein	In Person	CSO Arena made contact with Crystalynn on 3-10-2025 and gave a two day notice.
429 S Columbia	Trash	2/5/2025	Christopher Yates	Certified Mail Posted on Property	CSO Arena posted the letter to the property on February 27, 2025. A certified letter was also mailed on that same day. No response or attempt to clean up. March 6, 2025 the Seward Street Department removed all trash. An invoice is mailed out 3-11-2025.
937 Elm St	Vegetation/Trash	2/7/2025	Alan Bergantzel	In Person	CSO Shannon Arena made contact with the owner. He plans on taking all the trees and vegetation to the burn site on the next available Saturday.
832 Seward St	Trash	2/7/2025	Mark Masek	In Person	CSO Shannon Area made contact with the tenant. Trash is scheduled to be picked up on Friday, 2-7-2025. CSO Arena verified it was picked up, but there's more. Will verify it's picked up after 2-14-2025

2. City Treasurer Report

TREASURER'S REPORT		MONTH OF: FEBRUARY 2025				
VARIANCE AT: 41%						
DEPARTMENT	REVENUE BUDGET	CURRENT YTD REVENUE	VARIANCE	UNRECEIPTED BALANCE	PREVIOUS YTD REVENUE	DIFFERENCE B/W BUDGET YEARS
ELECTRIC	15,568,990	5,206,805	33%	10,362,185	5,462,434	(255,629)
ELEC BOND PYMT						
WATER	7,803,000	982,206	13%	6,820,794	883,323	98,883
WATER BOND PYMTS						
WATER SINKING FUND	20,000	- 0 -	0%	20,000	- 0 -	- 0 -
WASTEWATER TREATMENT	21,807,388	1,204,710	6%	20,602,678	1,081,729	122,980
WWTW BOND PYMT						
WWTW SINKING FUND	930,000	- 0 -	0%	930,000	- 0 -	- 0 -
TOTAL BUSINESS-TYPE FUNDS	46,129,378	7,393,720	16%	38,735,658	7,427,486	(33,766)
GENERAL REVENUES	5,411,339	1,745,163	32%	3,666,176	1,270,164	474,999
LEGAL	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
POLICE	6,650	1,375	21%	5,275	2,540	(1,165)
E911	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
POLICE EQUITABLE SHARING	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
STREET	5,997,066	723,291	12%	5,273,775	656,968	66,323
STREET STP FUNDS	190,428	- 0 -	0%	190,428	13,709	(13,709)
DEBT SERVICE	596,674	417,567	70%	179,107	648,253	(230,686)
RAIL CAMPUS	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
CDBG ECON. DEV. LOAN FUND	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
CDBG DOWNTOWN REVITAL GRANT	- 0 -	- 0 -	0%	- 0 -	65,432	(65,432)
BLDGS & GRDS (CITY HALL)	48,000	16,000	33%	32,000	24,943	(8,943)
LEVEE ACCREDITATION	146,250	- 0 -	0%	146,250	- 0 -	- 0 -
CIVIC CENTER	1,729,525	920,923	53%	808,602	58,424	862,499
LIBRARY	41,080	12,330	30%	28,750	77,392	(65,061)
PUBLIC PROPERTIES	31,250	8,609	28%	22,641	10,453	(1,843)
CEMETERY	65,000	27,501	42%	37,499	20,675	6,826
GOLF COURSE	599,525	41,695	7%	557,830	80,700	(39,005)
NEW PARK DEVELOPMENT	750	- 0 -	0%	750	478	(478)
NEW CEMETERY DEVELOPMENT	3,000	- 0 -	0%	3,000	1,440	(1,440)
GUTHMAN TRUST - REGULAR	425	133	31%	292	221	(89)
GUTHMAN TRUST - PAVING	100	59	59%	41	152	(94)
PERPETUAL CARE - PRINCIPAL	8,250	5,400	65%	2,850	3,300	2,100
PERPETUAL CARE - INTEREST	3,000	1,732	58%	1,268	1,795	(63)
BLDGS & GRDS (OTHER)	250	- 0 -	0%	250	4,616	(4,616)
BLDG INSP/PLAN & ZONING	104,450	34,698	33%	69,752	42,586	(7,888)
FIRE	360,000	244,344	68%	115,656	102,391	141,953
FIRE EQUIPMENT SINKING FUND	149,000	- 0 -	0%	149,000	5,412	(5,412)
TREE BOARD	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
ENGINEER	133,663	- 0 -	0%	- 0 -	- 0 -	- 0 -
DOWDING POOL	81,000	140	0%	80,860	20,987	(20,848)
CONCESSION STAND	900	900	100%	- 0 -	- 0 -	900
SWIMMING LESSONS	16,000	- 0 -	0%	16,000	- 0 -	- 0 -
RECREATION	42,850	17,711	41%	25,139	25,207	(7,496)
SPORTS COMPLEX LIGHTS	225	- 0 -	0%	225	296	(296)
SENIOR CENTER	98,000	40,728	42%	57,272	50,496	(9,768)
SENIOR SHUTTLE	4,600	1,902	41%	2,698	1,193	709
RECYCLING	5,500	528	10%	4,972	2,240	(1,712)
WELLNESS CENTER	415,000	30,959	0%	384,041	- 0 -	30,959
ECONOMIC DEVELOPMENT (LB840)	279,689	123,912	44%	155,777	154,069	(30,157)
CAPITAL IMPROVEMENTS FUND	11,161,100	4,171,212	37%	6,989,888	373,385	3,797,827
TAX INCREMENT FINANCING	642,906	251,624	39%	391,282	125,211	126,413
TOTAL GOVERNMENTAL FUNDS	28,373,445	8,840,434	31%	19,399,348	3,845,127	4,995,306

(UNAUDITED)

TREASURER'S REPORT		MONTH OF: FEBRUARY 2025				
VARIANCE AT: 41%						
	EXPENDITURES	CURRENT YTD		UNEXPENDED	PREVIOUS YTD	DIFFERENCE
DEPARTMENT	BUDGET	EXPENDITURES	VARIANCE	BALANCE	EXPENDITURES	B/W BUDGET YEARS
ELECTRIC	16,115,995	4,409,983	27%	11,706,012	4,902,337	(492,353)
ELEC BOND PYMT	492,108	463,635	94%	28,473	463,633	3
WATER	6,898,179	1,705,563	25%	5,192,616	1,324,803	380,760
WATER BOND PYMTS	357,426	99,021	28%	258,405	101,498	(2,476)
WATER SINKING FUND	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
WASTEWATER TREATMENT	12,754,281	681,114	5%	12,073,167	563,454	117,660
WWTW BOND PYMT	297,193	10,649	4%	286,544	11,609	(960)
WWTW SINKING FUND	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
TOTAL BUSINESS-TYPE FUNDS	36,915,182	7,369,965	20%	29,545,217	7,367,332	2,633
GENERAL EXPENSES	1,287,414	139,175	11%	1,148,239	124,618	14,557
LEGAL	75,483	31,978	42%	43,505	30,991	987
POLICE	1,952,173	905,848	46%	1,046,325	768,757	137,091
E911	246,299	102,625	42%	143,674	117,535	(14,911)
POLICE EQUITABLE SHARING	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
STREET	6,773,162	1,605,877	24%	5,167,285	2,335,601	(729,724)
STREET STP FUNDS	190,428	- 0 -	0%	190,428	3,633	(3,633)
DEBT SERVICE	591,674	22,190	4%	569,484	217,510	(195,320)
RAIL CAMPUS	11,000	17,945	163%	(6,945)	7,399	10,546
CDBG ECON. DEV. LOAN FUND	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
CDBG-DOWNTOWN REVITAL GRANT	- 0 -	- 0 -	0%	- 0 -	65,432	(65,432)
BLDGS & GRDS (CITY HALL)	26,729	10,953	41%	15,776	10,991	(38)
LEVEE ACCREDITATION	215,000	141,310	66%	73,690	65,574	75,736
CIVIC CENTER	1,764,525	1,315,404	75%	449,121	149,855	1,165,549
LIBRARY	596,015	249,588	42%	346,427	300,886	(51,298)
PUBLIC PROPERTIES	581,859	258,924	44%	322,935	258,143	781
CEMETERY	259,270	138,938	54%	120,332	105,461	33,478
GOLF COURSE	847,336	217,931	26%	629,405	164,345	53,586
NEW PARK DEVELOPMENT	100	- 0 -	0%	100	123	(123)
NEW CEMETERY DEVELOPMENT	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
GUTHMAN TRUST - REGULAR	145	- 0 -	0%	145	- 0 -	- 0 -
GUTHMAN TRUST - PAVING	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
PERPETUAL CARE - PRINCIPAL	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
PERPETUAL CARE - INTEREST	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
BLDGS & GRDS (OTHER)	13,400	999	7%	12,401	1,386	(387)
BLDG INSP/PLAN & ZONING	178,476	82,347	46%	96,129	54,129	28,218
FIRE	772,256	387,413	50%	384,843	171,417	215,995
FIRE EQUIPMENT SINKING FUND	185,000	- 0 -	0%	185,000	- 0 -	- 0 -
TREE BOARD	12,500	- 0 -	0%	12,500	- 0 -	- 0 -
ENGINEER	177,217	80,601	45%	- 0 -	60,702	19,900
DOWDING POOL	265,537	36,525	14%	229,012	78,100	(41,575)
CONCESSION STAND	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
SWIMMING LESSONS	11,189	- 0 -	0%	11,189	- 0 -	- 0 -
RECREATION	375,354	158,525	42%	216,829	136,617	21,908
SPORTS COMPLEX LIGHTS	- 0 -	- 0 -	0%	- 0 -	- 0 -	- 0 -
SENIOR CENTER	226,981	94,951	42%	132,030	129,174	(34,224)
SENIOR SHUTTLE	4,738	2,542	54%	2,196	2,640	(98)
RECYCLING	35,059	13,600	39%	21,459	19,180	(5,581)
WELLNESS CENTER	415,001	79,457	19%	335,544	39,416	40,041
ECONOMIC DEVELOPMENT LB840	279,690	184,647	66%	95,043	53,549	131,098
CAPITAL IMPROVEMENTS FUND	11,100,000	3,745,932	34%	7,354,068	189,652	3,556,280
TAX INCREMENT FINANCING	696,706	107,126	15%	589,580	222,401	(115,275)
TOTAL GOVERNMENTAL FUNDS	30,167,716	10,133,350	34%	19,937,750	5,885,216	4,248,134

(UNAUDITED)

**Cattle Bank & Trust (052)
Investment Portfolio (1)**

**Pledged Securities Detail
February 28, 2025**

H231
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Report Sequence: sgrp, CUSIP, Ticket

SGrp STyp Loc/PI	CUSIP Description S&P	Moody	Rate	State	Ticket-#	Call Type Next Call Dt Call Price	Maturity Dt Issue Dt Intent	Total Face Total Par	Pledged Face % of Total	Pledge Values		
										Par Value	Carrying Value	Market Value
PLEDGEE: CITY OF SEWARD (02)												
CMO	3137AWU78		1.250		185157011-1		12/15/2027	1,500,000.00	1,500,000.00	10,825.79	10,643.72	10,643.72
FHR	FHR 4145 AC						12/1/2012	10,825.79	100.00%	10,816.18	11.28	10,655.00
D02/02							AFS					
CMO	3137B0NV2		1.500		185157163-1		9/15/2025	2,000,000.00	2,000,000.00	6,752.54	6,683.84	6,683.84
FHR	FHR 4176 EC						3/1/2013	6,752.54	100.00%	6,750.03	8.44	6,692.28
D02/02							AFS					
GNMA	36176W2B6		4.000		185168920-1		12/15/2026	560,000.00	560,000.00	6,165.20	6,020.42	6,020.42
GNMA	GNMA POOL 778670						12/1/2011	6,165.20	100.00%	6,232.71	20.55	6,040.97
D02/02							AFS					
GNMA	3620ARB59		3.500		185171588-1		5/15/2025	1,000,000.00	1,000,000.00	1,180.14	1,163.06	1,163.06
GNMA	GNMA POOL 737260						5/1/2010	1,180.14	100.00%	1,181.19	3.44	1,166.50
D02/02							AFS					
MBS	3128MDW74		3.500		177039340-1		12/1/2028	1,450,000.00	1,450,000.00	101,484.60	99,676.82	99,676.82
FGLM	FHLMC POOL G14970						12/1/2013	101,484.60	100.00%	104,479.66	296.00	99,972.82
D02/02							AFS					
MBS	3128Q0GL5		4.000		185147609-1		5/1/2027	425,000.00	425,000.00	8,353.19	8,266.95	8,266.95
FGLM	FHLMC POOL J19203						5/1/2012	8,353.19	100.00%	8,481.57	27.84	8,294.79
D02/02							AFS					
MBS	31329KRS5		3.000		177051131-1		4/1/2033	1,000,000.00	1,000,000.00	143,771.71	136,189.40	136,189.40
FGLM	FHLMC POOL ZA2297						9/1/2018	143,771.71	100.00%	138,181.79	359.43	136,548.83
D02/02							AFS					
MBS	3132A8S34		2.500		177051143-1		1/1/2031	860,000.00	860,000.00	135,707.11	127,921.60	127,921.60
FGLM	FHLMC POOL Z57738						9/1/2018	135,707.11	100.00%	130,809.22	282.72	128,204.32
D02/02							AFS					
MBS	31375HAP9		6.575		185156211-1		2/1/2026	1,000,000.00	1,000,000.00	54.18	54.39	54.39
FNMV	FNMA ARM POOL 334914						1/1/1996	54.18	100.00%	54.22	0.30	54.69
D02/02							AFS					
MBS	3138AMK38		4.500		185159473-1		7/1/2026	500,000.00	500,000.00	8,255.42	8,239.73	8,239.73
FNMA	FNMA POOL A17513						7/1/2011	8,255.42	100.00%	8,327.54	30.96	8,270.69
D02/02							AFS					

Report reflects information submitted to Stifel Bond Accounting by the customer. It is not intended to be used as the official record of safekeeping location and/or pledged holdings. See customer's Safekeeping Agent reports as needed.

Cattle Bank & Trust (052)
Pledged Securities Detail
February 28, 2025

Report Sequence: sgrp, CUSIP, Ticket

SGrp STyp Loc/PI	CUSIP Description S&P	Moody	Rate	State	Ticket-#	Call Type Next Call Dt Call Price	Maturity Dt Issue Dt Intent	Total Face Total Par	Pledged Face % of Total	Pledge Values			Market Value
										Par Value Book Value	Carrying Value Interest Rec	Collateral Value	
MBS	3138EJLQ9 FNMA POOL AL2134		4.000		185159924-1		7/1/2027 7/1/2012 AFS	443,000.00	443,000.00	9,368.11	9,302.85	9,302.85	9,302.85
D02/02								9,368.11	100.00%	9,500.48	31.23	9,334.08	9,334.08
MBS	3138EKRM9 FNMA POOL AL3191		3.500		185160071-1		2/1/2028 2/1/2013 AFS	500,000.00	500,000.00	13,132.08	12,637.24	12,637.24	12,637.24
D02/02								13,132.08	100.00%	13,336.37	38.30	12,675.54	12,675.54
MBS	3138EKX75 FNMA POOL AL3401		5.500		177039339-1		2/1/2034 3/1/2013 AFS	2,000,000.00	2,000,000.00	191,704.18	193,745.72	193,745.72	193,745.72
D02/02								191,704.18	100.00%	209,481.23	878.64	194,624.36	194,624.36
MBS	3138EKXJ9 FNMA POOL AL3380		5.500		177039338-1		1/1/2034 3/1/2013 AFS	2,000,000.00	2,000,000.00	151,572.28	153,185.88	153,185.88	153,185.88
D02/02								151,572.28	100.00%	164,962.73	694.71	153,660.59	153,660.59
MBS	3138ELYF4 FNMA POOL AL4309		4.000		185160221-1		10/1/2028 10/1/2013 AFS	1,000,000.00	1,000,000.00	25,922.53	25,722.36	25,722.36	25,722.36
D02/02								25,922.53	100.00%	26,419.43	86.41	25,808.77	25,808.77
MBS	3138EMCY5 FNMA POOL AL4586		4.000		185160242-1		2/1/2027 12/1/2013 AFS	575,000.00	575,000.00	4,761.55	4,734.14	4,734.14	4,734.14
D02/02								4,761.55	100.00%	4,824.27	15.87	4,750.01	4,750.01
MBS	3138EMPD7 FNMA POOL AL4919		3.500		184006560-1		3/1/2029 2/1/2014 AFS	2,000,000.00	631,641.94	44,733.85	43,627.04	43,627.04	43,627.04
D02/02								141,643.08	31.58%	46,083.06	130.48	43,757.52	43,757.52
MBS	3138EQ5H1 FNMA POOL AL8047		3.500		176002956-1		11/1/2030 1/1/2016 AFS	1,050,000.00	1,050,000.00	139,909.86	133,171.55	133,171.55	133,171.55
D02/02								139,909.86	100.00%	145,773.06	408.07	133,579.62	133,579.62
MBS	3138WDU82 FNMA POOL AS4206		3.000		178000698-1		1/1/2030 12/1/2014 AFS	1,160,000.00	1,160,000.00	87,948.49	85,457.70	85,457.70	85,457.70
D02/02								87,948.49	100.00%	90,510.63	219.87	85,677.57	85,677.57
MBS	3140FBGJ3 FNMA POOL BD3800		2.000		177051139-1		7/1/2031 7/1/2016 AFS	1,375,000.00	1,375,000.00	236,585.44	222,176.17	222,176.17	222,176.17
D02/02								236,585.44	100.00%	226,776.34	394.31	222,570.48	222,570.48
MBS	3140J5EA3 FNMA POOL BM1028		2.500		177039342-1		12/1/2029 3/1/2017 AFS	1,750,000.00	1,750,000.00	166,643.28	152,820.22	152,820.22	152,820.22
D02/02								166,643.28	100.00%	169,377.96	347.17	153,167.39	153,167.39

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**Cattle Bank & Trust (052)
Investment Portfolio (1)**

**Pledged Securities Detail
February 28, 2025**

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Report Sequence: sgrp, CUSIP, Ticket

SGRP STYP Loc/PI	CUSIP Description S&P	Moody	Rate	State	Ticket-P#	Call Type Next Call Dt Call Price	Maturity Dt Issue Dt Intent	Total Face Total Par	Pledged Face % of Total	Pledge Values		Carrying Value Interest Rec	Market Value Collateral Value
										Par Value	Book Value		
MBS	3140J5EA3		2.500		185164038-1		12/1/2029	300,000.00	300,000.00	28,567.42	26,197.75	26,197.75	26,197.75
FNMA	FNMA POOL BM1028						3/1/2017	28,567.42	100.00%	28,630.92	59.52	59.52	26,257.27
D02/02							AFS						
MBS	3140X9LK9		3.000		177020855-1		1/1/2041	500,000.00	500,000.00	240,507.28	216,860.70	216,860.70	216,860.70
FNMA	FNMA POOL FM5729						1/1/2021	240,507.28	100.00%	253,132.04	601.27	601.27	217,461.97
D02/02							AFS						
MBS	31418AAC2		3.000		185165786-1		11/1/2026	1,000,000.00	1,000,000.00	10,689.10	10,077.31	10,077.31	10,077.31
FNMA	FNMA POOL MA0902						10/1/2011	10,689.10	100.00%	10,727.26	26.72	26.72	10,104.03
D02/02							AFS						
MBS	31418AKN7		3.000		177011537-1		10/1/2032	800,000.00	800,000.00	83,034.14	79,769.87	79,769.87	79,769.87
FNMA	FNMA POOL MA1200						9/1/2012	83,034.14	100.00%	86,287.36	207.59	207.59	79,977.46
D02/02							AFS						
MBS	31418AVK1		3.000		177039341-1		7/1/2028	1,000,000.00	1,000,000.00	66,022.61	64,601.69	64,601.69	64,601.69
FNMA	FNMA POOL MA1517						6/1/2013	66,022.61	100.00%	67,024.46	165.06	165.06	64,766.75
D02/02							AFS						
MBS	31418B5R3		4.000		177020853-1		6/1/2036	410,000.00	410,000.00	74,816.48	69,522.53	69,522.53	69,522.53
FNMA	FNMA POOL MA2655						5/1/2016	74,816.48	100.00%	79,181.47	249.39	249.39	69,771.92
D02/02							AFS						
MBS	31418DRM6		2.000		177046216-1		8/1/2030	810,000.00	610,000.00	175,718.23	165,932.70	165,932.70	165,932.70
FNMA	FNMA POOL MA4091						7/1/2020	175,718.23	100.00%	171,549.66	292.86	292.86	166,225.56
D02/02							AFS						
MBS	31418EA83		1.500		177048016-1		2/1/2032	179,142.00	167,163.35	99,973.99	91,974.83	91,974.83	91,974.83
FNMA	FNMA POOL MA4530						1/1/2022	107,137.96	93.31%	95,663.42	124.97	124.97	92,099.80
D02/02							AFS						
MUNI	25687CAZ1		2.250	NE	177039343-1	Cont	1/1/2034	120,000.00	120,000.00	120,000.00	96,597.60	96,597.60	96,597.60
GO	DOUGLAS CNTY NEB S&I #540					1/1/2027	1/5/2022	120,000.00	100.00%	120,000.00	450.00	450.00	97,047.60
D02/02							AFS						
MUNI	259290EB6		3.100	NE	185142828-1	Contin	8/15/2030	150,000.00	150,000.00	150,000.00	140,013.00	140,013.00	140,013.00
GO	DOUGLAS CNTY NE SAN & IMPT DIS					3/1/2025	6/15/2016	150,000.00	100.00%	150,000.00	206.67	206.67	140,219.67
D02/02							AFS						
MUNI	259292CS7		2.700	NE	185142831-1	Contin	11/15/2026	280,000.00	280,000.00	280,000.00	276,340.40	276,340.40	276,340.40
GO	DOUGLAS CNTY SAN IMPT DIST 427					3/1/2025	11/15/2017	280,000.00	100.00%	280,000.00	2,226.00	2,226.00	278,566.40
D02/02							AFS						

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Pledged Securities Detail
February 28, 2025

Cattle Bank & Trust (052)
Investment Portfolio (1)

Report Sequence: sgrp, CUSIP, Ticket

SGrp STyp Loc/PI	CUSIP Description S&P	Rate	Moody	Ticket-P#	State	Call Type Next Call Dt Call Price	Maturity Dt Issue Dt Intent	Total Face Total Par	Pledged Face % of Total	Pledge Values		
										Par Value Book Value	Carrying Value Interest Rec	Market Value Collateral Value
MUNI GO D02/02	259305DT4 DOUGLAS CNTY NEB S&I #499	2.500		178003667-1	NE	Cont 3/1/2027	3/1/2036 3/1/2022	150,000.00 150,000.00	150,000.00 100.00%	150,000.00 150,000.00	117,738.00 1,875.00	117,738.00 119,613.00
MUNI GO D02/02	25930EEB3 DOUGLAS CNTY NEB S&I #441	2.500		178003675-1	NE	Cont 3/15/2027	9/15/2035 3/18/2022	260,000.00 260,000.00	260,000.00 100.00%	260,000.00 260,000.00	207,789.40 2,997.22	207,789.40 210,786.62
MUNI GO D02/02	25930TBJ6 DOUGLAS CNTY NEB SANI & #421	2.900		184003054-1	NE	Cont 5/15/2025	11/15/2036 5/19/2020	50,000.00 50,000.00	50,000.00 100.00%	50,000.00 50,000.00	48,997.00 426.94	48,997.00 49,423.94
MUNI GO D02/02	25931BEG7 DOUGLAS CNTY NEB SAN & IMPT DI	2.750		184010678-1	NE	Cont 5/1/2026	5/1/2035 5/3/2021	175,000.00 175,000.00	175,000.00 100.00%	175,000.00 175,000.00	141,979.25 1,604.17	141,979.25 143,583.42
MUNI GO D02/02	25931LCN2 DOUGLAS CNTY NE SAN & IMPT	2.700		185142862-1	NE	Cont 3/1/2025	11/15/2028 11/15/2016	170,000.00 170,000.00	170,000.00 100.00%	170,000.00 170,000.00	160,850.60 1,351.50	160,850.60 162,202.10
MUNI GO D02/02	25931VBN1 DOUGLAS CNTY NE SAN & IMPT	3.500		185142866-1	NE	Cont 3/1/2025	8/15/2032 7/27/2017	50,000.00 50,000.00	50,000.00 100.00%	50,000.00 50,000.00	46,940.50 77.78	46,940.50 47,018.28
MUNI GO D02/02	25931VCF7 DOUGLAS CNTY NEB SAN #471	2.350		177020849-1	NE	Cont 2/15/2026	8/15/2035 2/19/2021	100,000.00 100,000.00	100,000.00 100.00%	100,000.00 100,000.00	85,789.00 104.44	85,789.00 85,893.44
MUNI GO D02/02	25933BEB6 DOUGLAS CNTY NEB SAN & IMPT DI	3.000		184003099-1	NE	Cont 5/15/2025	11/15/2035 5/19/2020	150,000.00 150,000.00	150,000.00 100.00%	150,000.00 150,000.00	142,491.00 1,325.00	142,491.00 143,816.00
MUNI GO D02/02	25936RBY1 DOUGLAS CNTY NEB S&I #537	2.400		177039345-1	NE	Cont 1/15/2027	1/15/2039 1/21/2022	150,000.00 150,000.00	150,000.00 100.00%	150,000.00 150,000.00	106,479.00 460.00	106,479.00 106,939.00
MUNI REV D02/02	373807CE4 GERING NEB COMBINED UTILS REV	1.850		184010461-1	NE	Cont 4/29/2026	12/15/2035 4/29/2021	100,000.00 100,000.00	100,000.00 100.00%	100,000.00 100,000.00	78,681.00 390.56	78,681.00 79,071.56
MUNI REV D02/02	57973FDD8 MCCOOK NE PUBLIC PWR DIST	3.150		185181069-1	NE	Cont 3/1/2025	12/15/2030 8/9/2017	100,000.00 100,000.00	100,000.00 100.00%	100,000.00 100,000.00	98,384.00 665.00	98,384.00 99,049.00

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**Cattle Bank & Trust (052)
Investment Portfolio (1)**

**Pledged Securities Detail
February 28, 2025**

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Report Sequence: sgrp, CUSIP, Ticket

SGrp S Typ Loc/PI	CUSIP Description S&P	Moody	Rate	State	Ticket-P#	Call Type Next Call Dt Call Price	Maturity Dt Issue Dt Intent	Total Face Total Par	Pledged Face % of Total	Pledge Values		Carrying Value Interest Rec	Market Value Collateral Value
										Par Value	Book Value		
MUNI	652810G22		3.000	IA	182011996-1	Cont	6/1/2033	185,000.00	185,000.00	185,000.00	182,667.15	182,667.15	
GO	NEWTON IOWA					6/1/2029	4/20/2022	185,000.00	100.00%	168,702.82	1,387.50	184,054.65	
D02/02	AA					100,000	AFS						
MUNI	71366VKE9		1.800	NE	177020856-1	Cont	12/15/2036	210,000.00	210,000.00	210,000.00	175,778.40	175,778.40	
REV	PERENNIAL PUB PWR DIST NEB ELE					2/17/2026	2/17/2021	210,000.00	100.00%	210,000.00	798.00	176,576.40	
D02/02						100,000	AFS						
MUNI	80373YER3		2.800	NE	182012079-1	Cont	10/15/2035	150,000.00	150,000.00	150,000.00	128,172.00	128,172.00	
GO	SARPY CNTY NEB S&I #158					4/15/2027	4/19/2022	150,000.00	100.00%	150,000.00	1,586.67	129,758.67	
D02/02						100,000	AFS						
MUNI	80377BKT8		2.350	NE	184010680-1	Cont	8/15/2034	180,000.00	180,000.00	180,000.00	143,496.00	143,496.00	
GO	SARPY CNTY NEB S&I DIST #264					5/3/2026	5/3/2021	180,000.00	100.00%	180,000.00	188.00	143,684.00	
D02/02						100,000	AFS						
MUNI	80377TBE2		2.800	NE	185187220-1	Cont	11/15/2028	85,000.00	85,000.00	85,000.00	80,785.70	80,785.70	
GO	SARPY CNTY NE SAN & IMPT DIST					3/1/2025	11/15/2016	85,000.00	100.00%	85,000.00	700.78	81,486.48	
D02/02						100,000	AFS						
MUNI	80377TBF9		2.900	NE	185187221-1	Cont	11/15/2029	85,000.00	85,000.00	85,000.00	79,581.25	79,581.25	
GO	SARPY CNTY NE SAN & IMPT DIST					3/1/2025	11/15/2016	85,000.00	100.00%	85,000.00	725.81	80,307.06	
D02/02						100,000	AFS						
MUNI	80378TEW8		3.850	NE	185187230-1	Cont	10/15/2033	85,000.00	85,000.00	85,000.00	81,061.95	81,061.95	
GO	SARPY CNTY NE SAN & IMPT DIST					3/1/2025	4/15/2018	85,000.00	100.00%	85,000.00	1,236.28	82,298.23	
D02/02						100,000	AFS						
MUNI	80379AEF5		2.700	NE	177011631-1	Cont	8/15/2038	290,000.00	290,000.00	290,000.00	216,496.60	216,496.60	
GO	SARPY CNTY NEB SAN & IMPT #243					8/15/2025	8/19/2020	290,000.00	100.00%	290,000.00	348.00	216,844.60	
D02/02						100,000	AFS						
MUNI	80379KEN6		2.300	NE	177018881-1	Cont	12/15/2034	50,000.00	50,000.00	50,000.00	39,244.50	39,244.50	
GO	SARPY CNTY NEB SAN & IMPT #272					12/15/2025	1/11/2021	50,000.00	100.00%	50,000.00	242.78	39,487.28	
D02/02						100,000	AFS						
MUNI	810140LP6		2.550	NE	182012068-1	Cont	1/15/2034	250,000.00	250,000.00	250,000.00	206,457.50	206,457.50	
GO	SCOTTS BLUFF CNTY NEB					4/21/2027	4/21/2022	250,000.00	100.00%	250,000.00	814.58	207,272.08	
D02/02						100,000	AFS						
MUNI	818483FG9		2.450	NE	185187657-1	Cont	2/15/2028	150,000.00	150,000.00	150,000.00	141,885.00	141,885.00	
REV	SEWARD NE ELEC REV					3/1/2025	6/15/2016	150,000.00	100.00%	150,000.00	163.33	142,048.33	
D02/02						100,000	AFS						

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Report Sequence: sgrp, CUSIP, Ticket

SGrp STyp Loc/PI	CUSIP Description S&P	Rate	State	Ticket-P#	Call Type Next Call Dt Call Price	Maturity Dt Issue Dt Intent	Total Face Total Par	Pledged Face % of Total	Pledge Values			Market Value Collateral Value
									Par Value	Carrying Value	Interest Rec	
MUNI GO D02/02	886094CD1 THURSTON CNTY NEB	2.500	NE	184003102-1	Cont 5/28/2025 100.000	12/15/2035 5/28/2020 AFS	200,000.00 200,000.00	200,000.00 100.00%	200,000.00 197,790.13	157,584.00 1,055.56	157,584.00 158,639.56	
TAX TAXGO D02/02	534239FX1 LINCOLN NEB	3.000	NE	177045043-1	Cont 8/20/2020	7/15/2026 8/20/2020 AFS	100,000.00 100,000.00	100,000.00 100.00%	100,000.00 99,797.54	98,406.00 383.33	98,406.00 98,789.33	
TAX TAXGO D02/02	61778RB8 MORRILL CNTY NEB SCH DIST #63	1.937	NE	177020846-1	Cont 12/1/2025 100.000	12/1/2031 2/25/2021 AFS	210,000.00 210,000.00	210,000.00 100.00%	210,000.00 210,000.00	171,481.80 1,016.93	171,481.80 172,498.73	
TAX TAXREV D02/02	68189TBA3 OMAHA NEB SPL OBLIG	6.400	NE	185184294-1	Cont 3/25/2008	2/1/2026 3/25/2008 AFS	20,000.00 20,000.00	20,000.00 100.00%	20,000.00 20,000.00	20,165.80 106.67	20,165.80 20,272.47	
CITY OF SEWARD							31,821,805.29		6,529,160.78 6,570,046.75	5,838,711.59 30,927.89	5,838,711.59 5,869,639.48	

CATTLE CASH IN BANK \$5,662,107.26

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Pledges By Pledgee And Maturity



Pledged To: CITY TREASURER

Jones Bank - Seward, NE

As Of 2/28/2025

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Receipt# Safekeeping Location	CUSIP	ASC 320 Maturity	Description Prerefund	Pool/Type Coupon	Moody S&P	Original Face Pledged Percent	Pledged		Market Value
							Original Face	Par	
COMM: COMMERCE BANK	082152CN7	AFS	BENNET VLG -REF NE 26 02/15/26	0.75		185,000.00 100.00%	185,000.00	185,000.00	178,817.30
COMM: COMMERCE BANK	148006EZ8	AFS	CASS CO SD #1 NE 26 12/15/26	2.35		200,000.00 100.00%	200,000.00	200,000.00	191,868.00
COMM: COMMERCE BANK	25932KCL7	AFS	DOUGLAS SID #404-REF NE 27 08/15/27	1.75		225,000.00 100.00%	225,000.00	225,000.00	219,442.50
COMM: COMMERCE BANK	869325CL2	AFS	SUTHERLAND -REF NE 28 06/15/28	0.95		140,000.00 100.00%	140,000.00	140,000.00	124,975.20
COMM: COMMERCE BANK	25932KCM5	AFS	DOUGLAS SID #404-REF NE 28 08/15/28	1.85		230,000.00 100.00%	230,000.00	230,000.00	221,639.50
COMM: COMMERCE BANK	25933AFG6	AFS	DOUGLAS SID #492-REF NE 28 08/15/28	3.20		175,000.00 100.00%	175,000.00	175,000.00	171,477.25
COMM: COMMERCE BANK	123540GD2	AFS	BUTLER CO SD - 0056 NE 28 12/15/28	1.35		150,000.00 100.00%	150,000.00	150,000.00	132,934.50
COMM: COMMERCE BANK	80373YCT1	AFS	SARPY CO SID #158-REF NE 29 11/15/29	3.10		155,000.00 100.00%	155,000.00	155,000.00	146,616.05
COMM: COMMERCE BANK	920340BQ8	AFS	VALPARAISO RURAL FIRE NE 3C 07/15/30	2.10		75,000.00 100.00%	75,000.00	75,000.00	65,579.25
COMM: COMMERCE BANK	486890X92	AFS	KEARNEY NE 30 10/15/30	2.60	A+	150,000.00 100.00%	150,000.00	150,000.00	137,490.00
COMM: COMMERCE BANK	0792124W3	AFS	BELLEVUE-REF NE 30 12/15/30	3.10		250,000.00 100.00%	250,000.00	250,000.00	231,467.50
COMM: COMMERCE BANK	751265RA9	AFS	RALSTON-VEHICLE NE 32 06/01/32	3.70		300,000.00 100.00%	300,000.00	300,000.00	300,105.00
COMM: COMMERCE BANK	25932WDR7	AFS	DOUGLAS CO #517 NE 32 08/15/32	2.70		235,000.00 100.00%	235,000.00	235,000.00	217,929.60

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Pledges By Pledgee And Maturity

BBA

Pledged To: CITY TREASURER

Jones Bank - Seward, NE

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As Of 2/28/2025

Receipt# Safekeeping Location	CUSIP	ASC 320	Description Maturity	Prerefund	Pool/Type Coupon	Moody S&P	Original Face Pledged Percent	Pledged			
								Original Face	Par	Book Value	Market Value
COMM: COMMERCE BANK	661615UB8	AFS	N PLATTE-REF NE 32 12/15/32		3.00	A+	200,000.00 100.00%	200,000.00	200,000.00	200,000.00	197,084.00
COMM: COMMERCE BANK	80378TEW8	AFS	SARPY SID #257-REF NE 33 10/15/33		3.85		250,000.00 100.00%	250,000.00	250,000.00	250,000.00	238,412.50
COMM: COMMERCE BANK	698864HR9	AFS	PAPILLION MUNI FACS NE 33 12/15/33		3.00	Aa1	175,000.00 100.00%	175,000.00	175,000.00	175,000.00	162,627.50
COMM: COMMERCE BANK	818468BN9	AFS	SEWARD-REF NE 33 12/15/33		2.35	AA	400,000.00 100.00%	400,000.00	400,000.00	400,000.00	364,456.00
COMM: COMMERCE BANK	943776KA1	AFS	WAVERLY NE 34 06/01/34		2.95		335,000.00 100.00%	335,000.00	335,000.00	335,000.00	285,835.40
COMM: COMMERCE BANK	840372SX5	AFS	SOUTH SIOUX CITY-REF NE 36 08/01/36		2.20		200,000.00 100.00%	200,000.00	200,000.00	200,000.00	177,662.00
COMM: COMMERCE BANK	25929PDW6	AFS	DOUGLAS SID #491-REF NE 36 09/15/36		2.60		200,000.00 100.00%	200,000.00	200,000.00	200,000.00	159,508.00
COMM: COMMERCE BANK	80378EDN2	AFS	SARPY SID #263-REF NE 36 09/15/36		3.80		260,000.00 100.00%	260,000.00	260,000.00	260,000.00	243,024.60
COMM: COMMERCE BANK	98676TCF8	AFS	YORK NE-B-REF NE 36 10/01/36		1.85		200,000.00 100.00%	200,000.00	200,000.00	198,968.80	142,600.00
COMM: COMMERCE BANK	23087RHC5	AFS	CUMING CO-B-REF NE 36 12/15/36		2.00		250,000.00 100.00%	250,000.00	250,000.00	250,000.00	199,672.50
COMM: COMMERCE BANK	68905WFK3	AFS	OTOE CO NE SD #501-B NE 36 12/15/36		1.70	Aa2	200,000.00 100.00%	200,000.00	200,000.00	200,000.00	161,728.00
COMM: COMMERCE BANK	80378DT4	AFS	SARPY CO SD#46 NE 36 12/15/36		2.00	AA-	200,000.00 100.00%	200,000.00	200,000.00	200,877.65	156,934.00
COMM: COMMERCE BANK	25938WBX0	AFS	DOUGLAS CO SID #562 NE 37 06/01/37		3.85		320,000.00 100.00%	320,000.00	320,000.00	320,000.00	284,614.40

Although the information in this report has been obtained from sources believed to be reliable, its accuracy cannot be guaranteed.
2/25/2025 10:35 AM - BLA / JNBT

Pledges By Pledgee And Maturity



Pledged To: CITY TREASURER

Jones Bank - Seward, NE

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As Of 2/28/2025

Receipt# Safekeeping Location	CUSIP	ASC 320 Maturity	Description Prerefund	Pool/Type Coupon	Moody S&P	Original Face Pledged Percent	Pledged		
							Original Face	Par	Market Value
COMM: COMMERCE BANK	80377XCV4	AFS	SARPY CO SID #190-REF NE 37 10/15/37	4.00		205,000.00 100.00%	205,000.00	205,000.00	190,473.70
COMM: COMMERCE BANK	25929RCY9	AFS	DOUGLAS CO SID #485 NE 38 05/15/38	2.65		200,000.00 100.00%	200,000.00	200,000.00	149,460.00
COMM: COMMERCE BANK	25933VBY5	AFS	DOUGLAS CO SANTN 559 NE 38 06/15/38	4.10		165,000.00 100.00%	165,000.00	165,000.00	152,172.90
COMM: COMMERCE BANK	25932EDK2	AFS	DOUGLAS CO SID #438 NE 38 08/15/38	4.20		250,000.00 100.00%	250,000.00	250,000.00	250,217.50
COMM: COMMERCE BANK	80373RDR9	AFS	SARPY CO DT #220-REF NE 38 08/15/38	4.05		170,000.00 100.00%	170,000.00	170,000.00	166,263.40
COMM: COMMERCE BANK	80387LAP3	AFS	SARPY CO SAN & IMP DT NE 38 08/15/38	2.75		290,000.00 100.00%	290,000.00	290,000.00	217,865.40
COMM: COMMERCE BANK	72778PCU5	AFS	PLATTE CO SD #5 NE 38 12/15/38	2.00	AA-	200,000.00 100.00%	200,000.00	200,062.44	148,492.00
COMM: COMMERCE BANK	80379KDHO	AFS	SARPY CO SID #272-REF NE 38 12/15/38	4.40		215,000.00 100.00%	215,000.00	215,000.00	203,643.70
COMM: COMMERCE BANK	25934MCK3	AFS	DOUGLAS SID #531-REF NE 39 01/15/39	4.35		200,000.00 100.00%	200,000.00	200,000.00	188,014.00
COMM: COMMERCE BANK	25936ECH6	AFS	DOUGLAS CO SID #561 NE 39 01/15/39	4.35		180,000.00 100.00%	180,000.00	180,000.00	169,212.60
COMM: COMMERCE BANK	25930BEE3	AFS	DOUGLAS CO SID #504 NE 39 08/15/39	3.40		215,000.00 100.00%	215,000.00	215,000.00	185,809.45
COMM: COMMERCE BANK	25931EGP9	AFS	DOUGLAS CO SAN #503 NE 39 08/15/39	2.65		225,000.00 100.00%	225,000.00	225,000.00	159,923.25
COMM: COMMERCE BANK	80373XBC1	AFS	SARPY CO SAN & IMP NT NE 39 08/15/39	2.60		200,000.00 100.00%	200,000.00	200,000.00	143,976.00

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2/25/2025 10:35 AM - BLA / JNBT

Pledges By Pledgee And Maturity



Pledged To: CITY TREASURER

Jones Bank - Seward, NE

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As Of 2/28/2025

Receipt# Safekeeping Location	CUSIP Location	ASC 320 Description Maturity	Prerefund	Pool/Type Coupon	Moody S&P	Original Face Pledged Percent	Pledged		
							Original Face	Par	Book Value
COMM: COMMERCE BANK	80373YDV5	AFS SARPY CO SID#158-REF NE 39 08/15/39		2.95		190,000.00 100.00%	190,000.00	190,000.00	174,431.40
COMM: COMMERCE BANK	25931BEJ1	AFS DOUGLAS SID #507-REF NE 40 05/01/40		3.15		185,000.00 100.00%	185,000.00	185,000.00	139,980.25
COMM: COMMERCE BANK	25933VDM9	AFS DOUGLAS CO SD #559 NE 40 05/15/40		3.40		175,000.00 100.00%	175,000.00	175,000.00	166,465.25
COMM: COMMERCE BANK	25930LDG7	AFS DOUGLAS CO NE SID#530 NE 40 09/15/40		3.00		150,000.00 100.00%	150,000.00	150,000.00	119,277.00
COMM: COMMERCE BANK	25933EEG9	AFS DOUGLAS CO SAN & IMPT NE 4C 11/15/40		3.15		190,000.00 100.00%	190,000.00	190,000.00	169,314.70
COMM: COMMERCE BANK	80388MBJ3	AFS SARPY CNTY SANITATION NE 4C 12/15/40		4.00		240,000.00 100.00%	240,000.00	240,000.00	199,125.60
COMM: COMMERCE BANK	617775EV9	AFS MORRILL CO NE 41 06/15/41		2.25		240,000.00 100.00%	240,000.00	240,000.00	158,068.80
COMM: COMMERCE BANK	25936EDY8	AFS DOUGLAS CO SID #561 NE 41 07/15/41		2.90		235,000.00 100.00%	235,000.00	235,000.00	186,651.10
COMM: COMMERCE BANK	25939LDA1	AFS DOUGLAS CO SID #567 NE 41 07/15/41		2.75		200,000.00 100.00%	200,000.00	200,000.00	126,532.00
COMM: COMMERCE BANK	25930LDN2	AFS DOUGLAS CO SAN #530 NE 41 08/15/41		2.85		200,000.00 100.00%	200,000.00	200,000.00	139,708.00
COMM: COMMERCE BANK	80379QBT3	AFS SARPY CO NE SAN-REF NE 41 08/15/41		2.75		255,000.00 100.00%	255,000.00	255,000.00	175,424.70
COMM: COMMERCE BANK	80387LAS7	AFS SARPY CO SAN & IMP DT NE 41 08/15/41		2.90		200,000.00 100.00%	200,000.00	200,000.00	140,768.00
COMM: COMMERCE BANK	25938MDE2	AFS DOUGLAS CO SAN & IMPT NE 41 09/01/41		2.80		200,000.00 100.00%	200,000.00	200,000.00	135,560.00

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Pledges By Pledgee And Maturity



Pledged To: CITY TREASURER

Jones Bank - Seward, NE

As Of 2/28/2025

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Receipt# Safekeeping Location	CUSIP	ASC 320	Description Maturity	Prerefund	Pool/Type Coupon	Moody S&P	Original Face Pledged Percent	Original Face	Pledged		Market Value
									Par	Book Value	
COMM: COMMERCE BANK	25933EFW3	AFS	DOUGLAS CO NE SAN-B NE 41 09/15/41		2.85		235,000.00 100.00%	235,000.00	235,000.00	235,000.00	163,856.10
COMM: COMMERCE BANK	25939HCU7	AFS	DOUGLAS CO SID#563 NE 41 11/15/41		2.85		200,000.00 100.00%	200,000.00	200,000.00	200,000.00	132,974.00
COMM: COMMERCE BANK	119483EL5	AFS	BUFFALO CO SD #0009 NE 41 12/15/41		2.00	A1	200,000.00 100.00%	200,000.00	200,000.00	194,521.17	142,886.00
COMM: COMMERCE BANK	259327W42	AFS	DOUGLAS CO SD #17 NE 41 12/15/41		4.00	AA	250,000.00 100.00%	250,000.00	250,000.00	255,931.11	250,447.50
COMM: COMMERCE BANK	25932XDN4	AFS	DOUGLAS CO NE SID-REF NE 41 12/15/41		2.75		250,000.00 100.00%	250,000.00	250,000.00	250,000.00	197,622.50
COMM: COMMERCE BANK	25940KAS4	AFS	SID DOUGLAS #596-REF NE 41 12/15/41		2.75		275,000.00 100.00%	275,000.00	275,000.00	275,000.00	189,109.25
COMM: COMMERCE BANK	808290FV7	AFS	SCHUYLER NE 42 03/15/42		2.75		250,000.00 100.00%	250,000.00	250,000.00	250,000.00	174,350.00
COMM: COMMERCE BANK	80376KBN2	AFS	SARPY CO SID #334 NE 42 05/15/42		3.70		215,000.00 100.00%	215,000.00	215,000.00	215,000.00	180,503.25
COMM: COMMERCE BANK	25932XE6H	AFS	DOUGLAS CO SID #524 NE 42 09/15/42		4.65		250,000.00 100.00%	250,000.00	250,000.00	250,000.00	233,267.50
COMM: COMMERCE BANK	25929MEM4	AFS	DOUGLAS CO SID #405-R NE 42 11/15/42		3.55		250,000.00 100.00%	250,000.00	250,000.00	250,000.00	184,565.00
COMM: COMMERCE BANK	006058DK4	AFS	ADAMS CO NE 42 12/15/42		4.00	AA-	300,000.00 100.00%	300,000.00	300,000.00	306,593.08	289,986.00
COMM: COMMERCE BANK	80387HCA3	AFS	SARPY CO SID #304 NE 43 05/15/43		5.00		200,000.00 100.00%	200,000.00	200,000.00	200,000.00	183,236.00
COMM: COMMERCE BANK	3132DMPY5	AFS	FRLMC 30YR 03/01/50	SD0439	3.50		1,000,000.00 100.00%	1,000,000.00	522,193.55	569,443.47	465,185.68

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Pledges By Pledgee And Maturity



Pledged To: CITY TREASURER

Jones Bank - Seward, NE

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Receipt# Safekeeping Location	CUSIP	ASC 320 Maturity	Description	Prerefund	Pool/Type Coupon	Moody S&P	Original Face Pledged Percent	Pledged			
								Original Face	Par	Book Value	Market Value
65 Securities Pledged To: 1010 - CITY TREASURER								14,910,000.00	14,432,193.55	14,486,397.72	12,259,320.03

JONES CASH IN BANK \$8,073,927.37

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2/25/2025 10:35 AM - BLA / JNBT

3. Claims & Payables Reports

CLAIMS LIST
3/18/2025
COUNCIL MEETING

Abbreviations: AF-Annual Fee; BE-Benefits; BU-Building Upkeep; CI-Capital Improvements; DF-Diesel Fuel; DO-Donations; EQ-Equipment; ENG-Engineering; EX-Expense; FA-Fixed Asset; GS-Gas; GU-Ground Upkeep; IT-Technology; INS- Insurance; INV-Inventory; LG-Legal; MA-Maintenance; MAT-Materials; MC-Miscellaneous; MH-Merchandise; MI-Mileage; ML-Meals; MS-Memberships; OI-Oil; OP-Operations; PF-Postage; PU-Publications; RE-Repairs; RI-Reimbursement; RS-Restaurant; SA-Salaries; SE-Services; SL-Sales; ST-Sales Tax; SU-Supplies; TE-Testing; TR-Training; TO-Tools; UN-Uniforms; UT-Utilities

ADE	RE	322.00
AKRS EQUIPMENT	RE	478.37
ALL COPY PRODUCTS	SE	12.18
ALLO FIBER	UT	590.59
AMAZON BUSINESS	MAT/SU	830.40
APPLIANCE MEDIC LLC	BU	161.35
AQUA-CHEM INC	SU	858.90
BADGER METER	SE	310.02
BAKER & TAYLOR	MAT	1,470.15
BECKY J BAKER	RI	91.00
BIC CONSTRUCTION LLC	CI	330,446.00
BILLY TROY	SE	225.00
BIZCO TECHNOLOGIES	IT	13,813.41
BLACK HILLS ENERGY	UT	5,804.17
BLACKBURN MANUFACTURING CO	SU	623.02
BORDER STATES INDUSTRIES INC	INV	17,106.03
BURMEVES LLC/BG&S TRANSMISSION	RE	1,157.50
CALLAWAY GOLF	MERCH	2,319.06
CHARTER/SPECTRUM	UT	433.49
CIHAL DANA	RI	182.44
CINDY VOEHL	RI	14.00
CITY - MERCHANT SERVICES	SE	2,693.02
CITY SEWARD BUILDINGS/GROUNDS	OP	4,000.00
CITY SEWARD UTILITIES	UT	50,027.17
CITY SEWARD LIBRARY PETTY CASH	PF	247.69
CITY SEWARD PERPETUAL CARE FD	MC	150.00
CORY MUELLER DBA BLUE RIVER ELECTRIC	RE	1,178.85
CROUCH'S FARM & HARDWARE	SU	854.98
ELECTRONIC CONTRACTING CO	SE	252.00
ELLIOTT PIPER	SE	250.00
EXCHANGE BANK	SE	3,300.00
FARMERS COOP - SEWARD	DF/RE	4,845.70

FAST MART	SU	5.58
FIRSTAR FIBER INC	SE	389.20
G & P DEVELOPMENT LANDFILL	BU	55.69
GENERAL CODE	SE	2,655.00
GRAND ISLAND PUBLIC LIBRARY	MC	24.95
GREAT PLAINS COMMUNICATIONS IN	UT	575.92
HACH COMPANY	SU	5,002.25
HANS MATTIE	RI	65.92
HARN R/O SYSTEMS INC	CI	286,659.84
HAWKINS INC	SU	2,993.20
HERPOLSHEIMER'S INC	RE	317.43
HIRERIGHT LLC	SE	53.05
HOBSON AUTOMOTIVE	OI	202.50
HUSKER ELECTRIC SUPPLY CO	SU	2,863.76
JACK THEIS	CI	581.00
JACKI MASON	MC	100.00
JONES AUTOMOTIVE	FA	5,343.92
LAST MILE NETWORK CONS GR LLC	IT	62.00
LEAGUE NE MUNICIPALITIES	TR	395.00
MEMORIAL HEALTH-DRUG	SE	35.00
MENARDS NORTH	BU	89.48
MID-AMERICAN BENEFITS LLC	BE	654.76
MIDWEST AUTO PARTS	OI/RE	521.34
MIDWEST AUTOMOTIVE	RE	2,814.67
MIDWEST LABORATORIES INC	TE	3,212.82
MIDWEST SERVICE & SALES	RE	463.00
MOCIC	MS	150.00
MUNICIPAL SUPPLY INC OF OMAHA	INV	622.40
NEBRASKA DEPT OF AGRICULTURE	MC	6.10
NEBRASKA EQUIPMENT INC	RE	10.40
NEBRASKA MACHINERY COMPANY	RE	2,522.18
NEBRASKA PUB POWER-DES MOINES	UT	529,907.60
NIFCO MECHANICAL SYSTEMS INC	BU	200.00
NORRIS PUBLIC POWER DISTRICT	UT	1,675.36
OLSSON	CI	25,976.50
ONE CALL CONCEPTS INC	SE	48.34
ONE SOURCE BACKGROUND CHECK CO	SE	44.00
O'REILLY AUTOMOTIVE INC	RE	177.97
PAC 'N' SAVE DISCOUNT FOODS	SU/ML	3,239.31
PAPER TIGER SHREDDING	SE	70.00
PASTEKA COLE R	SU	245.00
PIP	SU	1,746.08

RAILROAD MANAGEMENT CO III LLC	AF	821.58
RICHARD J MAILAND	SE	38.00
RIVERSIDE PORTABLES LLC	SE	112.00
SEWARD COUNTY CLERK/REG DEEDS	SE	41.00
SEWARD COUNTY EMA	SE	6.00
SEWARD COUNTY TREASURER	SE	20,524.91
SEWARD LUMBER & HOME CENTER	SU	747.40
SEWARD PUBLIC SCHOOLS	MC	450.00
SEWARD WIND LLC	UT	48,358.71
SHAWN SCHULTZ	MC	1,200.00
SPARETIME LOUNGE & GRILL	ML	2,302.73
SPORTS EXPRESS	SU	118.50
SWEET TEA MEDIA LLC	PU	3,440.86
THE FORT INC	UN	337.79
TOTAL FIRE & SECURITY INC	FA/SE	15,479.14
TRUCK CENTER COMPANIES	RE	1,605.05
VERIZON FINANCIAL SERVICES LLC	UT	451.29
VISA - PINNACLE BANK		
SAM'S CLUB	BU	58.84
WALMART	SU	118.22
TECHSOUP	IT	10.00
COLLABORATIVE SUMMER	SU	119.03
CODR PLUMBING	BU	208.95
WALL STREET JOURNAL	MAT	48.38
ABEBOOKS.COM	MAT	34.84
AMAZON.COM	SU	29.03
ZOOM	SE	15.99
ACCUCUT	SU	247.50
WESCO DISTRIBUTION INC	INV	7,073.50
WHEELHOUSE SOLUTIONS LLC	SU	514.13
WHITE CAP LP	SU	547.17
WINDSTREAM NEBRASKA INC	UT	1,229.27
	TOTAL	\$1,434,116.82

4. Police Department Report



City of Seward
Police Department
Chief Brian W. Peters

Monthly Statistics
_____ 20 _____

Service Calls	
Accidents	
Arrests	
Citations	
Warnings	
Parking Tickets	

Does not include red tag warnings, yellow tag warnings or verbal warnings

5. Draft Minutes of March 4, 2025, City Council Meeting

March 4, 2025

The Seward City Council met at 7:00 p.m. on Tuesday, March 4, 2025, with Mayor Joshua Eickmeier presiding and Deputy City Clerk Mattie Hans recording the proceedings. Upon roll call, the following Councilmembers were present: Zane Francescato, Megan Kahler, John Singleton, Tatum Tonniges, Matt Stryson, Rich Wergin. Councilmembers Absent: Jessica Kolterman, Karl Miller. Other officials present: City Administrator Greg Butcher, City Clerk Derek Bargmann, City Engineer Mike Oneby, and Officer Chris Waldron.

Notice of the meeting was given in advance thereof, and Mayor Eickmeier announced that a copy of the Open Meetings Act and tonight's agenda is posted in the meeting room and is accessible to members of the public. Mayor Eickmeier led those in attendance in the Pledge of Allegiance.

CONSENT AGENDA CONSIDERATION ITEMS

The following Consent Agenda items were approved in one single motion made by Councilmember Wergin, seconded by Councilmember Singleton.

1. Claims & Payables Report (totaling \$339,796.22)
2. Seward County Chamber & Development Partnership Report (Q1)
3. Draft Minutes of February 18, 2025, City Council Meeting

Aye: Francescato, Kahler, Singleton, Stryson, Tonniges, Wergin.
Nay: None. Absent: Kolterman, Miller. Motion carried.

PUBLIC HEARING

1. PUBLIC HEARING – 7:00 P.M. – CONSIDERATION OF ACQUISITION OF REAL ESTATE COMMONLY REFERRED TO AS 410 EAST SEWARD STREET, CITY OF SEWARD, SEWARD COUNTY, NEBRASKA FROM MEGAN SMELKER PERSONAL REPRESENTATIVE FOR THE ESTATE OF BOBBIE LEE PAYNE, JR.

A. CONSIDERATION OF A RESOLUTION AUTHORIZING THE MAYOR TO EXECUTE ALL DOCUMENTS RELATED TO ACQUISITION OF REAL ESTATE

City Administrator Butcher noted this is a floodplain property and thus the City is interested in purchasing for \$60,000.00. The City plans to clear and demo the property once acquired.

Mayor Eickmeier opened the public hearing at 7:03 p.m. With no public comment received, the public hearing was closed at 7:03 p.m.

Councilmember Singleton introduced **Resolution No. 2025-4**, to approve the acquisition of real estate commonly referred to as 410 East Seward Street. Councilmember Francescato moved, seconded by Councilmember Wergin, to approve the purchase agreement as presented.

Aye: Francescato, Kahler, Singleton, Stryson, Tonniges, Wergin.
Nay: None. Absent: Kolterman, Miller. Motion carried.

ADMINISTRATIVE ITEMS

1. CONSIDERATION OF A RESOLUTION DIRECTING THE CONVEYANCE OF REAL PROPERTY, LEGALLY DESCRIBED AS LOT 11, SEWARD RAIL CAMPUS PUD SECOND ADDITION, CITY OF SEWARD, SEWARD COUNTY NEBRASKA TO MEYCO HOLDINGS, LLC.

City Administrator Butcher indicated this lot is directly south of Plum Creek Seed Services and inaccessible after buildings were established on adjacent land. The City holds no plans to develop the lot mentioned. The public will have a 30 day remonstrance period.

Councilmember Singleton introduced **Resolution No. 2025-5**, for conveyance of Lot 11 in Seward Rail Campus PUD Second Addition, City of Seward to MeyCo Holdings, LLC. Councilmember Wergin moved, seconded by Councilmember Francescato, to dispense with the statutory rule.

Aye: Francescato, Kahler, Singleton, Stryson, Tonniges, Wergin.
Nay: None. Absent: Kolterman, Miller. Motion carried.

2. CONSIDERATION OF A CHANGE ORDER IN THE AMOUNT OF \$4,547.95 AND A TIME EXTENTION TO THE CONSTRUCTION CONTRACT WITH ERIKSEN CONSTRUCTION FOR THE 2024 REVERSE OSMOSIS IMPROVEMENTS PROJECT

City Engineer Oneby previewed the change order at the February 18, 2025, meeting which would add costs

March 4, 2025

for conduit and control wire as well as an additional nine weeks for project completion. An error was found in the contract documents following the meeting, thus the updated contract considered here contains specific language on timelines and responsibilities.

Councilmember Singleton moved, seconded by Councilmember Stryson to accept the revised change order with Eriksen Construction in the amount of \$4,547.95 for the Reverse Osmosis Improvements project.

Aye: Francescato, Kahler, Singleton, Stryson, Tonniges, Wergin.

Nay: None. Absent: Kolterman, Miller. Motion carried.

3. CONSIDERATION OF CONTRACT AGREEMENT WITH CHURCHICH RECREATION FOR THE PURCHASE OF A SHADE STRUCTURE FOR THE CITY OF SEWARD'S MUNICIPAL BANDSHELL IN THE AMOUNT OF \$146,574.50

City Administrator Butcher reported this is a project by the Rotary Club to celebrate 100 years of service to the community. The City will execute the contract as the property owner, but the project is expected to be paid for through private donations. The shade structure is planned to be installed by July 4, 2025.

Councilmember Singleton moved, seconded by Councilmember Tonniges, to approve a contract with Churchich Recreation for Bandshell shade structure.

Aye: Francescato, Kahler, Singleton, Stryson, Tonniges, Wergin.

Nay: None. Absent: Kolterman, Miller. Motion carried.

4. CONSIDERATION OF GENERAL ADMINISTRATION AGREEMENT AND CONSTRUCTION MANAGEMENT AGREEMENT WITH SOUTHEAST NEBRASKA DEVELOPMENT DISTRICT (SENDD) FOR CDBG PROJECT 24ED001 DARI PROCESSING PROJECT – WORTHMAN BOULEVARD IMPROVEMENTS

City Administrator Butcher noted that SENDD would serve as the grant and contract administrator on behalf of the City to ensure compliance to State regulations.

A. GENERAL ADMINISTRATION AGREEMENT WITH SENDD

Councilmember Stryson moved, seconded by Councilmember Wergin, to enter into General Administration agreement with SENDD for the DARI Processing Project.

Aye: Francescato, Kahler, Singleton, Stryson, Tonniges, Wergin.

Nay: None. Absent: Kolterman, Miller. Motion carried.

B. CONSTRUCTION MANAGEMENT AGREEMENT WITH SENDD

Councilmember Wergin moved, seconded by Councilmember Singleton, to enter into Construction Management agreement with SENDD for the DARI Processing Project upon disbursement of funds.

Aye: Francescato, Kahler, Singleton, Stryson, Tonniges, Wergin.

Nay: None. Absent: Kolterman, Miller. Motion carried.

5. DISCUSS CLAIMS PRESENTED FOR MAILBOX DAMAGE FOLLOWING SNOW REMOVAL FROM STREETS

City Administrator Butcher noted that in 2024, \$75.00 per mailbox damage claim was approved; therefore, is asking Council to establish the 2025 rate. The City is maintaining a list of improperly installed mailboxes which will not be eligible for claim reimbursement.

Councilmember Singleton moved, seconded by Councilmember Stryson, to establish a 2025 rate of \$75.00 per approved mailbox damage claim.

Aye: Francescato, Kahler, Singleton, Stryson, Tonniges, Wergin.

Nay: None. Absent: Kolterman, Miller. Motion carried.

6. UPDATE ON THE WELLNESS CENTER

City Administrator Butcher presented on behalf of Executive Director Brase for the Wellness Center updates. Many areas are nearing completion with projected occupancy to be given on March 10, 2025. The pool grout is curing and plaster completed, with plans to complete the final fill of the pool afterwards. The punch list will be completed within the next week. Full time positions were filled as follows, Recreation Director – Jamie Fields, Facility Director – Tom Vajgrt, and Child Care Director – Sam Patterson.

CITY ADMINISTRATOR'S REPORT

March 4, 2025

Councilmember Wergin moved, seconded by Councilmember Stryson, that the City Administrator's report of March 4, 2025, be accepted.

Aye: Francescato, Kahler, Singleton, Stryson, Tonniges, Wergin.
Nay: None. Absent: Kolterman, Miller. Motion carried.

STRATEGY SESSION

1. STRATEGY SESSION WITH CITY ATTORNEY REGARDING REAL ESTATE INTERESTS

Councilmember Singleton moved, seconded by Councilmember Francescato, that the Council enter a closed session with the Mayor, City Administrator, City Clerk, and Jonathan Jank for the protection of the public interest and to discuss real estate interests for a period not to exceed 30 minutes.

Aye: Francescato, Kahler, Singleton, Stryson, Tonniges, Wergin.
Nay: None. Absent: Kolterman, Miller. Motion carried.

Mayor Eickmeier stated the Council has voted to go into closed session at 7:24 p.m. for the protection of the public interest and to discuss real estate interests.

At 7:49 p.m., the closed session ended, and the following Councilmembers reconvened to regular session: Francescato, Kahler, Singleton, Stryson, Tonniges, Wergin. Mayor Eickmeier announced that no formal action was taken during the closed session.

MOTION TO ADJOURN

Councilmember Wergin moved, seconded by Councilmember Stryson, that the March 4, 2025, City Council Meeting be adjourned.

Aye: Francescato, Kahler, Singleton, Stryson, Tonniges, Wergin.
Nay: None. Absent: Kolterman, Miller. Motion carried.

Adjourned approximately 7:49 p.m.

THE CITY OF SEWARD, NEBRASKA

Joshua Eickmeier, Mayor

Derek Bargmann, City Clerk

PUBLIC HEARINGS

1. Public Hearing - 7:00 PM - Consideration of an Ordinance to Revise the City's Unified Land Development Ordinance (ULDO); Article 4 Zoning District Regulations; 410-4.8 Vacation of Streets and Alleys - Building/Zoning & Code Enf. Director Dworak

ORDINANCE NO. 2025-8

AN ORDINANCE TO AMEND THE MUNICIPAL CODE OF THE CITY OF SEWARD, CHAPTER 410 ZONING AND SUBDIVISION, ARTICLE 4 ZONING DISTRICT REGULATIONS; TO AMEND THE VACATION OF STREETS AND ALLEYS; TO REPEAL ALL ORDINANCES OR PARTS OF ORDINANCES IN CONFLICT; TO PROVIDE FOR AN EFFECTIVE DATE; TO PROVIDE FOR PUBLICATION OF THIS ORDINANCE IN PAMPHLET FORM.

BE IT ORDAINED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF SEWARD AS FOLLOWS:

That Chapter 410 of the Municipal Code of the City of Seward is hereby amended as follows:

Section 1. That §410-4.8 be amended as follows:

§410-4.8 Vacation of Streets and Alleys

Whenever a public street or alley is vacated, the zoning district adjoining each side of such right-of-way shall be extended out to the former center line, unless the entirety of the vacated public street or alley is sold, conveyed, exchanged, or leased to a single abutting property, then the zoning district will be extended to align with that property.

SECTION 2. REPEAL. All ordinances or parts of ordinances in conflict herewith are hereby repealed.

SECTION 3. WHEN OPERATIVE; PUBLICATION IN PAMPHLET FORM. This ordinance shall be published in pamphlet form and shall be in full force from and after its passage, approval and publication or posting as required by law.

Dated this _____ day of _____, 2025

CITY OF SEWARD, NEBRASKA

Joshua Eickmeier, Mayor

ATTEST: _____
Derek Bargmann, City Clerk

§ 410-4.8. Vacation of streets and alleys.

Whenever a public street or alley is vacated, the zoning district adjoining each side of such right-of-way shall be extended out to the former center line-, unless the entirety of the vacated public street or alley is sold, conveyed, exchanged, or leased to a single abutting property, then the zoning district will be extended to align with that property.

APPLICATION TYPE

ULDO Amendment

FINAL ACTION?

DEVELOPER/OWNER

PC HEARING DATE

March 10, 2025

RELATED APPLICATIONS

PROPERTY ADDRESS, ZONING DISTRICT/USE

BRIEF SUMMARY OF REQUEST

Review a Text Amendment to the City of Seward Unified Land Development Ordinance; Chapter 410 Zoning and Subdivision, Article 4 Zoning District Regulations; 410-4.8 Vacation of streets and alleys.

APPLICATION CONTACT

Tim Dworak

ANALYSIS

It was noted city code 340-3.11 Vacation of streets and alley, allows for the entire vacated property to be conveyed to one property owner in its entirety. Research discovered code 340-3.11 was amended and adopted August 20, 2002 by Ordinance No. 31-02 to align with Nebraska State Statute 16-611 Vacation of street or alley; abutting property; how treated, which allows for the entire vacated property to be conveyed to a single property owner. City ordinance 340-3.11 and Nebraska State Statute 16-611 are attached in the packet for reference.

City code 410-4.8 extended the zoning district abutting both sides of the vacation to the former center line of the right-of-way. To avoid the possibility of two (2) zoning districts on a property the amended ordinance would allow for the extension of the current zoning district to extend to the entire vacated property as conveyed to one property owner so not to create split zoning on a vacated property.

Prepared by

Tim Dworak

City of Seward Building - Zoning – Code Enforcement Director

2. Public Hearing - 7:00 PM - Consideration of an Application for the Transfer of a Special Use Permit, Allowing an Outdoor Dog Exercise Area, to a New Owner for the Property at 511 Bradford Street - Building/Zoning & Code Enf. Director Dworak



Application for Special Use Permit

Applications shall be submitted a minimum of 30 days prior to the City Planning Commission Meeting. City Planning Commission meets the 2nd Monday of each month.

Instructions:

1. Fill out the application form completely. Use additional sheets if needed.
2. Filing Fee is \$200. Notification Fee is \$100. Amount Due is \$300 payable to the City of Seward.
3. Contact the City of Seward Building & Zoning Director for questions.
4. Submit a list of property owners within 300 feet, prepared by a certified abstractor.

Permit No. _____

Date : 1/22/20

Applicants Name : Andy Wiltz

Applicants Address: _____

Phone Number: _____

Email: _____

Present use of Property: Outdoor dog play yard used by The Alps Bark Park

Requested use of Property : Requesting a new special use permit be granted to myself so The Alps Bark Park can continue utilizing the outdoor play space

Present Zoning: Downtown CBD

Legal Description: Seward Clouds Addition Block 37 LTS 10-13 & W1/2 VAC Alley ADJ Lot 5

Provisions of the Zoning Regulations you are seeking for this permit: See attached

Number of Years for Permit (5 yrs, 10 yrs, etc): Attached to Owner

Explain in detail what you propose to do: I am purchasing The Alps Bark Park and I am seeking a special use permit to continue business operations in the outdoor yard

Adjoining Property Use:

North: <u>Parking lot</u>	South: <u>Insurance Agency</u>
West: <u>Insurance agency</u>	East: <u>Homes in CBD</u>

This authorize the City of Seward Planning and Zoning Director to enter upon the property during normal working hours for the purpose of becoming familiar with the proposed situation. The Director may be accompanied by members the City of Seward Planning Commission or Seward City Council.

Applicant Signature:

PO BOX 38 · 142 N 7th St. Seward, NE 68434
402-643-2928 Opt. 3, Opt. 1
tim.dworak@cityofsewardne.gov

Below are the requirements for supplement use regulations of the Dog Day Care.

G. Dog day care.

- (1) The dogs shall be under the direct supervision of an on-duty company employee at all times.
- (2) Provide sight-obscuring fencing for all on-site outdoor exercise areas. The fence shall be subject to § 410-32.8, Fence regulations.
- (3) Outdoor exercise area shall have artificial turf and/or pea gravel.
- (4) Maximum of 15 dogs in the outdoor exercise area.
- (5) Outdoor exercise area hours of operation are from dawn to dusk.
- (6) The outdoor exercise area shall not be used on July 4.
- (7) Dog day care facilities shall not be adjacent to a residential zoning district; this includes across streets and rights-of-way.
- (8) The applicant shall be required to obtain all licenses and permits and meet the City's conditional use and site plan review requirements, as applicable.

Bradford St

800078039

800231000

800078098

800078055

800231525

Jackson Ave

N 6th St

N 5th St

800072722





800078039

800231000

800078098

800078055

800231525

N 6th St

N 5th St

Ave

Jackson Ave

City of Seward Planning Commission

142 N 7th St. Seward, NE 68434

Staff Report

Tim Dworak, Building/Zoning &
Code Enforcement Director
402-643-4000

APPLICATION TYPE

Special Use permit

FINAL ACTION?

DEVELOPER/OWNER

Andy Wiltz/The Alps Dog Retreat LLC

PC HEARING DATE

March 10, 2025

RELATED APPLICATIONS

PROPERTY ADDRESS, ZONING DISTRICT/USE

511 Bradford St – CBD - Commercial

ADJACENT ZONING DISTRICTS/USE:

North, CBD, Commercial – Twin Rivers Health Care

East, CBD, Residential – Mark Suhr

South, CBD, Commercial – Suhr & Lichty Insurance Agency, Inc

West, CBD, Commercial – Jack Russel – Farm Bureau Financial Services

BRIEF SUMMARY OF REQUEST

A Special Use Permit application for an outdoor exercise area at the Alps Dog Retreat, Doggy Day Care in the Central Business District (CBD).



APPLICATION CONTACT

Andy Wiltz [REDACTED]

ANALYSIS

The Alps Dog Retreat is changing owners and requesting the permit be assigned to the new owner. The Doggy Day Care use conditions for the Special Use Permit are listed below. The permit would be issued with the owner and expire should the owner no longer own the business the Alps Dog Retreat or no longer have an outdoor exercise area.

The notice of this Public Hearing was published in the Seward County Independent, a sign posted, and letters were mailed to properties within 300 feet.

APPROXIMATE LAND AREA:

0.52 acres or 22,758 square feet +/-

LEGAL DESCRIPTION:

LOTS 3, 10-13, 14-18 Block 37 CLOYDS ADDITION CITY OF SEWARD

Prepared by

Tim Dworak

City of Seward Building – Zoning – Code Enforcement Director

CONDITIONS OF APPROVAL – SPECIAL USE PERMIT # CU25-01.

As provided by the City of Seward Unified Land Development Ordinance, Article 44 Administrative Procedures and Penalties, section 410-44.3 Conditional Use Permits, this approval permits a Doggy Day Care in the CBD District.

SITE SPECIFIC CONDITIONS:

1. Dogs to be supervised by an on duty company employee at all times.
2. Outdoor area shall have obscuring fencing per §410-32.8 Fence Regulations.
3. Outdoor area shall have artificial turf and/or gravel.
4. Maximum of 15 dogs in the outdoor area.
5. Outdoor hours of operation are from dawn to dusk.
6. Outdoor area shall not be used July 4th of any year.

STANDARD CONDITIONS:

Return To:
City of Seward
PO Box 38
Seward, NE 68434

Notice of Special Use Permit

This Notice shall hereby certify that City of Seward approved Conditional Use Permit CU25-01 on March 18, 2025, granting Andy Wiltz a Special Use Permit for an outdoor dog exercise area in CBD – Central Business District at the property legally described as:

Lot 3, and all of vacated alley adjoining said lot to the East and including the North Half of the vacated alley adjacent thereto on South side; Lots 14, 15, 16, 17, 18, together with the South Half of the vacated alley North of lots 14, 15, 16, 17, 18, in Block 37, Cloyd's Addition, Seward, Seward County, Nebraska, and;

Lots 10, 11, 12, 13, and the South Half of vacated alley adjoining said lots to the North, in Block 37, Cloyd's Addition to the City of Seward, Seward County Nebraska.

(Commonly known as 511 Bradford St.)

with the following conditions:

1. Dogs to be supervised by an on-duty company employee at all times.
2. Outdoor area shall have obscuring fencing per §410-32.8 Fence Regulations.
3. Outdoor area shall have artificial turf and/or gravel.
4. Maximum of 15 dogs in the outdoor area.
5. Outdoor hours of operation are from dawn to dusk.
6. Outdoor area shall not be used July 4th of any year.
7. Two year renewal from date of approval.

Said special use permit shall run with Andy Wiltz, and is void once he is no longer the owner.

IN WITNESS WHEREOF, the undersigned has hereunto set his hand this ____ day of _____, 2025.

Joshua Eickmeier, Mayor City of Seward

STATE OF NEBRASKA

SS

COUNTY OF SEWARD

The foregoing instrument was acknowledged before me on the ____ day of _____, 2025, by Joshua Eickmeier, Mayor of the City of Seward.

Notary Seal:

Notary Public

3. Public Hearing - 7:00 PM - Presentation and Discussion of Functioning and Progress of the Seward Economic Development Plan - City Administrator Butcher

**CITIZENS ADVISORY REVIEW COMMITTEE
FOR THE LB 840 ECONOMIC DEVELOPMENT PLAN
SEMI-ANNUAL REVIEW REPORT**

To: The Seward City Council
From: Citizens Advisory Review Committee - LB 840 Economic Development Plan
Date: March 17, 2025
Re: Semi-annual review report required by the Economic Development Plan

The Citizens Advisory Review Committee (CARC) is a committee of registered voters appointed by the Mayor (and affirmed by the City Council) to review the Economic Development Plan (the Plan) established under LB 840. The CARC mainly reviews the actions taken by the LB 840 Application Review Board (ARB). The ARB is the committee that has the authority to spend the LB 840 funds.

The CARC met on February 19, 2025, to review the functioning and progress of the Plan. The meeting consisted of discussions about the following:

1. An LB 840 Activity Report was distributed to the CARC in advance of the meeting. The City Administrator walked the CARC through recent activity from August 1, 2024, thru December 31, 2024. The cash balance to the LB840 Economic Development Fund sat at \$352,234.80 as of the end of the term.
2. A copy of the general ledger reports including a report of all transactions from 8/1/24 to 12/31/24 was distributed prior to the meeting. Payments were made to Crouchs Farm and hardware (MC Retail) for improvements (\$100,000) and Squire Wards (\$179,147) for property upgrades to create the Pasta Barn and new Rue 6. The following payments remained pending: \$200,000 to the loan for the Focus Properties Apartment Complex; \$64,000 to the loan for Bottle Rocket Brewing. A potential grant of \$50,000 is pending for future fiscal years to SCCDP for an EDA Matching Grant. The CARC notes that it does not audit nor does it verify the numbers submitted to it in the general ledger reports. It is our understanding that these accounts are audited during the annual overall audit that is done on the city's financial records.
3. The CARC specially noted the following requests for improvements to the LB 840 program:
 - A. That applications should be reviewed by the City Administrator, City Finance Director, and the LB 840 Committee Chair before being brought forward. All three (3) should be in agreement to at least bring an application forward for consideration. This provides more oversight.
 - B. If a co-signor is needed on a loan (outside the principals of the business and their spouses), then the applicant should look to the co-signor for funds and a personal loan.
 - C. Applications should be considered on the basis of the applicant's ask and not back and forth negotiations outside the general parameters of the loan ask.

ADMINISTRATIVE ITEMS

1. Consideration of a Construction Contract in the amount of \$110,291.75 with Van Kirk, Bros. for construction of 474 ft of water main along Worthman Boulevard west of Pine Street - City Engineer Mike Oneby

03/13/2025
 25-037
 *** Jim Van Kirk

15:52
 Seward Worthman Drive Phase 1 water main

BID TOTALS

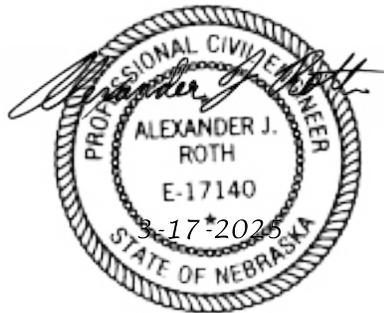
<u>Biditem</u>	<u>Description</u>	<u>Status - Rnd</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Bid Total</u>
10	TRAFFIC CONTROL	U	1.000	LS	250.00	250.00
20	MOBILIZATION (8%)	U	1.000	LS	7,500.00	7,500.00
30	GENERAL CLEARING AND GRUBBING	U	1.000	LS	1,000.00	1,000.00
40	EARTHWORK MEASURED IN EMBANKMENT (ESTABLISHED QUA	U	228.000	CY	25.00	5,700.00
50	STABILIZED CONSTRUCTION EXIT	U	1.000	EA	1,500.00	1,500.00
60	SEEDING, TYPE B	U	0.460	AC	2,000.00	920.00
70	EROSION CONTROL, CLASS 1A	U	470.000	SY	2.50	1,175.00
80	12" WATER MAIN PIPE	U	474.000	LF	118.00	55,932.00
90	6" WATER MAIN PIPE	U	7.000	LF	75.00	525.00
100	6" GATE VALVE AND BOX	U	2.000	EA	1,950.00	3,900.00
110	12" GATE VALVE AND BOX	U	1.000	EA	5,250.00	5,250.00
120	6" FIRE HYDRANT	U	2.000	EA	6,150.00	12,300.00
130	6" ANCHORING COUPLING, 18"	U	2.000	EA	450.00	900.00
140	6" ANCHORING ELBOW	U	1.000	EA	470.00	470.00
150	12" RETAINER GLAND	U	14.000	EA	207.00	2,898.00
160	6" RETAINER GLAND	U	2.000	EA	85.00	170.00
170	12" SOLID SLEEVE, M.J.	U	3.000	EA	550.00	1,650.00
180	12" PLUG, M.J.	U	1.000	EA	500.00	500.00
190	12"X6" TEE	U	2.000	EA	880.00	1,760.00
200	12"X90 DEG BEND	U	2.000	EA	1,060.00	2,120.00
210	CONC FOR PLUG BLOCKS & THRUST BLOCKS	U	2.400	C.Y.	950.00	2,280.00
220	STEEL FOR PLUG BLOCKS & THRUST BLOCKS	U	116.700	LBS	2.50	291.75
230	REMOVE FIRE HYDRANT	U	2.000	EA	650.00	1,300.00

Bid Total =====> \$110,291.75

SPECIAL PROVISIONS
CITY OF SEWARD (2025)
WORTHMAN BOULEVARD WATERMAIN
PHASE I
SCHEMMER PROJECT NO. 09336.001-A

SCHEMMER

Design with Purpose. Build with Confidence.



MARCH 2025

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GENERAL CONTRACT REQUIREMENTS

This project will utilize Nebraska Department of Transportation Standard Plans and Specifications.

All watermain related construction will utilize the 2023 City of Lincoln Standard Specifications for Municipal Construction and 2023 Lincoln Standard Plans (LSP).

These Special Provisions amend or supplement the Nebraska Department of Transportation Standard Specifications for Highway Construction, 2017 Edition, and other provisions of the Contract Documents as indicated herein. All provisions that are not so amended or supplemented via these special provisions remain in full force and effect.

The Contractor shall not take advantage of any apparent error, discrepancy or omission in the plan, specifications or geotechnical reports. Upon discovery of such an error, discrepancy or omission, the Contractor shall notify the City's representative immediately. The City's Representative will then make such corrections or interpretations as necessary to fulfill the intent of the plans and specifications. Materials or work described in words which, so applied, have known technical or trade meaning shall be held to refer to such recognized standards.

Figured dimensions on the plans shall be taken as correct but shall be checked by the Contractor before starting construction. Any errors, omissions, or discrepancies shall be brought to the attention of the City's Representative and the City's Representative's decision thereon shall be final. Correction of errors or omissions on the drawings or specifications may be made by the City's Representative when such correction is necessary for the proper execution of the work.

LIMITATIONS OF THE WORK

The Contractor will not be permitted to use pavement along existing Worthman Boulevard or Pine Street for construction purposes and for the storage of materials and equipment. Side streets are allowed to be closed where immediate work is taking place. The location and extent of the areas so used shall be designated by the Owner. The Owner shall approve all materials to be stored on site prior to their delivery. No materials or equipment may be placed upon the property of the Owner until the Owner has agreed to the location contemplated by the Contractor to be used for storage.

It shall be understood that the responsibility for protection and safekeeping of equipment and materials on or near the site shall be entirely that of the Contractor and that no claims shall be made against the Owner by reason of any act of an employee or trespasser. It shall be further understood that should any occasion arise necessitating access to the sites occupied by these stored materials and equipment, the Contractor owning or responsible for the stored materials or equipment shall immediately move same.

The Contractor shall be solely responsible for obtaining and shall pay all costs in connection with any additional work area, storage site, access to the site, or temporary right-of-way which may be required for proper completion of the work.

All prospective bidders shall visit the site to familiarize themselves with the existing site conditions, access locations, site constraints, existing site drainage, existing utilities and other construction currently underway or planned within the project area. In addition, the selected Contractor shall be required to verify the location, elevations and flowlines of existing utilities that may be in conflict with the proposed work or that will need to connect to the new work prior to start of construction. This may require the Contractor to pothole existing utilities in advance of the start of work to verify flowlines at outlets or connection points, location and depth of utilities, size and or material types of existing utilities. This verification work shall include but not be limited to connections to existing storm sewers, sanitary sewers and water mains. Verification of existing site conditions and utility locations shall not be paid for directly except where shown on the plans.

CONTRACT TIME

All work associated with this project shall be completed by April 30th, 2025. Once construction begins, the Contractor shall have no more than 14 calendar days to complete all work associated with the project. Suspension of calendar days may be requested by the Contractor to be approved by the City.

Determination of Final Completion shall be subject to the City's Representative's approval.

SPECIAL PROSECUTION AND PROGRESS

The following prosecution and progress of work shall be used in developing the baseline schedule for the project. The contractor will be required to submit a schedule of construction tasks that identify an order of completion based on the complete dates identified for this construction project.

General

All work shall be confined within the limits of the existing right-of-way or easements unless the Contractor has obtained separate rights from an adjacent property owner. The Contractor shall provide to the City's Representative written copies of any agreements for separate property rights that are obtained.

CONSTRUCTION STAKING

Construction staking shall be done by the Engineer at the Owners cost. The Engineer will furnish and set construction stakes or benchmarks establishing lines and grades and will furnish the Contractor with all necessary information relating to them. The Contractor shall be responsible for the preservation of all stakes and marks. The cost of replacing any stakes or marks destroyed or disturbed by the Contractor shall be charged against, and deducted from, the payment for the work.

The Contractor shall provide one week's notice for stakes when moving onto the work and 48 hours notice for any additional staking needs.

Any errors or apparent discrepancies found in previous surveys, plans, specifications, or special provisions shall immediately be called to the attention of the Engineer by the Contractor for correction or interpretation before proceeding with the work.

STATUS OF PERMITS

The City of Seward is in the process of obtaining a Construction Permit for Public Water Systems through the Nebraska Department of Environment and Energy (NDEE).

The disturbed area is anticipated to be less than one acre; therefore a National Pollutant Discharge Elimination System (NPDES) permit is not required for this project.

STATUS OF EASEMENT

No additional land rights have been acquired for this project.

STATUS OF UTILITIES

Utility facilities, aerial and/or underground exist within this project. The Contractor shall avoid damaging any utility(s). Any such damage caused by Contractor, Contractor's employees, subcontractors, suppliers or agents will be the responsibility of Contractor to repair at Contractor's expense. No additional compensation will be allowed for protecting utility(s) or for repair of any damage caused by Contractor, Contractor's employees, subcontractors, suppliers or agents. Contractor shall coordinate utility relocation or reconstruction with the appropriate utility company. Any relocation work necessary will be concurrent with construction.

CITY OF SEWARD UTILITIES

The City of Seward has existing power, water mains, sanitary sewers, and storm sewers within the limits of the project. Impacts to these utilities are not anticipated outside of improvements outlined within the plans. All work within this area which may impact public water, sewer, or power facilities will require coordination with the City of Seward Engineer and the City's Representative to minimize impact to daily activities.

The Contractor shall notify the City of any unforeseen conflicts with power lines. The City of Seward shall be responsible for any relocation and/or structural support of power lines.

The point of contact for the City of Seward is:

City of Seward Engineer

Contact: Michael Oneby, P.E.

Phone: (402) 643-4000

PRIVATE UTILITIES

There are no known private utilities located within the project limits based upon a February 2024 One Call utility locate. The Contractor shall notify the City of any unforeseen conflicts with private utilities. The Contractor shall complete their own One Call utility locate to verify.

WATER MAIN PIPE MATERIAL AND BACKFILL REQUIREMENTS

The 2023 City of Lincoln Standard Specifications for Municipal Construction and 2023 Lincoln Standard Plans (LSP) Standard Specifications shall be amended to include the following:

Section 20.01, C-D: FOUNDATION & BEDDING materials shall consist of lean clay.

Section 20.02, D: BACKFILL

Backfilling and compaction of excavations shall follow as closely after the construction as possible. All excavations shall be backfilled with approved material up to the original surface of the ground unless otherwise indicated on the plan. No backfill shall be made with material containing stone, large clods, frozen earth or debris of any kind. The backfill shall be placed in loose lifts not to exceed the thickness required to attain 12" thick compacted layers or as noted in a geotechnical report signed and sealed by an Engineer registered in the State of Nebraska.

Backfilling shall not be done in freezing weather, except by permission of the City's Project Manager, nor shall any fill be made where the material already in the trench is frozen. If construction proceeds at any time when frozen material is encountered and frozen material is placed in the trench line, all such trenches shall be re-compacted in the spring after frost conditions are no longer present in the ground. This re-compaction of the trench shall include the removal of all material to a depth of 12" below the depth of the frozen material and the replacement and re-compaction of the trench to the proper grade with suitable material.

Care shall be exercised in backfilling so as not to damage any finished Work. The backfill shall be brought up evenly on both sides of the utility or structure.

Unless otherwise directed by the City's Project Manager, compaction of backfill within 3' of all structures and utility appurtenances, including but not limited to, valves, hydrants, manholes, and inlets, shall be accomplished by mechanical compaction using hand operated tampers, rammers, or other approved devices for the soil type(s) encountered. Jetting or hydro-flushing of the backfill shall not be permitted.

Care shall be taken to ensure that the utility is properly bedded with lean clay material. Backfill shall be mechanically compacted to a minimum density of 96% of the maximum dry density of the material as determined by AASHTO Method T-99. The moisture content of the soils shall be between 2% below and 4% above the optimum moisture content as determined by the above test.

When the moisture content of the material is too low to obtain specified density, sufficient water shall be added to the material and/or lift thickness shall be decreased before compaction.

After backfilling, the Work area shall be kept maintained in a smooth and well drained condition.

Section 23.03, G: Polyvinyl Chloride (PVC) Pipe shall conform to AWWA C900-16. All pipe on this project shall be PVC 1120 DR-18 with O.D. conforming to that of ductile iron pipe.

SEPARATION OF WATER MAIN AND SEWERS

See attached Water Main and Sanitary/Storm Separations (2023) guidance from NDEE.

WATERMAIN TESTING AND DISINFECTION

Piping Tests: Conduct piping tests after thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.

Hydrostatic Tests: Test at not less than 1-1/2 times working pressure for 2 hours, per Section 10 AWWA C605.

Disinfection: All new main and connections to existing main shall be disinfected in accordance with AWWA C651-14. Following chlorination the main shall be flushed within 24 hours. Provisions shall be made to prevent contamination of existing mains by cross-connection during pressure testing, disinfection or flushing of new mains.

City of Seward will take all samples and perform all bacteriological testing for the project. The City will pay testing cost for up to two sets of tests for each segment tested. Contractor will reimburse the City for all costs in excess of two failed tests, for each segment.

All other testing and sampling, flushing and or reflushing testing and sampling shall be at the Contractor's expense and will be considered subsidiary to items for which direct payment is made.

GENERAL CLEARING AND GRUBBING

The work area consists of grasses, shrubs and pavement. With this in mind, clearing and grubbing of vegetation within the project area may be required. The Contractor will not be allowed to dispose of trees, stumps, logs, down timber, shrubs, brush, weeds, or other herbaceous material resulting from clearing and grubbing operations on the Project Right-of-Way.

CONTAMINATED SOIL REMOVAL

During the execution of the work on this project the Contractor may encounter contaminated soils, debris or groundwater (media). If contaminated media is encountered the Contractor shall immediately cease excavation operations and contact the City's Representative. If it is

determined by the City's Representative that the contaminated soils cannot be used on-site (e.g. as backfill for the utility trenches), the Contractor shall be required to dispose of any contaminated media in accordance with all federal, state and local laws.

In the event the Contractor or on-site construction management personnel suspect that contaminated media is encountered or will be during the performance of the work, they shall immediately notify the City's Representative and follow their direction for resolution on how to manage the contaminated media. Typical indications of potentially contaminated media include discoloration and/or odors associated with the media removed as part of boring, trenching or other excavation work.

During the course of the project the Contractor shall not haul any excavated material that is suspected to be contaminated off-site without the prior approval of the City's Representative. As such, the Contractor shall provide locations on-site to temporarily stockpile all excavated material that may be suspected to contain contaminated soils. All temporary stockpiles of contaminated soils shall be kept separate from clean soils and shall comply with the requirements set forth in the Construction Storm Water Pollution Prevention Plan (SWPPP) (if required). The City's Representative will determine the appropriate method for disposal of the excavated material if it is determined to be contaminated and make a recommendation to the Contractor. Work associated with removal and disposal of contaminated material will be considered on an 'Extra Work' basis.

EROSION CONTROL, CLASS 1A

Section 810 of the Standard Specifications shall be amended to include the following:

- A. The work included in this item shall consist of providing an accepted uniform stand of perennial turf grasses by fine grading and furnishing and placing fertilizer, seed, and mulch on all areas to be treated as shown on the plans. This shall include, but not be limited to: disking, harrowing, leveling/fine grading, planting, fertilizing, mulching, establishment, and maintenance till acceptance.

PART 1 SUBMITTALS:

- A. The Contractor shall submit the following samples, certifications, or test results prior to use on the project:
 - a) Fertilizer - Form for Affidavit (on official stationery of supplier) certifying compliance with State and Federal regulations and standards of the Association of Official Agricultural Chemists.
 - b) Seed - Form for Affidavit (on official stationery of supplier) certifying compliance with State and Federal regulations and testing provisions of the Association of Official Seed Analysts for each shipment of seed for this project.
 - c) Sample and product information on erosion control blankets and hold down pins.
 - d) Sample and product information on hydromulch.
 - e) All original seed tags for all bags (and partial bags) of seeds used on the project shall be submitted to the Engineer.

- f) Soil test identifying the lawn and garden package values before the seed bed preparation process has been started. Soil report is to include the cation exchange capacity (CEC), levels of phosphorus, potassium, calcium, magnesium and other nutrients, soil PH and soil buffer PH and suggested pounds per Acre recommendations to achieve a prepared soil for seeding on bare ground.
- g) Typical desired nutrient levels for the area are; Organic matter 3%, PH 6-7.2, Phosphorus 25-30ppm, Potassium 150-200 ppm.

PART 2 - PRODUCTS

2.01 GENERAL:

All materials furnished in accordance with the requirements of this specification shall be delivered, where applicable, in sealed, unbroken packages bearing the brand and maker's name, and shall be stored on platforms and be properly covered to protect them from the weather and damage.

2.02 FERTILIZER/NUTRIENTS:

Commercial composite fertilizer or nutrients, uniform in composition, dry and free flowing. It shall bear the manufacturer's guaranteed statement of analysis which shall be as designated in the soils report for original fertilization/nutrient modification to the insitu soils. Any fertilizer/nutrients which becomes caked or otherwise damaged, rendering it unsuitable for use, will not be accepted.

2.03 SEED:

A. Acceptable Seed Mixtures (Nebraska Region B)

Seed Mixtures for Nebraska Region B
Loess & Glacial Drift (see the map on page 24)

Rural Highway Shoulder Mixture

Species	Minimum Purity (percent)	Lbs. of PLS/acre
Perennial ryegrass – Linn, Amazon, Norlea	85	15
Western wheatgrass – Barton	85	3.5
Slender wheatgrass	85	12
Kentucky fescue	85	15
Red fescue (<i>Festuca rubra</i>)	85	6
Buffalograss – Cody, Bison, Sundancer, Texoka	80	3.5
Fults alkali grass (<i>Puccinellia distans</i>)	85	2
Sideoats grama – Butte, El Reno, Trailway	75	4
Sand dropseed (<i>Sporobolus cryptandrus</i>)	90	0.5
Oats/Wheat (wheat in the fall)	90	16

Or Approved Equivalent.

2.04 WATER: Potable.

Verify that prepared soil base is ready to receive work of this Section. Fill all depressions and rivulets with topsoil to establish a smooth grade. Beginning of installation means acceptance of existing site conditions.

2.05 PREPARATION OF TOPSOIL:

A. Conditioned soil:

1. The Contractor shall be responsible for determining the availability of organic soil additive material prior to bidding the project. If there is not sufficient supply of organic soil additive material, the Contractor shall condition the soil by nutrients and fertilizer per the requirements of this specification
2. 2 inches of organic soil additive shall be incorporated into the topsoil as described above.
3. The Contractor shall notify the Engineer five (5) days prior to the start of amended soil activities.
4. Once the Contractor is allowed to use manufactured organic soil, the Contractor shall notify the Engineer five (5) days in advance to schedule pick up of the manufactured organic soil material.
5. The Contractor shall place the conditioned soil in accordance with the Contract Documents.

6. Conditioned soil may be accomplished by mixing the organic soil additive with a stockpile of topsoil material then placing, or by spreading the organic soil additive over replaced topsoil and mixing together in place.
 7. Organic soil additive may be spread over undisturbed native soil to a depth of two (2) inches and incorporated into the native soil to a total depth of six (6) inches.
 8. Fertilizer shall not be added when using manufactured organic soil.
- B. Soil conditioning by nutrients/fertilizer, only if compost is not available.
1. Apply if needed according to recommendations from a soil test
 2. Apply 19-19-19 or equivalent nutrients fertilizer at the rate of 450 lbs/AC as a minimum.
 3. Incorporate recommended nutrients/fertilizer into the top 4-6 inches of the soil by discing or other means.
- C. Seedbed preparation
1. Harrow, disk or rake the topsoil to a depth of three (3") on slopes flatter than 3:1 and one to three (1-3") inches for slopes steeper than 3:1 in a minimum of two directions.
 2. When an area is compacted, crusted or hardened, the soil surface shall be loosened by discing, raking, or harrowing.
 3. Seed bed preparation should not be undertaken when excessively wet conditions exist.
 4. Remove all debris and stones having any dimension greater than one inch.
 5. Rake finish surface smooth

2.06 RATE OF APPLICATION:

- A. Initial Fertilizing: Application rate shall be obtained from the required soils report.
- B. General Lawn Seed: 12 pounds per 1,000 SF.
- C. Refertilizing: As required by the engineer if the establishment is not as required to complete the seeding.

2.07 SEEDING:

- A. Drill seed or sow (broadcast) grass seed, applying half the quantity in one direction, and the remaining quantity at right angles to it.
- B. Do not sow seed on a windy day, or when the ground is frozen, wet or otherwise non-tillable.
- C. Cover seed with a thin layer of topsoil by raking or dragging.
- D. Cover newly seeded area with hydromulch or erosion control blankets. Hydromulch or erosion control blankets shall be applied within twenty four (24) hours after planting seed.
- E. Install erosion control blankets where shown on the Drawing(s) and as per manufacturer's instructions. Hold down pins shall be installed two (2) pins per square

yard.

2.08 SEEDING SEASON:

- A. The suggested calendar dates for seeding are:
 - Spring: March 15 to June 1.
 - Fall: August 15 to October 1.
- B. All disturbed soil areas shall be treated during the seeding season.
- C. Areas at final grade: Permanent seeding will be accomplished

2.09 MAINTENANCE:

- A. To achieve better germination of seed, the Contractor may water the seeded areas in order to maintain a moist seed bed at all times. If the Contractor chooses to water the seeded areas, water should be applied so that the topsoil is wet to a depth of two inches. Apply one complete coverage to the seeded area in an eight-hour period.
- B. Protect the seed bed with barricades, if necessary, to keep all traffic off the area.
- C. After the seed mixture has germinated, reseed all areas which have failed to show a uniform stand of germinated seed.
- D. Maintain all seeded areas until acceptance. Suggested maintenance items shall include, but not be limited to any or all of the following, whichever are necessary:
 - 1. Regrading.
 - 2. Refertilizing.
 - 3. Reseeding.
 - 4. Re-Hydromulching or repositioning or replacing erosion control blankets.
 - 5. Watering.
 - 6. Weeding.
 - 7. Rolling.
 - 8. Filling in eroded areas.

2.10 INSPECTION AND ACCEPTANCE OF SEEDED AREAS:

- A. Submit written notice requesting inspection by the Engineer at least ten days prior to the anticipated date.
- B. No seeded areas will be inspected for acceptance prior to sixty (60) days from date of seeding.
- D. A satisfactory stand of grass which is acceptable is defined as consisting of a uniform stand of at least eighty-five percent (85%) established permanent grass species. An acceptable stand of grass will be determined by the Engineer.

E. Appropriate materials to be furnished and installed by the contractor for Erosion Control Class 1A can be obtained from the NDOT approved products list.

F. Other items required to be furnished and installed before payment are; testing, soil conditioning with fertilization/nutrients, conditioned soil, seed bed preparation, and seeding will all be incidental to the direct pay items for erosion control

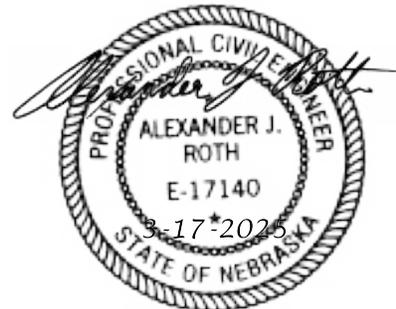
1. Soil Test required by this special provision are subsidiary.
2. Conditioned soil added to the area to be seeded shall not be paid for directly but will have to be completed in accordance with this special provision. The cost for the Contractor to provide, haul, and mix the organic soil additive shall be considered incidental to items for which the Contract provides direct payment
3. Fertilizer/ Nutrients added to the area to be seeded shall not be paid for directly but will have to be completed in accordance with the soils report.

APPENDIX A – CITY OF LINCOLN, NEBRASKA STANDARD SPECIFICATIONS

CHAPTER 20 – CONSTRUCTION FOR UTILITIES AND STRUCTURES

CHAPTER 23 – WATER MAINS

WATER MAIN AND SANITARY/STORM SEPARATIONS (2023) GUIDANCE
FROM NDEE.



CITY OF LINCOLN, NEBRASKA, STANDARD SPECIFICATIONS

CHAPTER 20

CONSTRUCTION FOR UTILITIES AND STRUCTURES

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CITY OF LINCOLN, NEBRASKA, STANDARD SPECIFICATIONS

CHAPTER 20

CONSTRUCTION FOR UTILITIES AND STRUCTURES

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	A. GENERAL	2015
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20.11	FINAL CLEANUP	2016
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	C. SODDING AND SEEDING	2016
20.12	COLD WEATHER CONSTRUCTION	2016
	A. LIMITS OF CONSTRUCTION	2016
	B. SUSPENSION OF WORK	2017
20.13	SUBSTANTIAL COMPLETION	2017
20.14	FINAL ACCEPTANCE	2017
20.15	GUARANTEE	2017

CHAPTER 20

CONSTRUCTION FOR UTILITIES AND STRUCTURES

20.00 GENERAL

Construction for utilities and structures shall include the excavation and backfill of all materials necessary to complete the Work in conformance with the plans and these Standard Specifications; all necessary sheeting, shoring and bracing; and any pumping that may be necessary to keep the trench free from water. Construction for utilities and structures shall also include the removal and replacement of pavement, driveways and sidewalks; disposal of surplus materials, borrow, maintenance and protection of excavation, and the restoration of all surfaces to a satisfactory condition.

These Standard Specifications shall apply to all utility and structure work regardless of the type of Work being performed.

20.01 MATERIALS

The following materials are approved for use in the City of Lincoln pursuant to the Standard Specifications described herein. Alternate materials maybe requested in writing to the Director of Public Works and Utilities.

A. SMOOTH STEEL PIPE CASING

Smooth steel pipe used for encasement shall be of the diameter, length, and wall thickness shown on the Plans. The encasement shall be new welded steel pipe conforming to ASTM Designation A 139, Grade B. All joints shall be welded.

B. CORRUGATED METAL PIPE

Corrugated metal pipe used for encasement shall be copper steel galvanized and shall conform to the requirements of AASHTO “Standard Specifications for Corrugated Metal Culvert Pipe”, Designation M-36, and shall be of the diameter, length and gauge as shown on the Plans.

C. FOUNDATION

Foundation material shall conform to the requirements of ASTM “Standard Specifications for Concrete Aggregates”, Designation C-33. The gradation for foundation material shall be size Number 357 (2" to #4).

D. BEDDING

For Lincoln Water System and Lincoln Wastewater System projects, bedding material shall be a well graded “crusher run” crushed rock with a percent passing gradation range of 1" - 100, #4 - 20 to 60, #10 - 0 to 30 and #200 - 0 to 10, unless otherwise designated on the plans or Special Provisions or approved by the City’s Project Manager.

For Lincoln Watershed Management projects, limestone rock and crushed concrete will also be permitted, provided that the gradation range requirements listed above are satisfied.

20.01 MATERIALS (Continued)

E. GROUT

The grout shall be mixed in the volumetric proportions of 2 parts Portland cement, 1 part fly ash, and not to exceed 6 parts sand. Enough water shall be used to produce a pumpable grout.

F. FLOWABLE FILL

Flowable fill material shall meet the requirements of Chapter 3 of these Standard Specifications.

20.02 EARTHWORK

A. CLEARING AND GRUBBING

Clearing and grubbing shall be accomplished as provided in Chapter 2 of these Standard Specifications.

B. TREE REMOVAL

The removal of trees and stumps shall be accomplished as provided in Chapter 2 of these Standard Specifications.

C. EXCAVATION

In general, all excavation shall be made by open cut from the surface of the ground and at the width and to the depth necessary for the proper construction of the utility and its appurtenances, according to the plans and these Standard Specifications. The Work shall be performed in conformance with Occupational Safety and Health requirements. Nothing contained in these Standard Specifications or Contract Documents shall relieve the Contractor from complying with any Local, State, or Federal safety requirements. The Work shall be performed within the limits of construction as shown on the plans. All necessary precautions must be made to prevent slides and cave-ins. Bracing or sheeting, shall be provided to maintain the sides and bottom of the trench in unstable material.

The excavated material shall be handled in such a manner as to cause a minimum of inconvenience to public travel and to permit safe and convenient access to public and private property along the line of Work. If a utility excavation is to remain open overnight in the built environment, all material (spoil) excavated, shall be properly covered and protected. If the excavation is to remain open for more than five (5) business days, all excavated material shall be removed from the job site. If excavating and backfilling on the same day, all unsuitable material (spoil) shall not be used for backfill. It shall be the Contractor's responsibility to secure the necessary permission and make all necessary arrangements for all required storage, borrow, and disposal sites.

Access shall be provided at all times to fire hydrants and water valves in the vicinity of the Work and firefighting equipment shall have access to any structure at all times. Trenches shall not be opened more than 100' in advance of the installed utility or as directed by the City's Project Manager. All trenches shall be backfilled as soon as practical after the pipe is in place, or as ordered by the City's Project Manager. Unless otherwise specified or authorized by the City's Project Manager, all excavated material shall be placed on the street side of the trench.

20.02 EARTHWORK (Continued)

C. EXCAVATION (Continued)

Holes for pipe bells shall be provided at each joint, but shall be no larger than necessary for joint assembly and assurance that the pipe barrel will lie flat on the trench bottom. Other than the bell holes, the trench bottom shall be true and even in order to provide support for the full length of the pipe barrel.

Excavation below subgrade with subsequent refilling with loose earth will not be permitted. Should the Contractor inadvertently excavate below subgrade, such over excavation shall be filled and brought up to grade with compacted soil, crushed rock, or sand or gravel as approved by the City's Project Manager.

The width of the utility trench at the top of the pipe shall be no greater than the width specified in the standard bedding details. Excessive trench width may be cause for providing a higher class bedding at no cost to the City. The width of excavation for utility lines 6" or greater in diameter shall be a minimum of 3'. In no case shall the excavation be less than 2' greater than the outside diameter of the pipe or the outside dimensions of the structure to be built. The bottom of all excavations shall be finished to the true profile grade, of full width, and cleared of any rocks, clods, roots, or other material that may interfere with properly placing the pipe or structure.

No measurement or direct payment will be made for any excavation required as part of the Work. The costs of excavation will be considered subsidiary to other items for which direct payment is made.

D. BACKFILL

Backfilling and compaction of excavations shall follow as closely after the construction as possible. All excavations shall be backfilled with approved material up to the original surface of the ground unless otherwise indicated on the plan. No backfill shall be made with material containing stone, large clods, frozen earth or debris of any kind. The backfill shall be placed in loose lifts not to exceed the thickness required to attain 12" thick compacted layers or as noted in a geotechnical report signed and sealed by an Engineer registered in the State of Nebraska.

Backfilling shall not be done in freezing weather, except by permission of the City's Project Manager, nor shall any fill be made where the material already in the trench is frozen. If construction proceeds at any time when frozen material is encountered and frozen material is placed in the trench line, all such trenches shall be re-compacted in the spring after frost conditions are no longer present in the ground. This re-compaction of the trench shall include the removal of all material to a depth of 12" below the depth of the frozen material and the replacement and re-compaction of the trench to the proper grade with suitable material.

Care shall be exercised in backfilling so as not to damage any finished Work. The backfill shall be brought up evenly on both sides of the utility or structure.

Backfilling against any concrete structure shall not be started until test specimens of the concrete develop a compressive strength of at least 2000psi.

Unless otherwise directed by the City's Project Manager, compaction of backfill within 3' of all structures and utility appurtenances, including but not limited to, valves, hydrants, manholes, and inlets, shall be accomplished by mechanical compaction using hand operated tampers, rammers, or other approved devices for the soil type(s) encountered.

20.02 EARTHWORK (Continued)

D. BACKFILL (Continued)

Jetting or hydro-flushing of the backfill shall not be permitted. Care shall be taken to ensure that the utility is properly bedded with material of an approved density or in conformance with these Standard Specifications. The initial 12" of backfill above the top of the pipe shall be carefully placed to protect the pipe bedding from further backfilling operations.

Backfill shall be mechanically compacted to a minimum density of 96% of the maximum dry density of the material as determined by AASHTO Method T-99. The moisture content of the soils shall be between 2% below and 4% above the optimum moisture content as determined by the above test.

When the moisture content of the material is too low to obtain specified density, sufficient water shall be added to the material and/or lift thickness shall be decreased before compaction.

After backfilling, the Work area shall be kept maintained in a smooth and well drained condition.

E. BASIS OF PAYMENT

No measurement or direct payment will be made for any backfilling or compaction required as a part of this Work. The costs of backfilling and compaction will be considered subsidiary to other items for which direct payment is made. When directed by the City's Project Manager, additional water shall be mixed in with backfill materials to allow compaction to be completed. Such water quantities shall be paid as an "EXTRA WORK" item. Lincoln Water System hydrant meter readings immediately before/after the addition of water shall establish the volume of water used.

F. MAINTENANCE AND PROTECTION OF EXCAVATIONS

Temporary support, adequate protection and maintenance of all underground and surface utilities, structures, drains, sewers, and other obstructions encountered in the progress of the Work shall be furnished by the Contractor at Contractor's own expense. Contractor shall take all reasonable precautions to prevent movement of the sides of such excavations. The Contractor shall protect all excavations from surface water by the construction of adequate dikes. The Contractor shall furnish and put in place such sheeting and bracing as may be required to support the sides of the excavations and the Contractor shall remove such sheeting and bracing as the trenches or excavations are filled. The City's Project Manager may order the sheeting be left in place if, in the City's Project Manager's opinion, the utility or structure might be damaged by its being removed.

In lieu of sheeting and bracing, the Contractor may use a trench box of adequate design during the construction of the utility to protect the utility and all personnel.

The Contractor shall satisfy the City's Project Manager that the proposed methods of bedding and foundation material placement is in compliance with the requirements of the Standard Drawings for pipe bedding details when the trench box is moved. The Contractor shall protect the integrity of the pipe embedment zone when utilizing or moving the trench box.

20.02 EARTHWORK (Continued)

F. MAINTENANCE AND PROTECTION OF EXCAVATIONS (Continued)

No measurement or direct payment shall be made for maintenance and protection of excavations, except for sheeting left in place as required above. Payment for sheeting left in place shall be made as an “EXTRA WORK” item. Such payment shall be the value of the sheeting minus the cost of removal. The cost of maintaining and protecting excavations shall be considered subsidiary to the other items for which direct payment is made.

G. DISPOSAL OF SURPLUS MATERIAL

The Contractor shall dispose of all surplus excavated material not needed for fills or other designated purposes. All material deemed unsuitable by the City’s Project Manager shall be disposed of properly and replaced with approved material.

No measurement or direct payment shall be made for disposal or stock piling surplus materials. The costs of disposal or stock piling surplus materials shall be considered subsidiary to the other items for which direct payment is made.

All material deemed unsuitable by the City’s Project Manager and required to be removed from the job site, as well as approved replacement material not readily available at the job site, shall be measured and paid for as an “EXTRA WORK” item.

H. SOIL EROSION CONTROL

Soil Erosion Control shall be accomplished as provided in Chapter 32 of these Standard Specifications.

20.03 UTILITY ALIGNMENT AND GRADE

Prior to excavation, investigation shall be made to the extent necessary to determine the location of underground structures and utilities. Care shall be exercised by the Contractor during excavation to avoid damage to existing structures or utilities. Where shown on the plans, or as requested by the City’s Project Manager, the Contractor shall make such excavation as may be necessary to ascertain the vertical and horizontal location of existing utilities.

The utilities and structures shall be constructed and maintained to the lines and grades established by the plans and Standard Specifications. When crossing existing utilities or other structures, alignment and grade may be adjusted by the City’s Project Manager to provide clearance as required or deemed necessary to maintain minimum clearance, or to prevent future damage or contamination of either utilities or structures.

20.04 GROUND WATER

The Contractor is required to follow proper dewatering (e.g. includes sediment bags or use of sediment basins) to avoid eroding the soil on the construction site. Best management practices must be followed when water is being pumped to lakes, wetlands or directly to storm sewer inlets. When selecting discharge areas from a dewatering process, the Contractor shall not permit the water to be pumped directly into slopes, if available, dewatering activities should be directed to a vegetated area such as a well-established grassed area.

The Contractor shall discontinue dewatering if the area being discharged to shows signs of instability or erosion. If utilizing channels, the Contractor must ensure they are stable and protected with grass or vegetation. The Contractor shall avoid dewatering during heavy rain conditions. The Contractor shall never discharge water that has been contaminated with oil, grease, or chemical products, as these would need to be collected and disposed of properly and legally.

The Contractor shall provide and maintain adequate equipment to remove and dispose of ground water entering the excavations, trenches, or other parts of the Work. Each excavation shall be kept dry during subgrade preparation and continually thereafter until the structure to be built, or the pipe to be installed therein, is completed to the extent that no damage from hydrostatic pressure, flotation or other cause will result.

All excavations for concrete structures or trenches which extend down to or below ground water shall be dewatered by lowering and keeping the ground water below the bottom of the pipe or as required to maintain a stable foundation.

The Contractor will be held responsible for the condition of any existing storm sewer system which may be used for drainage purposes on this contract, and all storm sewers shall be left clean and free of sediment. The Contractor shall not pump or drain any ground water or surface runoff into any part of the sanitary sewer system.

No measurement or direct payment shall be made for removal and disposal of ground water unless otherwise provided in the proposal or Special Provisions. The costs of removal and disposal of ground water shall be considered subsidiary to the other items of Work for which direct payment is made.

20.05 FOUNDATION AND BEDDING

A. GENERAL

Foundation and bedding materials shall meet the requirements of these Standard Specifications.

Foundation materials generally will be required where unstable soil conditions exist at the bottom of the trench. Foundation material shall be placed to the satisfaction of the City's Project Manager.

Bedding material shall be placed and compacted as called for on the plans. After the pipe has been properly placed to grade and line on the initial bedding course, additional bedding material shall be placed in 6" lifts and thoroughly settled by mechanical compaction in order to fill all voids below, around and above the top of the pipe as shown on the Standard Plans details for pipe bedding.

B. BASIS OF PAYMENT

Foundation material when placed in conformance with these Standard Specifications as directed by the City's Project Manager shall be paid as an "EXTRA WORK" item. Weight tickets for material installed shall be submitted prior to any payment for this "EXTRA WORK" item. This "EXTRA WORK" payment shall be full compensation for furnishing all materials, installation, labor, equipment, tools and incidentals necessary to create a stable foundation.

No measurement or direct payment shall be made for bedding material, except that all weight tickets for bedding material shall be submitted prior to any payment for pipe being installed. The cost of bedding materials, in the appropriate classes for the type of pipe material utilized, as shown on the drawings or for the structures constructed, shall be considered subsidiary to the other items of Work for which direct payment is made.

20.06 HORIZONTAL DIRECTIONAL DRILLING

A. GENERAL

Horizontal directional drilling (HDD) is a trenchless excavation method which is accomplished in three phases. The first phase consists of drilling a small diameter pilot hole along a designed directional path. The second phase consists of enlarging the pilot hole to a diameter suitable for installation of the pipe. The third phase consists of pulling the pipe into the enlarged hole. The Contractor shall furnish all labor, materials, tools, equipment, drilling fluids, and other items as necessary for a complete and functional installation as required, to the lines and grades shown on the Plans and as specified.

B. SUBMITTALS

1. Shop drawings, catalog data, and manufacturer's technical data showing complete information on material composition, physical properties, and dimensions of new pipe, fittings and drilling fluids. Include manufacturer's recommendation for handling, storage, and repair of pipe and fittings damaged.
2. The proposed phasing and schedule of the Work including location of launching and receiving pits, services affected, length of pipe effected during each phase, and proposed traffic disruptions. The phasing and schedule of the Work must be approved by the City's Project Manager prior to Work starting.
3. The proposed methods for monitoring, prevention, containment, and clean-up of drilling fluid surface returns at unauthorized locations.
4. The tabulation of pilot hole survey coordinates.
5. Written record of the installation pullback loads on the utility during the installation process.
6. Plan and profile drawings of the documented as-built location of the installed utility.

20.06 HORIZONTAL DIRECTIONAL DRILLING (Continued)

C. MATERIALS

1. Water main installed by HDD shall use Certa-Lok C900 RJ, Class 200 DR 14 pipe as manufactured by Certainteed, or approved equal. Pipe material other than Certa-Lok must be approved prior to ordering. Restrained joint pipe shall also meet all performance requirements of AWWA C900.
2. The Contractor shall at all times provide and maintain instrumentation which will accurately locate the pilot hole, measure drill string axial and torsional loads, and measure drilling fluid discharge rate and pressure. The City's Project Manager shall have access to these instruments and their readings at all times. A log of all recorded readings shall be maintained by the Contractor and will become a part of the Project Record Documents supplied by Contractor. Instrumentation systems shall be calibrated immediately prior to beginning the work.
3. The Drilling Fluid System shall be capable of mixing and delivering the drilling fluid to the drill head or the reamer in the volumes and pressures required. Contractor shall maximize recirculation of drilling fluid surface returns. Contractor shall provide solids control and fluid cleaning equipment of a configuration and capacity that can process surface returns and produce drilling fluid suitable for reuse.
4. The Drilling Fluid shall be used as required during the installation of the pilot hole, enlarging of the pilot hole, and installation of the water pipe. No drilling fluid will be accepted or utilized that does not comply with permit requirements and environmental regulations.
5. Drill Pipe (drill stem) shall be of sufficient size and strength to resist all installation loadings including tensile, compressive, bending, and torsional loads. An appropriate safety factor shall be used by the Contractor in sizing the drill pipe.
6. Drill Head configuration shall be as selected by Contractor and compatible with requirements for location system.
7. Reamer and Swivels shall be as selected by Contractor. Reamer and swivel assembly shall be capable of enlarging borehole while preventing damage due to rotation of the pipe during its pullback into its final position.

20.06 HORIZONTAL DIRECTIONAL DRILLING (Continued)

D. INSTALLATION

1. BORING OF THE PILOT HOLE

Install pilot hole using steerable drilling head. Pilot hole shall be drilled along the path shown on the Drawings to the tolerances listed herein. Listing of tolerances shall not relieve Contractor from responsibility for safe operations or damage to adjacent utilities and structures.

Monitor location of drill head as required to install pilot hole to indicated lines and grades, but in no instance shall the interval between locating the drilling head exceed 15' in length along the alignment.

Use drilling fluids as required to lubricate and support the pilot hole excavation.

Pilot hole shall be free from abrupt changes in line or grade that could result in unacceptably high loadings on the drill pipe or the water pipe during installation.

After completion of pilot hole drilling, Contractor shall provide a tabulation of coordinates, referenced to the drilled entry point, which accurately describe the location of the pilot hole. This tabulation shall be in addition to the log of recorded readings required.

2. PRE-REAMING OF THE PILOT HOLE

Subsequent to the City's Project Manager's acceptance of pilot hole, Contractor may, at his option, pre-ream the pilot hole as necessary for installation of the water pipe.

Pre-reaming operations shall be conducted at the discretion of the Contractor. Contractor shall insure that a hole sufficient to accommodate the pull section of water pipe has been produced. Any damage to the water pipe resulting from inadequate pre-reaming shall be the responsibility of the Contractor. All provisions of this Specification relating to simultaneous reaming and pulling back operations shall also pertain to pre-reaming operations.

Use drilling fluids as required to lubricate and to support the reamed pilot hole.

Use of pre-reaming shall be at the option of the Contractor; however, lack of pre-reaming shall not result in excessive installation loads on the water pipe.

3. REAMING AND PULLBACK OF THE MAIN

Contractor shall utilize a reamer to enlarge the pilot hole to sufficient size for installation of the main without imposing excessive installation loadings on the water pipe.

Grippers used on the water pipe shall not damage adjacent sections of the pipe. Sections of the pipe utilized by the grippers shall be removed from the pipe after installation.

Contractor shall handle and support the pull section of water pipe so as to prevent damage and minimize pullback forces. Pull section of water pipe shall be supported as it proceeds during pull back so that it moves freely and the pipe is not damaged.

20.06 HORIZONTAL DIRECTIONAL DRILLING (Continued)

D. INSTALLATION (Continued)

Contractor shall use drilling fluids as required to lubricate and support the reamed pilot hole, lubricate installation of the water pipe, and completely fill all overcut of the reamed pilot hole.

The pull section of water pipe shall be installed in the reamed hole in such a manner that external pressures are minimized and an appropriate counter-balancing internal pressure is maintained. Any damage to the pipe resulting from external pressure during installation shall be the responsibility of Contractor. The pipe shall be filled with water as it enters the ground to ensure that adequate internal pressure is maintained at all points to counter balance external collapse pressures. Contractor shall submit pipe filling procedure proposed for use to the City's Project Manager for review and acceptance.

Contractor shall continuously monitor the pulling loads imposed upon the water pipe. The maximum allowable tensile load imposed on the water pipe shall not exceed the recommendations of the pipe manufacturer. Contractor shall take all required measures necessary to prevent installation loads on the water pipe from exceeding those recommended by the pipe manufacturer. If necessary, Contractor shall at his own expense, stop the pullback of the water pipe, remove the section of pipe installed within the enlarged pilot hole, and pre-ream the pilot hole as required to allow installation of the water pipe without exceeding the allowable pullback forces.

After the installation, Contractor shall determine and log the installed location and depth of the water pipe. Contractor shall submit to the City's Project Manager a drawing detailing the installed location of the water pipe in both plan and profile view.

E. REJECTION

1. If the pilot hole is rejected by the City's Project Manager, the Contractor shall, at his own expense, backfill the rejected pilot hole with bentonite, and install a pilot hole acceptable to the City's Project Manager.
2. Monitoring records indicate that pullback loads exerted on pipe exceeded the loadings recommended by pipe manufacturer.
3. Installation outside of the allowable tolerances.

F. TOLERANCES

Tolerances for the pilot hole and the installed water pipe shall be as listed below.

1. For vertical tolerance, the water pipe shall be installed at the grade indicated on the plans. Minor deviations from the grade indicated on the plans may be allowed, provided that:
 - a. The soil cover above the top of the water pipe shall not be less than shown on the drawings.
 - b. Except at crossings under water courses, the water pipe shall maintain downward slope towards all blowoff points to provide for positive drainage of the water pipe.
 - c. The water pipe shall maintain upward slope towards all venting points to provide for positive venting and air release from the water pipe.

20.06 HORIZONTAL DIRECTIONAL DRILLING (Continued)

F. TOLERANCES (Continued)

2. For horizontal tolerance, the water pipe shall be installed at the locations indicated on the plans. Minor deviations from the locations indicated on the plans may be allowed, provided that:
 - a. The horizontal deviation of the water pipe from the location required on the drawings shall not exceed one (1) foot at any location along the water pipe without prior authorization of the City's Project Manager.
 - b. The horizontal deviation shall not cause the water pipe to interfere with existing structures, utilities, or result in any part of the finished work being installed outside of the permanent easements.

G. CLEAN UP AND DISPOSAL OF MATERIALS

1. Contractor shall remove all construction debris and spoil material and dispose of it at an acceptable location.
2. Drilling fluid shall be removed from pits and then the pits backfilled as required.
3. Disposal of excess drilling fluids shall be the responsibility of the Contractor and shall be conducted in compliance with all environmental regulations, right-of-way and workspace agreements, and permit requirements. Disposal of drilling fluids shall not be allowed on the project site.
4. Contractor shall employ his best efforts to maintain full annular circulation of drilling fluids. Drilling fluid returns at location other than the entry and exit points shall be minimized. In the event that annular circulation is lost, Contractor shall take steps to restore circulation. If inadvertent surface returns of drilling fluids occur, they shall be immediately contained as required and collected. If the amount of the surface return is not great enough to allow practical collection, the affected area shall be diluted with fresh water and the fluid will be allowed to dry and dissipate naturally. If the amount of the surface return exceeds that which can be contained and collected using practical methods, drilling operations shall be suspended until surface return volumes can be brought under control.

H. BASIS OF PAYMENT

Directional Drilling for carrier pipes completed in conformance with these Specifications and accepted by the City's Project Manager shall be measured and paid for at the contract unit price bid per linear foot for DIRECTIONAL DRILLING FOR __" WATER MAIN, for each size and type called for in the Contract Documents. Such payment shall be full compensation for all materials, equipment, tools, labor and incidentals necessary to produce the directional drill and install the carrier pipe as required in the Contract Documents.

20.07 CONCRETE AND REINFORCING STEEL FOR STORM DRAINAGE

A. GENERAL

When called for on the plans, the Contractor shall construct reinforced concrete collars, elbows, plugs and headwalls for storm drainage at the locations indicated. The collars, elbows, plugs and headwalls shall conform to the details shown in the Lincoln Standard Plans.

B. BASIS OF PAYMENT

When called for in the proposal, concrete for storm water collars, elbows, plugs and headwalls placed in conformance to these Standard Specifications and accepted by the City's Project Manager shall be paid for at the contract unit price bid per cubic yard for CONCRETE FOR COLLARS, ELBOWS, PLUGS AND HEADWALLS, IN PLACE. The concrete shall not be measured separately for payment, but the quantities shall be established based upon the volume of concrete required for the Design Section, unless otherwise specified. Such payment shall be full compensation for all mixing, hauling, forming, placing, jointing, curing, finishing, excavation, backfill, materials, equipment, tools, labor, and incidentals necessary to complete the structure.

When called for in the proposal, payment for reinforcing steel for collars, elbows, plugs and headwalls placed in conformance with these Standard Specifications and accepted by the City's Project Manager shall be made at the contract unit price bid per pound for REINFORCING STEEL FOR COLLARS, ELBOWS, PLUGS AND HEADWALLS, IN PLACE. The reinforcing steel shall not be measured separately for payment, but the quantities shall be established based upon weight of steel required for the Design Section, unless otherwise specified. Such payment shall be full compensation for all placing, tying, chairs, materials, equipment, tools, labor, and incidentals necessary to place the steel in the proper locations in conformance with the plans.

20.08 CONCRETE AND REINFORCING STEEL FOR SANITARY SEWER

A. GENERAL

When called for on the plans, the Contractor shall construct reinforced concrete plugs and collars for sanitary sewer at the locations indicated. The plugs and collars shall conform to the details shown in the Lincoln Standard Plans.

B. BASIS OF PAYMENT

When called for in the proposal, concrete for sanitary sewer plugs and collars placed in conformance to these Standard Specifications and accepted by the City's Project Manager shall be paid for at the contract unit price bid per cubic yard for CONCRETE FOR PLUGS AND COLLARS, IN PLACE. The concrete shall not be measured separately for payment, but the quantities shall be established based upon the volume of concrete required for the Design Section, unless otherwise specified. Such payment shall be full compensation for all mixing, hauling, forming, placing, jointing, curing, finishing, excavation, backfill, materials, equipment, tools, labor, and incidentals necessary to complete the structure.

20.08 CONCRETE AND REINFORCING STEEL FOR SANITARY SEWER (Continued)

B. BASIS OF PAYMENT (Continued)

When called for in the proposal, payment for reinforcing steel for sanitary sewer plugs and collars placed in conformance with these Standard Specifications and accepted by the City's Project Manager shall be made at the contract unit price bid per pound for REINFORCING STEEL FOR PLUGS AND COLLARS, IN PLACE. The reinforcing steel shall not be measured separately for payment, but the quantities shall be established based upon weight of steel required for the Design Section, unless otherwise specified. Such payment shall be full compensation for all placing, tying, chairs, materials, equipment, tools, labor, and incidentals necessary to place the steel in the proper locations in conformance with the plans.

20.09 CONCRETE AND REINFORCING STEEL FOR WATER MAIN

A. GENERAL

When called for on the plans, the Contractor shall construct reinforced concrete thrust collars, thrust blocks, anchorages, gravity blocks, tee blocks and plug blocks for water main at the locations indicated. The thrust blocks, anchorages, tee blocks and plug blocks shall conform to the details shown in the Lincoln Standard Plans.

Concrete shall be L3500 conforming to Chapter 3 of these Standard Specifications. Reinforcing steel shall conform to "Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement" ASTM Designation A615, Grade 40 or 60, or "Standard Specification Axle-Steel Deformed and Plain Bars for Concrete Reinforcement" ASTM Designation A617, Grade 60.

B. BASIS OF PAYMENT

When called for in the proposal, concrete for water main thrust collars, thrust blocks, anchorages, gravity blocks, tee blocks and plug blocks placed in conformance to these Standard Specifications and accepted by the City's Project Manager shall be paid for at the contract unit price bid per cubic yard for CONCRETE FOR COLLARS, BLOCKS AND ANCHORAGES, IN PLACE. The concrete shall not be measured separately for payment, but the quantities shall be established based upon the volume of concrete required for the Design Section, unless otherwise specified. Such payment shall be full compensation for all mixing, hauling, forming, placing, jointing, curing, finishing, excavation, backfill, materials, equipment, tools, labor, and incidentals necessary to complete the structure.

When called for in the proposal, payment for reinforcing steel for water main thrust collars, thrust blocks, anchorages, gravity blocks, tee blocks and plug blocks placed in conformance with these Standard Specifications and accepted by the City's Project Manager shall be made at the contract unit price bid per pound for REINFORCING STEEL FOR COLLARS, BLOCKS AND ANCHORAGES, IN PLACE. The reinforcing steel shall not be measured separately for payment, but the quantities shall be established based upon weight of steel required for the Design Section, unless otherwise specified. Such payment shall be full compensation for all placing, tying, chairs, materials, equipment, tools, labor, and incidentals necessary to place the steel in the proper locations in conformance with the plans.

20.10 PAVEMENT CONSTRUCTION AND RECONSTRUCTION

Pavement reconstruction and miscellaneous masonry reconstruction shall be accomplished in conformance as described in these Standard Specifications.

20.11 FINAL CLEANUP

A. GRAVEL OR ROCK ROADWAY SURFACE

Where the Work of the Contract crosses or is parallel to any unpaved roadway and where the roadway surface is affected in any way by operations under the contract, the Contractor shall repair and restore the same to at least its original condition. Such restoration shall include, but not be limited to, regrading ditches and roadway surface, restoration of culverts and drives, and placement of rock or gravel surfacing as directed by the City's Project Manager.

The cost of regrading ditches, roadway surfaces, and drives shall not be paid for directly but shall be considered subsidiary to other items of Work for which direct payment is made.

Culverts required to be removed and re-laid shall be measured and paid for as provided in Chapter 21 of these Standard Specifications. Crushed rock or gravel surfacing shall be measured and paid for as provided in Chapter 9 of these Standard Specifications.

B. FINAL CLEANUP AND PARKING SPACE FINISH

When all other Work has been completed, the Contractor shall thoroughly clean all pavement, parking spaces, sidewalks, rights-of-way, storage areas, access roads, and private property of all earth and other debris by use of approved equipment. All pavement, parking spaces, sod, sidewalks, storage areas, access roads and private property shall be restored to a condition at least equal to that existing prior to any operations under this Contract.

No measure or direct payment shall be made for cleanup or parking space finish. The costs of cleanup and parking space finish shall be considered subsidiary to other items for which direct payment is made.

C. SODDING AND SEEDING

Sodding and seeding shall be accomplished as provided in Chapter 30 of these Standard Specifications.

20.12 COLD WEATHER CONSTRUCTION

A. LIMITS OF CONSTRUCTION

Work to be performed in developed areas, or Work affecting the operation, capacity, and safety of arterial and collector streets, between December 1 and March 15, shall be limited by the following provisions:

1. A maximum of 650 linear feet within the limits of the project may be under construction at one time.
2. A maximum of 2 intersections may be closed at one time within project limits, even though the third intersection may not violate the 650' limit described in Paragraph 1 above.
3. "Under Construction" shall include all operations which disrupt or limit the use of public facilities, such as pavement removal, sidewalk removal, excavation, backfilling, pipe laying, material storage, equipment storage, and/or any other operation deemed by the City's Project Manager as a disruption of normal ingress and egress to the public right-of-way within project limits.

20.12 COLD WEATHER CONSTRUCTION (Continued)

A. LIMITS OF CONSTRUCTION (Continued)

4. Temporary restoration will be required to reduce long-term disruptions and inconvenience during construction. 2 weeks after beginning Work in an area, the City's Project Manager shall require temporary restoration of facilities by the Contractor. The entire cost of installation, maintenance, and removal of such temporary installations shall be the Contractor's responsibility.

B. SUSPENSION OF WORK

Suspension of Work during the winter construction period, December 1 to March 15, may be requested by the Contractor under the following conditions:

1. The request must be made in writing to the City's Project Manager and shall include the beginning date and duration. If Work is to be resumed prior to expiration of time requested, 48 hours written notice of such intent will be required.
2. The Contractor shall be required to restore all vehicular and pedestrian facilities to full use by either permanent or temporary restoration before the suspension period will become effective.
3. Calendar days included in the period that Work is actually suspended shall be counted from the effective suspension date, and the governing completion date shall be adjusted accordingly.

In no case shall a granted suspension of Work be cause for requesting or granting additional calendar days for completion of this Contract.

The City's Project Manager shall state to the Contractor, in writing, the effective suspension date and the date on which the suspension expires.

In addition, following the suspension period, the City's Project Manager shall notify the Contractor, in writing, of the new completion date of the Contract as provided above.

20.13 SUBSTANTIAL COMPLETION

Refer to Chapters 21 through 23 for a specific definition of Substantial Completion for each type of utility Work.

20.14 FINAL ACCEPTANCE

Refer to Chapters 21 through 23 for a specific definition of Final Acceptance for each type of utility Work.

20.15 GUARANTEE

Refer to Chapters 21 through 23 for a specific definition of guarantee for each type of utility Work.

CITY OF LINCOLN, NEBRASKA, STANDARD SPECIFICATIONS

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CHAPTER 23

WATER MAINS

23.00 GENERAL

The Work covered in this chapter includes the materials, appurtenant devices, water services, installation and testing of water main construction and reconstruction.

23.01 MATERIALS PURCHASED FROM THE CITY

The Contractor shall purchase the following materials from the Lincoln Water System:

- Valves
- Valve boxes, rings and lids
- Fire hydrants

The above materials are available for inspection at the Lincoln Water System Service Center. The Contractor shall provide all labor and transportation for loading and hauling of said materials.

Water will be supplied to the Contractor in conformance with the General Conditions and Title 17 of the Lincoln Municipal Code.

All materials shall be billed to the Contractor at prices and rates established by the Lincoln Transportation and Utilities Business Office. Contractors may obtain the current material prices from the Lincoln Transportation and Utilities Business Office.

23.02 CONSTRUCTION SERVICES PURCHASED FROM THE CITY

The Contractor shall purchase the following services from the Lincoln Water System:

- Flushing and disinfection services and materials
- Water main tapping and abandonments
- Water main shutdowns
- Installation of hydrant extensions

All services shall be billed to the Contractor at prices and rates established by the Lincoln Transportation and Utilities Business Office.

23.03 CONTRACTOR SUPPLIED MATERIALS

A. REFERENCED STANDARDS

1. American National Standards Institute (ANSI). American Water Works Association (AWWA). Society of Cable Telecommunications Engineers (SCTE). All referenced standards shall be the latest revision thereof
 - a. ANSI/AWWA C104/A21.4 - Cement-Mortar Lining for Ductile Iron Pipe and Fittings
 - b. ANSI/AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems
 - c. ANSI/AWWA C110/A21.10 - Ductile-Iron and Gray-Iron Fittings
 - d. ANSI/AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

23.03 CONTRACTOR SUPPLIED MATERIALS (Continued)

A. REFERENCED STANDARDS (Continued)

1. American National Standards Institute (ANSI) (Continued)

- e. ANSI/AWWA C115/A21.15 - Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges
- f. ANSI/AWWA C151/A21.51 - American National Standard for Ductile-Iron Pipe, Centrifugally Cast for Water
- g. ANSI/AWWA C153/A21.53 - Ductile-Iron Compact Fittings for Water Service
- h. ANSI/AWWA C301 - Prestressed Concrete Pressure Pipe, Steel-Cylinder Type
- i. ANSI/AWWA C651- Disinfecting Water Mains
- j. AWWA C800 – Underground Service Line Valves and Fittings
- k. ANSI/AWWA C900-16 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4" thru 60" for Water Transmission and Distribution
- l. AWWA C906-15 – Polyethylene (PE) Pressure Pipe and Fittings, 4" through 65"
- m. AWWA M28 – Rehabilitation of Water Mains
- n. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800
- o. ANSI/SCTE 77 T15 – Specifications for Underground Enclosure Integrity

2. American Society for Testing and Materials (ASTM)

- a. A193 – Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
- b. A380 – Standard Practice for Cleaning, Descaling and Passivating of Stainless Steel Parts, Equipment and Systems
- c. A536 – Standard Specification for Ductile Iron Castings
- d. A617 - Specifications for Axle-Steel Deformed and Plain Bars for Concrete Reinforcement.
- e. B62 – Standard Specification for Composition Bronze or Ounce Metal Castings
- f. B88 - Specification for Seamless Copper Water Tube
- g. B584 – Standard Specification for Copper Alloy Sand Castings for General Applications
- h. D1248 – Specification for Plastic Molding and Extrusion Materials, Type 1, Class C, Grade 5
- i. F1216-09 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube

23.03 CONTRACTOR SUPPLIED MATERIALS (Continued)

A. REFERENCED STANDARDS (Continued)

2. American Society for Testing and Materials (ASTM) (Continued)
 - j. F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joint Plastic Pipe
 - k. G97 – Standard Test Method for Laboratory Evaluation of Magnesium Sacrificial Anode Test Specimens for Underground Applications
3. National Association of Corrosion Engineers (NACE)
 - a. NACE SP0169 – Control of External Corrosion on Underground or Submerged Metallic Piping Systems
 - b. NACE TM0497 – Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Piping Systems
4. Material and Construction Trade Standards
 - a. Ductile Iron Pipe Research Association, Polyethylene Encasement Installation Guide
 - b. Uni-Bell PVC Pipe Association, Installation Guide for PVC Pressure Pipe

B. JOINT TYPES

1. Push-on joints shall conform to the requirements of ANSI/AWWA C111/A21.11 for ductile iron pipe and “Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe ASTM F477 for Polyvinyl Chloride Pipe.”
2. Mechanical joints shall conform to the requirements of ANSI/AWWA C111/A21.11. Bolts and nuts for mechanical joints shall be high-strength, low alloy steel as described in Paragraph 11-6.5 of ANSI A21.11.
3. Restrained push-on joints shall conform to the performance requirements as described in Section 11.9 of ANSI A21.11.
4. Special mechanical joints shall conform to the following:
 - a. Swivel couplings (anchoring couplings) shall mean a standard plain end connection with an integrally cast compression gland and freely rotating bolt ring bearing on the compression gland, designed to mate with a standard mechanical joint connection and to prevent the joint from separating under pressure when all bolts are in place. Swivel couplings shall be similar to Tyler Pipe swivel adapter or U.S. Pipe rotatable mechanical joint gland. The rotatable bolt ring portion of swivel couplings shall be fabricated from ductile iron and shall have the letters “D.I.” or the words “Ductile Iron” cast in the bolt ring.
 - b. Solid couplings shall mean a standard plain end connection with an integrally cast compression gland and bolt ring, designed to mate with a standard MJ bell and gasket. Solid couplings shall be similar to Tyler Pipe solid gland or U.S. Pipe integral mechanical joint gland.

23.03 CONTRACTOR SUPPLIED MATERIALS (Continued)

B. JOINT TYPES (Continued)

- c. All retainer glands shall utilize a wedge action principle or grip ring principle to fully restrain the fitting and pipe together. Wedge Action Retainer Glands shall be ductile iron with heat-treated ductile iron wedges and twist-off torque nut bolts. Ductile iron shall be per ASTM A536 grade 65-45-12. Wedges shall have a minimum hardness of 370 BHN. The gland shall allow for a minimum deflection of 3° and allow joint movement after installation. The gland shall be provided with torque limiting twist-off nuts with an additional fixed hex head to allow for removal and reinstallation of the gland. Twist-off torque nut bolts shall be coated or lubricated in a manner to prevent corrosion and pre-mature twist-off of the torque limiting twist-off nuts. Additional requirements include:

TABLE 23.03 A – WEDGE REQUIREMENTS FOR RETAINER GLANDS

Specification Item	Ductile Iron Pipe	PVC Pipe
Pressure Rating For 6"-12" Pipe	350 psi	305 psi (DR 14)
Pressure Rating For 16" Pipe	350 psi	235 psi (DR 18)
Pressure Rating for 24" and larger	250 psi	NA
Color	Black	Red
Acceptable Manufacturers	EBAA Iron Megalug Series 1100 Ford Uni-Flange Series 1400 STAR Stargrip 3000 SIGMA One-Lok SLD TYLER UNION TUFGRIP	EBAA Iron Megalug Series 2000PV STAR PVC Stargrip 4000E9408985 TYLER UNION TUFGRIP PVC FORD Uni-Flange Series 1500

Acceptable manufacturers are required to meet all stated specifications requirements. Failure to meet requirements shall be cause for rejection.

- d. Mechanical Joint Restraint Adaptors for connection of MJ valves to MJ fittings and MJ fittings to MJ fittings shall be a bolt-through positive restraint mechanism meeting working pressure specifications of AWWA C153 for compact fittings and manufactured of ductile iron conforming to ASTM A536, 80-55-06. MJ adaptors shall connect standard mechanical joint fittings (AWWA C110 or C153) and valves at a linear distance not to exceed three (3) inches and without attachment to pipe. MJ adaptors shall be installed with standard styrene butadiene rubber (SBR) MJ gaskets conforming to the latest revision of AWWA C111 be supplied with an NSF 61, 7-mil. fusion bonded epoxy coating. The bolts and nuts shall be ASTM A193 Type 304 Stainless Steel Acceptable manufacturer shall be Foster Adaptor.
5. Flange connections shall conform to the requirements of ANSI B16.1 for 125-pound class and shall also conform to ANSI/AWWA C115/A21.15. The flange gaskets shall be 1/8" thick red rubber. The gasket shall be of the full face or inside bolt ring coverage styles. Bolts shall be sufficient length to expose 1/4" to 1/2" of the bolt beyond the outer face of the nut when the joint is fully assembled.

23.03 CONTRACTOR SUPPLIED MATERIALS (Continued)

B. JOINT TYPES (Continued)

6. Precast concrete cylinder pipe joints shall conform to AWWA C301. The joint rings shall be galvanized steel. The external joint filler material shall be cement impregnated polyurethane foam in a closed loop form equal to Mar Mac Flex-Protex or shall be a cement mortar grout composed of 1 part Portland or mortar cement to 2 parts sand and sufficient water to flow easily. Joint diapers shall be heavy-duty cotton with wire or steel straps in the hem. Diapers shall be a minimum of 6" wide for all pipes 36" in diameter or smaller. All diapers for pipes larger than 36" shall be a minimum of 7" wide.

C. GASKET MATERIAL

All gaskets, with the exception of gaskets for flanged joints, shall be neoprene or other synthetic rubber. Natural rubber gaskets are not acceptable.

D. JOINT LUBRICANTS

All joint lubricants shall be a vegetable soap base or equal and shall be supplied by the pipe manufacturer. Lubricants shall be supplied in sterile, tightly sealed, small quantity containers. Any lubricant which has been contaminated with dirt or other foreign material shall be rejected.

E. DUCTILE IRON PIPE

Ductile iron pipe shall conform to the requirements of ANSI/AWWA C151/A21.51. All pipe shall be Class 52 unless otherwise specified. The cement mortar lining shall be standard weight and shall conform to the requirements of ANSI/AWWA C104/A21.4. Unless otherwise specified, all pipe shall be supplied in 18' or 20' lengths and shall have push-on type joints.

F. PRESTRESSED CONCRETE CYLINDER PIPE

Prestressed concrete cylinder pipe shall be manufactured in conformance with AWWA C301 and shall be designed in conformance with Appendix A or Appendix B of that Specification. Pressures and external loads used in design shall be as specified elsewhere in the Contract Documents.

The Contractor shall supply the following information for approval prior to delivery of the pipe and appurtenances:

1. Design Calculations
2. Proof of Design Test Results
3. Tabulated Layout Schedule
4. Affidavit of Compliance

Fine aggregate shall be clean natural sand. Artificial or manufactured sand shall not be used.

All branch outlets and other connections shall be of the joint type shown on the plans. Where projects are terminated without connecting to existing pipe, a mechanical joint bell adapter and mechanical joint plug shall be provided.

Adapter section shall be provided to connect to valves, fittings and existing pipe. All adapters, fittings and other specials shall be cement mortar lined.

23.03 CONTRACTOR SUPPLIED MATERIALS (Continued)

G. POLYVINYL CHLORIDE (PVC) PIPE

Polyvinyl Chloride (PVC) pipe shall conform to AWWA C900-16. All pipe 12" in diameter or smaller shall be PVC 1120 DR 14 with O.D. conforming to that of ductile iron pipe unless otherwise specified. PVC pipe larger than 12" in diameter shall be PVC 1120 DR 18 conforming to that of cast iron pipe unless otherwise specified. Joints shall be push-on type with rubber compression ring joints conforming to "Standard Specification for Elastomeric Seals (Gaskets) for Joint Plastic Pipe" ASTM F477.

H. HIGH-DENSITY POLYETHYLENE (HDPE) PIPE, FITTINGS, SERVICES AND CONNECTORS

High-Density Polyethylene (HDPE) Pipe, Fittings, Services, and Connectors may be used only upon submittal, review, and approval of the Lincoln Water System. All items installed without prior approval shall be removed at the contractor's expense.

All contractors working with HDPE must be certified and hold a current certification card authorized by McElroy Butt-Fusion Training or GF – Electrofusion Training.

The only acceptable methods of fusion for Lincoln Water System are:

1. Butt-Fusion (must include data logger information for each butt-fusion)
2. Electro-Fusion (electro-fusion fittings must be submitted and reviewed by LWS prior to installation)

Socket Fusions and Sidewall Fusions are not allowed.

I. CURED-IN-PLACE PIPE (CIPP) LINING

Cured-in-place pipe (CIPP) lining may be used only upon review and approval of the Lincoln Water System. Liner material shall be a Class IV fully structural Cured-in-place pipe in accordance with AWWA M28, ASTM F1216-09, ASTM F1743-08 or ASTM F2019-03 with the exception that the liner thickness is in accordance with ASTM F1216-07a.

J. CAST IRON AND DUCTILE IRON FITTINGS

Cast iron and ductile iron fittings shall conform to the requirements of ANSI/AWWA C110/A21.10 and shall be supplied with a standard weight cement mortar lining conforming to ANSI/AWWA C104/A21.4 and all necessary glands, bolts, nuts and gaskets to complete a non-restrained mechanical joint fitting connection. Ductile iron compact fittings shall be in conformance with ANSI/AWWA C153/A21.53. All joints shall be mechanical joint bells unless otherwise provided in the Contract Documents.

Pressure ratings for fittings shall be a minimum of 250 p.s.i. water working pressure for 12" nominal diameter and smaller, based on the diameter of the largest bell. For fittings larger than 12" nominal diameter, a pressure rating of 150 p.s.i. shall be used unless otherwise specified.

23.03 CONTRACTOR SUPPLIED MATERIALS (Continued)

K. ANCHORING COUPLINGS AND FITTINGS

Anchor couplings shall consist of a length of pipe with a solid coupling end connection and a swivel coupling end connection. Anchor couplings shall be similar to Tyler Pipe adapter swivel fittings or U.S. Pipe hydrant connection pieces.

Anchor elbows shall consist of 90° elbow with 2 swivel couplings, Anchor elbows shall be similar to the Tyler Pipe Swivel x Swivel 90° ELL swivel fittings.

Anchor pipe shall consist of a length of pipe with 2 swivel coupling end connections.

Swivel tees shall be cast to the requirements of ANSI A21.10 with mechanical joint run end connection and a swivel coupling on the branch connection. Swivel tees shall be similar to Tyler Pipe MJ x MJ x swivel tees or U.S. Pipe valve and hydrant tees.

L. RESTRAINT COLLARS FOR VALVES AND REDUCERS

Restraint collars for valves and reducers when using PVC for water main construction shall be supplied and constructed in conformance to the applicable Lincoln Standard Plans or contract Special Provisions. Restraint collars for valves and reducers shall be considered subsidiary to PVC Water Main construction and are not measured or paid for as a separate fitting for purposes of this chapter.

M. POLYETHYLENE ENCASEMENT

Polyethylene encasement shall be Class C, black pigmented, 8 mils. thick, linear low density, polyethylene conforming to the requirements of ANSI/AWWA C105/A21.5. The encasement may be supplied in flat sheets or tubes at the Contractor's option. Tape used to repair or patch the encasement shall be manufactured from synthetic materials. Duct tape shall not be used for repairs. The tubes, measured when laid flat, and the flat sheets shall conform to TABLE 23.03 B – POLYETHYLENE ENCASEMENTS.

TABLE 23.03 B – POLYETHYLENE ENCASEMENTS

Nominal Pipe Diameter	Polyethylene Encasement Tube and Sheet Widths (inches)	
	Tube	Sheet
6"	20	40
8"	24	48
12"	30	60
16"	37	74
24"	54	108
30"	67	134
36"	81	162
48"	108	216
54"	121	242

N. COPPER SERVICE PIPE

Copper water service pipe shall be Type “K” seamless soft-drawn copper tubing which conforms to the “Specifications for Seamless Copper Water Tube”, ASTM Designation B 88.

23.03 CONTRACTOR SUPPLIED MATERIALS (Continued)

O. SERVICE PIPE CONNECTORS

All copper service pipe connectors shall be fabricated from red brass. All copper supply and service pipe shall be joined by either flared-end connectors or brazed, non-lead, eutectic joints.

All connectors intended for use on HDPE applications must be submitted and approved by LWS prior to installation or payment. All items installed without prior approval shall be removed at the contractor's expense.

P. HYDRANT DRAIN MATERIAL

Hydrant drain material shall be clean, washed, hard, durable, uncoated, and uniformly graded Class "A" gravel as specified by the Nebraska Department of Transportation. Gradation shall be as follows:

TABLE 23.03 C – HYDRANT DRAIN MATERIAL GRADATIONS

Sieve Size	% Passing	Tolerance
3/4"	100	0
3/8"	95	+/- 5
#4	78	+/- 4
#10	16	+/- 13
#200	3	+/- 3

Q. AIR RELIEF VALVES

Air relief valves shall be provided by the Contractor to conform to the size, type and configuration shown on the plans.

R. TRACER WIRE

All PVC water mains owned by the City of Lincoln shall be installed with a locator wire attached. The wire shall be direct bury 12 AWG solid steel core, copper clad wire with 30 mil, blue, HDPE insulator. Wire shall have a 30-volt rating with a minimum tensile break force of 380 pounds.

Approved manufacturer shall be Copperhead Industries, Pro-Line Pro-Trace, or equal. The wire shall be installed with as few splices as possible. Splices shall utilize end to end 3M DBR connectors, sealed with silicone sealant, aqua seal, or equal and covered with Scotch #33 electrical tape.

Tracer wire must be properly grounded at all dead-end mains, including cul-de-sacs. Grounding of tracer wire shall be achieved by using a 1.5-lb drive-in magnesium ground rod with a minimum 20-feet of #12 high strength copper-clad steel wire coated with red 30 mil HDPE insulation connected to the rod, specifically manufactured for this purpose. Where the anode wire will be ran into the top of a valve box, a minimum of 18 inches of excess/slack wire is required after meeting final elevation.

Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include Copperhead Ground Rod (ANO-12), Pro-Trace (PTANODE12) or an approved equal.

23.03 CONTRACTOR SUPPLIED MATERIALS (Continued)

S. GEOTEXTILE FILTER FABRIC

Geotextile Filter Fabric, for water main construction, shall be Mirafi 500X, Synthetic Industries 200ST, or approved equal and shall be supplied and constructed in conformance to the applicable Lincoln Standard Plans or contract Special Provisions. Geotextile Filter Fabric shall be considered subsidiary to Water Main construction and are not measured or paid for as a separate item for purposes of this chapter.

23.04 REMOVED MATERIALS

A. GENERAL

When called for on the plans and Contract Documents, the Contractor shall remove water main pipe and dispose of it.

When called for on the plans, the Contractor shall remove and reset water main valves, hydrants, and plugs at the location and grade as indicated on the plans. The Contractor shall exercise care in the removal and resetting of these items. Removal and Resetting of hydrants and valves will only be allowed in cases where the existing item was installed within the past 5 years, otherwise they shall be Removed and Salvaged. Remove and Reset items must be in “like new” condition, clean, with no defects including the painted surfaces. The Contractor shall thoroughly examine each appurtenance to ascertain whether it is in proper working condition; and if there is a question regarding the condition of the appurtenance, the Contractor shall contact the Lincoln Water System to exchange the item for one that is working.

When called for on the plans and Contract Documents, water main valves, hydrants, and plugs shall be removed and salvaged. The Contractor shall deliver the salvaged appurtenances to the Lincoln Water System Shop. Receipts for salvaged materials shall be delivered to the City’s Project Manager.

B. BASIS OF PAYMENT

Water main pipe removed in conformance with these Specifications and accepted by the City’s Project Manager shall be measured and paid for at the contract unit price bid per linear foot for REMOVE WATER MAIN. Such payment shall be full compensation for all excavation, removal, backfill, disposal of excess materials, equipment, tools, labor and incidentals necessary to perform the Work called for.

Water main valves, hydrants and plugs removed and relayed, removed and salvaged, or removed in conformance with these Specifications and accepted by the City’s Project Manager shall be measured and paid for at the contract unit price bid per each for REMOVE AND SALVAGE _____, REMOVE AND RESET _____, or REMOVE _____. Such payment shall be full compensation for all excavation, removal of appurtenances and thrust blocking, bedding or foundation rock if required, resetting, loading of salvaged items, resetting valve box, backfill, materials, equipment, tools, labor and incidentals necessary to perform the Work.

23.05 HANDLING AND STORAGE

The Contractor shall protect all material from damage and handle material carefully in conformance with the manufacturer's recommendations. Equipment used to handle material such as slings, lifting lugs, hooks and other devices shall be designed to protect pipe, coatings, linings, joint elements, castings, valves, hydrants, and all other material.

Gaskets shall be protected from deterioration and stored out of direct sunlight for prolonged periods and in such a manner that they will not contact oils, fumes, solvents, and other materials and substances that attack rubber or synthetic rubber materials.

All hydrants and valves shall be protected so that latent water within the valves or hydrants will not freeze. The hydrants and valves shall be stored in such a manner that water will not enter drains and other openings. All butterfly valves shall be stored indoors. All resilient seated wedge valves shall be stored indoors or with the wedge in a raised position. All pipe, fittings, valves and hydrants shall be kept clean and protected from contamination by mud and dirt.

Prestressed concrete cylinder pipe shall not be stacked higher than allowed by the manufacturer's recommendations. PVC pipe shall not be stacked higher than 8' or in conformance with manufacturer's recommendations whichever is less. Ductile iron pipe shall not be stacked higher than allowed in TABLE 23.05 A – DUCTILE IRON PIPE STORAGE.

TABLE 23.05 A – DUCTILE IRON PIPE STORAGE

Pipe Size	Maximum Number of Tiers
6"	13
8"	11
12"	9
16"	7
24"	5
30"	4
36"	4

No direct measurement or payment for storage and handling of materials used in the construction of water mains will be made. The costs associated with the materials to be incorporated into the Work shall be considered subsidiary to the items for which direct payment is made.

23.06 EXCAVATION AND BACKFILL

Excavation and backfill for water mains and appurtenances shall conform to the requirements of Chapter 20 of these Specifications except as hereinafter modified for water main construction. Unless otherwise shown on the plans, modified by Special Provisions, or directed by the City's Project Manager, all PVC pipe shall be embedded with approved materials to at least 6" above the top of the pipe.

23.07 INSTALLATION OF PIPE AND FITTINGS

A. GENERAL

The Contractor shall use the proper tools and equipment necessary to safely install all pipe, fittings and appurtenances to the lines and grades as shown on the plans. Installation of pipe and fittings shall be in conformance to manufacturer's requirements and instructions except where otherwise provided in the specifications. Prior to beginning Work, the Contractor shall submit to the City's Project Manager a copy of the manufacturer's installation instructions for review and approval. The Contractor shall retain a copy of the installation instruction at the project site for reference during construction. PVC pipe shall be installed in strict conformance to the manufacturer's requirements and instruction except that in no case shall PVC pipe be installed by bending the pipe.

B. CUTTING PIPE

1. Ductile Iron Pipe

When nonstandard lengths of pipe are required to install valve and fittings, terminate lines, or make connections, the Contractor shall cut the pipe using an abrasive wheel, milling type cutter, or other approved mechanical cutter. Torch cutting shall be used only with specific permission of the City's Project Manager and then only in strict conformance with the manufacturer's recommendations. After cutting, the Contractor shall bevel the ends of the pipe to approximate the manufactured bevel of a full length of pipe. Pipe which is not cut square or which has rough and jagged edges that might nick or cut gaskets shall be reworked to the approval of the City's Project Manager.

2. Prestressed Concrete Cylinder Pipe

No cutting of prestressed cylinder pipe will be allowed. All pipe which does not fit or close shall be rejected and the rejected pipe removed from the job site.

3. PVC Pipe

PVC pipe shall be cut using carpenter, hack saws or abrasive wheel. Care shall be taken to make all cuts square and perpendicular to the longitudinal axis of the pipe. After cutting, the Contractor shall bevel the ends of the pipe to approximate the manufactured bevel of a full length of pipe. Pipe which is not cut square or which has rough and jagged edges that might nick or cut gaskets shall be reworked to the approval of the City's Project Manager. When 12" butterfly valves are called for on the plans for PVC pipe, the pipe ends shall be chamfered on the inside radius as detailed in the Lincoln Standard Plans so that the valve operates to a fully closed position.

23.07 INSTALLATION OF PIPE AND FITTINGS (Continued)

C. PREVENTING CONTAMINATION

Existing valves and valves connecting the existing system to the new construction shall be operated only by the Lincoln Water System; except that the Contractor may operate those valves to fill the new mains for testing, only after notification of Lincoln Water System personnel.

The Contractor shall keep the pipe and appurtenances clean and free from tools, rags, dirt, mud, non-potable water, and other foreign materials and objects at all times during installation. If pipe laying is stopped or delayed for any reason, the Contractor shall seal the open ends of all pipes. Seals shall be capable of preventing the entry of water and other foreign material with the excavation completely full of water.

All pipes shall be jointed immediately after placement in the excavation. Bell-ends of pipe shall face in the direction of laying. The Contractor shall ensure that the pipe is not displaced after it is laid to the proper line and grade; and should the pipe become displaced the Contractor shall relay the pipe to the proper line and grade at no additional cost or expense to the City.

D. UTILITY CONFLICTS

Where unforeseen conflicts between the water construction and existing utilities are discovered, the Contractor shall immediately notify the City's Project Manager. Where the water main is to be constructed below or within 18" of a storm sewer pipe, the Contractor shall lay a full length of water main pipe centered on the sewer or such length as will provide the maximum possible separation of the joints in the water main from the sewer line. The Contractor shall also reconstruct any sanitary sewer with (1) 20' length of C900 pressure pipe or equivalent, such that the maximum possible separation between the water main and the sewer pipe joints will result. The backfill material shall be select, low-permeability soil.

Where the water main is located below a sanitary sewer pipe, to prevent the possibility of contaminated wastewater reaching the potable water main, the entire space between the top of the water main up to the spring line (half way) of the sanitary sewer shall be back-filled with flowable fill. No granular fill shall be used. The extent along the water main shall be the entire length of pipe and fittings at the bottom of the excavation, and the extent along the sewer shall be to undisturbed earth. This flowable backfill shall be subsidiary to other items of work for which direct payment is made.

Where existing water mains are to be looped around another utility, the Contractor shall plan his Work so that disruptions to water service are minimized. The Contractor shall provide adequate personnel, equipment and materials necessary to complete the Work as quickly as possible. All necessary materials shall be on site, and wherever possible, the Contractor shall preassemble the entire looping configuration, including bends or offsets and restraint devices, before the water main will be scheduled for shutdown by Lincoln Water System. Service fees charged by the Lincoln Water System shall be considered subsidiary to the cost of looping the water main in the event of a utility conflict. Additional fees for extended shutdowns shall not be cause for additional compensation to the Contractor.

23.07 INSTALLATION OF PIPE AND FITTINGS (Continued)

E. CAST-IN-PLACE THRUST RESTRAINTS

The Contractor shall construct concrete thrust blocks conforming to the requirements of the Lincoln Standard Plans at all locations shown on the plans or indicated by the City's Project Manager. All thrust blocks shall be placed so that pipe and fitting joints will be accessible for repairs. The bearing face of all thrust blocks shall rest against undisturbed soil.

When the existing water mains must be reconstructed or looped, the Contractor shall restrain all fittings with ductile iron retainer glands installed in conformance with the manufacturer's recommendations in addition to concrete thrust blocks, anchorages and/or gravity blocks.

Gravity block straps of the size and type specified in the Lincoln Standard Plans shall be State Steel type M1020, or equivalent, low carbon, low manganese, general purpose, merchant quality stainless steel that is suitable for forming and welding. All strap material not embedded in concrete shall be covered with polywrap or tape prior to backfilling.

F. TRACER WIRE

The Contractor shall install tracer wire (as per 23.03 P) directly to the top of the pipe between the 10 o'clock and 2 o'clock positions, with non-conductive pipe only. Tracer wire shall be secured to the main every 5' with tape patches and shall be secured so that some slack can be taken out of the wire for valve and tap installations. Tracer wire shall be extended to the ground surface and terminated in conformance with the Standard Plans using a coil of excess wire at least 18" in length inside the valve box. For line valves and hydrant branch valves (branch less than 10') the tracer wire shall be attached to the exterior of the valve box and inserted into the valve box 8" from the top of the box through a field drilled 1/2" hole. Tracer wire shall be installed with as few splices as possible. No bare wire shall be exposed, with the exception of 1" of wire to be stripped at the access loop for contact with tracing equipment. The two ends of the wire shall be knotted to prevent strain on the splice. Branch connections shall be made without cutting the main wire utilizing a connection clip and sealing the joint the same as splices. All new tracer wire installations shall be located using typical low frequency (512Hz) line tracing equipment, witnessed by the contractor, inspector and LWS representative, prior to acceptance of ownership. A locating device transmitting the 512Hz signal shall be set up and connected to the new tracer wire at the new connection to the existing water main (typically a temporary valve or permanent valve on the new portion of the project) and successfully traced to each dead end or temporary hydrant, without connecting the transmitting device at any other locations on the new project. Any deviations from the 512Hz frequency shall be discussed with the LWS representative during the testing, deviations from the 512Hz frequency shall only be approved by LWS. All wires failing to provide successful testing for signal transmission shall be repaired or replaced at the Contractor's expense. Continuity testing in lieu of actual line tracing shall not be accepted. After testing the ends, all tracer wires shall be sealed with heat shrink tape. Installation and testing of tracer wire shall be considered subsidiary to the installation of non-conductive pipe.

All water main reconstructions (loops for conflicting utilities) as shown on LSP 301 shall have tracer installed when using PVC pipe. When reconstruction is performed on ductile iron pipe or cast-iron pipe, tracer wire shall be terminated on both ends of the loop directly to the existing pipe using an exothermic welded connection, or a stainless steel Cathodi-Clamp™. Polyethylene encasement shall be (re)installed over the areas of the existing pipe where the tracer is terminated extending from a minimum of 2' past the connection point of the new PVC pipe to a minimum of 2' past the wire termination point on the existing water main.

23.07 INSTALLATION OF PIPE AND FITTINGS (Continued)

G. JOINTING PIPES

1. General

All bells, gaskets, lubricants and appurtenances shall be kept clean. Gaskets shall be of the proper style for the pipe being laid. Joints shall be deflected after assembly.

2. Ductile Iron Pipe

Bell ends shall be protected during joining by approved methods.

Maximum pipe joint deflections for push-on and mechanical jointed pipe shall conform to TABLE 23.07 A – MAXIMUM JOINT DEFLECTIONS.

3. PVC Pipe

PVC pipe shall be joined by inserting the spigot end of the pipe into the bell no further than marked by the manufacturer. Insertion on the PVC pipe further than the manufacturer’s mark shall require reassembly. Bell ends shall be protected during joining by approved methods. Maximum pipe joint deflections for PVC pipe shall conform to the manufacturers recommended standards for the brand of pipe being installed.

4. Mechanical Joints

Mechanical joints shall be assembled in strict conformance with the manufacturer's instructions and recommendations. Bolts on opposite sides of the joint shall be drawn up evenly to ensure even pressure around the gland and gasket. The Contractor shall tighten all retainer gland screw wedges according to manufacturer’s recommendations for each type of retainer gland and pipe material. Prior to final tightening, the Contractor shall make any necessary deflections. Deflections for DUCTILE IRON pipe shall not exceed those shown in TABLE 23.07 A – MAXIMUM JOINT DEFLECTIONS.

TABLE 23.07 A – MAXIMUM JOINT DEFLECTIONS (DUCTILE IRON PIPE ONLY)

Pipe Diameter	Push-on Joints			Mechanical Joints		
	Deflection Angle	Maximum Offset	Minimum Curve Radius	Deflection Angle	Maximum Offset	Minimum Curve Radius
6"	4° 00'	17.0"	285'	4° 00'	17.0"	285'
8"	4° 00'	17.0"	285'	4° 00'	17.0"	285'
12"	4° 00'	9.5"	285'	4° 00'	9.5"	285'
16"	2° 24'	9.5"	475'	2° 24'	9.5"	475'
24"	2° 24'	9.5"	475'	2° 24'	9.5"	475'
30"	2° 24'	9.5"	475'	2° 24'	9.5"	475'
36"	2° 24'	9.5"	475'	2° 24'	9.5"	475'
48"	1° 36'	6.5"	715'	1° 36'	6.5"	715'
54"	1° 12'	5.0"	955'	1° 12'	5.0"	955'

23.07 INSTALLATION OF PIPE AND FITTINGS (Continued)

G. JOINTING PIPES (Continued)

5. Prestressed Concrete Cylinder Pipe Joints

The Contractor shall make all joints in prestressed concrete cylinder pipe in strict conformance with the manufacturer's instructions and recommendations. After placing the gasket on the spigot end of the pipe, the Contractor shall run a smooth round steel rod between the gasket and the spigot for one complete turn around the pipe and repeat in the opposite direction to ensure uniform stretching of the gasket.

After seating but prior to homing the pipe, the Contractor shall check the gasket for proper location using feeler gauges. Gaskets for pipes larger than 24" in diameter shall be checked from both the inside and outside of the pipe. Pipes shall be deflected where required after homing, according to the following:

TABLE 23.07 B – MAXIMUM JOINT OPENINGS

Pipe Diameter	Maximum Joint Opening
6"-36"	3/4"
48"	1'
54"	1'-1/8"

The exterior joint recesses shall be filled with cement mortar. Cement mortar shall be rodded into diaper with a wire curved to conform to the radius of the pipe.

H. POLYETHYLENE ENCASEMENT

Polyethylene (PE) encasement shall be installed on all ductile and cast-iron water mains, water valves, fittings and water services using Method A or B as detailed in AWWA/ANSI C105/A21.5 except that the encasement shall consist of double wrapping. All pipe and fittings encased with PE shall be handled, repaired and installed in conformance to guidelines published by DIPRA. The Contractor shall double wrap and seal with tape all bolted connections, anchoring couplings, anchoring elbows, valves, and fire hydrants. Encasement for fittings and valves on PVC pipe shall extend a minimum of 18" past the joint. The Contractor shall ensure that hydrant drain holes are not blocked or covered. All water main and service valves shall be doubled wrapped, fully encased and sealed with tape around the valve stem operator underneath the operating nut.

The Contractor shall wrap all copper supply pipes from the tap extending 5' away from any ductile or cast iron main, and shall repair all PE encasement at the tap location. Copper services connected to PVC water mains are not required to be encased, unless otherwise noted. All ductile iron fittings used on PVC water services shall be doubled wrapped.

23.07 INSTALLATION OF PIPE AND FITTINGS (Continued)

I. WATER MAIN SHUTDOWNS

The Lincoln Water System schedules and performs all shutdowns of the existing water system and corresponding interruptions of service to customers. Unless otherwise approved by the Engineer, the Contractor shall excavate areas of work prior to LWS scheduling shutdowns with customers to better assess the time required for the service interruption. In all cases the Contractor shall provide at least 48-hour notification for a request to interrupt service.

The Lincoln Water System also schedules and performs tapping, valve operation, and flushing and disinfection services, when required. In all cases the Contractor shall notify the Assistant Superintendent of Water Construction, or his representative, to provide for scheduling such services at least 48 hours prior to the time that they are needed. These services shall be scheduled only during City working hours.

Prior to LWS making the shutdown, the Contractor shall be fully prepared to perform the work in the most expedient manner possible. The Contractor shall have all necessary fittings, pipe, tools, and accessories available onsite and all parts/pieces necessary to complete the work must be preassembled to the extent possible to perform the work. If in the opinion of LWS, the City's Project Manager or the Engineer that the contractor is not fully prepared to perform the work, a shutdown shall not be provided. The LWS reserves the right to charge the contractor a lump sum amount not to exceed \$200 if the shutdown is cancelled due to lack of preparedness. This condition shall be not cause for claim of damages or additional compensation by the Contractor.

If the proposed work involves 8" or larger water mains, any fittings to complete the installation or affects service to commercial or industrial customers, then a plan must be submitted to LWS for approval. The aforementioned plan shall indicate all fittings and dimensions of any pieces to be installed to complete the work causing the shutdown. The plan shall indicate the estimated time out of service, requested time for the shutdown, general description of how the work will be performed, required pumping equipment and the number of employees expected to perform the work.

The water main shall be excavated prior to the shutdown and the excavation prepared to make work conditions safe and clean. Where directed by LWS, the City's Project Manager or the Engineer, the contractor shall use approved bedding material in the bottom of the excavation to provide a suitable work surface for ease of construction and to provide for sanitary conditions. These materials shall be compensated in accordance to applicable bid items.

Contractors shall be adequately equipped to pump drain water and anticipate some leakage of water past valves. Adequate pumping equipment shall be a condition for approval of the shutdown plan.

23.07 INSTALLATION OF PIPE AND FITTINGS (Continued)

I. WATER MAIN SHUTDOWNS (Continued)

There shall be no cost for a shut-down which interrupts water service for less than two (2) hours. For interruptions of water service lasting two (2) or more hours, the shut-down fees are as follows:

TABLE 23.07 C - WATER MAIN SHUTDOWN APPLICABLE FEE SCHEDULE

Hours of Shutdown	Applicable Fee
0 – 2 hours	no charge
2 – 3 hours	\$200
3 – 4 hours	\$700
4 – 5 hours	\$1,700
5 – 6 hours	\$4,200
6 – 7 hours	\$9,200
7 – 8 hours	\$19,200
over 8 hours to 12 hours	\$15,000 each additional hour
over 12 hours	\$25,000 each additional hour

Example: Fee for water main shut down for 11.5 hours =
 $\$19,200 + \$15,000 + \$15,000 + \$15,000 + \$15,000 = \$79,200$

The shut down time shall be considered the time from when the water main has been isolated by the Lincoln Water System (LWS) to the extent possible up to the time that LWS is notified that work has been completed sufficiently to allow service to be restored. This cost shall not be reimbursable.

23.07 INSTALLATION OF PIPE AND FITTINGS (Continued)

J. BASIS OF PAYMENT

WATER MAIN of the various sizes called for on the plans shall be measured and paid for at the contract unit price bid per linear foot for each different diameter required. Pipe shall be measured through fittings and valves. Such payment shall be full compensation for all excavation, backfill, pipe, bedding material, other materials, testing, equipment, tools, labor, and incidentals necessary to complete the Work in conformance with these Specifications and as accepted by the City's Project Manager.

DUCTILE IRON PIPE WATER MAIN of the various types and sizes called for on the plans shall be measured and paid for at the contract unit price bid per linear foot for each different diameter required. Pipe shall be measured through fittings and valves. Such payment shall be full compensation for all excavation, backfill, pipe, other materials, testing, equipment, tools, labor and incidentals necessary to complete the Work in conformance with these Specifications and as accepted by the City's Project Manager.

POLYVINYL CHLORIDE (PVC) WATER MAIN of the various types and sizes called for on the plans shall be measured and paid for at the contract unit price bid per linear foot for each different diameter required. Pipe shall be measured through fittings and valves. Such payment shall be full compensation for all excavation, backfill, pipe, bedding material, other materials, testing, equipment, tools, labor, and incidentals necessary to complete the Work in conformance with these Specifications and as accepted by the City's Project Manager. HIGH-DENSITY POLYETHYLENE (HDPE) PIPE of various sizes, including fittings for HDPE applications, must be submitted and approved by LWS prior to installation or payment. All items installed without prior approval shall be removed at the contactor's expense.

All CAST IRON AND DUCTILE WATER MAIN FITTINGS, including ductile iron compact fittings, shall be measured separately and shall be paid for at the contract unit price bid per each for the various fittings called for in the proposal.

Glands, bolts, nuts and gaskets necessary to complete a non-restrained mechanical joint connection for water main fittings are considered accessory items to the connection. No direct payment shall be made for these items, but are considered subsidiary to CAST IRON AND DUCTILE IRON WATER MAIN FITTINGS for which payment is made.

RETAINER GLANDS of the various sizes called for to complete a restrained mechanical joint connection for water main fittings shall be counted and paid for at the contract unit price bid per each. All Work shall be in conformance with these Specifications and accepted by the City's Project Manager.

23.08 INSTALLATION OF VALVES AND HYDRANTS

A. GENERAL

Immediately prior to installation, the Contractor shall inspect all valves and hydrants to ensure they are in good operating condition and free from defects. All valves shall be installed in such a manner that the operating nut and key will be in a vertical position. When the operator is located on the side of the valve, the Contractor shall install the valve with the operator located on the curb side of the valve.

All valve sizes should rest on support block with treated wood wedge(s) driven between the bottom of the valve and the support blocking. Valves 12" in diameter and larger shall be installed resting on one or more precast concrete support blocks 18" square and 4" thick which bear against undisturbed earth.

The Contractor shall check the installation of all butterfly valves to be certain that the valve can be operated throughout its entire range of operation, and that it does not have contact with the inside edges of the pipe when operating.

Where tapping sleeves and valves are to be installed, the Contractor shall make all excavations to the dimensions required and provide all necessary trench protection. The Contractor shall provide precast concrete pads and other stabilizing materials under the tapping valves necessary to prevent rotation of the tapping sleeve on the main.

The Contractor shall provide and install a valve box over every valve operator. The valve box shall be installed plumb and centered over the operating nut and with the bottom of the box sufficiently lower than the operating nut to prevent the entry of soil. The top of the box shall be set flush with the final grade or paved surface. Valve box adjusting rings shall not be used to adjust valve boxes to grade. Valve boxes shall be stabilized to prevent out of alignment during compaction. Misaligned valve boxes shall be replaced during the warranty period. Only one valve box extension can be used at each location. Valves installed at a depth of 7' or greater will require a 6" diameter Sch. 80 PVC pipe used to reach grade with Sch 40 coupler mounted just below surface level to attach ring and lid. Upon final construction, the valve box ring and lid should be set flush with grade.

Hydrants shall be set plumb, resting on precast concrete pads, 4" thick and 16" square. The support pads shall rest against undisturbed earth. The top of the flange on the hydrant shall be set to the grade shown on the plans. A hydrant of the length shown on the plans shall be used to attain this elevation. The Contractor shall make appropriate deflections or rotations in the tee and anchoring elbow, or use an anchoring offset, to meet this grade.

Fire hydrant barrel lengths shown on the plans are estimated and may not be sufficient dimensions for actual field conditions due to conflicting utilities and field modifications of water main profile. Contractors shall confirm actual hydrant barrel length required prior to construction so that hydrants are constructed in accordance with the LSP. This work shall be subsidiary to the water main construction.

Where a hydrant extension is necessary to meet the required grade, the hydrant extension shall be installed only by Lincoln Water System. Only one extension will be permitted on a hydrant. The Contractor shall remove and reset all hydrants which cannot be adjusted to grade with one extension. The Contractor shall notify the City's Project Manager or that person's representative when hydrant extensions are required.

23.08 INSTALLATION OF VALVES AND HYDRANTS (Continued)

A. GENERAL (Continued)

The Contractor shall place a minimum of 0.75 cubic yards of hydrant drain material (as per 23.03 N) around the base of the hydrant to allow free ready drainage of the barrel. Polyethylene wrap shall be placed on top of the drainage gravel prior to the commencement of backfilling. Hydrant drain holes shall be kept open and clean at all times. Care should be exercised as to not block the drain holes with polyethylene wrap or concrete from backing blocks.

When obtaining hydrants from the Lincoln Water System, the Contractor shall determine and select the hydrant shoe configuration that best suits proper orientation of the steamer (large) nozzle perpendicular to the curb line. When required, adjustments to the final hydrant nozzle orientation shall be made by the Lincoln Water System with all applicable costs and fees assessed to the Contractor. These fees shall be considered subsidiary to the cost of installing the water main and shall not be cause for additional compensation by the Contractor.

Backfill shall be accomplished in conformance with the provisions of Chapter 20 of these Specifications, except that all backfill within 3' of all hydrants and valve boxes shall be compacted using a mechanical hand tamper to 96% of maximum dry density as measured by AASHTO Method T-99.

B. BASIS OF PAYMENT

All VALVES of the various types and sizes indicated on the plans and actually installed shall be counted and paid for at the contract unit price bid per each. Such price shall include the valve, valve box, support blocks, other materials and labor necessary to install the valves, all equipment, tools, and incidentals necessary to complete the Work in conformance with these Specifications and as accepted by the City's Project Manager.

All HYDRANTS installed, as shown on the plans or as directed, except temporary hydrants used for flushing or disinfection of the mains, shall be counted and paid for at the contract unit price bid per each for HYDRANT, COMPLETE, L=5.5' or L=6.5'. Such price shall be full compensation for all loading, hauling, installation, thrust blocking, hydrant drain material, backfilling, labor, tools, materials, equipment and incidentals necessary to complete the Work in conformance with these Specifications and as accepted by the City's Project Manager.

All HYDRANT EXTENSIONS necessary to adjust the hydrants to grade shall be counted and paid for at the contract unit price bid per each for HYDRANT EXTENSION, COMPLETE. Such price shall be full compensation for all installation costs charged by Lincoln Water System, hydrant extension kits, labor, tools, materials, equipment and incidentals necessary to complete the Work in conformance with these Specifications and as accepted by the City's Project Manager.

The unit price for HYDRANT EXTENSION, COMPLETE shall be an established unit price per each in the bid proposal.

23.09 BENTOMAT® CL GEOSYNTHETIC CLAY LINER

A. GENERAL

This work shall consist of installation of Bentomat® CL Geosynthetic clay liner (GCL) on water pipe as specified on the plans.

B. MATERIAL

GCL shall be Bentomat® CL Geosynthetic clay liner (GCL) as manufactured by CETCO and dry Bentonite granules shall be non-toxic, high swelling, low dust, granular, sodium bentonite used for sealing overlapped sections of geosynthetic clay liner around pipe. Acceptable brands are CETCO Volclay CG-50 (50 lb. bag) and BAROID granular bentonite (50 lb. bag) available at local horizontal directional drilling (HDD) supply companies.

C. INDICATIONS FOR USE

As specified on drawings, in Contract Specifications or as directed by the Engineer, GCL shall be installed in accordance with this Construction Standard on all water pipe in locations where it is impractical or unfeasible to obtain the required separation between the water main and existing or proposed sanitary or storm sewers per State of Nebraska Department of Health and Human Services Title 179 NAC 7.

The GCL shall be installed 360° around polyethylene encased pipe to create a second barrier between the pipe and the surrounding soil. For pipe that normally is not encased in polyethylene wrap (i.e. PVC, HDPE, etc), install one layer of polyethylene wrap prior to installing the GCL. All lumps of clay, mud, and so forth, on the pipe surface shall be removed prior to installation of the polyethylene encasement and GCL.

During installation, care shall be taken to prevent soil from becoming trapped between the polyethylene encased pipe and GCL.

The GCL shall be installed in a manner to provide a snug fit. Extra care shall be taken to completely cover and bridge irregular surfaces such as bell-spigot interfaces, bolted connections, and fittings. The GCL shall not be installed in locations where the surrounding soil is contaminated.

D. EQUIPMENT

Additional equipment needed for installation of GCL's includes:

- Sharp Gasket Knife and spare blades
- Bentonite mastic and/or granular Bentonite paste made from dry powder sodium Bentonite
- Adhesive tape

Cutting GCL shall be performed using a sharp gasket knife. Frequent blade changes are recommended to avoid tearing of the geotextile components of the GCL.

The GCL shall be sealed around pipe joints, MJ hubs, flanges, bolts, nuts, valve bonnets, actuators, etc. using tape and bentonite past or bentonite mastic to seal GCL to these irregular surfaces.

23.09 BENTOMAT® CL GEOSYNTHETIC CLAY LINER (Continued)

E. BENTONITE PASTE PREPARATION

Bentonite paste shall be prepared immediately prior to installation of the GCL. Mix water with bentonite granules to form a paste with a consistency similar to peanut butter. Spread bentonite past on seams and folds before taping. If desired, bentonite paste may be spread with a trowel on polyethylene-wrapped pipe and fittings before wrapping with GCL.

F. INSTALLATION ON PIPE

The standard 15’ wide roll of GCL is similar to heavy carpeting for handling purposes. Unroll the 15’ roll of GCL and cut off the required amount needed to wrap around the outside diameter plus the required seam overlap on the bell end of MJ or RJ pipe. Refer to Table 23.09A below for the amount to cut from the roll.

TABLE 23.09 A – BENTOMAT GCL INSTALLATION GUIDE

PIPE SIZE	OD MJ/RJ BELL	CIRCUMFERENCE OF MJ/RJ BELL	MINIMUM SEAM OVERLAP ON MJ/RJ BELL	FEET TO CUT FROM 15’ WIDE ROLL
6”	11.44”	35.94”	6”	4’
8”	13.97”	43.89”	6”	4’
12”	18.75”	58.90”	6”	6’
16”	23.22”	72.95”	6”	7’
24”	32.54”	102.23”	9”	10’

The GCL shall be wrapped around the pipe for the full length of the piping section, as indicated on project drawings or as directed by the Engineer, plus 2 additional feet. Therefore, if the section of pipe is longer than 13’, additional sections of GCL shall be cut off of the roll and installed on the pipe in an overlapped fashion until the required length of pipe plus the additional 1’ on each end has been wrapped.

For example:

If a section of 12" diameter pipe to be covered with GCL is 20’ long, two 6’ long sections would be cut off the 15’ wide GCL roll. These sections would be trimmed and overlapped a minimum of 1’ in the middle and 1’ on each end of the pipe section for a total distance of 22’, see Figure 1 and Figure 2. Seal the area where the two sections of GCL overlap with Bentonite paste and tape closed.

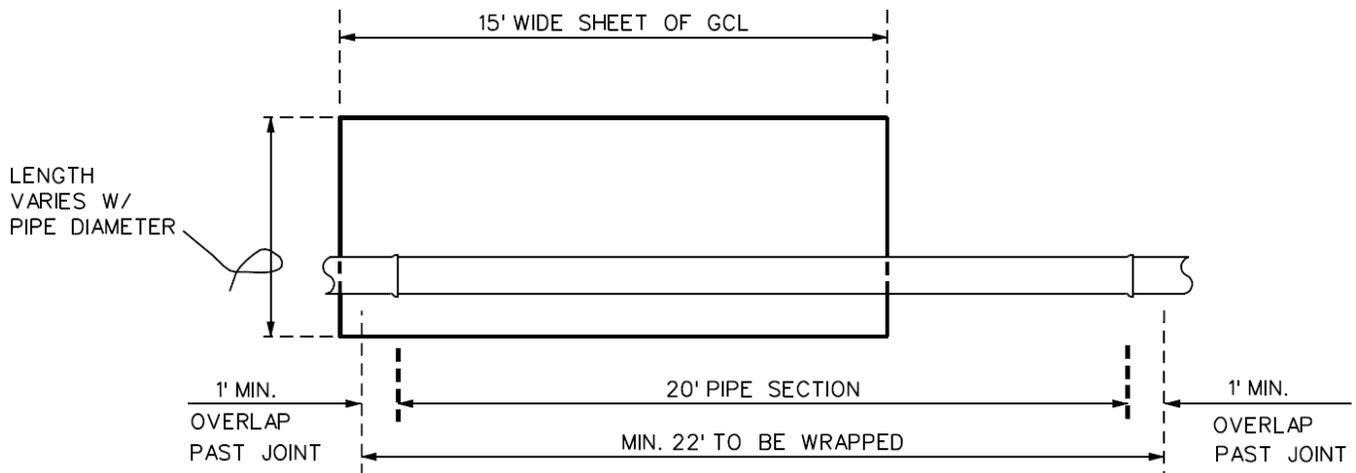


FIGURE 1

23.09 BENTOMAT® CL GEOSYNTHETIC CLAY LINER (Continued)

F. INSTALLATION ON PIPE (Continued)

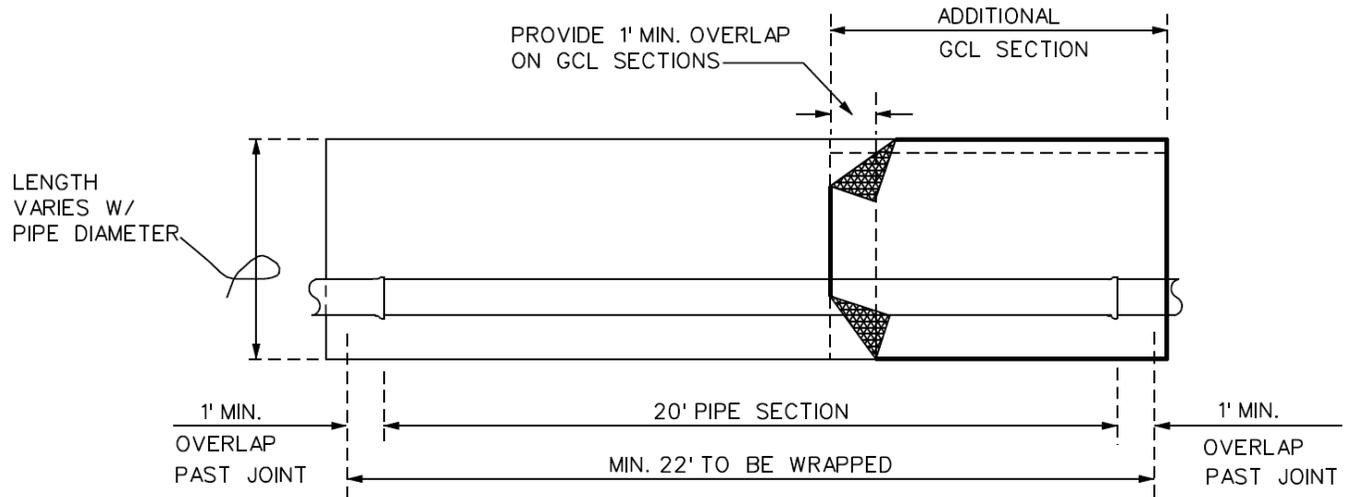


FIGURE 2

Bring the sections of GCL up and around the circumference of the pipe overlapping the bell, barrel and spigot with a minimum of 6" to 9" as specified in Table 1. Take up the slack width at the top of the pipe as shown in Figure 3 to make a snug but not tight fit along the barrel of the pipe and/or surface of fitting, securing any folds in the GCL with tape. Folds shall be made, pasted and taped closed such that open area of fold does not collect back-fill material. Spread bentonite paste over folds and seams to seal wrap as needed prior to backfilling.

After folds and seams have been pasted and taped closed along the longitude of the pipe section the ends shall be pasted with bentonite and sealed with tape as shown in Figure 4.

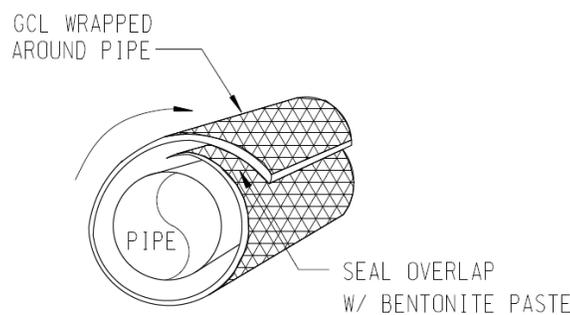


FIGURE 3

23.09 BENTOMAT® CL GEOSYNTHETIC CLAY LINER (Continued)

F. INSTALLATION ON PIPE (Continued)

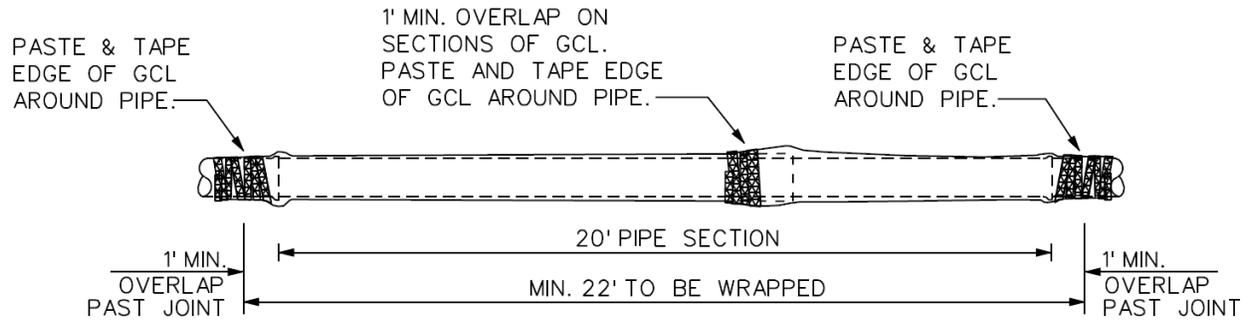


FIGURE 4

G. INSTALLATION AT SEWER CROSSING

Bentomat® encasement at sewer crossing shall extend a minimum of 10' beyond the outside edges of single sewers. At locations where multiple sewers are crossed, the encasement shall extend 10' from the outside edge of the first sewer crossing to 10' beyond the outside edge of the last sewer crossing. See Figure 4A.

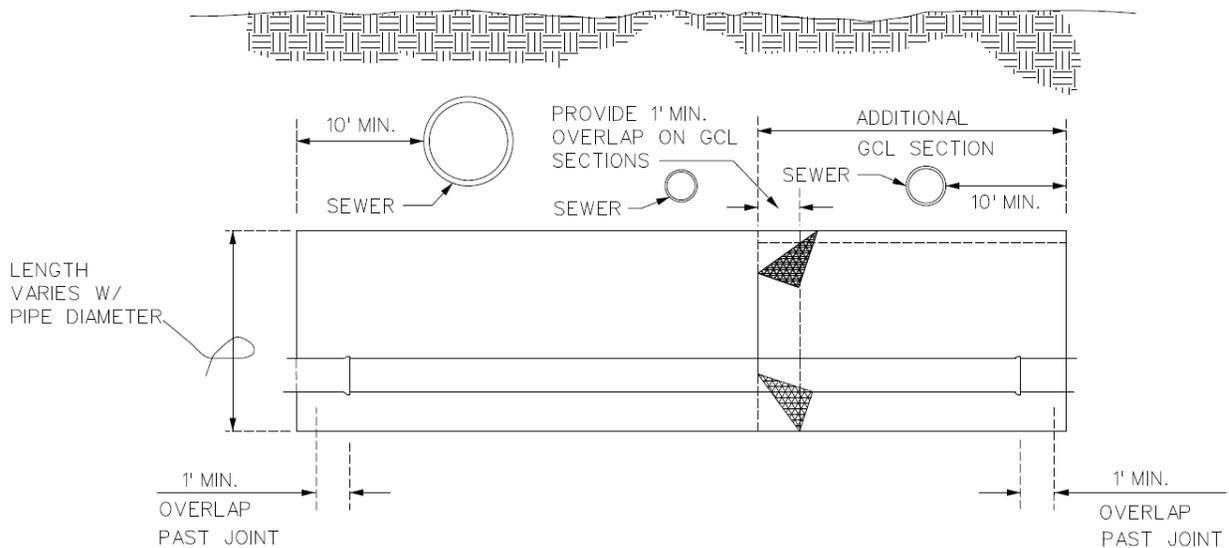


FIGURE 4A

H. BASIS OF PAYMENT

Bentomat® CL Geosynthetic clay liner (GCL) installed per this Chapter, as shown on the plans or as directed, shall be paid for at the contract unit price bid per Square Foot for BENTOMAT GEOSYNTHETIC CLAY LINING. Such price shall be full compensation for all loading and unloading, hauling, excavation, installation, backfilling, labor, tools, materials, equipment and incidentals necessary to complete the Work in conformance with these Specifications and as accepted by the City's Project Manager.

23.10 TEMPORARY HYDRANTS AND BLOW-OFF FOR FLUSHING AND DISINFECTION

A. GENERAL

Temporary hydrants and blow-offs shall be provided as shown on the plans or as determined by the Lincoln Water System to provide adequate discharge of water for preliminary and final flushing of the water main(s) in conformance to AWWA C651. The installation of temporary hydrants and blow-offs shall include any necessary protection of surrounding areas from damage caused by water erosion and any other provisions necessary for the conveyance of discharge water to protect downstream facilities or property.

B. BASIS OF PAYMENT

When called for in the proposal, payment for temporary hydrants and blow offs used in conformance with these Specifications and accepted by the City's Project Manager shall be made at the contract unit price bid per each for TEMPORARY HYDRANT AND BLOW-OFF. The Such payment shall be full compensation for installation of temporary hydrant and blow-off, necessary erosion protection, discharge water conveyance and downstream protection, removal of temporary hydrant and blow-off and any materials, equipment, tools, labor, or incidentals necessary to complete the work in conformance with the plans.

23.11 WATER SERVICE CONSTRUCTION OR RECONSTRUCTION

A. GENERAL

For the purpose of constructing or reconstructing all water supply and service lines, the Contractor shall comply with the provisions of Title 17 of the Lincoln Municipal Code. The Contractor shall cause all Work to be performed by a licensed plumber. All water services that are uncovered in the course of construction shall be inspected by the Lincoln Water System to assess their integrity and recommend replacement to customers when found to be in unsatisfactory condition. All water services that are reconstructed shall be inspected by the Lincoln Water System.

Copper water supply or service lines which are to be looped or reconstructed shall be constructed of Type "K" seamless soft-drawn copper tubing or ductile iron pipe.

HDPE Service Pipe can only be used as a repair on existing HDPE service lines and not as a repair on other service line material types.

All HDPE service pipe and fittings for HDPE applications must be submitted and approved by LWS prior to installation or payment. All items installed without prior approval shall be removed at the contractor's expense.

The Contractor shall place all reconstructed water services or looped water services so as to provide a minimum cover of 4'. Minimum lateral clearance from structures open to the weather, such as storm sewer inlets, shall be 3'.

All other clearance shall be a minimum of 6".

23.11 WATER SERVICE CONSTRUCTION OR RECONSTRUCTION (Continued)

A. GENERAL (Continued)

Looping a water service shall consist of the reconstruction of a water service across the width of the excavation for the facility being built or within 5' of said excavation. When the break in the service line is within 5' of either the tap or the curb stop, the Contractor shall loop the service pipe from the tap or curb stop to the opposite side of the excavation and only 1 joint will be allowed. When the break in the service line is beyond 5' from the tap or curb stop, the Contractor shall loop only that portion of service within the excavation and 2 joints will be allowed. All joints shall be located at or near the edges of the excavation and in no case shall the joints be positioned beneath other pipes or structures. Unless specifically approved by LWS due to conflicts with driveway pavement, sidewalk pavement, landscaping or trees, replacement taps will have no joints in the supply pipe if the excavation is located within 5 ft. of the curb stop.

When a service constructed of lead, galvanized steel, pitted copper, or other material considered unacceptable according to Title 17 of the Lincoln Municipal Code requires looping or reconstruction, the entire service from tap to curb stop shall be replaced.

When a water service which does not conflict with the Work is damaged by the Contractor, it must be repaired or replaced at the expense of the Contractor to the City's Project Manager's satisfaction. Copper service pipe in good condition may be repaired, all other unacceptable service materials shall be replaced from tap to curb stop, except for water services that contain or may have previously contained lead materials or lead contaminated materials, which require full replacement from tap to meter.

When a service is replaced to the corporation tap, a new tap may be required. No tap shall be allowed to remain which is smaller than 3/4".

New curb stops and boxes may be required when the service is reconstructed to the curb stop. Such curb stop may be ordered to be replaced if inoperable or obsolete. All curb stops and boxes shall be supplied by the Lincoln Water System at no cost to the Contractor.

All corporation taps, labor and equipment required to replace taps will be supplied by the Lincoln Water System to the Contractor at no cost. The Contractor shall be responsible for all excavation, boring, backfilling, installation of curb stops and boxes, sod, pavement, and other incidentals necessary to complete the looping or reconstruction.

All water services crossing or paralleling a new main shall be transferred to the new main if the main is 16" or smaller.

Any tap removed from service shall be immediately abandoned at the main by the Lincoln Water System at no cost to the Contractor, unless the main is to be abandoned as part of the Work of the contract. The Contractor shall be responsible for excavation, backfill, sod, pavement and other incidentals necessary to complete the abandonment.

Whenever a water service is reconstructed that provides fire protection (fire service), the Contractor shall obtain the necessary Underground Fire Sprinkler Permit through the City's Building and Safety Department, Bureau of Fire Prevention. The Contractor shall comply with the requirements of the permit and anticipate and arrange any necessary inspections of the fire service reconstruction.

23.11 WATER SERVICE CONSTRUCTION OR RECONSTRUCTION (Continued)

B. BASIS OF PAYMENT

When the items of Work stated below do not appear as bid items in the proposal form, all Work necessary for the looping or reconstruction of water services shall be paid for as an Extra Work item.

When the items of Work stated below are included in the proposal form, the payment shall be as follows:

COPPER WATER SERVICE PIPE or DUCTILE IRON WATER SERVICE PIPE of the various sizes called for shall be measured and paid for at the contract unit price bid per linear foot. Such payment shall be full compensation for all materials, tools, equipment, and labor including the licensed plumber, excavation, backfill, sod, clean-up and incidentals necessary to install the pipe in a manner acceptable to the City's Project Manager.

Boring for water service pipe shall be measured and paid for at the contract unit price per linear foot for BORING FOR ___" WATER SERVICE PIPE. Such payment shall be full compensation for all labor, materials, equipment, tools and incidentals necessary to produce the bore hole ready to receive the water service pipe, as accepted by the City's Project Manager. Water service pipe to be placed in the bore hole shall be paid for as provided above.

LOOP WATER SERVICE shall be measured and paid for at the contract unit price bid per each. This payment shall be full compensation for all labor, equipment, excavation, backfill, tools, incidentals, and materials except pipe, necessary to complete the Work in a manner acceptable to the City's Project Manager.

CONSTRUCT OR RECONSTRUCT WATER SERVICE shall be measured and paid for at the contract unit price bid per each. Such payment shall be full compensation for all labor, tools, and materials, except pipe and materials supplied by the City, equipment, excavation, backfill and incidentals necessary to complete the Work in a manner acceptable to the City's Project Manager.

23.12 ABANDONMENT OF WATER MAIN

A. GENERAL

When existing water mains are shown to be abandoned in place on the plans, the Contractor shall plug each end of the abandoned water main segment with a sleeve and plug or concrete after all services have been connected to the new water main for that section.

When existing water valve boxes are shown to be abandoned in place on the plans and the proposed water main is in service with service lines reconnected, the Contractor shall turn the valves to the off position, remove 1 or more feet of the top section of the valve box, fill with sand, and cap or plug with concrete.

B. BASIS OF PAYMENT

ABANDONMENT OF WATER MAIN shall be measured and paid for at the contract lump sum amount. Such payment shall be full compensation for all labor, tools, and materials necessary to complete the Work in a manner acceptable to the City's Project Manager.

23.13 HIGHWAY, STREET AND RAILROAD CROSSING

Highway, street and railroad crossings shall be constructed as indicated on the plans and as specified in the respective permits issued, if applicable. The City will obtain all necessary permits. Pipe encasement shall be constructed in conformance with Chapter 20 of these Specifications.

23.14 TESTING

The Contractor shall notify Lincoln Water System 48 hours prior to pressure testing water mains on new construction. The Contractor shall furnish all gauges, pumps and other equipment necessary to perform all of the acceptance tests and shall provide all assistance necessary or required by the City's Project Manager to verify the test results. No test shall be conducted until all thrust blocking has attained sufficient strength to resist any thrusts imposed by the test pressures applied.

The Contractor shall carefully fill the main or mains to be tested with water from the existing water distribution system. The Contractor shall bleed all air from pipes, valves, fittings and hydrants during filling operations. All corporation stops required to expel air shall be installed by the Lincoln Water System. The Contractor shall provide and backfill all excavations required to install corporation stops. All air taps will be abandoned by the Lincoln Water System personnel after testing is completed.

The Contractor shall pump water into the system to raise the pressure to the level indicated in the table below at the lowest elevation in the section being tested. The Contractor shall maintain the test pressure, within +/- 5 (psi), during the entire test period. The pressure testing period shall be a minimum of 2 hours. The Contractor shall carefully measure all water added to the system during that period. The rate of water added per 1,000 feet of pipeline shall not exceed maximum allowable rate as shown in TABLE 23.14 A – WATER MAIN PRESSURE TESTING.

TABLE 23.14 A – WATER MAIN PRESSURE TESTING

Nominal Pipe Size	Maximum Allowable Rate (gallons/hour)	Test Pressure (psi)
6"	0.57	200
8"	0.76	200
12"	1.15	200
16"	1.32	150
24"	1.99	150
30"	2.48	150
36"	2.98	150
48"	3.97	150
54"	4.47	150

When the pipeline being tested contains sections of various diameters, the allowable losses shall be the sum of the computed allowable losses for each size. Where sections are isolated for testing, the allowable losses will be computed for the length of sections being isolated.

During the test period, the ground surface along the length of the section being tested shall be examined for leakage. All detected leaks shall be repaired regardless of the test results.

In the event that the test requirements are not met, the Contractor shall locate and repair all defects at his own expense. Following the repairs, the tests shall be repeated until the test result requirements are met.

Pressure testing shall not be measured or paid for directly. Testing shall be considered subsidiary to those items for which direct payment is made.

23.15 DISINFECTION OF THE COMPLETED WORK

The Contractor shall keep the Work clean during construction to facilitate disinfection. All excavation and backfill required to install chlorination taps shall be provided by the Contractor.

For water mains 24" and smaller, the Contractor shall provide for the scheduling of the flushing and disinfection by the Lincoln Water System at least 24 hours in advance of the time that those services are desired. All costs of disinfection, including tests, shall be billed to and paid for by the Contractor.

For water mains 30" and larger, the Contractor shall provide a flushing and disinfection plan to the City's Project Manager for review and approval that is in conformance to the Special Provisions or the requirements specified in AWWA C651. This plan shall include the method and disinfectant to be used in disinfection process, the concentration of disinfectant to be used, the method of neutralization of the disinfectant prior to discharge into open channels or storm sewer systems. The documented results of the bacteriological tests shall be provided to the City's Project Manager with a copy to the Lincoln Water System.

Flushing and disinfection will be repeated at the Contractor's expense until bacteriological tests conducted by the Lincoln Water System indicate the system is properly disinfected.

The Work required to disinfect the system shall not be measured for direct payment. Disinfection shall be considered subsidiary to those items for which direct payment is made

23.16 COLD WEATHER CONSTRUCTION

All construction performed in cold weather or during periods where frost penetration of the soil exceeds 6" shall be in conformance with Chapter 20 of these Specifications.

23.17 SUBSTANTIAL COMPLETION

Water main Work shall be considered substantially complete when all pipe is laid, all hydrants, valves, fittings and appurtenances installed and operable, backfill complete, testing complete and accepted, disinfection complete, tap holes backfilled, water services connected, paving, sidewalks and driveways replaced, final clean-up and park space finished.

23.18 FINAL COMPLETION AND ACCEPTANCE

The project shall be considered eligible for final acceptance by the City when all required Work is complete and accepted by the City's Project Manager, including all Work associated with existing water main abandonment, valve box grade adjustments, required grade adjustments to hydrants including installation of hydrant extensions in conformance to these specifications, required adjustments to hydrant nozzle orientation, seeding and/or sodding, and correction of all deficiencies found as a result of testing and/or final inspection by the City's Project Manager.

23.19 GUARANTEE

At any time during the two-year guarantee period, and within the time period allowed, the Contractor shall correct any defect in material or workmanship which has been brought to his attention. Such items shall include but not be limited to trench settlement including subsequent pavement damage, pipe leaks, damage to polyethylene encasement, hydrants out of plumb, hydrants which drain improperly, valve boxes out of plumb or offset from center of operating nut, or service line leaks.

23.20 CATHODIC PROTECTION

A. GENERAL

When called for on the plans and Contract Documents, the Contractor install cathodic protection for Ductile iron water mains having a diameter of greater than or equal to 12-inches (and their smaller appurtenances such as lateral connections to existing water mains and/or fire hydrants) that are installed using open-trench excavations and driven and bored casings. This shall not apply to water mains installed via horizontal directional drilling.

B. SUBMITTALS

1. Product Data

Submit manufacturer's specifications, recommendations, and installation instructions for each of the following main product categories and all applicable product subheadings specified in this Specification:

- a. Electrical Continuity Provisions for Ferrous Pipe (Materials and Testing Procedure)
- b. Corrosion Monitoring Test Stations, Buried Reference Electrodes and Calibrated Wire Shunts
- c. Electrical Isolation Devices
- d. Galvanic Anodes
- e. Wire, Cable, and Splices
- f. Exothermic Welds and Connection Devices

Manufacturer's product submittals shall be incorporated into a single document to demonstrate that the items have been properly coordinated by the CONTRACTOR as a unit.

- a. A notation shall be made on each shop drawing submitted as to the item's specific use by the appropriate Article-Paragraph referenced in this Specification.
- b. Multiple or incomplete submittals furnished by the CONTRACTOR may be rejected.

2. Quality Assurance

- a. Furnish the services of an individual certified by NACE International® as a Level CP2 Corrosion Technician to monitor compliance with this Specification and to ensure that the cathodic protection system components conform to this Specification.
- b. Submit the CP Technician's qualifications and prior experience before installation of any cathodic protection components.
- c. After the cathodic protection system has been installed, field commissioning of the cathodic protection system will be performed by the CP Technician furnished by the CONTRACTOR for review and approval by the CITY OF LINCOLN'S CP Specialist.

C. DELIVERY, STORAGE AND HANDLING

Manufacturers shall provide adequate care to protect cathodic protection materials from damage during handling, storage, hauling, and installation.

23.20 CATHODIC PROTECTION (Continued)

D. WARRANTY ON CONTRACTOR-PROVIDED MATERIALS

All Contractor-provided materials shall be guaranteed for a period of one year. The one-year period shall commence at the time of the final installation of all components by the Contractor and after the system has been tested and properly adjusted for operation by Lincoln Water System's Corrosion Engineer.

E. APPROVED MATERIAL SUPPLIERS

The following list of suppliers is provided for the CONTRACTOR's convenience in procuring the material required by this Specification. It shall remain the CONTRACTOR's responsibility to ensure that the materials furnished meet the physical descriptions and performance characteristics listed herein.

1. Subject to meeting the requirements of this Specification, cathodic protection materials are available from the following manufacturers-suppliers:
 - a. Mesa Products, Inc., (918-627-3188).
 - b. BK Corrosion, LLC, (713-225-0349).
 - c. T. Christy Enterprises, (800-258-4583).

F. ELECTRICAL CONTINUITY PROVISIONS – FERROUS PIPE

Insulated Stranded Copper Cable

1. The quantity and gauge of continuity bond cables required for each pipe joint shall be as shown on the CP Installation Detail Drawings included hereinafter in this Specification.
 - a. The CONTRACTOR, at his option, may install the largest gauge of continuity bond cable for all pipe sizes provided that the weld shots do not damage the pipe wall or its interior lining.
2. Bond cables shall be factory-made with formed copper sleeves installed at both ends of the bond cable using the manufacturer's proper-sized hammer dies.
3. Bond cables shall be fabricated by the same manufacturer as the exothermic weld equipment used to connect the cable to the structure.
4. Cable shall be constructed of stranded copper equipped with a high molecular weight polyethylene insulation. Insulation shall conform to ASTM D1248 – Specification for Plastic Molding and Extrusion Materials, Type 1, Class C, Grade 5 and be configured as follows:
 - a. No. of Strands: 7
 - b. Outer Jacket Thickness: 0.110 inches
 - c. Length: 18 inches (min.)
5. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:
 - a. Continental Industries (918-627-5210), thermOweld® Jumper Bonds.
 - b. ERICO Products, Inc. (440-248-0100), Cadweld® Bonds – Formed Terminal.

23.20 CATHODIC PROTECTION (Continued)

G. CORROSION MONITORING TEST STATIONS

1. Non-Metallic Post-Type Test Stations

- a. Monitoring stations shall be a non-metallic post-type station mounted on a non-metallic conduit post. Test station shall be furnished with a capped terminal board equipped with wire/cable binding posts to permit ready access and shall be constructed as follows:

- (1) Terminal Board: Polycarbonate plastic (clear).
- (2) Test Station Cap: Polycarbonate plastic (color coded by test station type).
- (3) Conduit Post: UV stabilized polyethylene (white).
- (4) Binding Posts: Nickel-plated marine brass (6 minimum).
- (5) Shorting Bars: Nickel-plated copper.

- b. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:

- (1) Tinker & Razor Company (909-890-0700), Model T-3.

2. Flush-Mounted Test Station Enclosures

- a. Test station shall be contained in a heavy-duty, polymer concrete, flush-to-grade utility enclosure able to withstand incidental traffic and constructed as follows:

- (1) The open bottom body shall be constructed of polymer concrete having a minimum compressive strength of 87 MPa.
- (2) The cover shall be constructed of polymer concrete having a non-skid surface and shall cover the body of the enclosure. Cover shall be capable of withstanding a minimum of 20,000 pounds without failure in accordance with the requirements ANSI/SCTE 77/T15 applications.
- (3) Cover shall have a minimum of two hex-capped stainless-steel hold-down bolts placed at opposite corners and shall be labeled "CP TEST" in minimum 1" high letters.

- b. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:

- (1) Oldcastle Polymer, Model 1324-12
- (2) New Basis, Inc. (951-787-0600) Model PCA132412S.

23.20 CATHODIC PROTECTION (Continued)

G. CORROSION MONITORING TEST STATIONS (Continued)

3. Prepackaged Cu-CuSO₄ Reference Electrodes

- a. Description: Cu-CuSO₄ electrodes shall be used for soil environments to provide a stable electrical benchmark from which to measure the cathodic protection system's effectiveness. Electrodes shall be constructed as follows:
 - (1) Element: Copper rod encapsulated in a proprietary backfill electrolyte containing high purity copper sulfate crystals and a chloride ion trap to prevent contamination of the electrolyte.
 - (2) Service life of the reference electrode shall be no less than 20 years.
 - (3) Lead Wire: No. 14 RHH-RHW (yellow) stranded copper wire. Lead wire shall be sufficiently long to reach its termination point without splicing.
- b. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:
 - (1) Borin Manufacturing, Inc. (310-822-1000) Model SRE-007-CUY.
 - (2) GMC Electrical, Inc. (909-947-6016) Model CU-1-UGPC.

4. Calibrated Wire Shunts

- a. Description: Color-coded calibrated wire shunts shall be used to connect the cathodic protection system's anode header cable and structure return connection circuits.
- b. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:
 - (1) Tinker & Razor Company (909-890-0700), 0.01-ohm wire shunt with yellow mounting plate rated at 8 amps.

H. ELECTRICAL ISOLATION DEVICES

1. Plastic Pipe Inserts (PPI): In soils not known to be contaminated with hydrocarbons, PPI shall be constructed as shown on the CP Installation Detail Drawings included hereinafter in this Specification.
 - a. High Density polyethylene Pipe Inserts (HDPI) shall meet the requirements for Type III, Grade P345 Polyethylene Material as defined in ASTM Specification D-1248 (PE 3408). The minimum pressure class/SDR rating acceptable shall be Class 200/SDR 11. The pipe shall have an outside diameter matching the ductile iron pipe to which it is connected.
 - b. Mechanical joint anchor fittings shall be used to transition from ductile iron to HDPE or PVC. The fitting shall be stronger than the pipe in that when it is subjected to tensile stress the pipe will pull apart before the fitting will pull out and the pipe will blow before the fitting will rupture under pressure.

23.20 CATHODIC PROTECTION (Continued)

H. ELECTRICAL ISOLATION DEVICES (Continued)

2. Flange Isolation Kit (FIK) Assemblies: In soils not known to be contaminated with hydrocarbons, FIK shall be constructed as shown on the CP Installation Detail Drawing included hereinafter in this Specification. Provide FIK assemblies matching the pressure rating of the pipe.
 - a. FIK assemblies shall be certified by an independent certification agency to meet the requirements of the NSF-61 Standard and shall consist of the following components:
 - (1) Flange Gasket Retainer: Full-faced (Type E) G-10 Epoxy Glass.
 - (2) Sealing Elements: Ethylene propylene diene monomer (EPDM) quad O-Rings.
 - (3) Isolation Sleeves: 1/32-inch thick G-10 Epoxy Glass.
 - (4) Isolation Washers: Double 1/8-inch thick G-10 Epoxy Glass.
 - (5) Backup Washers: Double 1/8-inch thick Type 304 Stainless Steel.
 - b. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:
 - (1) GPT, Inc.(303-988-1242) Model LineBacker[®].
 - (2) Lamons[®] (713-222-0284) Model IsoGuard[™].
3. Petrolatum Tape-Wrap Encapsulation of Buried FIK
 - a. All buried FIK shall be encapsulated in a three-part cold-applied petrolatum tape coating consisting of a primer, profiling mastic, and a low-temperature petrolatum tape.
 - (1) Primer:
 - (a.) Solids Content: 100%
 - (b.) Specific Gravity: 1.08
 - (c.) Specific Volume: 26 cubic inches/pound
 - (d.) Flash Point: > 356 °F
 - (e.) Coverage: 10-22 sq. ft./pound
 - (2) Profiling Mastic:
 - (a.) Solids Content: 100%
 - (b.) Specific Gravity: 0.605
 - (c.) Specific Volume: 46 cubic inches/pound
 - (d.) Flash Point: 356 °F
 - (e.) Coverage: Varies by application
 - (3) Low-Temperature Petrolatum Tape:
 - (a.) Thickness: 46 mils
 - (b.) Maximum Service Temperature: 122 °F
 - (c.) Roll Width: 2 inches to 12 inches
 - (d.) Roll Length: 33 feet
 - (e.) Coverage with 55% Overlap: 87 sq. ft. of tape per 100 sq. ft. of pipe

23.20 CATHODIC PROTECTION (Continued)

H. ELECTRICAL ISOLATION DEVICES (Continued)

3. Petrolatum Tape-Wrap Encapsulation of Buried FIK (Continued)

- b. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:

(1) Denso NA, Inc. (281-821-3355) Denso Paste S105/Profiling Mastic/LT Tape.

4. Electrically Isolating Corporation Stops

- a. Electrically isolating corporation stops shall be constructed as follows:

- (1) All brass construction conforming to AWWA Standard C800 (ASTM B-62 and ASTM B-584).
- (2) Solid one-piece tee-head and stem with EPDM O-ring in stem.
- (3) Ball-style valve with molded EPDM seat to support fluorocarbon-coated brass ball.
- (4) Factory-assembled nylon insulator installed between the body assembly and flared copper/nut service line. Individual or field-installed threaded nylon or plastic components are not acceptable.
- (5) All threaded components must be metal. Entire assembly threads secured with adhesive to prevent unintentional disassembly and to render unit leak resistant to 300 psi working pressure.

- b. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following, no substitutions:

- (1) Mueller Company (770-206-4200), Model N35000N Insulated Ball Corporation Assembly.
- (2) A.Y. McDonald (800-292-2737), Model 74701B Corporation Stop with #74755DB Copper Flare x Female Copper Flare Dielectric Bushing.

5. Casing Spacers

- a. Carrier pipe shall be contained within each steel casing sleeve by the use of casing isolation spacers.

- (1) Configuration:

- (a.) Carrier pipe shall be positioned such that the carrier rests near the bottom of the casing pipe and the height of the risers and runners shall be sized to provide a bottom clearance not less than one-half inch between the casing pipe and the extreme outside diameter of the any joint bell of the carrier pipe and a top clearance of three-fourths inch minimum.

- (2) Band Sections:

- (a.) Casing spacer shall be a two-piece shell per carrier pipe and made from T304 stainless steel of a minimum 14-gauge thickness.

23.20 CATHODIC PROTECTION (Continued)

H. ELECTRICAL ISOLATION DEVICES (Continued)

5. Casing Spacers (Continued)

(2) Band Sections: (Continued)

- (b.) Each shell section shall be lined with a 0.090" thick, ribbed PVC extrusion with a retaining section that overlaps the edges of the shell and prevents slippage.
- (c.) PVC Liner shall have a hardness of 85-90 durometer.
- (d.) Bearing surfaces (runners) shall be ultra-high molecular weight polyethylene (UHMW) to provide abrasion resistance and a low coefficient of friction (0.12).

(3) Runners:

- (a.) The runners shall be attached to the support risers at appropriate positions to properly support the carrier pipes within the casing pipe and to ease installation.
- (b.) The runners shall be mechanically bolted to the spacer.

(4) Risers:

- (a.) Risers shall be MIG welded to the shell, where applicable.
- (b.) Risers shall be made of T304 stainless steel of a maximum 10 gauge with bolt heads welded to the inside of the risers for strength.
- (c.) Bottom risers 6" and over in height shall be reinforced. All reinforcing plates shall be 10-gauge T304 stainless steel and shall be MIG welded to mating parts.
- (d.) All weldments shall be fully chemically passivated in accordance with ASTM A380.

- b. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:

- (1) Cascade Waterworks Manufacturing Co. (800-426-4301), Model CCS.
- (2) Advance Products and Systems, Inc. (337-233-6116), Model SSI.
- (3) The BWM Company (828-247-0630). Model SS-Pipe Size.

6. Pipe Penetration Sleeve Seals

- a. Isolating sleeve seals shall be modular mechanical type constructed of expanding, interlocking links shaped to continuously fill and seal the annular space between the carrier pipe and the sleeve or opening, and shall be constructed as follows:

- (1) Links: Synthetic rubber.
- (2) Fasteners: Zinc-coated steel.

- b. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:

- (1) GPT, Inc. (303-988-1242) Model Link-Seal®.
- (2) Advance Products and Systems, Inc. (337-233-6116), Model Innerlynx®.

23.20 CATHODIC PROTECTION (Continued)

H. ELECTRICAL ISOLATION DEVICES (Continued)

7. Casing End Seals

a. Casing end seals shall be wrap-around style and shall be constructed as follows:

- (1) Annulus Wrapping: 1/8-inch thick neoprene rubber.
- (2) Hold-down Banding: 1/2-inch wide Type 304 SS worm gear banding.

b. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:

- (1) GPT, Inc. (303-988-1242) Model S Pull-On End Seal.
- (2) Advance Products and Systems, Inc. (337-233-6116), Model AM End Seal.

I. GALVANIC ANODES

1. Magnesium Anodes

a. Description: Magnesium anodes shall be capable of delivering a minimum efficiency of 500 amp-hours per pound of magnesium and shall have the following metallurgical analysis:

b. Quality Assurance: Furnish spectrographic analysis for assurance of chemical composition and ASTM G97 for verification of electro-chemical properties on samples from each heat or batch of anodes supplied for this project.

c. Metallurgy:

- (1) Aluminum: 0.01% (max.)
- (2) Manganese: 0.50% - 1.3%
- (3) Copper: 0.02% (max.)
- (4) Nickel: 0.001% (max.)
- (5) Iron: 0.03% (max.)
- (6) Other (each): 0.05% (max.)
- (7) Other (total): 0.30% (max.)
- (8) Magnesium: Balance

d. Packaged Magnesium Anode Backfill: Completely surround the anode ingot in backfill without voids. Provide magnesium anodes packaged within a cotton sack in a special chemical backfill having the following proportions:

- (1) Ground Hydrated Gypsum: 75%
- (2) Powdered Bentonite: 20%
- (3) Anhydrous Sodium Sulfate: 5%
- (4) Provide backfill with a grain size such that 100% is capable of passing a 20-mesh screen and 50% is retained by the 100-mesh screen.

23.20 CATHODIC PROTECTION (Continued)

I. GALVANIC ANODES (Continued)

1. Magnesium Anodes (Continued)

e. Anode Lead Wire

- (1) The standard lead wire for a magnesium anode shall be at least 10 feet in length of No. 12 AWG solid copper wire with Type TW (red) thermoplastic insulation
- (2) Lead Wire Connection to Anode Core
 - (a.) Magnesium anodes shall be cast with a minimum 20-gauge galvanized steel core.
 - (b.) One end of the anode shall be recessed to expose the core for silver-soldering the lead wire.
 - (c.) The silver-soldered lead wire connection and anode recess shall be filled with an electrical potting compound before packaging.

(3) Magnesium Anode Physical Parameters

Anode Weight (#)		Nominal Package Dimensions (in.)	
Bare Anode	Pkg'd Anode	Length	Diameter
48	98	38	8.0

- f. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:
 - (1) Mesa Products, Inc., (918-627-3188).
 - (2) BK Corrosion, LLC, (713-225-0349).
 - (3) T. Christy Enterprises, (800-258-4583).

2. Zinc Anodes

- a. Description: Zinc anodes shall be capable of delivering a minimum efficiency of 335 amp-hours per pound of zinc.
- b. Quality Assurance: Furnish spectrographic analysis for assurance of chemical composition for verification of electro-chemical properties on samples from each heat or batch of anodes supplied for this project.
- c. Metallurgy:
 - (1) Aluminum: 0.005% (max.)
 - (2) Cadmium: 0.003% (max.)
 - (3) Iron: 0.0014% (max.)
 - (4) Lead: 0.003% (max.)
 - (5) Copper: 0.002% (max.)
 - (6) Zinc: Balance

23.20 CATHODIC PROTECTION (Continued)

I. GALVANIC ANODES (Continued)

2. Zinc Anodes (Continued)

d. **Packaged Zinc Anode Backfill:** Completely surround the anode ingot in backfill without voids. Provide Zinc anodes packaged within a cotton sack in a special chemical backfill having the following proportions:

- (1) Ground Hydrated Gypsum: 75%
- (2) Powdered Bentonite: 20%
- (3) Anhydrous Sodium Sulfate: 5%
- (4) Provide backfill with a grain size such that 100% is capable of passing a 20-mesh screen and 50% is retained by the 100-mesh screen.

e. **Zinc Anode Lead Wire**

(1) The standard lead wire for a Zinc anode shall be at least 10 feet in length of No. 12 AWG solid copper wire with Type TW (red) thermoplastic insulation

(2) **Lead Wire Connection to Anode Core**

- (a.) Zinc anodes shall be cast around a centralized ¼-inch diameter electro-galvanized mild steel rod core.
- (b.) Lead wire shall be silver-soldered to the rod core.
- (c.) Wrap soldered connection with two half-lapped layers of rubber tape followed by two half-lapped layers of vinyl tape.

f. **Zinc Anode Physical Parameters**

Anode Weight (#)		Nominal Package Dimensions (in.)	
Bare Anode	Pkg'd Anode	Length	Diameter
60	130	66	5.5

g. Subject to meeting the requirements of this Special Provision, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:

- (1) Mesa Products, Inc., (918-627-3188).
- (2) BK Corrosion, LLC, (713-225-0349).
- (3) T. Christy Enterprises, (800-258-4583).

23.20 CATHODIC PROTECTION (Continued)

J. WIRE, CABLE AND SPLICES

1. Anode Header Cable and Structure Return Connection (Direct Burial)

- a. High molecular weight polyethylene insulated stranded copper cable shall be used for all underground portions of the cathodic protection system's anode header cable and structure return connection circuits. Insulation shall conform to ASTM D1248 – Specification for Plastic Molding and Extrusion Materials, Type 1, Class C, Grade 5.
- b. The DC cables shall be sized as follows:
 - (1) No. of Strands: 7
 - (2) Outer Jacket: 0.110" thickness
 - (3) Anode Header Cable: No. 8 AWG (red)
 - (4) Structure Return Connection: No. 8 AWG (blue)

2. Test Wires for CP System Monitoring (Direct Burial)

- a. Cross-linked polyethylene (XLPE) Type RHW-2 and USE-2 for use at 600 volts or less shall be used for all underground structure connections as part of the CP system's monitoring circuit. Wire insulation shall conform to NEC for direct burial, general-purpose applications at a maximum continuous operating temperature of 90 degrees C in either wet or dry locations.
- b. The test wires shall be configured as follows:
 - (1) Conductors shall be Class B stranded annealed uncoated copper per UL Standard 854 and 44.
 - (2) Primary Insulation: 0.045" thickness
 - (3) Gauge and Structure Color Code: #12 AWG (colors as shown on drawings)
- c. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:
 - (1) Graybar Electric Company (800-472-9227)
 - (2) Omni Cable Corp. (800-292-6664)
 - (3) Kris-Tech Wire (315-339-5268)

3. Compression Crimp Splice Connectors

- a. All underground spliced connections used within the DC cathodic protection circuit shall be made through the use of copper compression crimp connectors.
 - (1) The proper size connectors shall be used in accordance with the manufacturer's recommendations.
 - (2) Connectors shall be crimped with a hand tool capable of delivering a minimum of 9000 pounds of compressive force.
- b. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:
 - (1) Burndy LLC-US (800-346-4175).

23.20 CATHODIC PROTECTION (Continued)

J. WIRE, CABLE AND SPLICES (Continued)

4. Splice Encapsulation

- a. All underground spliced connections used within the DC cathodic protection circuit shall be sealed with rubber and plastic tape contained within a waterproof coating.
- b. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:
 - (1) 3M Electrical Products (1-888-364-3577) - Scotch Brand 23 Rubber Splicing Tape.
 - (2) 3M Electrical Products (1-888-364-3577) - Scotch Brand 33+ Vinyl Electrical Tape.
 - (3) 3M Electrical Products (1-888-364-3577) - Scotchkote Electrical Coating.

K. EXOTHERMIC WELDS AND CONNECTION DEVICES

1. All connections used within the DC cathodic protection system circuit shall be by exothermic welds.
 - a. The proper size welders, metal charges, and wire sleeves shall be used in accordance with the manufacturer's recommendations. Do not mix different manufacturers' products.
 - (1) When connecting to horizontal ductile iron or cast-iron structures, use a maximum of 32-gram weld metal charge and furnaces designated specifically for cast iron.
 - (2) When connecting to horizontal carbon steel structures, use a maximum of 25-gram weld metal charge and furnaces designated specifically for carbon steel.
 - b. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:
 - (1) Continental Industries (918-627-5210), Model thermOweld®.
 - (2) ERICO Products, Inc. (440-248-0100), (440-248-0100), Model Cadweld®.
2. Coating of Wire and Cable Connections to Structures
 - a. A pre-fabricated plastic sheet with an igloo-shaped dome and entry tunnel filled with an oil- and gas-resistant elastomeric rubber and a primer-less elastomeric tape for bonding directly to the structure.
 - b. Subject to meeting the requirements of this Specification, acceptable manufacturer's products which may be incorporated into the work include the following *or an approved equal*:
 - (1) Continental Industries (918-627-5210), Model thermOcap® PC.
 - (2) Chase Corporation (781-332-0700), Model Royston Handy Cap® IP.

23.20 CATHODIC PROTECTION (Continued)

L. INSTALLATION OF CATHODIC PROTECTION MATERIALS - GENERAL

Examine the areas and conditions under which cathodic protection materials are to be installed and notify RESIDENT PROJECT REPRESENTATIVE in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected.

Drawings: Install all cathodic protection components and equipment according to the following CP Installation Detail Drawings included hereinafter in this Specification.

1. Drawing No. CP-101: Single Horizontal Anode Installation
2. Drawing No. CP-102: Single Vertical Anode Installation
3. Drawing No. CP-301: Continuity Bonding across Ductile Iron Pipe Joint
4. Drawing No. CP-311: Continuity Bonding across Vertical Gate Valve
5. Drawing No. CP-312: Continuity Bonding across Butterfly Valve or Horizontal Gate Valve
6. Drawing No. CP-321: Insulating Rubber & Tape Wye Splice for Sacrificial Anode Cable Connections
7. Drawing No. CP-322: Insulating Rubber & Tape Butt Splice for Sacrificial Anode Cable Connections
8. Drawing No. CP-401: Exothermic Weld Procedure for Ferrous Pipe Material (Horizontal Only)
9. Drawing No. CP-611: Anode Test Station (ATS)
10. Drawing No. CP-612: ATS Terminal Board Installation Details
11. Drawing No. CP-621: Casing Test Station (CTS)
12. Drawing No. CP-622: CTS Terminal Board Installation Details
13. Drawing No. CP-631: Potential Test Station (PTS)
14. Drawing No. CP-632: PTS Terminal Board Installation Details
15. Drawing No. CP-641: Foreign Crossing (Over WM) Test Station (FTS)
16. Drawing No. CP-642: Foreign Crossing (Under WM) Test Station (FTS)
17. Drawing No. CP-643: FTS Terminal Board Installation Details
18. Drawing No. CP-651: Isolation Test Station (ITS)
19. Drawing No. CP-652: ITS Terminal Board Installation Details
20. Drawing No. CP-653: Isolation Test Station at Tapping Sleeve (ITS-TAP)
21. Drawing No. CP-691: Flush-Mounted Enclosure for Test Station Terminal Board & Wires
22. Drawing No. CP-692: Post-Mounted Test Station for Terminal Board & Wires
23. Drawing No. CP-801: Flange Isolation Kit (FIK)
24. Drawing No. CP-804: Polyvinyl Chloride Pipe Insert (PVPI)
25. Drawing No. CP-805: High Density polyethylene Pipe Insert (HDPI)
26. Drawing No. CP-806: Isolation (Ball Type) Corporation Stop (ICS)
27. Drawing No. CP-807: Isolation Service Fitting (Copper Flare) for ¾" to 2" Pipe (ISF)
28. Drawing No. CP-808: Electrical Isolation Devices for Metallic Casing Sleeves
29. Drawing No. CP-809: Electrical Isolation at Pipe Entry with Reinforced Concrete Wall

23.20 CATHODIC PROTECTION (Continued)

M. INSTALLATION OF CATHODIC PROTECTION MATERIALS – QUALITY CONTROL

1. CONTRACTOR's Quality Control System

Implement a quality control system monitored to ensure that the standards for materials, workmanship, construction, and functional performance established by this Specification are adhered to throughout the course of the Work.

2. CONTRACTOR's Technical Assistance

The CONTRACTOR shall have access (via telephonic assistance) from cathodic protection system material suppliers throughout the duration of the Work.

N. INSTALLATION OF ELECTRICAL CONTINUITY PROVISIONS – FERROUS PIPE

1. General: Factory-made cable bonds shall be installed across all non-welded ferrous pipe joints except as follows:

- a. Pipe joints that are specifically required to be electrically isolated.
- b. Bond around all valves - do not connect cable bonds to valve housing.

2. Method:

- a. Inspect each bond cable to ensure a continuous electrical conductor with no cuts or tears in the cable insulation.
- b. Attach bond cable to water main by the exothermic welding process in accordance with the manufacturer's instructions.
- c. Do not use any exothermic weld equipment that is either damp or wet.
- d. Cover all exothermic welds with a pre-fabricated, igloo-shaped, domed-plastic elastomeric rubber cover as described in this Specification.

3. Post-Installation Visual Inspection: Inspect all electrical continuity bond cable connections by visually examining each exothermic weld connection for strength and suitable coating prior to backfilling.

4. Post-Installation Continuity Testing: CONTRACTOR shall use the following procedure to verify all bonded pipe joints are electrically continuous prior to backfilling. All data shall be documented for the job record and submitted each day to the CITY OF LINCOLN and also summarized and submitted to the CITY OF LINCOLN at the completion of the project.

- a. Measure the electrical potential at each side of selected bonded connections with a portable copper/copper-sulfate reference electrode (CSE) and a digital voltmeter having at least 10 mega-ohm input impedance.
- b. Place the CSE into the soil within 18-inches of the bonded connection and do not move the CSE.
- c. Connect the red meter lead to the CSE and the black meter lead to the pipe (not the cable). Ensure a secure direct contact to the pipe by using an awl or similar tool.

23.20 CATHODIC PROTECTION (Continued)

N. INSTALLATION OF ELECTRICAL CONTINUITY PROVISIONS – FERROUS PIPE (Continued)

4. Post-Installation Continuity Testing (Continued)
 - d. Measure and record the DC voltage between the CSE and the pipe on EACH side of the bonded connection.
 - e. The two DC voltage readings must be identical to indicate an acceptable connection.
5. Acceptance Criterion: If, in the opinion of the CITY OF LINCOLN, any exothermic weld is deficient, the CONTRACTOR shall remove and replace the deficient welded connection at no expense to the City of Lincoln.
6. Backfilling of Bond Cables:
 - a. Perform backfilling that will prevent damage to the bond cables and connections to the water main.
 - b. If construction activity damages a bond cable, the CONTRACTOR shall remove and replace the bond cable at no expense to the CITY OF LINCOLN.

O. INSTALLATION OF CORROSION MONITORING TEST STATIONS

1. General: Install the required number of test stations at the locations shown or as directed by the CITY OF LINCOLN.
2. Reference Electrode
 - a. Keep permanent reference electrodes dry and protect from freezing before installation.
 - b. Remove plastic or paper shipping bags from around the reference electrode prior to installation.
 - c. Place reference electrode in native soil within 12 to 36 inches of the water main.
3. Test Wires
 - a. Provide test station lead wires that are continuous with no cuts or tears in the insulation covering the conductor.
 - b. Attach test leads to the water main by the exothermic welding process.
 - c. Connect all test station wires to one side of the terminal board using the test station manufacturer's standard binding posts at the locations shown on the Plans.
 - d. Install wire shunt plate and shorting bars to the opposite side of terminal board from the incoming wires.
 - e. Install wire shunt plate last to permit easy removal from terminal board without having to disassemble other test station wire and cable connections.

23.20 CATHODIC PROTECTION (Continued)

O. INSTALLATION OF CORROSION MONITORING TEST STATIONS (Continued)

4. Terminal Board and Test Stations within Flush-Mounted Enclosure:
 - a. Route all test station wires through the mounting pipe and run to an area along the water main that will not accumulate standing water or allow the test station to be silted over.
 - b. Install the test station terminal board on top of the mounting pipe and extend the pipe vertically to allow at least 24" below bottom of the enclosure.
 - c. Install the top of test station head and color-coded cap to allow a minimum separation of 1" from the underside of the enclosure cover. Permanently mark as-built pipeline stationing number on test station cap or mounting post.
 - d. Set the top of the enclosure flush to final grade outside of vehicular traffic areas and support with a minimum 6" gravel base to support and drain the inside of the enclosure.
 - e. Fasten the two hold-down bolts of the enclosure lid but do not over tighten.
 - f. Thoroughly backfill and compact the soil surrounding the enclosure to prevent settling and voids.
 - g. Drive a vertical 12-inch long steel rebar flush into the ground and immediately alongside the enclosure to facilitate locating with a magnetic sensing device.
5. Terminal Board and Test Stations on Mounting Post:
 - a. Route all test station wires through the mounting pipe and run to an area along the water main that will not accumulate standing water.
 - b. Install the test station terminal board on top of the mounting pipe and extend the pipe vertically to a height of at least 36" to 42" above final grade.
 - c. Install the top of test station head and color-coded cap. Permanently mark as-built pipeline stationing number on test station cap or mounting post.
 - d. Thoroughly backfill and compact the soil surrounding the mounting post to prevent settling and voids.
 - e. Install CITY OF LINCOLN-supplied bollard/post in areas with high vegetation that could obscure test station's PE mounting post.
 - f. Affix CITY OF LINCOLN-supplied adhesive identification label to test station's mounting pipe.

23.20 CATHODIC PROTECTION (Continued)

O. INSTALLATION OF CORROSION MONITORING TEST STATIONS (Continued)

6. Post-Installation Backfilling

- a. Protect test leads during the backfilling operation to avoid damage to the wire insulation and integrity of the conductor.
- b. Protect permanent reference electrode during backfilling to avoid damage to the electrode and its lead wire.
- c. If, in the opinion of the CITY OF LINCOLN, the installation of the test station wires or the reference electrode is deficient, the CONTRACTOR shall remove and replace these components at no expense to the City of Lincoln.

P. INSTALLATION OF ELECTRICAL ISOLATION DEVICES

1. General: Install the required number of electrical isolation devices at the locations shown on the CP Installation Schedule provided hereinafter in this Specification or as directed by the CITY OF LINCOLN. The water main intended for cathodic protection shall be electrically isolated at the following locations:
 - a. At all copper water service laterals at the corporation stop.
 - b. At all metallic casing sleeves beneath street or rail crossings.
 - c. At all connections to existing metallic water mains or at connections to new water mains that are not intended for cathodic protection.
2. Casing Isolation Testing:
 - a. After casing spacers are installed but prior to grouting of the casing annulus, perform electrical isolation test to verify that casing and carrier pipes are electrically separated as follows:
 - (1) Measure and record the DC voltage difference between the casing and the carrier pipes using a digital voltmeter having at least 10 mega-ohm input impedance.
 - (2) If the DC voltage difference is not greater than zero DC millivolts, remove electrical connection between the casing and carrier pipes to provide electrical separation and repeat the electrical isolation test. Do not grout the casing annulus until a DC voltage difference of greater than zero DC millivolts is measured and recorded.
3. Flange Isolation Kit (FIK) Procedure:
 - a. Inspect the gasket kit and verify that the material is as specified and that the material is not damaged.
 - b. Clean the bolting materials. Apply lubricant or anti-seizing compound to all threads required for alignment with nuts and nut facings.

23.20 CATHODIC PROTECTION (Continued)

P. INSTALLATION OF ELECTRICAL ISOLATION DEVICES (Continued)

3. Flange Isolation Kit (FIK) Procedure: (Continued)

- c. Align flange faces so that they are parallel and concentric with each other and within 0.010 inch without external loading or springing.
- d. Line up bolt holes by driving two tapered drift pins in opposite directions to each other into two diametrically opposite bolt holes.
- e. Insert insulating sleeves into bolt holes. Sleeves must slide in easily; if not, flanges must be realigned. Do not force sleeves into bolt holes.
- f. Assemble studs/bolts as follows:
 - (1) Run one nut on each stud so that two full threads are showing beyond the nut.
 - (2) Slide steel backup washer onto stud and insert into bolt hole. If flange requires two-sided insulation, add an insulating washer after the steel washer.
 - (3) From the opposite end of the stud, place an insulating washer, steel backup washer, and a nut; tighten by hand.
 - (4) Torque the first two studs at diametrically opposite locations to a maximum of 30 percent of the final torque value in a star pattern.
 - (5) Repeat star-torqueing pattern at each bolt by increasing torque to 50-60 percent of final value.
 - (6) Continue torqueing all studs in a star pattern using the specified torque setting (100 percent) until there is no further rotation of the nuts.
- g. Acceptance
 - (1) Immediately after a FIK has been installed in accordance with the manufacturer's specifications, the CONTRACTOR will perform an electrical isolation test using a radio frequency isolating test meter to verify the flange will not permit current flow across it.
 - (2) If, in the opinion of the CITY OF LINCOLN, the FIK is shorted, the CONTRACTOR shall remove and replace the isolation gasket or bolt sleeves/washers at the CONTRACTOR's expense.
- h. Sealing Buried Isolation Flanges
 - (1) After any buried FIK has been tested and found to be 100 percent effective, the entire isolator shall be encapsulated in a three-part, non-toxic, petrolatum tape wrap before burial.
 - (2) Encapsulation shall completely cover both flange sides and shall extend a minimum of six inches beyond the ends of all flange bolt heads and nuts.

23.20 CATHODIC PROTECTION (Continued)

Q. INSTALLATION OF GALVANIC ANODES

1. General: Install the required number of anodes at the locations shown on the CP Installation Schedule provided hereinafter in this Specification or as directed by the CITY OF LINCOLN.
2. Method
 - a. Remove plastic or paper shipping bags from around prepackaged anodes prior to installation.
 - b. Install in the manner and at the dimensions from the water main as shown on the CP Installation Details. Field modifications shall be made only with the approval of the CITY OF LINCOLN.
 - c. Handle galvanic anodes in such a manner to avoid damaging anode materials and wire connections.
 - d. Attach anode lead wire to insulated header cable or route lead wire directly to pipe or test station as required.
 - e. Splices are not permitted within the length of a factory-fabricated anode lead wire.
 - f. Install prepackaged anodes with compacted backfill material, such that no voids exist between the anode material and the backfill.
 - g. In soils that do not exhibit any signs of moisture content or granular soils that have no cohesive strength, pour 5 gallons of water over the anode after backfilling and tamping have been completed to a point about 6 inches above the anode. After the water has been absorbed by the earth, backfilling shall be completed to the ground surface level.

R. INSTALLATION OF WIRE, CABLE AND SPLICES

1. Install underground wires, cables, and connections at a minimum 36 inches below final grade with a minimum separation of 6 inches from other underground structures.
2. Seal splices against water penetration as follows:
 - a. Clean and then wrap with a minimum of two half-lapped layers of rubber electrical tape.
 - b. Apply two half-lapped layers of plastic electrical tape.
 - c. Cover with a fast-drying electrical sealant.

23.20 CATHODIC PROTECTION (Continued)

S. INSTALLATION OF EXOTHERMIC WELDS AND CONNECTION DEVICES

1. All exothermic welding shall be performed in accordance with the manufacturer's recommendations for welding equipment, weld metal charge size, and applicability to the structure. Do not use exothermic weld equipment if the graphite mold is wet.
2. Structure Surface Preparation
 - a. All bare metal shall be free of dust, dirt, grease, oil and other foreign matter.
 - b. Practical removal shall be by either power or hand wire brushing.
 - c. Grinding or filing shall remove sharp edges or burrs.
3. Installation of Elastomeric Cover over Exothermic Welds
 - a. Clean the pipe surface which is to be covered by removing all moisture, dirt, grease and other contaminants.
 - b. The weld areas shall be no more than warm to the touch before applying the elastomeric cover.
 - c. Remove the release paper from the back of the mastic pad. Avoid touching the exposed elastomeric tape.
 - d. Apply the mastic pad to the structure by firmly pressing on all edges making sure that the tunnel area of the plastic dome completely covers the lead wire entering the exposed copper of the connection.
 - e. Push the dome of the plastic weld cap firmly over the exothermic weld area and the wire entering the weld cap.

T. POST-INSTALLATION TESTING OF CATHODIC PROTECTION SYSTEMS

1. General: CITY OF LINCOLN will provide services of a NACE-certified CP Specialist for periodic field inspections and technical oversight of the CONTRACTOR's commissioning services of the cathodic protection system in accordance with the following NACE International[®] reference standard and standard test method:
 - a. NACE International[®] Standard Practice SP0169 (latest edition).
 - b. NACE International[®] Standard Test Method TM0497 (latest edition).
2. After installation of the cathodic protection system, field tests including the following items will be performed by the CP Technician furnished by the CONTRACTOR:
 - a. Take photographs of each test station – both of the terminal board and also the surrounding landscape for future identification and locating.
 - b. Verify that each test station wire is attached to the appropriate structure using the proper color code.

23.20 CATHODIC PROTECTION (Continued)

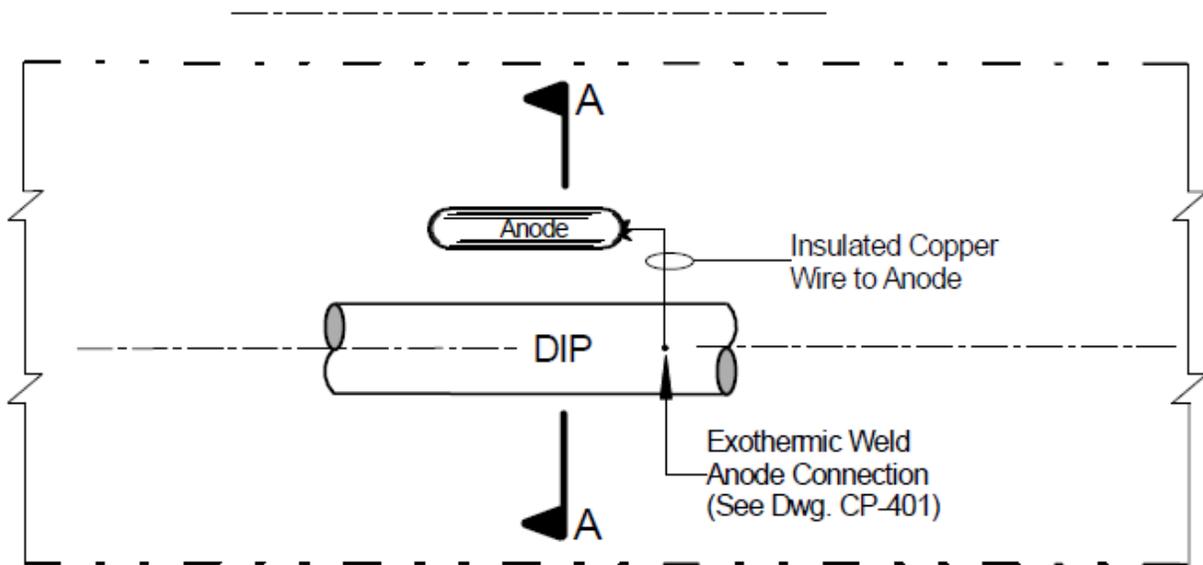
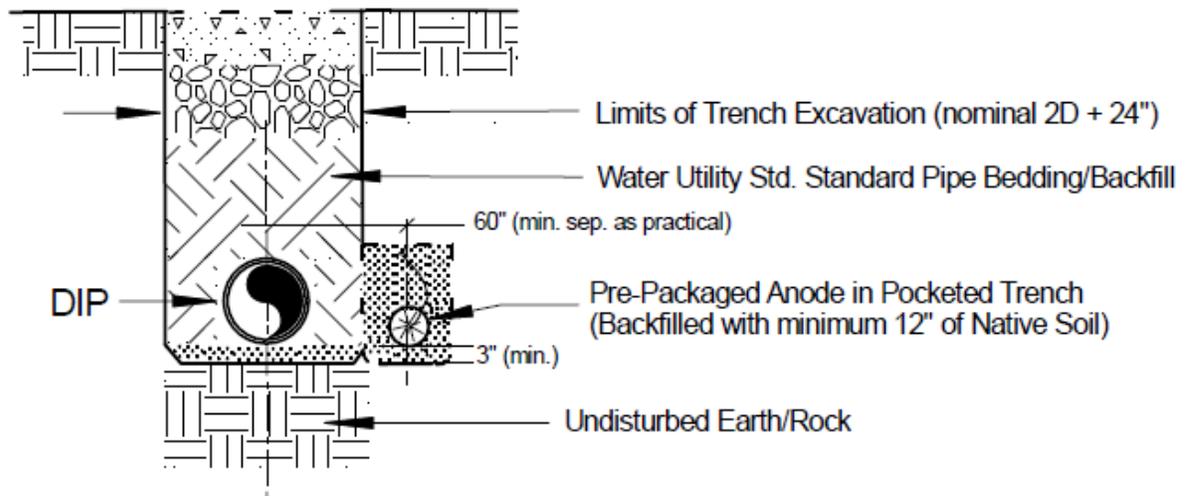
T. POST-INSTALLATION TESTING OF CATHODIC PROTECTION SYSTEMS (Continued)

2. After installation of the cathodic protection system, field tests including the following items will be performed by the CP Technician furnished by the CONTRACTOR: (Continued)
 - c. Measure cathodic protection data at each test station as follows:
 - (1) Red Cap Anode Test Station: ON S/S potentials of the pipeline using the buried reference electrode and a portable Cu-CuSO₄ reference cell. Momentarily disconnect the anode(s) from the circuit and record Instant-Off S/S potentials of the pipeline using the buried reference electrode and a portable Cu-CuSO₄ reference cell. Measure the total current through the anode circuit via the TS shunt.
 - (2) Orange Cap Isolation Test Station: Structure-to-soil potentials of the pipeline and the foreign structure (across the FIK) using the buried Cu-CuSO₄ reference electrode and a portable reference cell.
 - (3) Blue Cap Casing Test Station: Structure-to-soil potentials of the pipeline and the casing using the buried reference electrode and a portable Cu-CuSO₄ reference cell.
 - (4) Green Cap Potential Test Station: Structure-to-soil potentials of the pipeline using the buried reference electrode and a portable Cu-CuSO₄ reference cell.
 - (5) White Cap Foreign Test Station: Structure-to-soil potentials of the pipeline and the foreign structure using the buried reference electrode and a portable Cu-CuSO₄ reference cell. Note any DC interference to the pipeline.
 - d. Determine the effectiveness of each accessible electrical isolation device.
 - e. Prepare and submit a summary report to the CITY OF LINCOLN and RESIDENT PROJECT REPRESENTATIVE containing to include a description of the structures intended for protection, a description of the cathodic protection systems, and a tabulation/analysis of the data versus NACE International[®] performance standards.
3. Final Acceptance: Assist the CITY OF LINCOLN's CP Specialist after energizing and commissioning of the cathodic protection system to ensure that deficiencies are corrected prior to acceptance by the RESIDENT PROJECT REPRESENTATIVE.
 - a. The costs for any additional field tests or inspections by the CITY OF LINCOLN's CP Specialist that result from either material or installation deficiencies will be charged to the CONTRACTOR at direct cost with no mark-up and deducted from the CONTRACTOR's final pay application for the project.
 - b. The cathodic protection system installation will be deemed acceptable for full payment only after being tested by the CONTRACTOR's CP Technician and determined to meet the minimum performance criterion established in this Specification by the CITY OF LINCOLN'S CP Specialist.

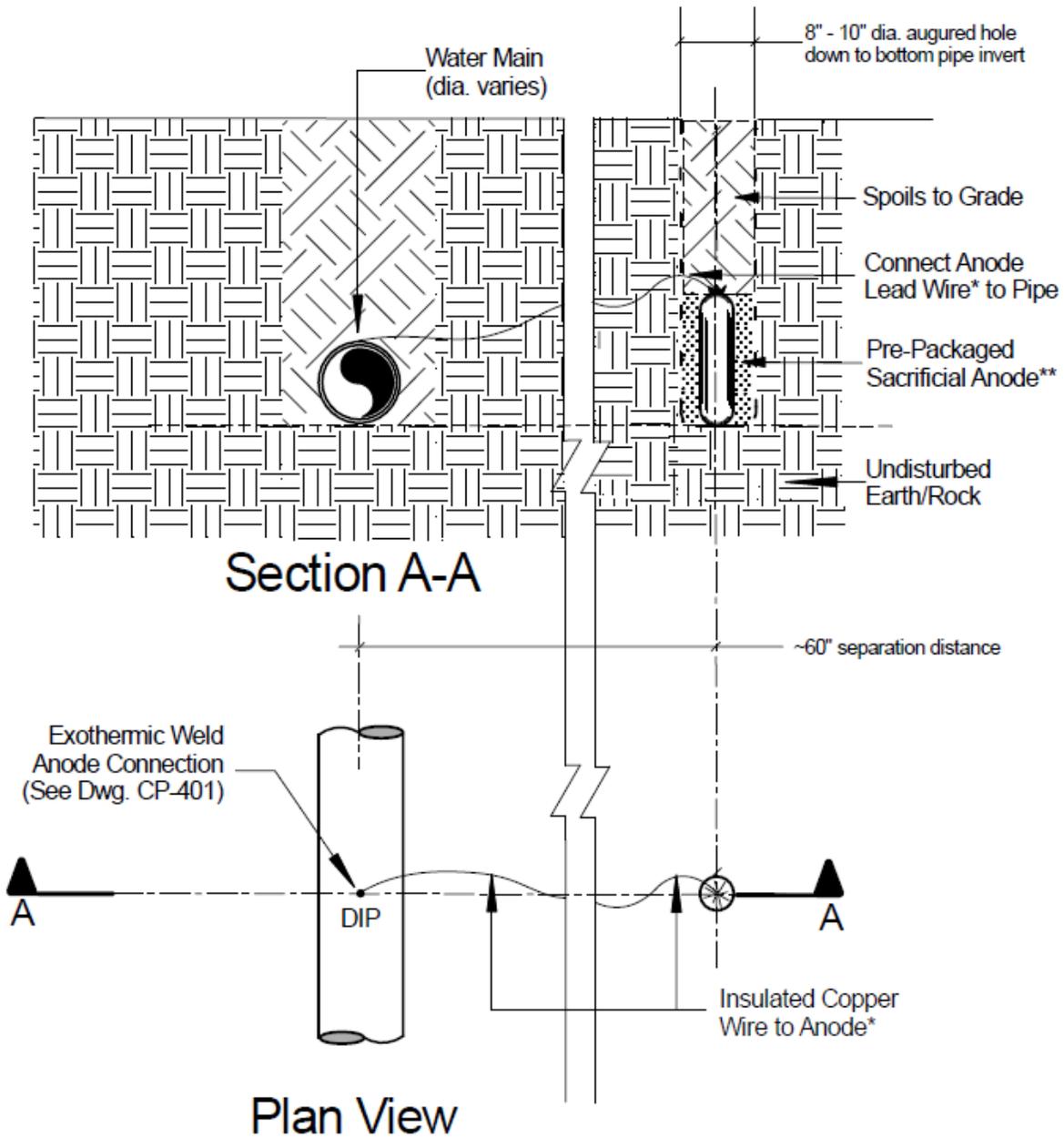
U. BASIS OF PAYMENT

All Cathodic Protection components installed per this Chapter, as shown on the plans or as directed, shall be paid for at the contract unit price bid per Lump Sum for CORROSION CONTROL SYSTEM. Such price shall be full compensation for all loading and unloading, hauling, excavation, installation, backfilling, labor, tools, materials, equipment and incidentals necessary to complete the Work in conformance with these Specifications and as accepted by the City's Project Manager.

DRAWING NO. CP-101
SINGLE HORIZONTAL ANODE INSTALLATION



DRAWING NO. CP-102
SINGLE VERTICAL ANODE INSTALLATION



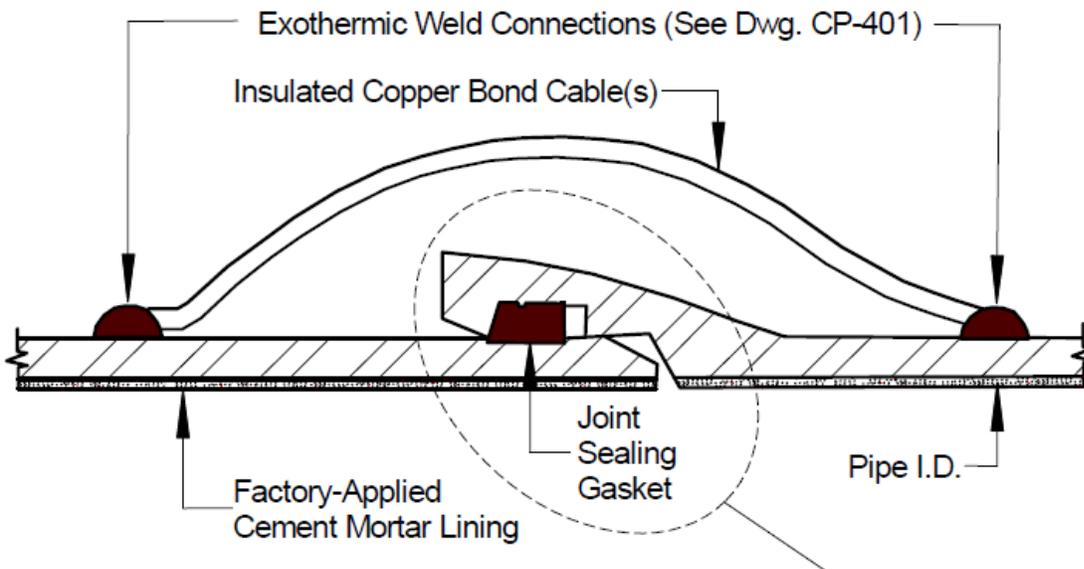
** Surrounded with Clay/Native Soil (no aggregate)
 * Protect anode wire by backfilling at min. 36" depth

DRAWING NO. CP-301
CONTINUITY BONDING ACROSS DUCTILE IRON PIPE JOINT

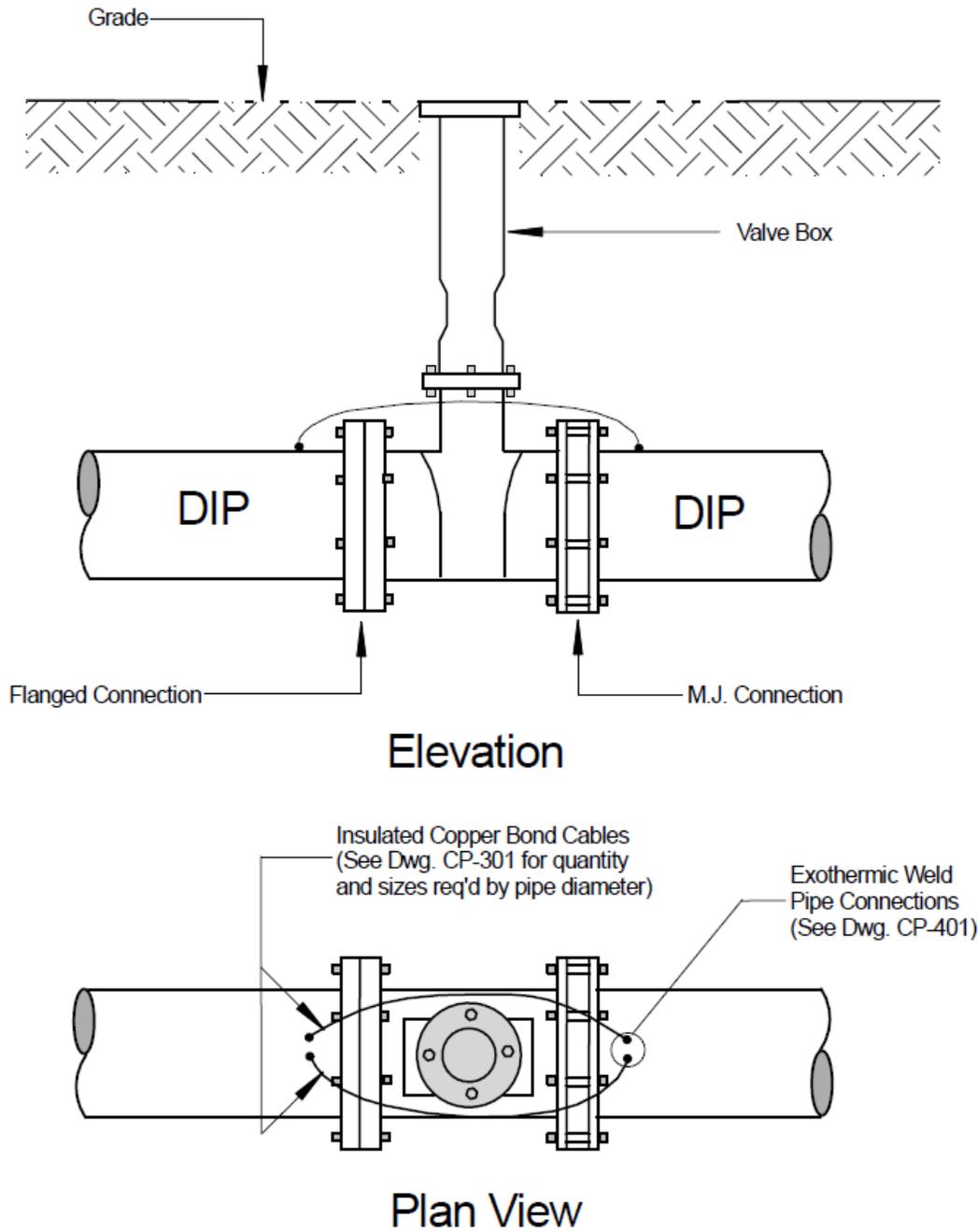
Pipe Joint Bonding Information	Pipe Dia. (in.)	Pipe Mat'l	Continuity Bond	
			Min. Cable Sizes	
			Qty.	AWG #
	> 24	DIP	3	2
	16 to 24	DIP	2	2
	10 to 14	DIP	2	4
	6 to 8	DIP	1	8

Refer to City of Lincoln Special Provisions for material and installation requirements

Note: Bonding across water main valves shall be as shown on CP-311 and CP-312

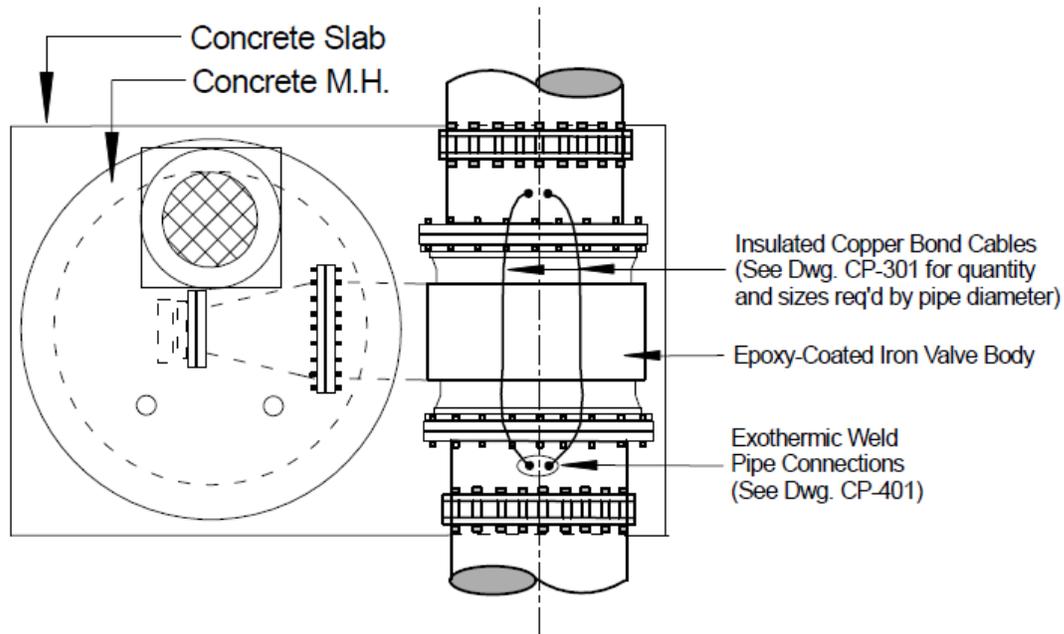


DRAWING NO. CP-311
CONTINUITY BONDING ACROSS VERTICAL GATE VALVE

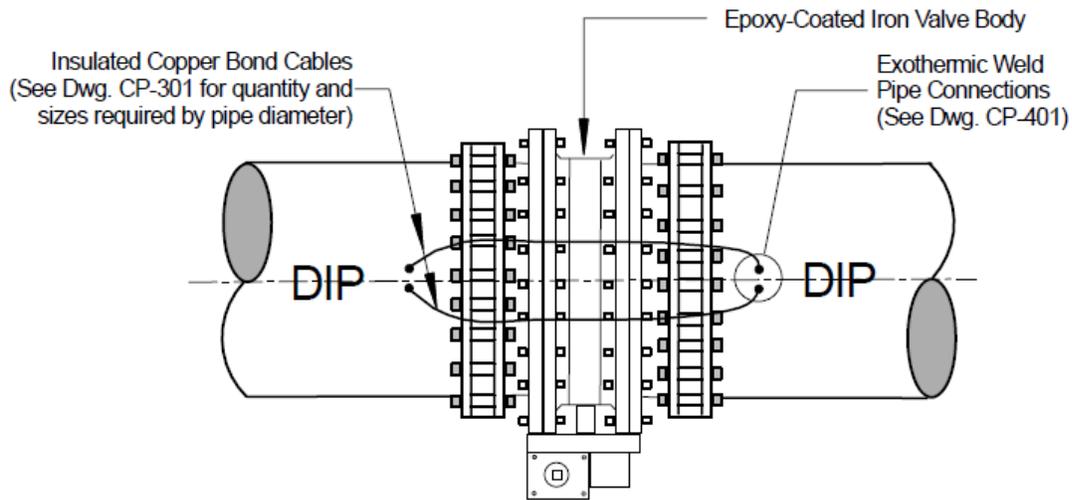


DRAWING NO. CP-312

CONTINUITY BONDING ACROSS BUTTERFLY VALVE OR HORIZONTAL GATE VALVE

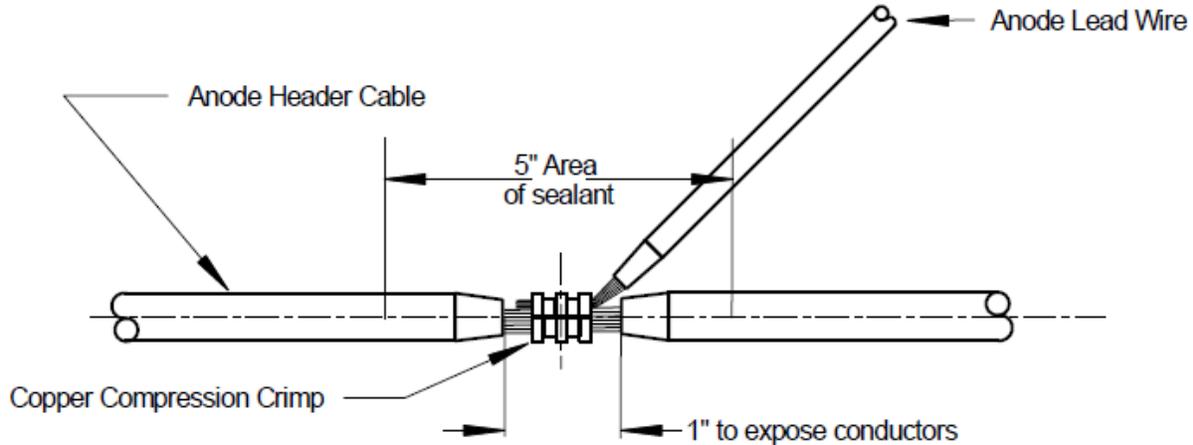


Plan View - Gate Valve



Plan View - Butterfly Valve

DRAWING NO. CP-321
INSULATING RUBBER & TAPE WYE SPLICE FOR SACRIFICIAL ANODE CABLE CONNECTIONS



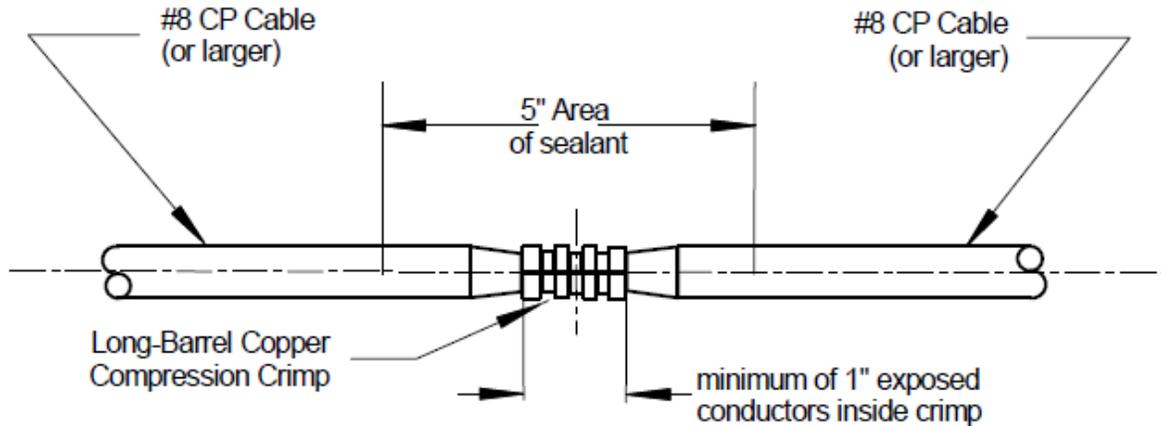
Crimp Splice Procedure

Remove approximately 1" of cable insulation to expose clean copper conductors. Join the conductors by inserting them equidistance into the compression connection sleeve. Crimp conductors firmly in place using a crimping tool that requires a complete crimp before the tool can be removed. A minimum of 2 equally-spaced crimp indents is required. Test the crimped connection by pulling on the cables.

Suggested Splice Sealing Procedure

Roughen the cable insulation 2" beyond the end of the exposed conductors. Ensure the entire surface over which the tape will be applied is clean using a lint-free cloth. Do not use solvents. Fill voids with insulating putty tape as required. Apply a high-voltage rubber tape half lapped over all bare conductors. Tape should be tensioned as recommended by the manufacturer. Half-lap tape to produce a uniform buildup to 1-1/2 times cable diameter over the body of the splice with ends tapered approximately 1 inch over the original jacket. Cover rubber tape with two layers of vinyl pressure-sensitive tape one-half lapped. Coat the entire tape wrap with a brush-applied electrical sealant.

DRAWING NO. CP-322
INSULATING RUBBER & TAPE BUTT SPLICE FOR SACRIFICIAL ANODE CABLE
CONNECTIONS



Note: "Splinting" the entire connection before burial to minimize wire stress is recommended.

Crimp Splice Procedure

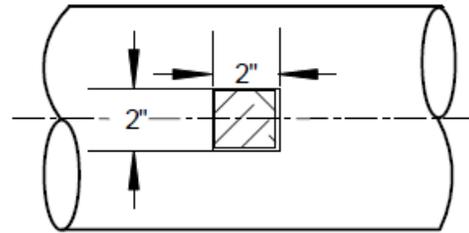
Remove at least 1" of cable insulation to expose clean copper conductors. Join the conductors by inserting them equidistance into the compression connection sleeve. Crimp conductors firmly in place using a crimping tool that requires a complete crimp before the tool can be removed. A minimum of 3 equally-spaced crimp indents is required. Test the crimped connection by pulling on the cables.

Suggested Splice Sealing Procedure

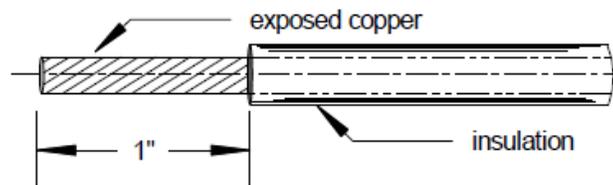
Roughen the cable insulation 2" beyond the end of the exposed conductors. Ensure the entire surface over which the tape will be applied is clean using a lint-free cloth. Do not use solvents. Fill voids with insulating putty tape as required. Apply a high-voltage rubber tape half lapped over all bare conductors. Tape should be tensioned as recommended by the manufacturer. Half-lap tape to produce a uniform buildup to 1-1/2 times cable diameter over the body of the splice with ends tapered approximately 1 inch over the original jacket. Cover rubber tape with two layers of vinyl pressure-sensitive tape one-half lapped. Coat the entire tape wrap with a brush-applied electrical sealant.

**DRAWING NO. CP-401
EXOTHERMIC WELD PROCEDURE FOR FERROUS PIPE MATERIALS
(HORIZONTAL ONLY)**

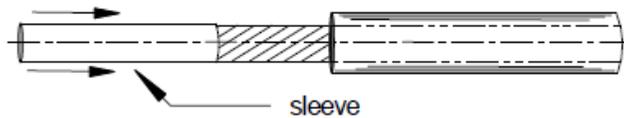
1. Clean a small square area at the top dead center of the pipe. Use a grinder or flat file to expose bright shiny metal.



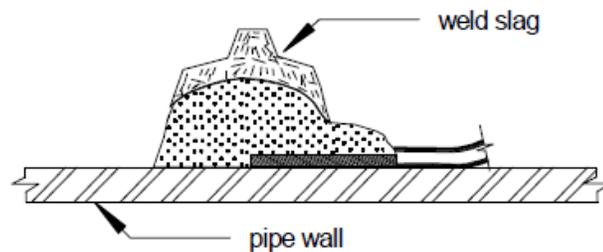
2. Strip off about 1" of insulation from stranded/solid copper wires or stranded copper cables.



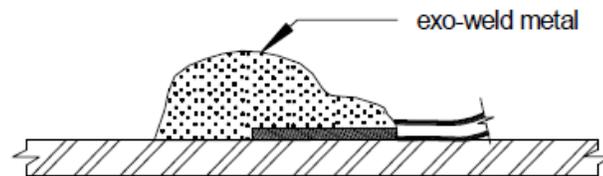
3. Slip on a copper weld sleeve to #10 AWG wire and smaller test wire and to #2 AWG or #4 AWG stranded copper bond cables.



4. Place the weld furnace directly over the copper wire or cable and while holding firmly in place, ignite flash powder with a flint igniter. After cooling, remove all slag from the top of the weld metal.

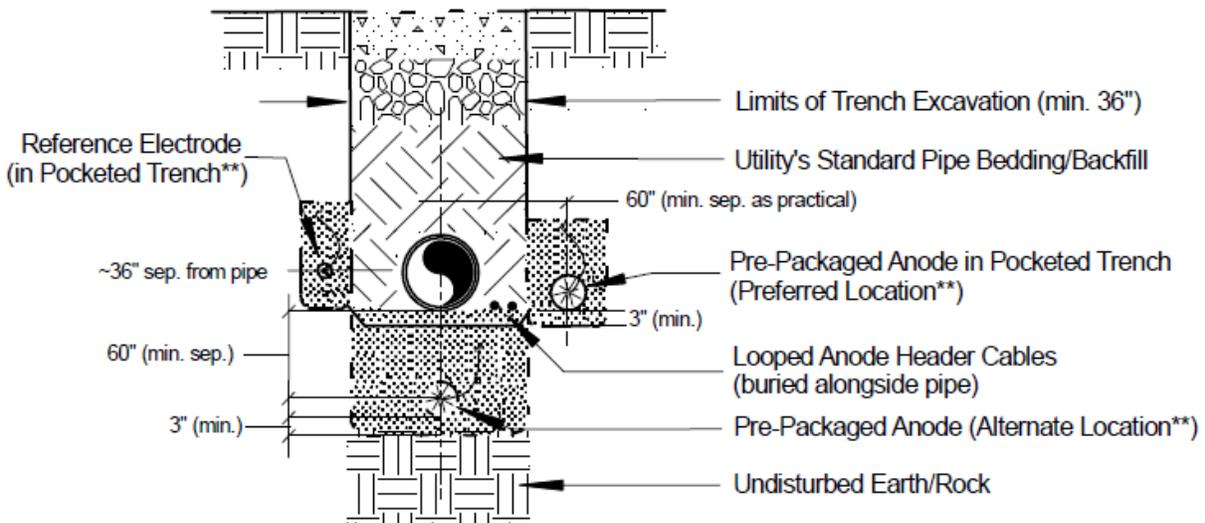


5. Apply cold-applied mastic/cap to cover all exposed copper and bare pipe metal prior to backfilling.

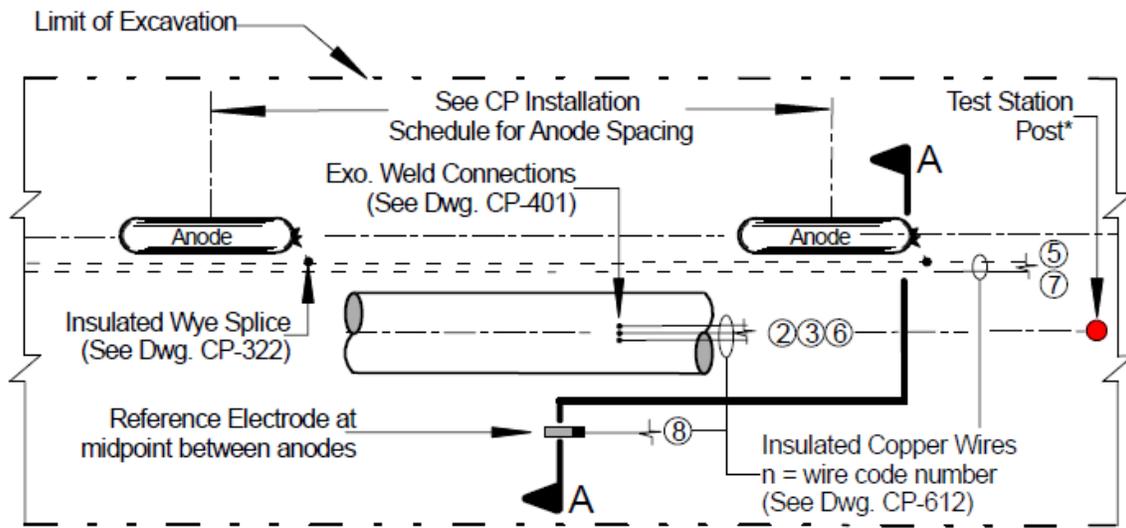


Do not use exothermic weld equipment if the graphite furnace is wet.
Follow manufacturer's specific instructions for storage, handling, and use.

DRAWING NO. CP-611
ANODE TEST STATION (ATS)



Section A-A

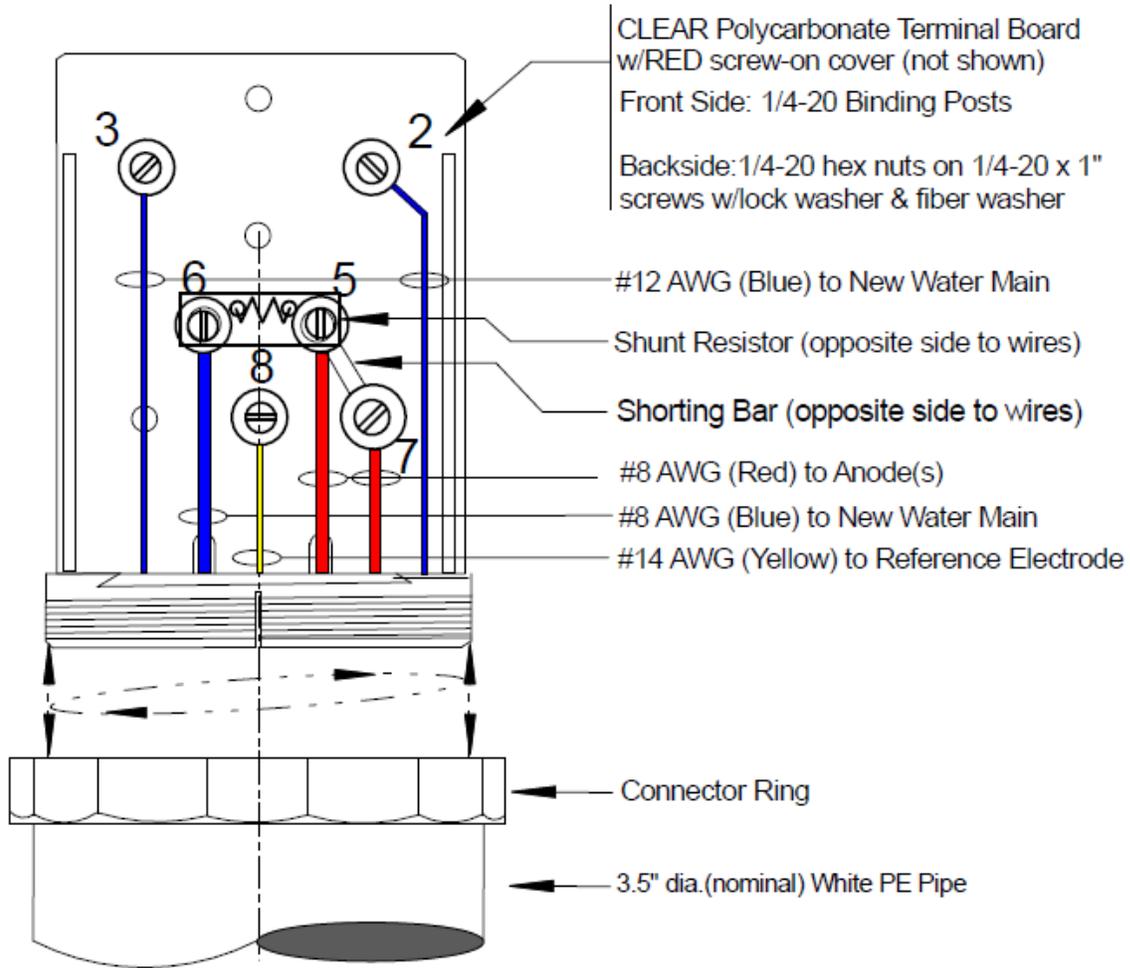


Plan View

**Backfilled with min. 12" Native Soil

* Install all test station types (specified as either post- or flush-type) within 35' of buried reference electrode

DRAWING NO. CP-612
ATS TERMINAL BOARD INSTALLATION DETAILS



Side 1: Wire and Cable Binding Post Connections

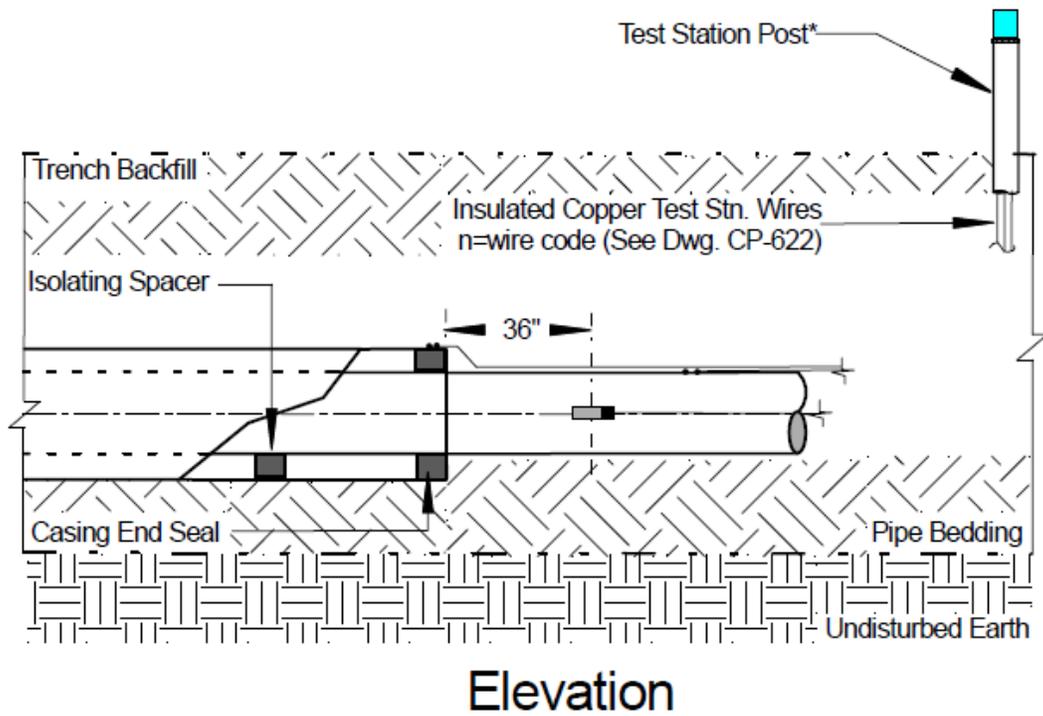


Side 2: Shunt & Shorting Bar Connections

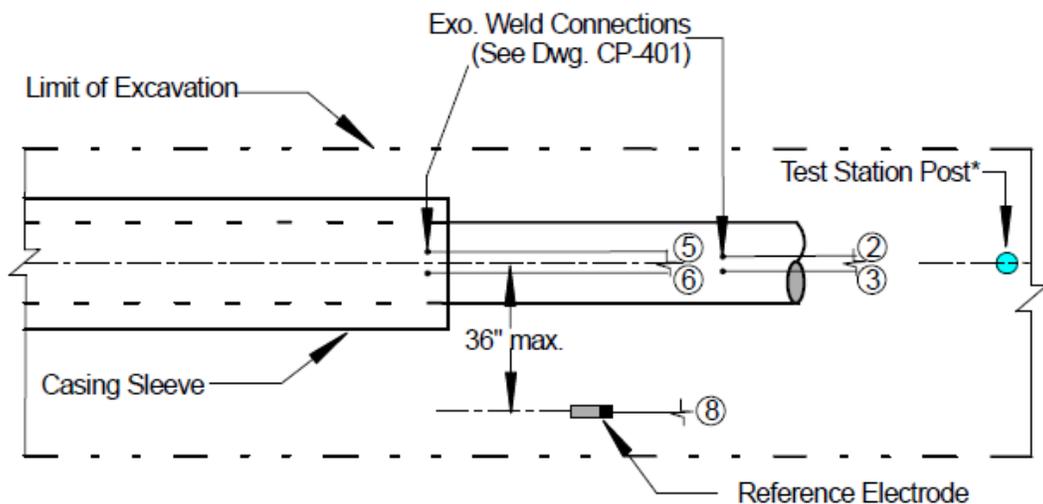


Terminal Board Cover Removed

DRAWING NO. CP-621
CASING TEST STATION (CTS)



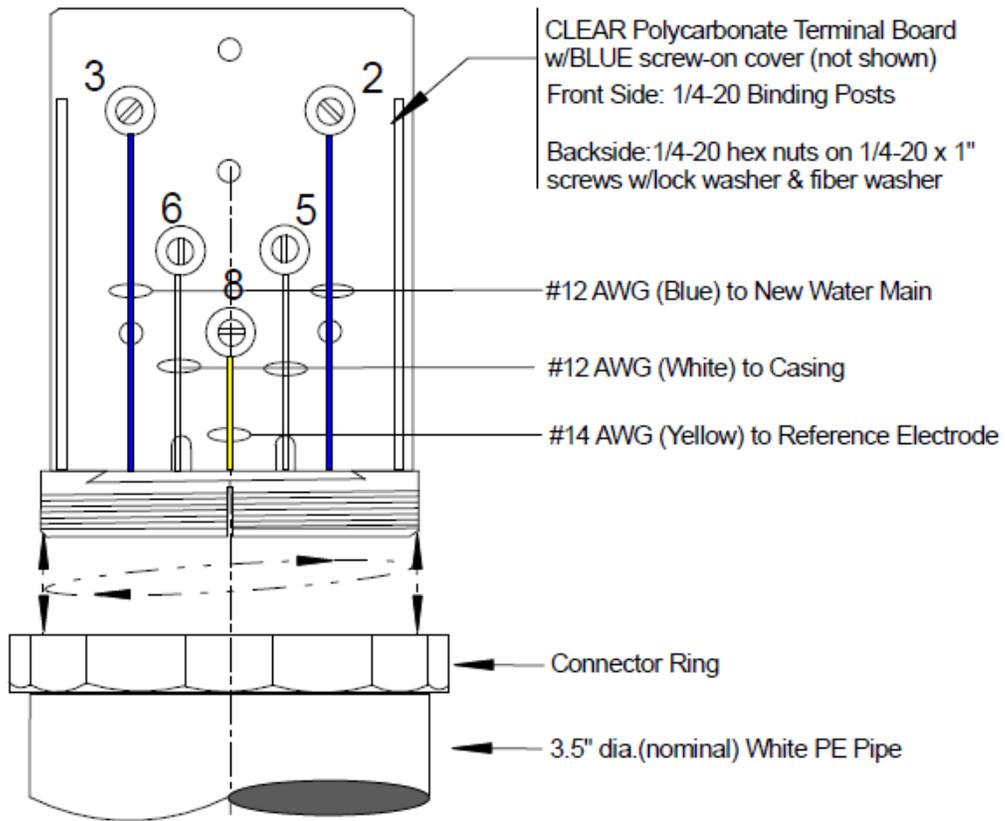
Elevation



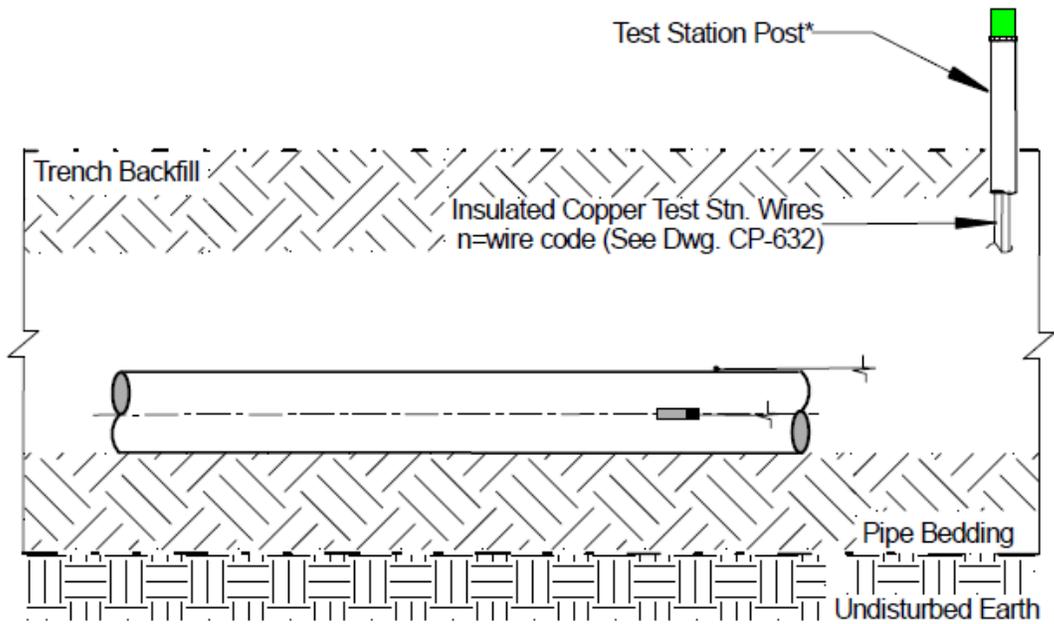
Plan View

* Install all test station types (specified as either post- or flush-type) within 35' of buried reference electrode

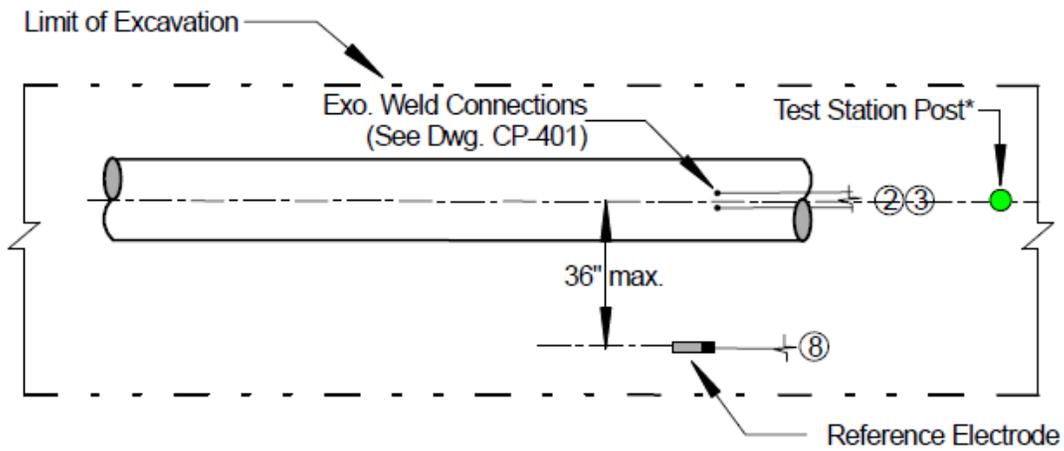
DRAWING NO. CP-622
CTS TERMINAL BOARD INSTALLATION DETAILS



**DRAWING NO. CP-631
POTENTIAL TEST STATION (PTS)**



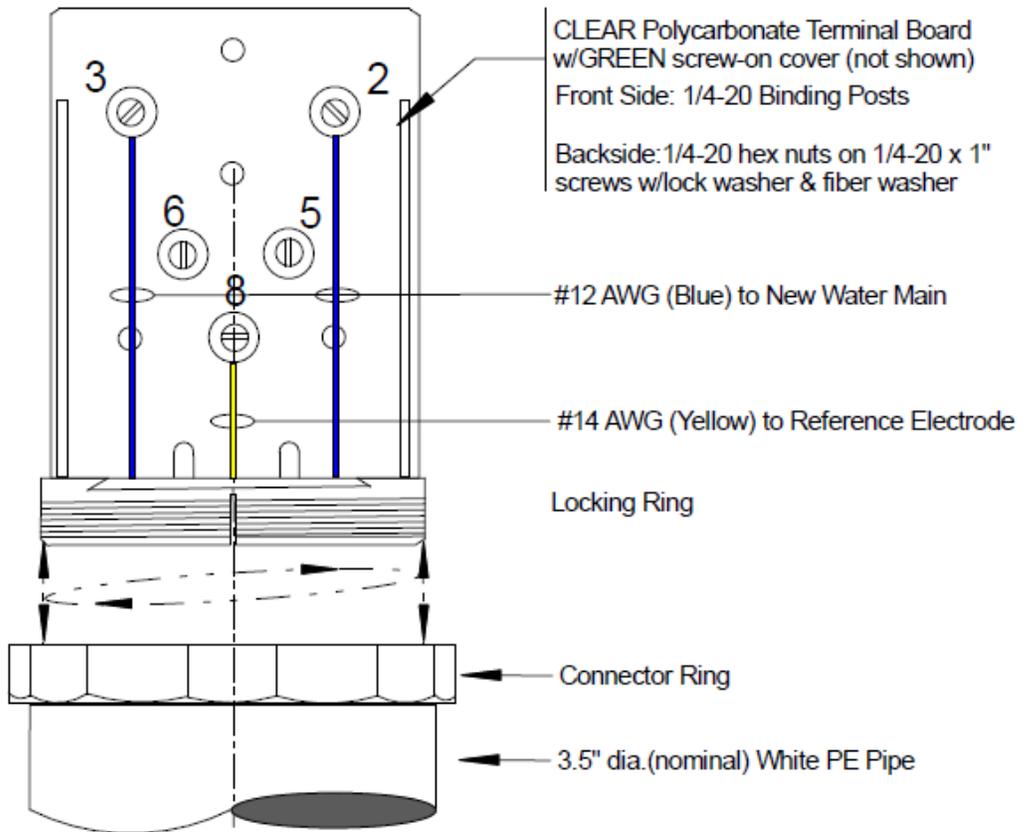
Elevation



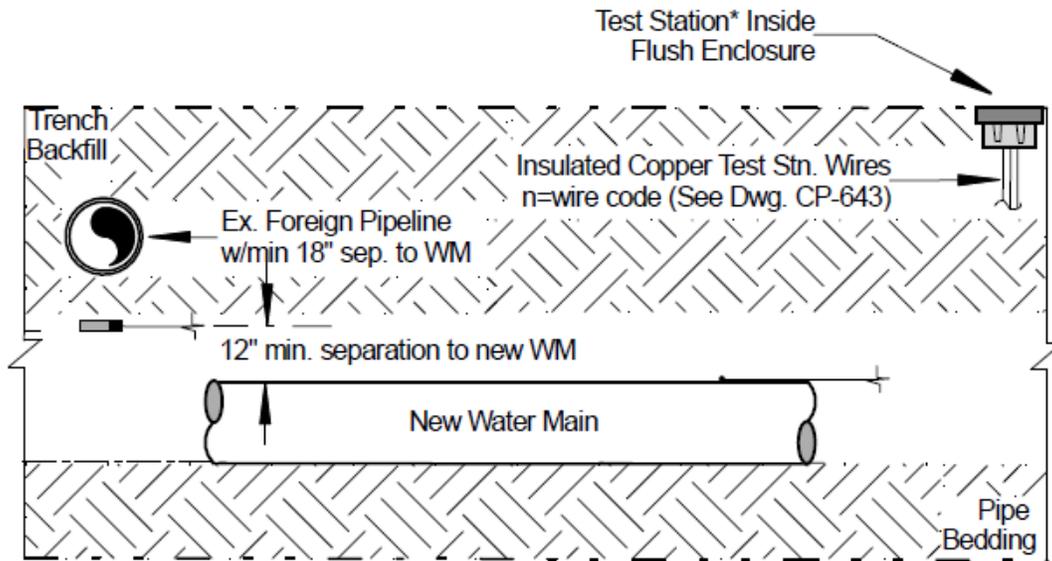
Plan View

* Install all test station types (specified as either post- or flush-type) within 35' of buried reference electrode

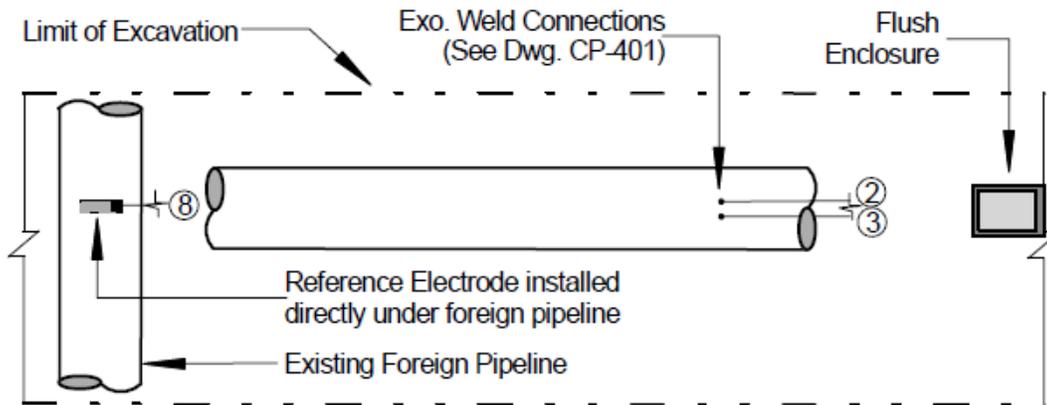
DRAWING NO. CP-632
PTS TERMINAL BOARD INSTALLATION DETAILS



DRAWING NO. CP-641
FOREIGN CROSSING (OVER WM) TEST STATION (FTS)



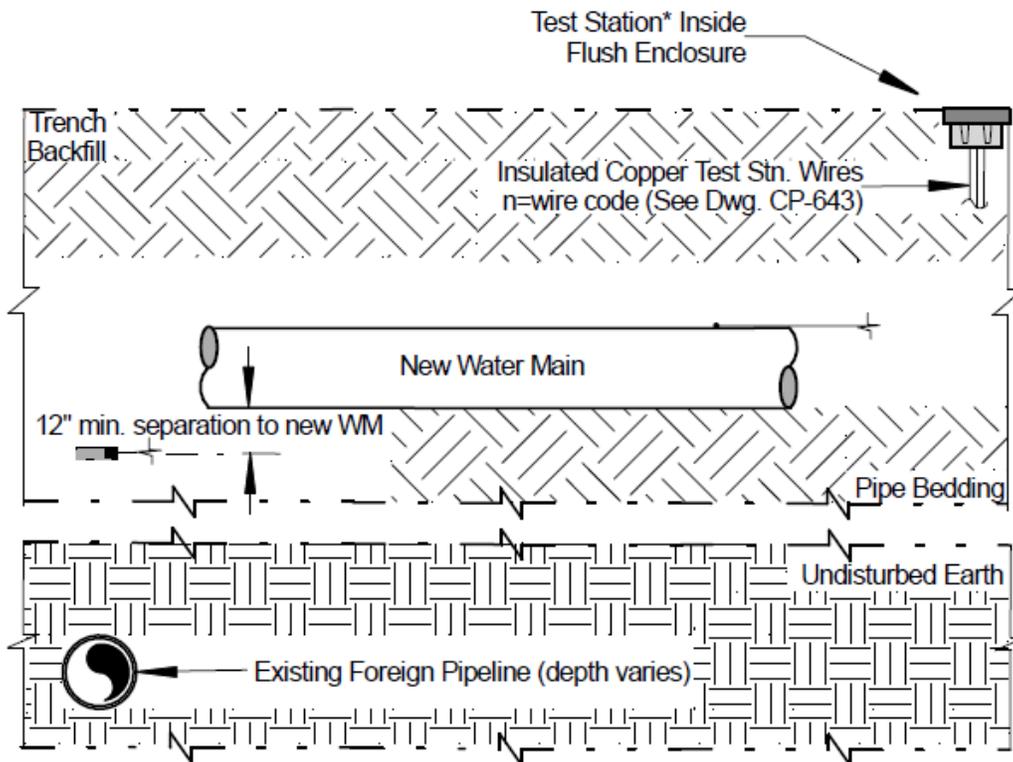
Elevation



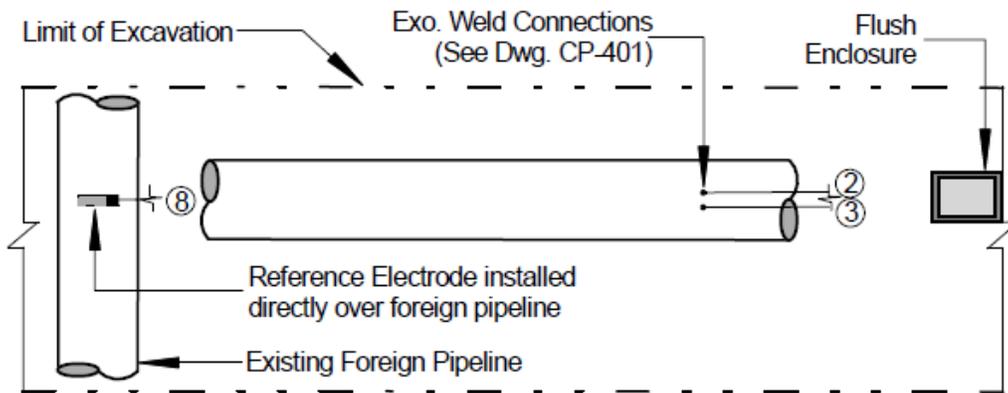
Plan View

* Install flush test station enclosure within 35' of buried reference electrode

DRAWING NO. CP-642
FOREIGN CROSSING (UNDER WM) TEST STATION (FTS)



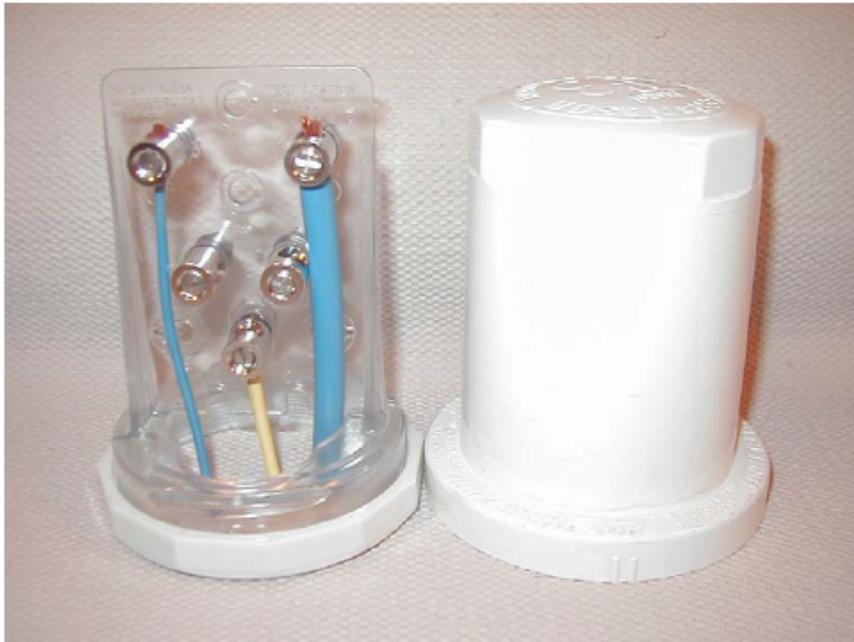
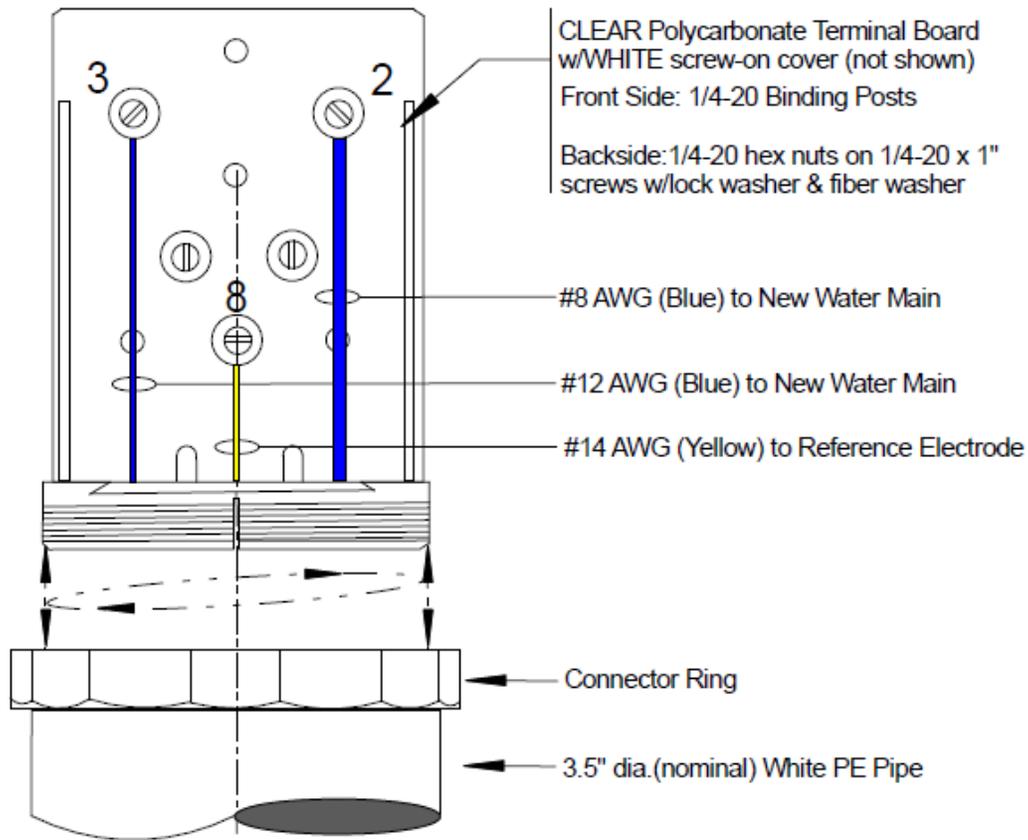
Elevation



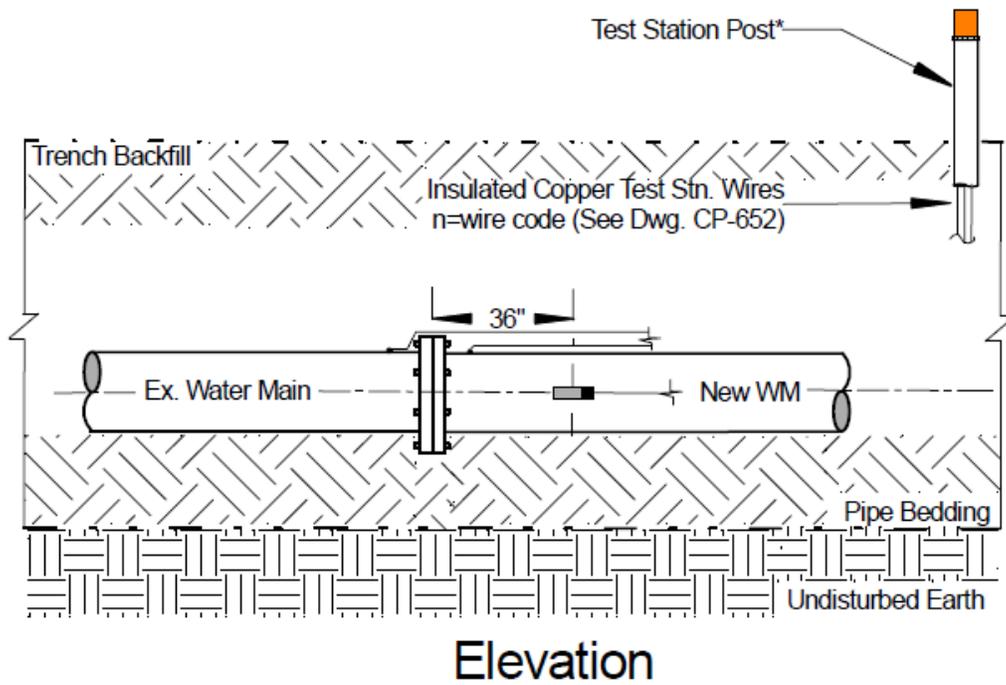
Plan View

* Install flush test station enclosure within 35' of buried reference electrode

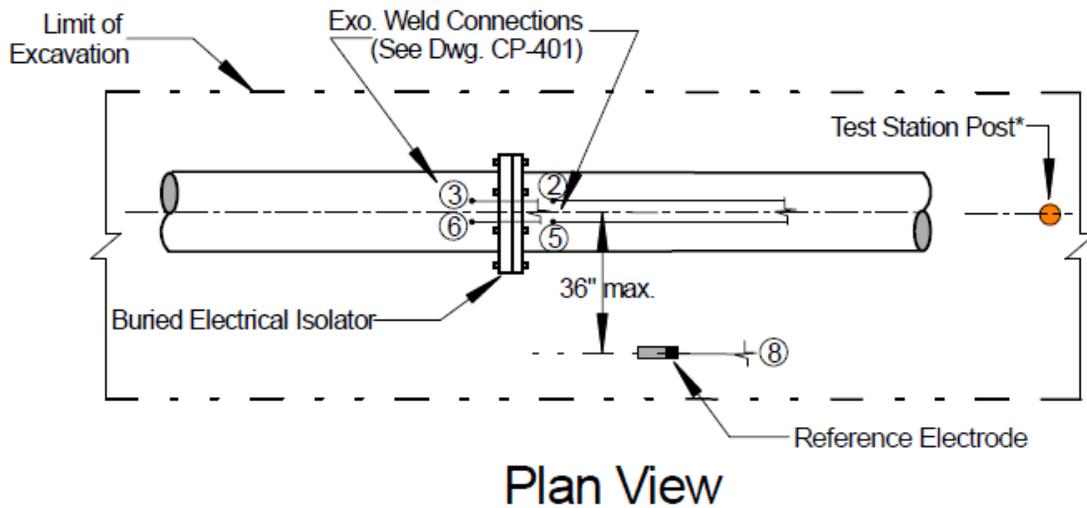
DRAWING NO. CP-643
FTS TERMINAL BOARD INSTALLATION DETAILS



**DRAWING NO. CP-651
ISOLATION TEST STATION (ITS)**



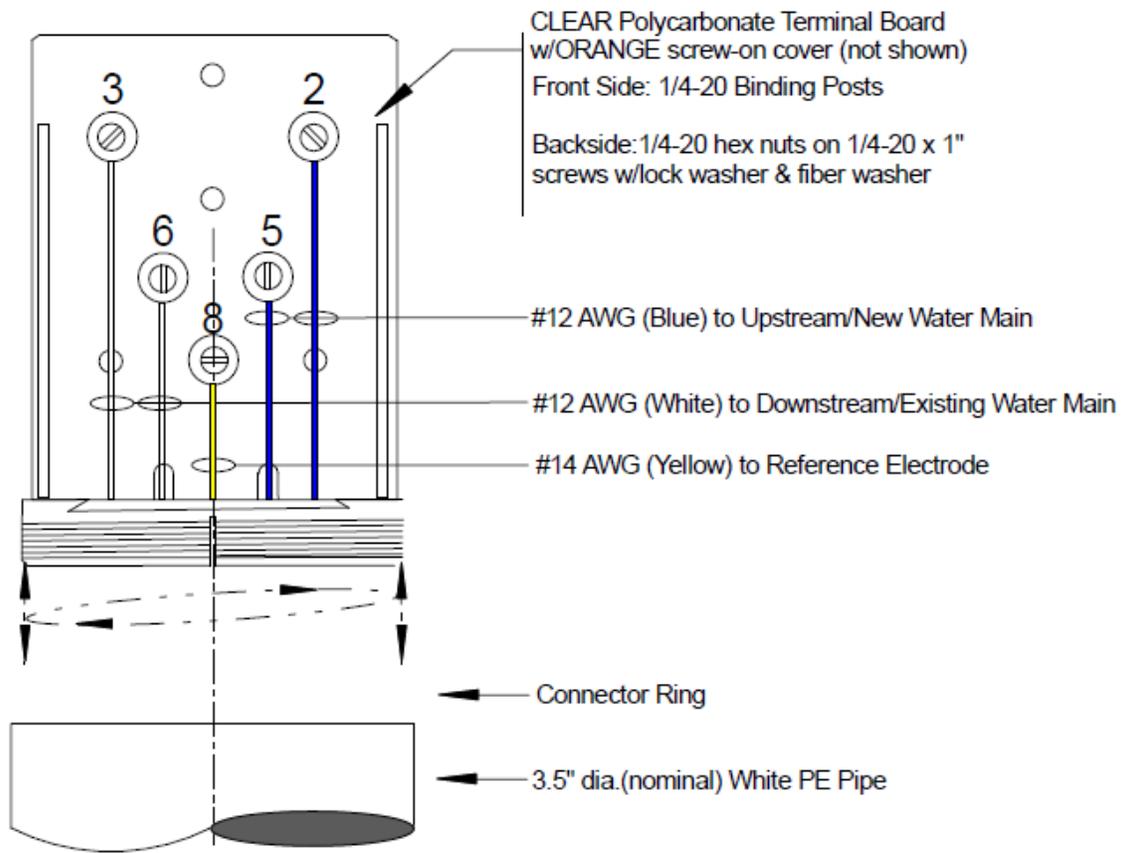
Elevation



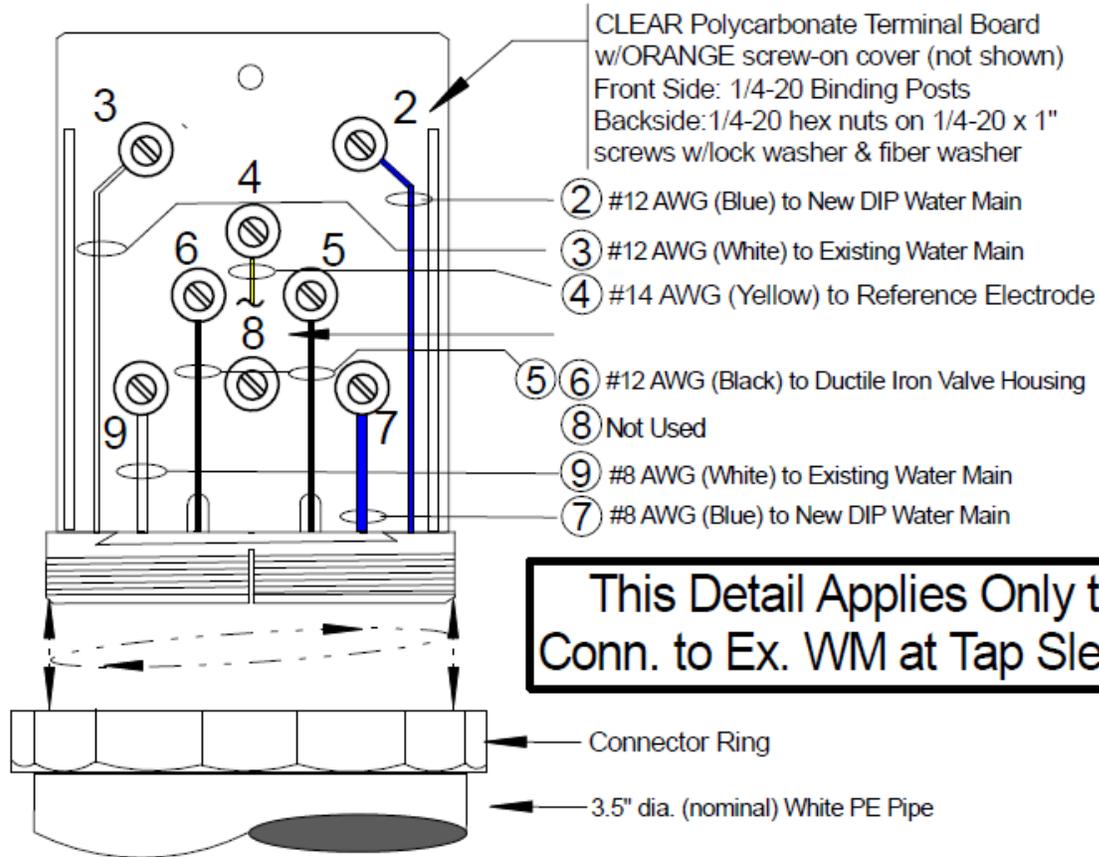
Plan View

* Install all test station types (specified as either post- or flush-type) within 35' of buried reference electrode

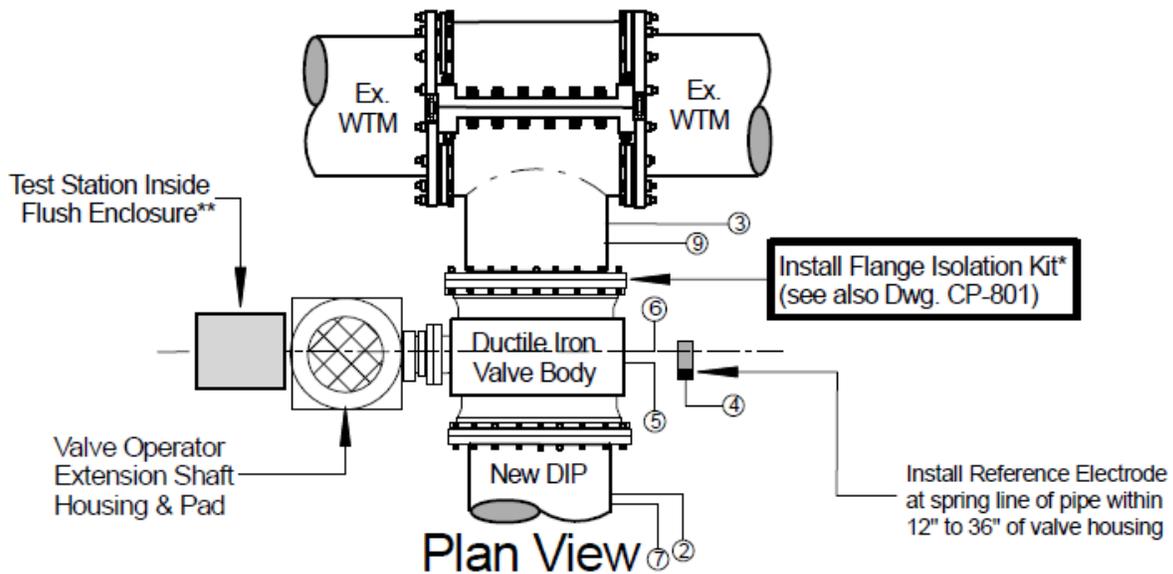
DRAWING NO. CP-652
ITS TERMINAL BOARD INSTALLATION DETAILS



DRAWING NO. CP-653
ISOLATION TEST STATION AT TAPPING SLEEVE (ITS-TAP)



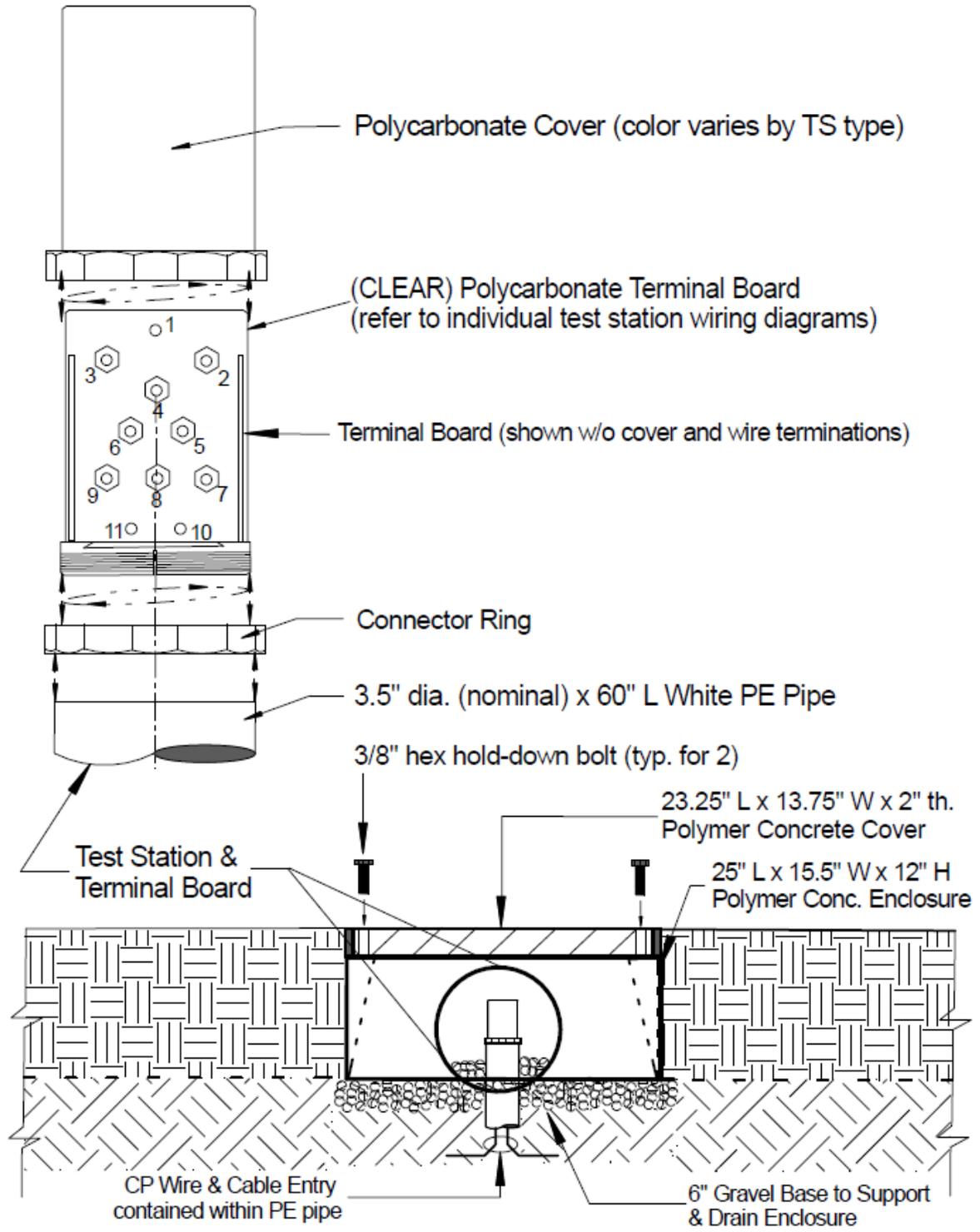
**This Detail Applies Only to
Conn. to Ex. WM at Tap Sleeve**



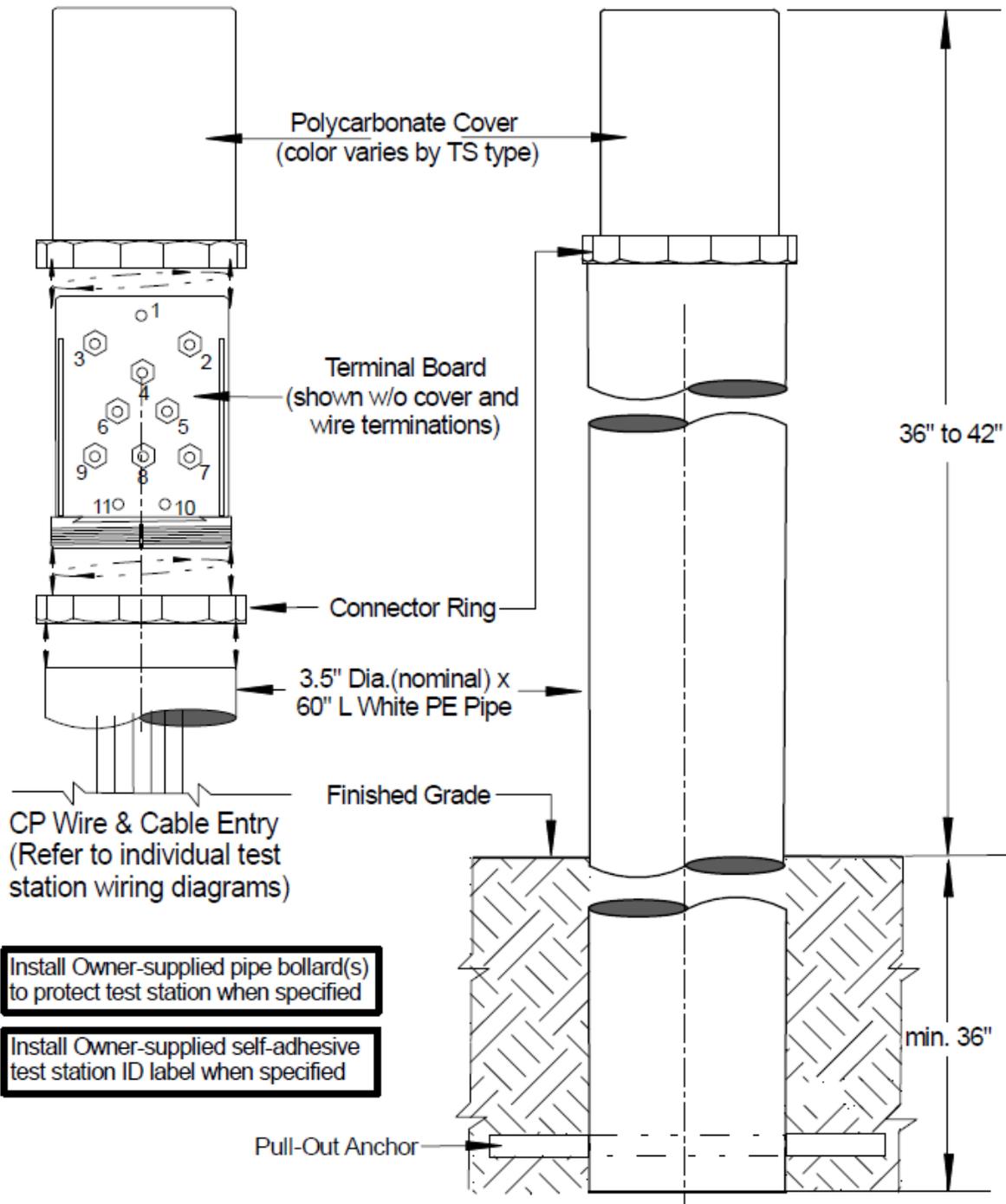
*FL-FL connection required at this point

**Install flush test station enclosure within 35' of buried reference electrode

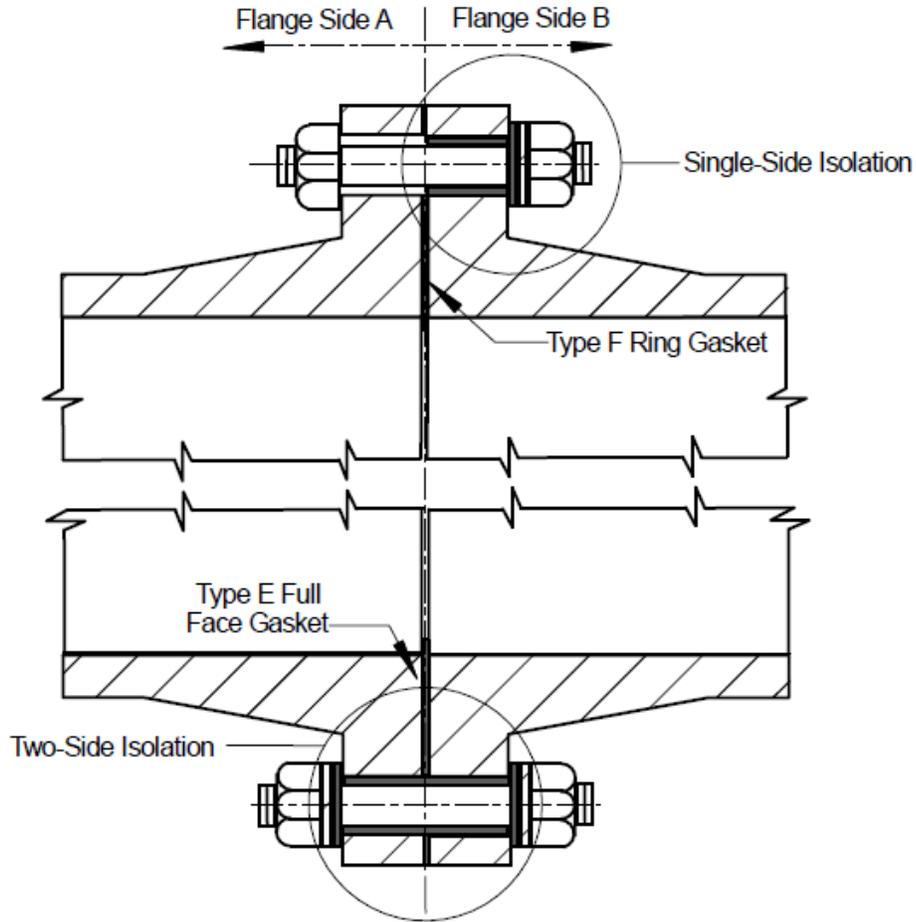
DRAWING NO. CP-691
FLUSH-MOUNTED ENCLOSURE FOR TEST STATION TERMINAL BOARD & WIRES



DRAWING NO. CP-692
POST-MOUNTED TEST STATION FOR TERMINAL BOARD & WIRES



**DRAWING NO. CP-801
FLANGE ISOLATION KIT (FIK)**

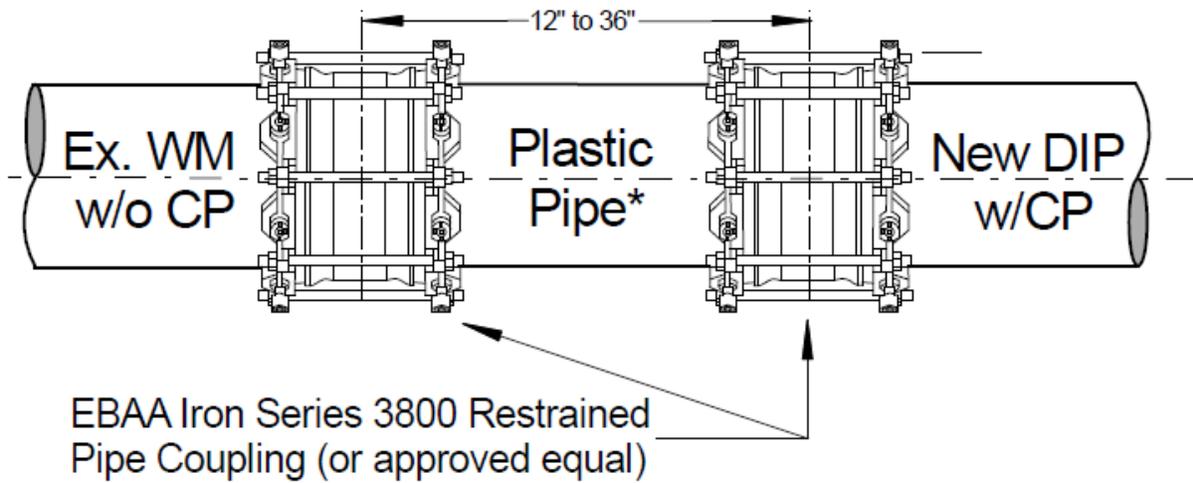


Note: ANSI-AWWA companion flanges are required. FIK cannot be installed on M.J. joints.

Required Information to Properly Size a Flange Isolation Kit

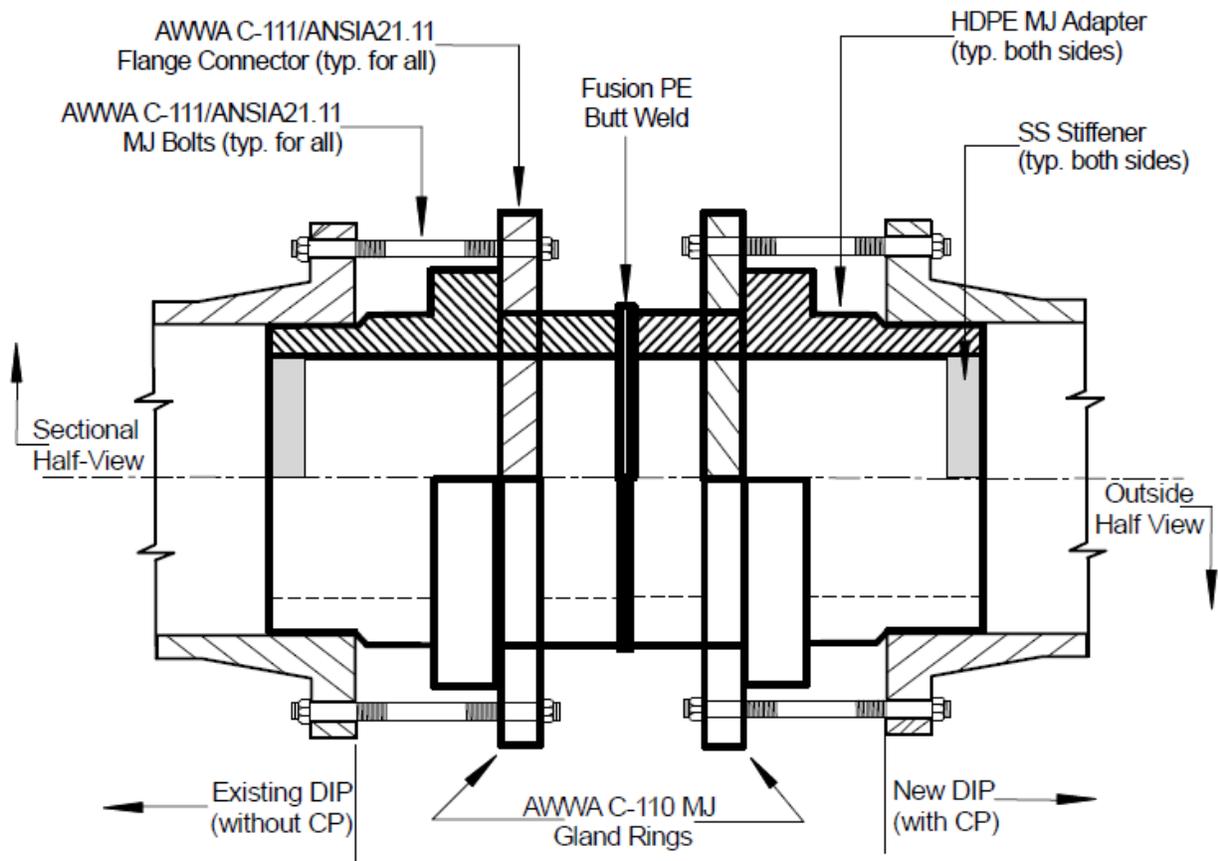
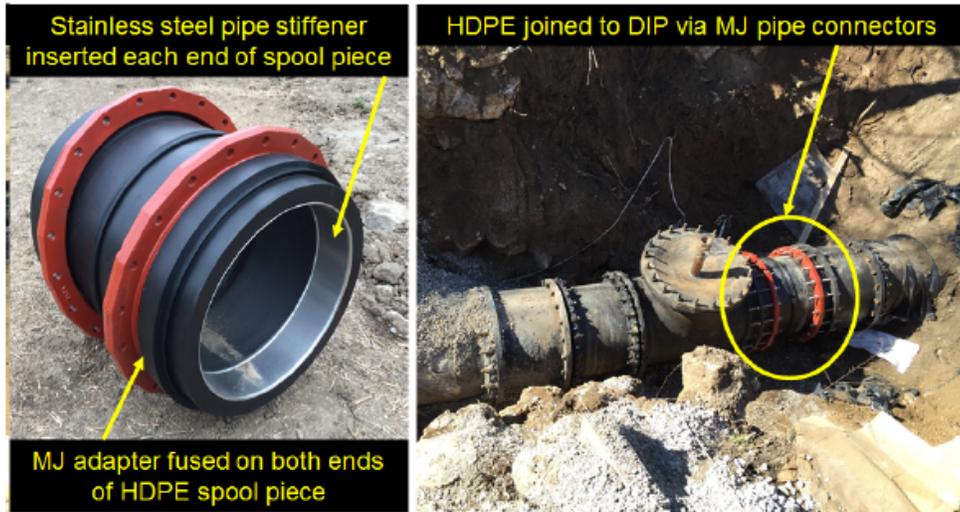
Flange Spec.	_____
Flange Size	_____
Flange Rating	_____
Flange O.D.	_____
Flange I.D.	_____
Bolt Circle Ø	_____
Qty. Bolt Holes	_____
Flange Bolt Ø	_____
Bolt Hole Ø	_____
Flange Thickness (A)	_____
Flange Thickness (B)	_____

DRAWING NO. CP-804
POLYVINYL CHLORIDE PIPE INSERT (PVPI)



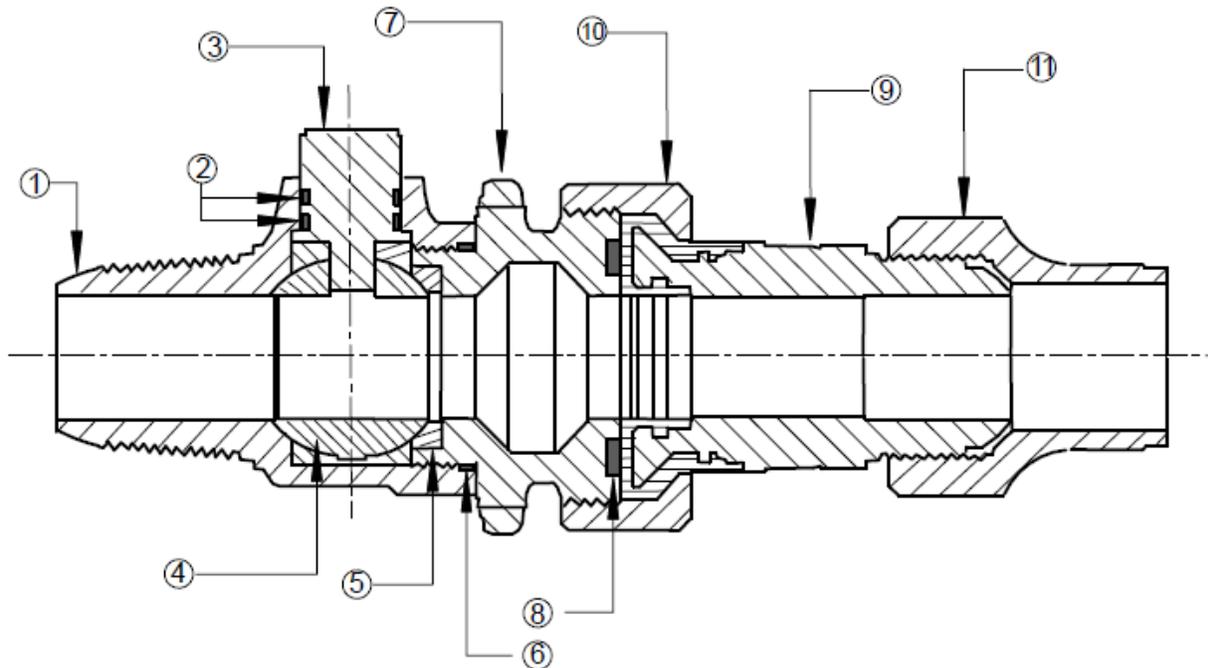
Nominal Pipe Size (in.)	PVC Pipe Specification*	
	C900 PVC	C905 PVC
Minimum	4	14
Maximum	12	24

DRAWING NO. CP-805
HIGH DENSITY POLYETHYLENE PIPE INSERT (HDPI)



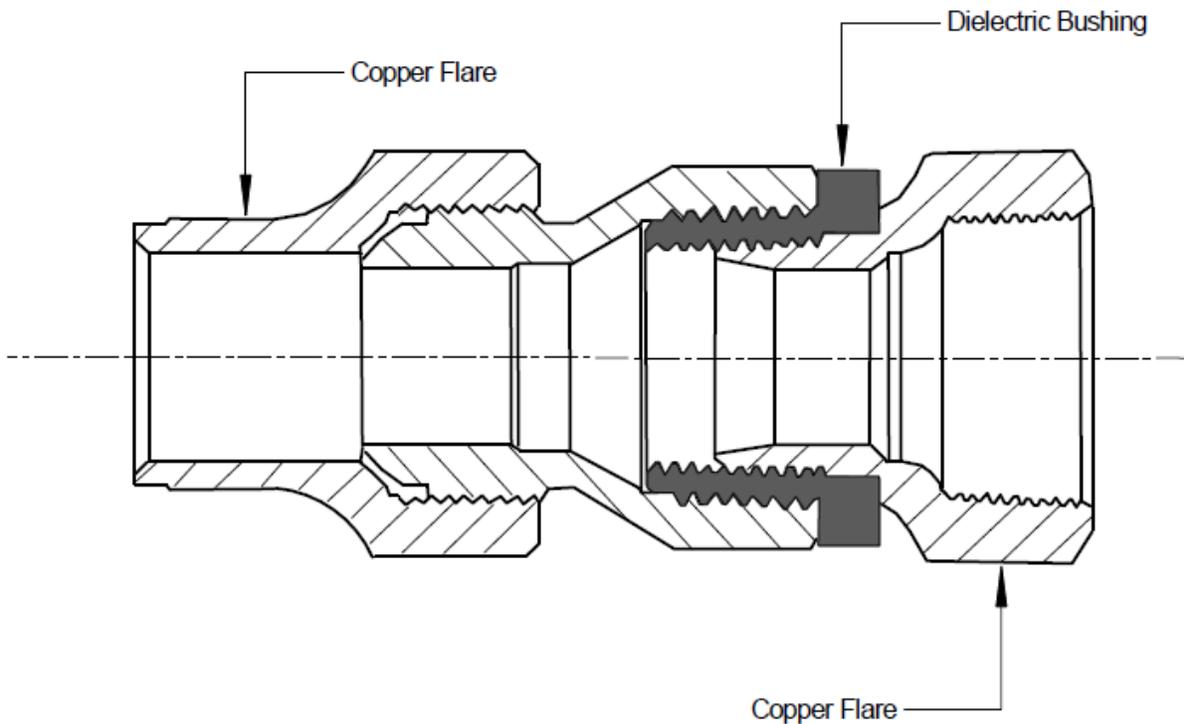
DRAWING NO. CP-806
ISOLATION (BALL TYPE) CORPORATION STOP (ICS)

COMPONENT LIST FOR BALL CORP VALVE LLB ASSEMBLY CC X CS				
MARK	DESCRIPTION	MATERIAL	ASTM	ALLOY or TYPE
1	BODY	BRASS	CAST LOW LEAD ALLOY	
2	D-RING	RUBBER	D-2000	EP
3	STEM	BRASS	CAST LOW LEAD ALLOY	
4	BALL	BRASS	CAST LOW LEAD ALLOY	
5	GASKET	RUBBER	D-2000	NITRILE
6	D-RING	RUBBER	D-2000	EP
7	END PIECE	BRASS	CAST LOW LEAD ALLOY	
8	D-RING	RUBBER	D-2000	NITRILE
9	INSULATED TAIL PC.	BRASS w/NYLON	CAST LOW LEAD ALLOY	
10	COUP. NUT	BRASS	B-62	ALLOY C83600
11	TUBE NUT	BRASS	B-62	ALLOY C83600
MUELLER MODEL N35000N SHOWN (other models are similar)				



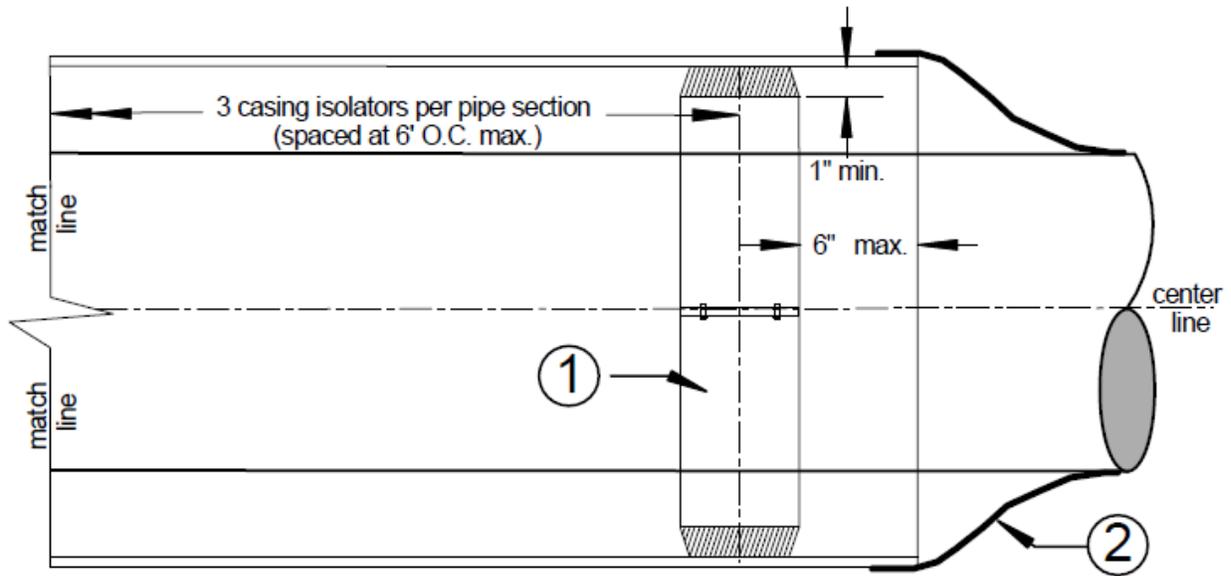
DRAWING NO. CP-807
ISOLATION SERVICE FITTING (COPPER FLARE) FOR ¼" TO 2" PIPE (ISF)

Follow the manufacturer's installation instructions.
Do NOT to tighten across the dielectric bushing.
NOTE: These fittings are NOT field serviceable.

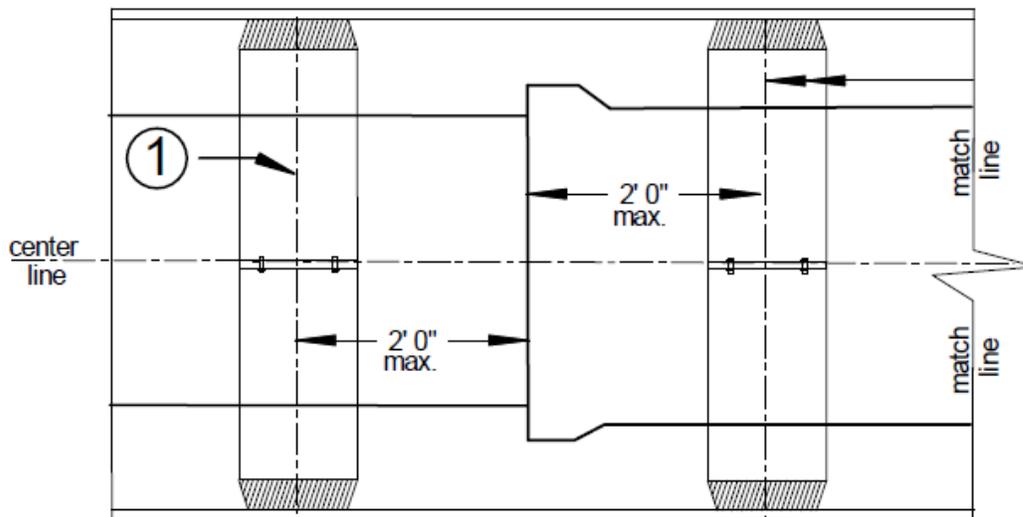


A.Y. McDonald Model 747-55DB Shown (other manufacturers' products are similar)

DRAWING NO. CP-808
ELECTRICAL ISOLATION DEVICES FOR METALLIC CASING SLEEVES



Casing Isolator and Casing End Seal

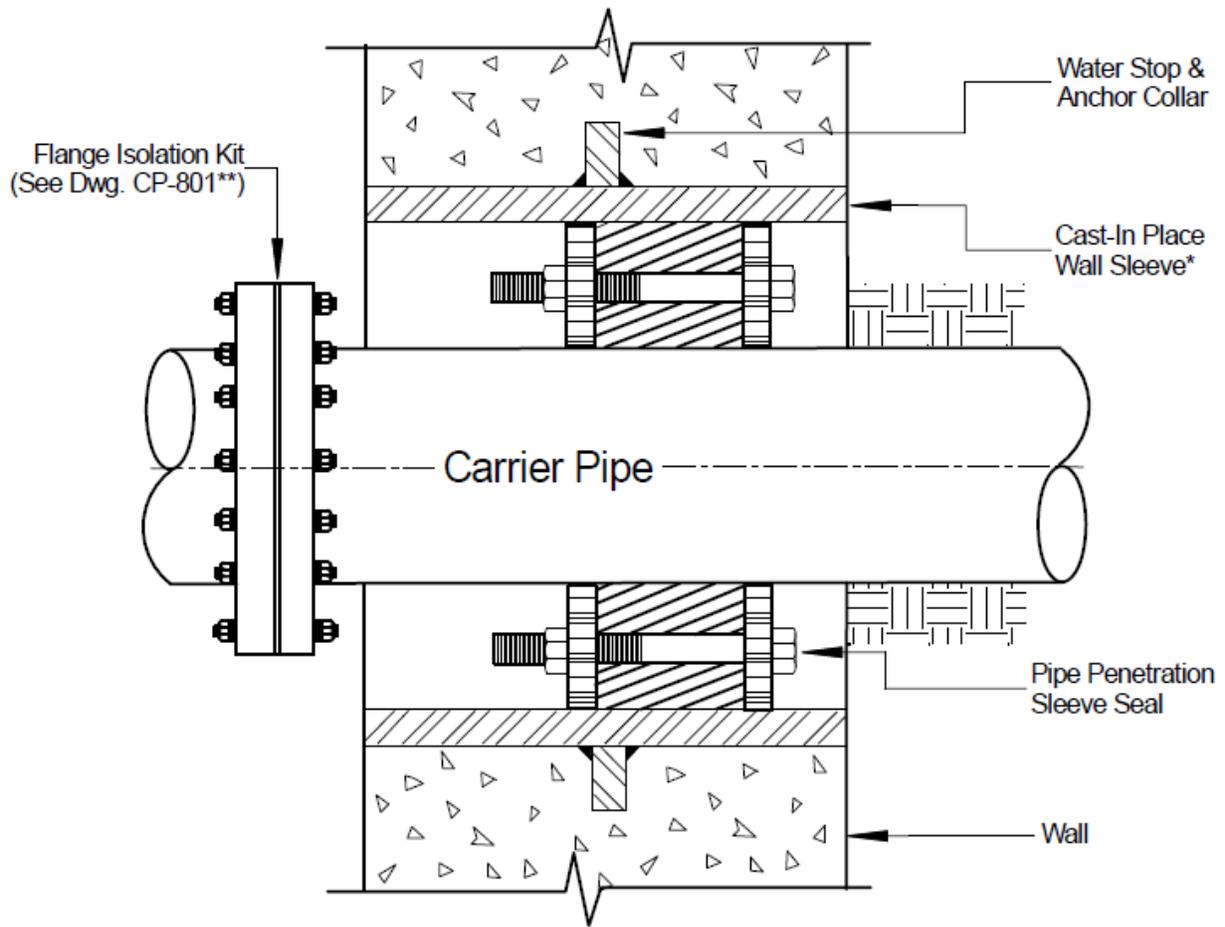


Casing Isolators Installed at Pipe Joint

- ① Stainless Steel Band Casing Isolator w/Dielectric Runners
- ② Wrap-Around Casing Boot End Seal (pipe not req'd to be centered)

Note: Ductile Iron Pipe is shown - casing isolators for welded steel pipe are similar

DRAWING NO. CP-809
ELECTRICAL ISOLATION AT PIPE ENTRY WITHIN REINFORCED CONCRETE WALL



- * Wall may be cored as an alternative to using wall sleeve
- ** Do not ground pipe between FIK and wall

This guidance document is advisory in nature but is binding on an agency until amended by such agency. A guidance document does not include internal procedural documents that only affect the internal operations of the agency and does not impose additional requirements or penalties on regulated parties or include confidential information or rules and regulations made in accordance with the Administrative Procedure Act. If you believe that this guidance document imposes additional requirements or penalties on regulated parties, you may request a review of the document.

Water Main and Sanitary/Storm Sewer Separations

The Department recognizes the challenges and difficulties in designing and installing distribution mains, especially in areas fraught with existing utilities. This guide is developed to assist design engineers with sewers and water main separation design and installation. In the design and installation of water mains, design engineers must strive to achieve the separation distances required for water mains and fire hydrants from sanitary sewer, storm sewer and other potential sources of contamination as per the Recommended Standards for Water Works, 2007 Edition (RSFWW). In cases where it is *impractical* to achieve those separations required in the RSFWW, the protocols provided in this document should be followed to be considered substantial conformance by the Department.

I. Sanitary Sewer and Water Main Separations

A. Sanitary sewer and water main horizontal separations for parallel installations.

1. Scenario 1
 - a. A 10-foot radial separation is considered equivalent to the 10-foot horizontal separation requirement if the water main is above the sanitary sewer and not within 5 feet horizontally.
2. Scenario 2
 - a. If the horizontal separation is **greater than 8 feet but less than 10 feet**, the installation would be acceptable if the following is provided:
 - i. Engineer's professional opinion that the water quality in the water main will not be impacted based on an evaluation of the proposed installation and soil conditions; **and**
 - ii. Reasons are provided as to why it is not practical to provide the 10 feet of separation.
3. Scenario 3
 - a. If the horizontal separation is **greater than 4 feet but less than 8 feet**, the installation would be acceptable if the following is provided:
 - i. Engineer's professional opinion that the water quality in the water main will not be impacted based on an evaluation of the proposed installation and soil conditions;
 - ii. Reasons are provided as to why at least 8 feet of separation cannot be provided; **and**
 - iii. The water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer **or**
 - iv. The engineer may encase either the water or sewer pipe for protection (rigid welded piping or cement/concrete-at least 4 to 6 inches thick etc.) at locations where the separation cannot be met **or**
 - v. The sewer pipe needs to be water works grade 150 psi pressure rated pipe meeting AWWA Standards and pressure tested to ensure water tightness **or**
 - vi. An alternate method of protection with approval from the Department prior to construction.

4. Scenario 4

- a. If the horizontal separation is less than 4 feet, **written approval from the Department is required prior to installation.**

B. Sanitary sewer and water main vertical separations at crossings.

1. Scenario 1

- a. If the water main is above the sanitary sewer pipe and the vertical separation is greater than 12 inches but less than 18 inches, the installation would be acceptable if the following is provided:
- i. Engineer's professional opinion that the water quality in the water main will not be impacted based on an evaluation of the proposed installation and soil conditions;
 - ii. Reasons are provided as to why the 18-inch separation cannot be met; **and**
 - iii. One full length of water pipe needs to be located so that both joints will be as far from the sanitary sewer crossing as possible.

2. Scenario 2

- a. If the water main is above the sanitary sewer pipe and the vertical separation is greater than 6 inches but less than 12 inches, the installation would be acceptable if the following is provided:
- i. Engineer's professional opinion that the water quality in the water main will not be impacted based on an evaluation of the proposed installation and soil conditions;
 - ii. Reasons are provided as to why at least 12 inches separation cannot be met;
 - iii. One full length of water pipe needs to be located so that both joints will be as far from the sanitary sewer crossing as possible;
 - iv. Proper support is provided to prevent settlement and breaking pipe; **and**
 - v. The engineer may encase either the water or sewer pipe for protection (rigid welded piping or cement/concrete-at least 4 to 6 inches thick etc.) for at least 12 feet on each side of the crossing with the ends sealed **or**
 - vi. The sewer pipe needs to be water works grade 150 psi pressure rated pipe meeting AWWA Standards and be pressure tested to ensure water tightness **or**
 - vii. An alternate method of protection with approval from the Department prior to construction.

3. Scenario 3

- a. If the water main is below the sanitary sewer, and the vertical separation is greater than 6 inches but less than 18 inches, the installation would be acceptable if the following is provided:
- i. Engineer's professional opinion that the water quality in the water main will not be impacted based on an evaluation of the proposed installation and soil conditions;
 - ii. Reasons are provided as to why at least 18 inches separation cannot be met;
 - iii. One full length of water pipe needs to be located so that both joints will be as far from the sanitary sewer crossing as possible;
 - iv. Proper support is provided to prevent settlement and breaking pipe; **and**
 - v. The engineer may encase either the water or sewer pipe for protection (rigid welded piping or cement/concrete-at least 4 to 6 inches thick etc.) for at least 12 feet on each side of the crossing with the ends sealed **or**
 - vi. The sewer pipe needs to be water works grade 150 psi pressure rated pipe meeting AWWA Standards and be pressure tested to ensure water tightness **or**
An alternate method of protection with approval from the Department prior to construction.

4. Scenario 4

- a. If the vertical separation between the sewer line and the water main will be less than 6 inches, **written approval from the Department is required prior to installation.**

II. Storm Sewer and Water Main Separations

In general, the pollution hazards from a storm sewer are not as significant as a sanitary sewer since the storm sewer does not have flow in it year-round. However, during rainstorm events, it may carry surface runoff which contains chemical pollutants, but the pathogenic microbial impact is likely to be less than that of a sanitary sewer. For storm sewer and water main separation, the protocols provided in Sections II.A and II.B must be followed.

A. Storm sewer and water main horizontal separations for parallel installations.

1. Scenario 1

- a. If the horizontal separation is **greater than 4 feet but less than 10 feet**, the installation would be acceptable if the following is provided:
 - i. Engineer's professional opinion that the water quality in the water main will not be impacted based on an evaluation of the proposed installation and soil conditions;
 - ii. Reasons are provided as to why the 10 feet of separation cannot be met; **and if necessary,**
 - iii. Additional protection deemed necessary by the design engineer.

2. Scenario 2

- a. If the horizontal separation **will be less than 4 feet, written approval from the Department is required prior to installation.**

B. Storm sewer and water main vertical separations at crossings.

1. Scenario 1

- a. If the water main **is above** the storm sewer pipe and the vertical separation is **greater than 6 inches but less than 18 inches**, the installation would be acceptable if the following is provided:
 - i. Engineer's professional opinion that the water quality in the water main will not be impacted based on an evaluation of the proposed installation and soil conditions;
 - ii. Reasons are provided as to why the 18-inch separation cannot be met; **and**
 - iii. One full length of water pipe needs to be located so that both joints will be as far from the storm sewer crossing as possible - preference shall be given to keep joints further from any sanitary sewer than a storm sewer.

2. Scenario 2

- a. If the water main **is below** the storm sewer pipe and the vertical separation is **greater than 6 inches but less than 18 inches**, the installation would be acceptable if the following is provided:
 - i. Engineer's professional opinion that the water quality in the water main will not be impacted based on an evaluation of the proposed installation and soil conditions;
 - ii. Reasons are provided as to why the 18-inch separation cannot be met;
 - iii. One full length of water pipe needs to be located so that both joints will be as far from the storm sewer crossing as possible - preference shall be given to keep joints further from any sanitary sewer than a storm sewer;
 - iv. Proper support is provided to prevent settlement and breaking pipe; **and**
 - v. The engineer may encase either the water or sewer pipe for protection (rigid welded piping or cement/concrete-at least 4 to 6 inches thick etc.) for at least 12 feet on each side of the crossing with the ends sealed **or**
 - vi. The sewer pipe needs to be water works grade 150 psi pressure rated pipe meeting AWWA Standards and be pressure tested to ensure water tightness (the storm sewer pipe needs be watertight when pressure tested to at least 10 psi test pressure) **or**
 - vii. An alternate method of protection with approval from the Department prior to construction.

3. Scenario 3

- a. If the vertical separation between the storm sewer and the water main **will be less than 6 inches, written approval from the Department is required prior to installation.**

III. Force Main Separations

At least **10 feet of horizontal separation** between water mains and sanitary sewer force mains must be provided. There must be at least **18 inches of vertical separation** at crossings between water mains and force mains and one full length of water pipe shall be located so both joints will be as far from the sewer as possible at the crossing. **Where it is impossible to meet these separation requirements for force mains, the installation must not proceed prior to consulting and obtaining written approval from the Department.**

IV. Fire Hydrants Separations

A. Fire Hydrants and Sanitary Sewer Separations

1. Hydrant drains must not be connected to or located within **10 feet of sanitary sewers. Where it is impossible to provide 10 feet of horizontal separation between sanitary sewer and fire hydrant drains, written approval from the Department is required prior to installation.**

B. Fire Hydrants and Storm Sewer Separations

1. Where it is impractical to meet the 10-foot horizontal separation requirement for storm sewer and hydrant drains, less than 10 feet of horizontal separation would be acceptable if the following is provided:
 - a. Engineer's professional opinion that the water quality in the water main will not be impacted based on an evaluation of the proposed installation and soil conditions;
 - b. Reasons are provided as to why the 10 feet of horizontal separation cannot be met; **and**
 - c. At least 5 feet of horizontal separation is provided.
2. **Where it is impossible to provide at least 5 feet of horizontal separation between storm sewers and hydrant drains, written approval from the Department is required prior to installation.**

PLANS FOR CONSTRUCTION

WORTHMAN BOULEVARD WATER MAIN

PHASE 1

CITY OF SEWARD

SCHEMMER
 Design with Purpose. Build with Confidence.
 333 SOUTH 21ST STREET, SUITE 102
 LINCOLN, NEBRASKA 68510
 CERTIFICATE OF AUTHORIZATION: CA-0666

PROJECT NO.	SHEET NO.
SCHEMMER NO. 09336001-A	A1

ALL NON-WATER MAIN CONSTRUCTION SHALL ADHERE TO THE 2017 ENGLISH EDITION OF THE NEBRASKA STANDARD SPECIFICATIONS.

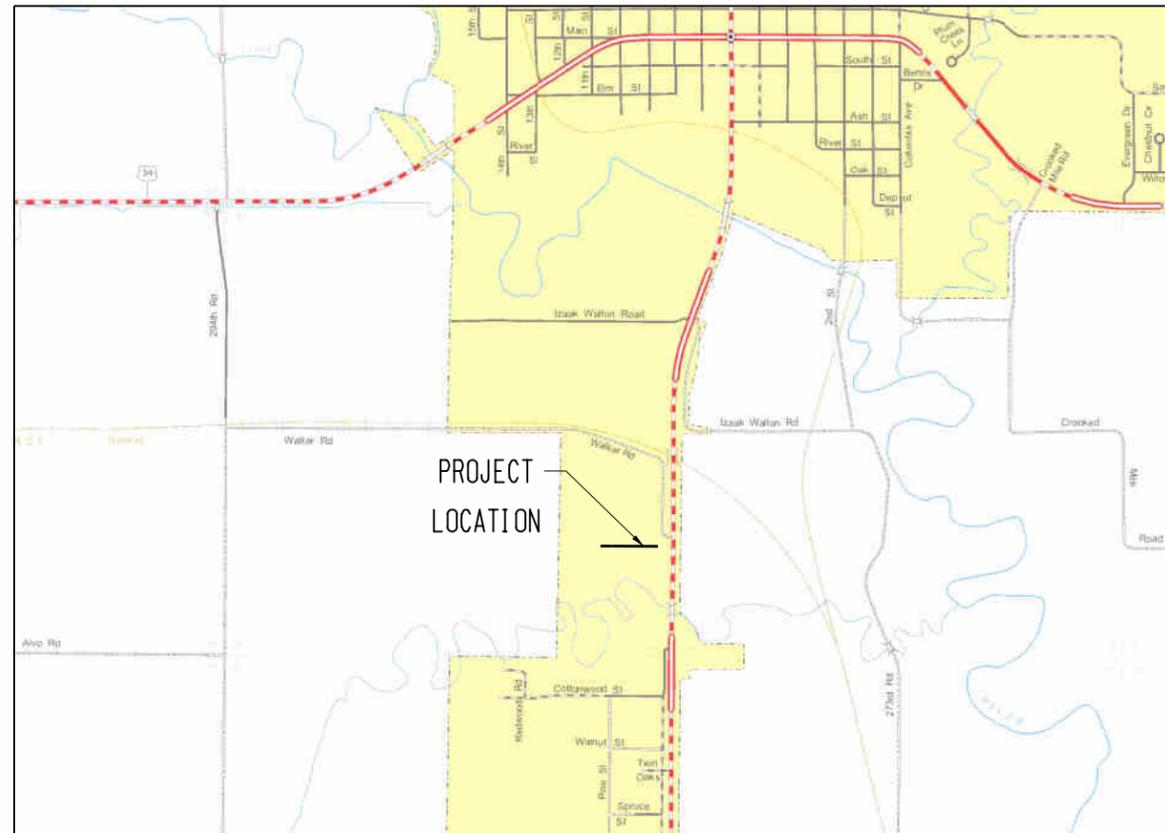
ALL WATER MAIN CONSTRUCTION SHALL ADHERE TO THE SPECIAL PROVISIONS.

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
A1	TITLE SHEET
C1	SUMMARY OF QUANTITIES
F1 - F2	HORIZONTAL ALIGNMENT AND CONTROL POINTS
G1	GENERAL INFORMATION
G2	BERM GRADING
K1 - K2	WATER MAIN

NDOT STD. PLAN NO.	DESCRIPTION
501	EROSION CONTROL
502	SILT FENCE DETAILS
920	TRAFFIC CONTROL, CONSTRUCTION & MAINTENANCE
923	TRAFFIC CONTROL ROAD CLOSURE
924	URBAN TRAFFIC CONTROL PLAN

LINCOLN STD. PLAN NO.	DESCRIPTION
185	PIPE BEDDING
301	WATER MAIN RECONSTRUCTION
310	WATER MAIN VALVE MANHOLES, AIR RELIEFS AND BLOW OFFS
320	R.C. COLLARS, THRUST BLOCKS, ANCHORAGES, TEE BLOCKS AND PLUG BLOCKS
325	TRACER WIRE INSTALLATION
330	HYDRANT INSTALLATIONS
340	WATER TAPPING EXCAVATION PIT, BUTTERFLY VALVE AND CUT IN DETAIL



THE WORK ON THIS PROJECT CONSISTS OF GROUPS	
1-GRADING, L-EROSION CONTROL, W-WATER	
▲ GROUPS 1, L, W	ARE INCLUDED IN THE LETTING OF _____
▲ GROUPS _____	ARE INCLUDED IN THE LETTING OF _____
■ GROUPS _____	ARE INCLUDED IN THE LETTING OF _____

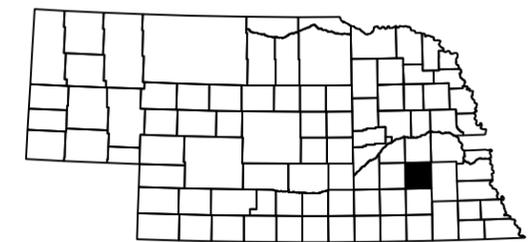
PLANS PREPARED BY:
 THE SCHEMMER ASSOCIATES, INC.
 333 S. 21ST STREET, SUITE 102
 LINCOLN, NE 68510

CONVENTIONAL SIGNS

FENCE R.O.W. OR WIRE	— x —
GUARDRAIL	— / / / / /
TRAVELED WAY	= = = = =
DIKE	XXXXXXXXXX
CULVERT	— [] —
POWER POLE	■
TELEPHONE POLE	◆
MAILBOX	□
RAILROAD TRACKS	— [] —
MARSH	~ ~ ~ ~ ~
TREE - CONIFEROUS	● ● ● ● ●
TREE - DECIDUOUS	○ ○ ○ ○ ○

R.O.W. LEGEND

NEW CONTROLLED ACCESS	— [] —
PREVIOUS CONTROLLED ACCESS	— [] —
LIMITS OF CONSTRUCTION	— [] —
PREVIOUS R.O.W.	— [] —
NEW R.O.W.	[]
EXISTING PERMANENT EASEMENT	[]
TEMPORARY EASEMENT	[]
EXCESS TAKING	[]
PERMANENT EASEMENT	[]
EXISTING RAILROAD EASEMENT	[]
NEW RAILROAD PERMANENT EASEMENT	[]
NEW RAILROAD TEMPORARY EASEMENT	[]



SEWARD	CITY
APPROVED: _____	
DATE _____	

S U M M A R Y O F Q U A N T I T I E S

ROADWAY DESIGN DIVISION.

GRADING GROUP I

ITEM	QUANTITY	UNITS
TRAFFIC CONTROL	1	LUMP SUM
MOBILIZATION	1	LUMP SUM
GENERAL CLEARING AND GRUBBING	1	LUMP SUM
EARTHWORK MEASURED IN EMBANKMENT	228	CUBIC YARDS
STABILIZED CONSTRUCTION EXIT	1	EACH

EROSION CONTROL GROUP L

ITEM	QUANTITY	UNITS
SEEDING, TYPE B	0.46	ACRES
EROSION CONTROL, CLASS 1A	470	SQUARE YARDS

WATER MAIN GROUP W

ITEM	QUANTITY	UNITS
12" WATER MAIN PIPE	474	LINEAL FEET
6" WATER MAIN PIPE	7	LINEAL FEET
6" GATE VALVE AND BOX	2	EACH
12" GATE VALVE AND BOX	1	EACH
6" FIRE HYDRANT	2	EACH
6" ANCHORING COUPLING, 18"	2	EACH
6" ANCHORING ELBOW	1	EACH
12" RETAINER GLAND	14	EACH
6" RETAINER GLAND	2	EACH
12" SOLID SLEEVE, M.J.	3	EACH
12" PLUG, M.J.	1	EACH
12" X 6" TEE	2	EACH
12" X 90 DEG BEND	2	EACH
CONCRETE FOR PLUGS BLOCKS & THRUST BLOCKS	2.4	CUBIC YARDS
STEEL FOR PLUGS BLOCKS & THRUST BLOCKS	116.7	POUNDS
REMOVE FIRE HYDRANT	2	EACH

File: 09336001 Water Main Summary.dwg
 Date: 13-MAR-2025 08:58
 & WORTHMAN BLVD., SEWARD, NE
 Computer: LINMEGANS

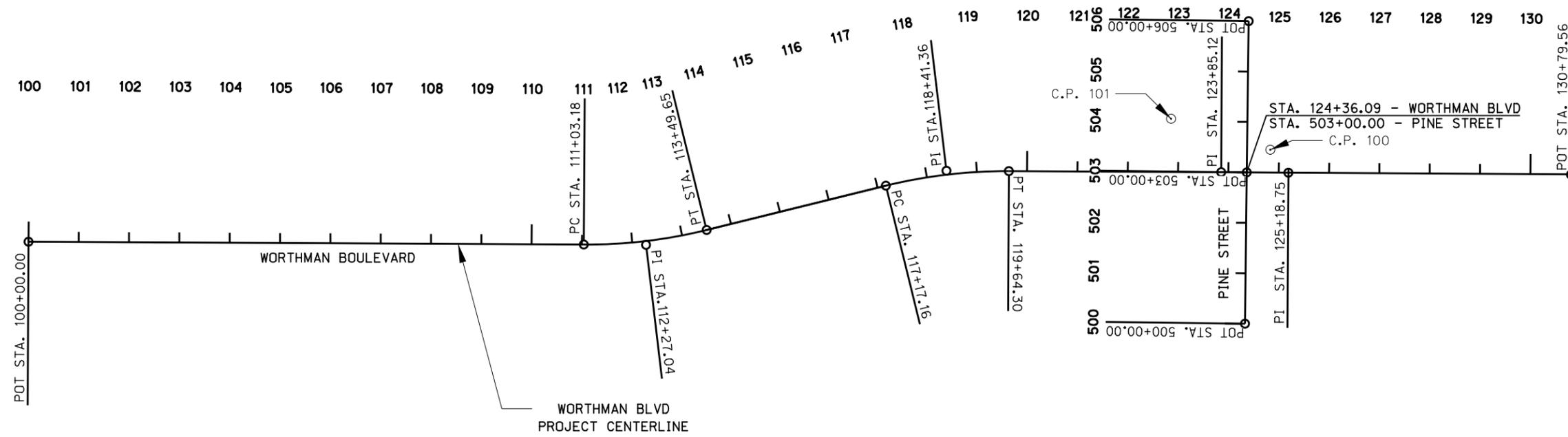


ROADWAY DESIGN DIVISION.

File: 09336001 Water Main Horz & Profile for WORTHMAN BLVD, SEWARD, NE
 Date: 12-MAR-2025 08:37
 Computer: LINMEGANS

CONTROL POINTS				
NO.	X	Y	Z	DESCRIPTION
100	90159.859	80376.769	1449.460	5/8" REBAR WITH CAP
101	89962.647	80438.198	1454.815	5/8" REBAR WITH CAP

GEOPAK ALIGNMENT INFORMATION		
ALIGNMENT	CHAIN	PROFILE
WORTHMAN BOULEVARD	WORTHMAN	WORTHMAN_PRO
PINE STREET	PINE_ST	PINE_ST_PRO



HORIZONTAL ALIGNMENT & CONTROL

Beginning chain WORTHMAN description

Point 28 N 80,194.376 E 87,692.471 Sta 100+00.00

Course from 28 to PC WORTHMAN1 S 89° 42' 37" E Dist 1,103.184

Curve Data

Curve WORTHMAN1

P.I. Station 112+27.04 N 80,188.172 E 88,919.498
 Delta = 14° 07' 16" (LT)
 Degree = 5° 43' 46"
 Tangent = 123.858
 Length = 246.461
 Radius = 1,000.000
 External = 7.641
 Long Chord = 245.838
 Mid. Ord. = 7.583
 P.C. Station 111+03.18 N 80,188.798 E 88,795.641
 P.T. Station 113+49.65 N 80,217.782 E 89,039.765
 C.C. N 81,188.785 E 88,800.698
 Back = S 89° 42' 37" E
 Ahead = N 76° 10' 07" E
 Chord Bear = N 83° 13' 45" E

Course from PT WORTHMAN1 to PC WORTHMAN2 N 76° 10' 07" E Dist 367.510

Curve Data

Curve WORTHMAN2

P.I. Station 118+41.36 N 80,335.336 E 89,517.223
 Delta = 14° 09' 38" (RT)
 Degree = 5° 43' 46"
 Tangent = 124.207
 Length = 247.148
 Radius = 1,000.000
 External = 7.684
 Long Chord = 246.520
 Mid. Ord. = 7.626
 P.C. Station 117+17.16 N 80,305.642 E 89,396.618
 P.T. Station 119+64.30 N 80,334.622 E 89,641.428
 C.C. N 79,334.639 E 89,635.685
 Back = N 76° 10' 07" E
 Ahead = S 89° 40' 15" E
 Chord Bear = N 83° 14' 56" E

Course from PT WORTHMAN2 to 29 S 89° 40' 15" E Dist 420.818

Point 29 N 80,332.205 E 90,062.239 Sta 123+85.12

Course from 29 to 30 S 89° 38' 56" E Dist 133.629

Point 30 N 80,331.386 E 90,195.865 Sta 125+18.75

Course from 30 to 31 S 89° 39' 24" E Dist 560.813

Point 31 N 80,328.026 E 90,756.668 Sta 130+79.56

Ending chain WORTHMAN description

Beginning chain PINE_ST description

Point 14 N 80,031.915 E 90,109.581 Sta 500+00.00

Course from 14 to 15 N 0° 41' 33" E Dist 300.000

Point 15 N 80,331.893 E 90,113.207 Sta 503+00.00

Course from 15 to 16 N 0° 41' 33" E Dist 300.000

Point 16 N 80,631.871 E 90,116.834 Sta 506+00.00

Ending chain PINE_ST description



GENERAL INFORMATION

ROADWAY DESIGN DIVISION.

LEGEND

- G --- GAS LINE
- E --- ELECTRICAL SERVICE
- P --- POWER LINE
- OP --- OVERHEAD POWER LINE
- SAN --- SANITARY SEWER
- SS --- STORM SEWER
- T --- TELEPHONE LINE
- FO --- FIBER OPTIC TELE. LINE
- OT --- OVERHEAD TELEPHONE LINE
- TV --- CABLE TV LINE
- OTV --- OVERHEAD CABLE TV LINE
- W --- WATER LINE
- O --- FENCE - CHAIN LINK
- X --- FENCE - R.O.W. OR WIRE
- □ --- FENCE - WOOD
- FLOWLINE
- CENTER LINE DRIVE
- Ⓚ BENCH MARK
- Ⓜ CENTER PIVOT
- ⊙ CONTROL POINT
- XXXXXXXXX DIKE
- Ⓞ GAS METER
- ⊗ GAS VALVE
- ⊕ GRID TICK
- GUARDRAIL
- GUARD POST
- GUY POLE
- GUY WIRE
- ☀ OR □ LIGHT POLE
- MAILBOX
- ⊙ MANHOLE
- ⊕ MARSH
- OIL WELL
- ⬡ PHOTO CODE POINT
- POWER BOX
- ⬢ POWER POLE
- ⊖ POWER PULL BOX
- ⊖ PROPANE TANK
- ⊖ R.O.W. MARKER
- ⊖ ADVANCED R.R. WARNING SIGN
- ⊖ RAILROAD WARNING
- ⊖ RAILROAD TRACKS
- ⊖ RETAINING WALL
- ⊖ SATELLITE DISH
- ⊖ SIGN
- ☀ TRAFFIC SIGNAL
- ☀ TRAFFIC SIGNAL/ST. LIGHT
- ⊖ TELEPHONE BOX
- ⊖ TELE. FIBER OPTICS BOX
- ⊖ TELEPHONE PULL BOX
- ⊖ TELEPHONE POLE
- ⊖ TELEVISION BOX
- ☀ TREE - CONIFEROUS
- ☀ TREE - DECIDUOUS
- ⊖ TREE STUMP
- ⊖ WATER (FIRE) HYDRANT
- ⊖ WATER VALVE
- ⊖ WATER METER
- ⊖ WELL
- ⊖ WINDMILL

COMPACTION REQUIREMENTS

The following compaction requirements are recommended for the plans.

COMPACTION REQUIREMENTS
 Class III (See Specifications)

	SOIL TYPE	DEPTH BELOW FINISH SUBGRADE	PERCENT DENSITY	MOISTURE REQUIREMENTS	
				MINIMUM	MAXIMUM
Embankment / Roadway Grading, including driveways, to receive concrete pavement	Silt-Clay	Upper 3 feet	98 Min.	Opt. -3%	Opt. +2%
	Silt-Clay	At depths greater than 3 feet	95 Min.	Opt. -3%	Opt. +2%
	Granular	All depths	100 Min.	**	**
Embankment / Roadway Grading, including driveways, to receive flexible pavement	Silt-Clay	Upper 3 feet	100 Min.	Opt. -2%	Opt. +1%
	Silt-Clay	At depths greater than 3 feet	95 Min.	Opt. -3%	Opt. +2%
	Granular	All depths	100 Min.	**	**
Embankment / Roadway Grading to receive gravel surfacing / crushed rock embedment	All	All depths	95 Min.	**	**
	All	All depths	95 Min.	Opt. -3%	Opt. +2%

Subgrade Preparation, Shoulder Subgrade Preparation (Concrete Pavement)	Silt-Clay	The upper 6 inches of subgrade soil	98 Min.	Opt. -3%	Opt. +2%
	Granular	The upper 6 inches of subgrade soil	100 Min.	**	**
Subgrade Preparation, Shoulder Subgrade Preparation (Flexible Pavement)	Silt-Clay	The upper 6 inches of subgrade soil	100 Min.	Opt. -2%	Opt. +1%
	Granular	The upper 6 inches of subgrade soil	100 Min.	**	**

Embankment of driveways which are not to be surfaced	All	All depths	Class I	(See Specifications)	
Bituminous Pavement Patching	All	Underlying Material	100 Min.	(See Specifications)	
Foundation Course / Subgrade Stabilization	--	--	100 Min.	(See Specifications)	

Granular Structural Fill (MSE Walls, Granular Fill for bridges, Culverts, etc)	Granular	All depths	100 Min.	Opt. -3%	Opt. +3%

** Moisture as necessary to obtain density.
 (A moisture target value at maximum density shall be established in the field by the Contractor during the compaction process. The acceptable moisture content shall be ± 2% of the target value.)

NOTES

The location of all aerial and underground utility facilities may not be indicated in these plans. Underground utilities, whether indicated or not will be located and flagged by the utilities at the request of the contractor. Utilities are located within the project area. Any utility relocation will be at the contractor's expense. Nebraska One Call will be utilized.

No excavation will be permitted in the area of underground utility facilities until all such facilities have been located and identified to the satisfaction of all parties. The excavation must be accomplished with extreme care in order to avoid any possibility of damage to the utility facility.

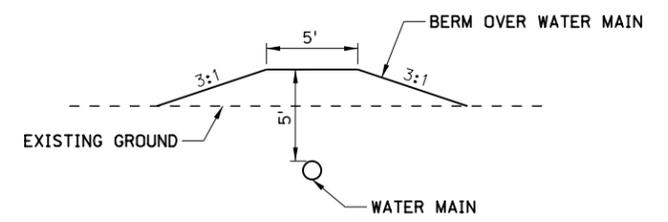
The Contractor will be required to furnish Borrow on this Project.

The Contractor shall furnish and maintain all necessary barricades, warning signs, lights and flaggers per the MUTCD and NDOT Standard Specifications. The Contractor shall inspect and verify all appropriate barricades and signs are placed accordingly and upright at the end of each construction day, or as directed by the Engineer.

Prior to construction, Contractor shall submit to the City Engineer for approval a traffic control plan and construction schedule for road closure.

Contractor to remove, salvage and reset any necessary traffic signs in their original location, unless noted otherwise.

Concrete washout stations shall be constructed as needed during the paving operations. This shall be considered subsidiary to other items receiving direct payment.



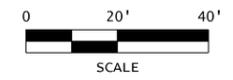
EARTH BERM DETAIL
 NOT TO SCALE

EARTHWORK QUANTITIES		
STATION TO STATION	EXCAVATION AVAILABLE (CU. YDS.)	EARTHWORK MEASURED IN EMBANKMENT (CU. YDS.)
119+20 - 121+50	7	228

NO BALANCE FACTOR APPLIED.

File: 09336001 Water Main General Information.dwg 15 & WORTHMAN BLVD., SEWARD, NE
 Date: 12-MAR-2025 11:58 Computer: LINNIEGANS
 Scale: 1:200



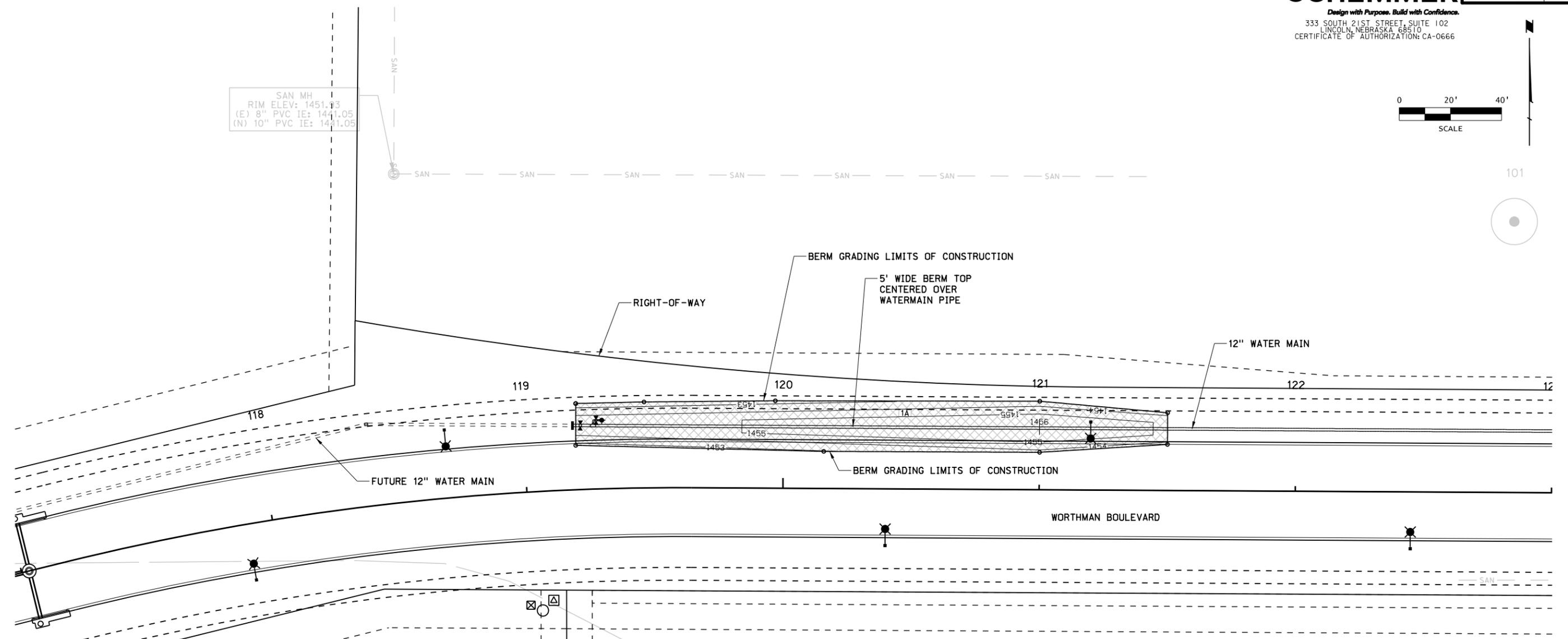


101



ROADWAY DESIGN DIVISION.

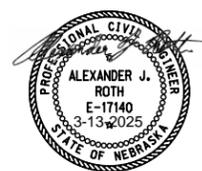
SAN MH
 RIM ELEV: 1451.93
 (E) 8" PVC IE: 1441.05
 (N) 10" PVC IE: 1441.05



1A BUILD EROSION CONTROL-CLASS 1A, PLAN 501				
STATION TO	STATION	SIDE	DESCRIPTION	SQ. YDS.
119+20	121+50	LT./RT.	WITHIN BERM LIMITS	470

SEEDING, TYPE "B" 0.46 ACRES
 CONTRACTOR TO PLACE SEEDING IN ALL DISTURBED AREAS

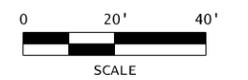
File: 09336001 Water Main Berm Grading Highway 15 & Worthman Blvd, Seward, NE
 Date: 13-MAR-2025 08:43
 Computer: LINMEGANS



BERM GRADING AND EROSION CONTROL

ROADWAY DESIGN DIVISION.

Design with Purpose. Build with Confidence.
333 SOUTH 21ST STREET, SUITE 102
LINCOLN, NEBRASKA 68510
CERTIFICATE OF AUTHORIZATION: CA-0666

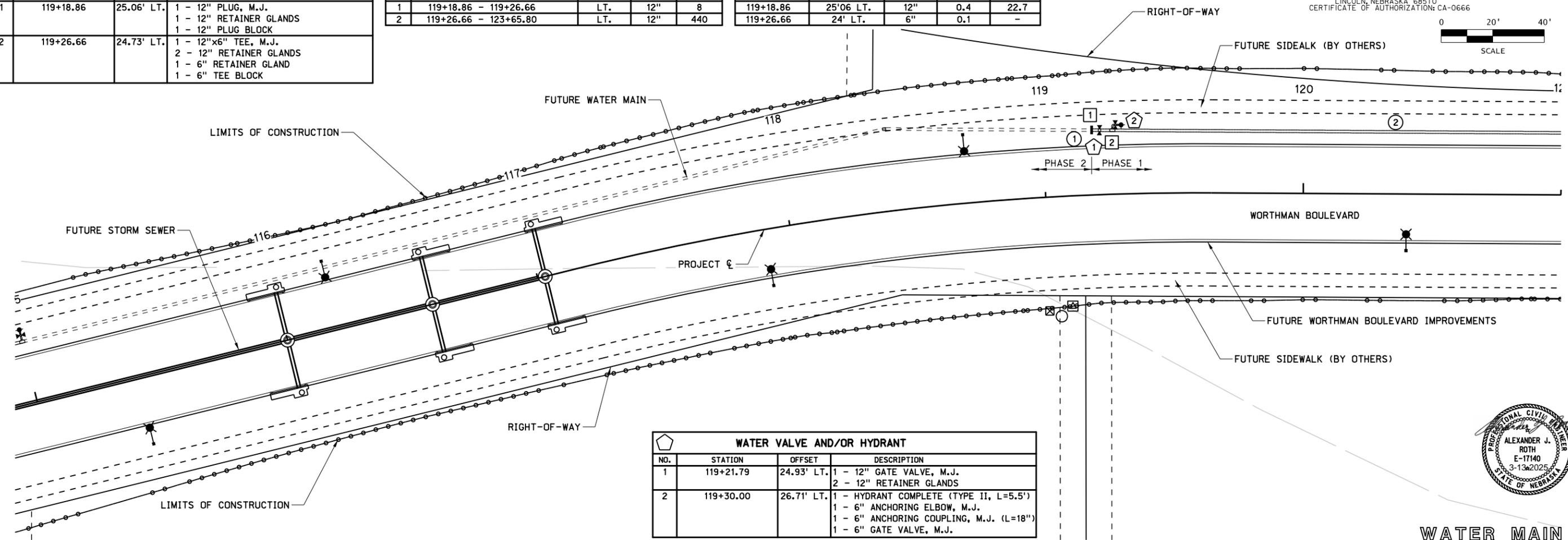


DUCTILE IRON WATER MAIN FITTINGS, M.J.			
NO.	STATION	OFFSET	DESCRIPTION
1	119+18.86	25.06' LT.	1 - 12" PLUG, M.J.
			1 - 12" RETAINER GLANDS
			1 - 12" PLUG BLOCK
2	119+26.66	24.73' LT.	1 - 12"x6" TEE, M.J.
			2 - 12" RETAINER GLANDS
			1 - 6" RETAINER GLAND
			1 - 6" TEE BLOCK

WATER MAIN					
NO.	STATION	TO STATION	SIDE	SIZE	L.F.
1	119+18.86	- 119+26.66	LT.	12"	8
2	119+26.66	- 123+65.80	LT.	12"	440

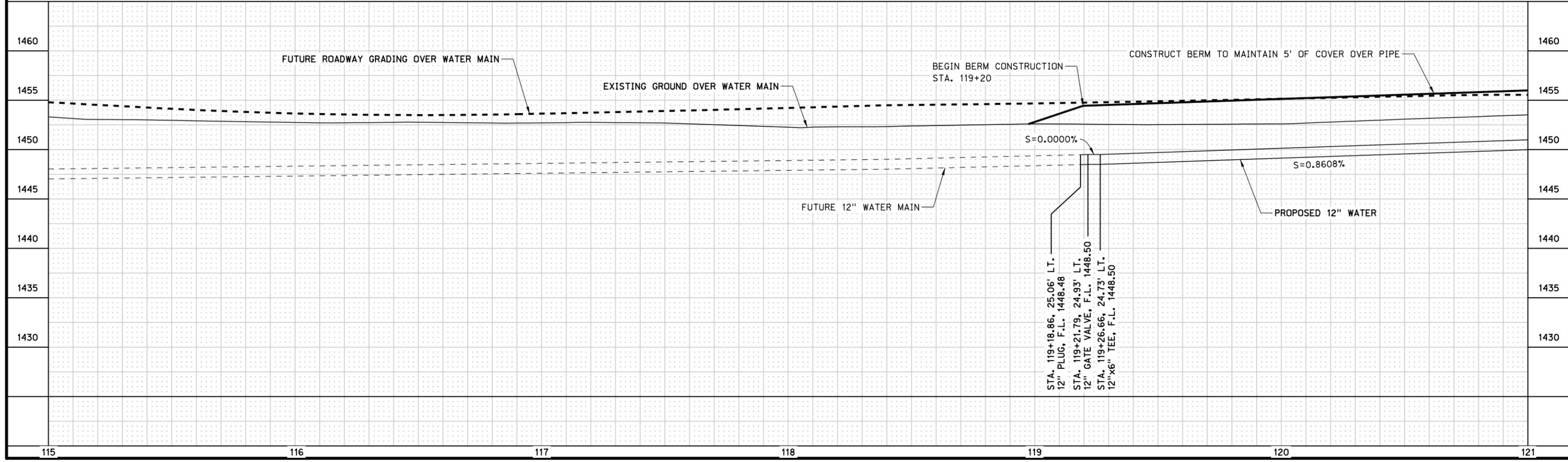
CONC. & STEEL FOR PLUG BLOCKS & THRUST BLOCKS					
STATION	OFFSET	SIZE	CONC (CY)	STEEL (LB)	
119+18.86	25'06 LT.	12"	0.4	22.7	
119+26.66	24' LT.	6"	0.1	-	

WATER VALVE AND/OR HYDRANT			
NO.	STATION	OFFSET	DESCRIPTION
1	119+21.79	24.93' LT.	1 - 12" GATE VALVE, M.J.
			2 - 12" RETAINER GLANDS
2	119+30.00	26.71' LT.	1 - HYDRANT COMPLETE (TYPE II, L=5.5')
			1 - 6" ANCHORING ELBOW, M.J.
			1 - 6" ANCHORING COUPLING, M.J. (L=18")
			1 - 6" GATE VALVE, M.J.

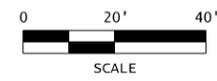


WATER MAIN

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Date: 12-MAR-2025 08:37 Computer: LIMMIGANS
Scale: 1:40



Design with Purpose. Build with Confidence.
 333 SOUTH 21ST STREET, SUITE 102
 LINCOLN, NEBRASKA 68510
 CERTIFICATE OF AUTHORIZATION: CA-0666

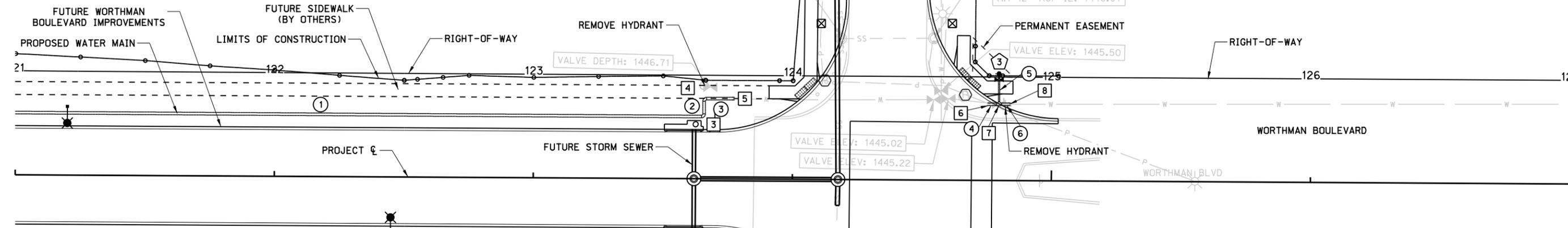


WATER MAIN				
NO.	STATION TO STATION	SIDE	SIZE	L.F.
2	123+65.80	24'-31' LT	12"	6
3	123+65.80 - 123+77.10	31' LT.	12"	12
4	124+75.65 - 124+79.65	29' LT.	12"	4
5	124+79.65	29'-38' LT	6"	7
6	124+79.65 - 124+83.65	29' LT.	12"	4

CONC. & STEEL FOR PLUG BLOCKS & THRUST BLOCKS				
STATION	OFFSET	SIZE	CONC (CY)	STEEL (LB)
123+65.80	24' LT.	12"	0.9	47
123+65.76	31' LT.	12"	0.9	47
124+79.65	29.41' LT.	6"	0.1	-

ORM GRATE
 ELEV: 1450.55
 PVC IE: 1441.05
 PVC IE: 1441.05

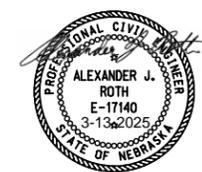
FORM INLET
 ELEV: 1450.26
 RCP IE: 1440.21
 RCP IE: 1446.16



DUCTILE IRON WATER MAIN FITTINGS, M.J.			
NO.	STATION	OFFSET	DESCRIPTION
3	123+65.80	24' LT.	1 - 12"x90 DEG BEND, M.J. 2 - 12" RETAINER GLANDS 1 - 12" THRUST BLOCK
4	123+65.76	31' LT.	1 - 12"x90 DEG BEND, M.J. 2 - 12" RETAINER GLANDS 1 - 12" THRUST BLOCK
5	123+77.10	31' LT.	1 - 12" SOLID SLEEVE, M.J. 1 - 12" RETAINER GLANDS
6	124+75.65	29.39' LT.	1 - 12" SOLID SLEEVE, M.J. 1 - 12" RETAINER GLANDS
7	124+79.65	29.41' LT.	1 - 12"x6" TEE, M.J. 2 - 12" RETAINER GLANDS 1 - 6" RETAINER GLAND 1 - 6" TEE BLOCK
8	124+83.65	29.43' LT.	1 - 12" SOLID SLEEVE, M.J. 1 - 12" RETAINER GLANDS

WATER VALVE AND/OR HYDRANT			
NO.	STATION	OFFSET	DESCRIPTION
3	124+79.58	41.19' LT.	1 - HYDRANT COMPLETE (TYPE IV, L=5.5') 1 - 6" ANCHORING COUPLING, M.J. (L=18") 1 - 6" GATE VALVE, M.J.

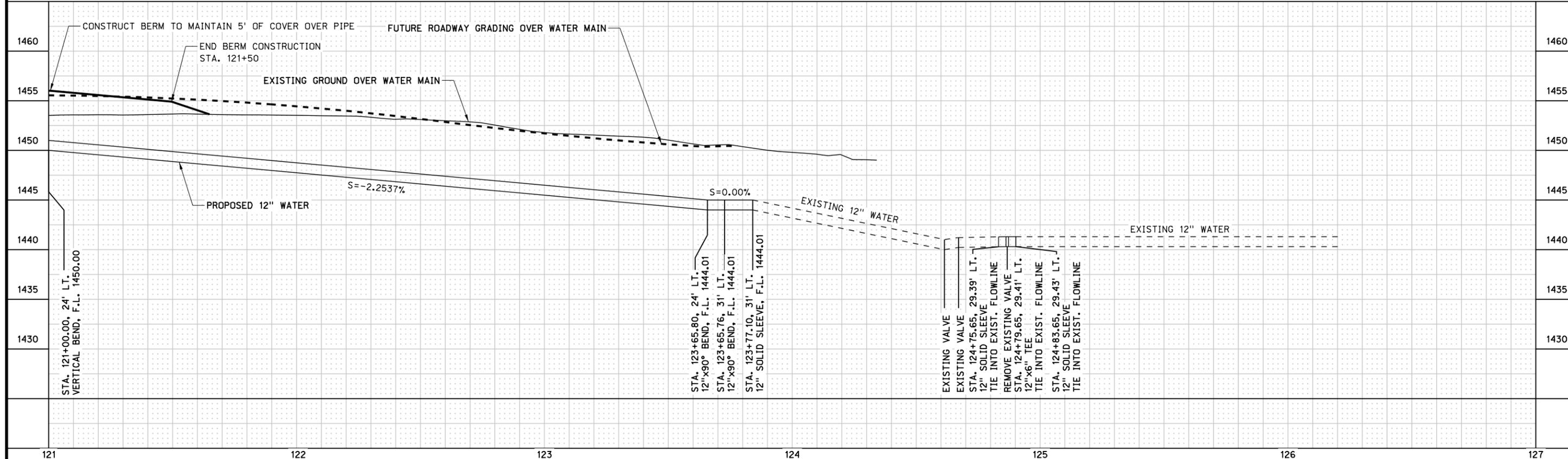
REMOVE HYDRANT		
STATION	SIDE	EACH
123+65.73	36' LT.	1
124+81.64	29' LT.	1

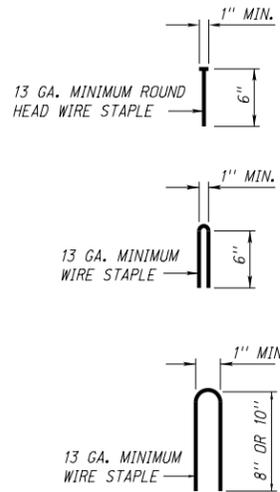


WATER MAIN

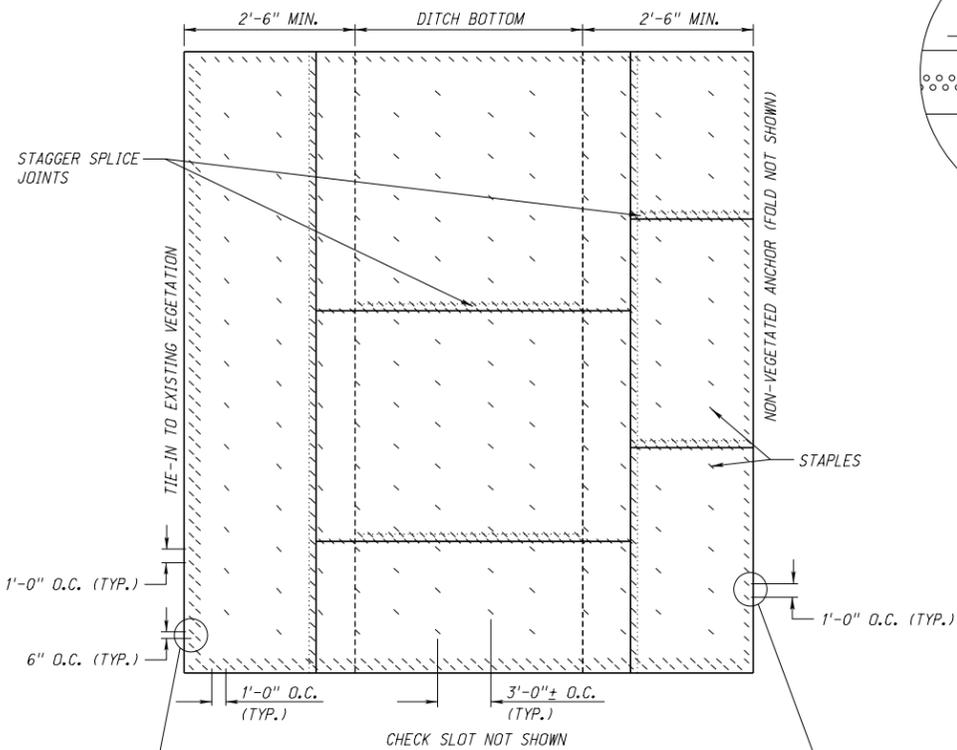
ROADWAY DESIGN DIVISION.

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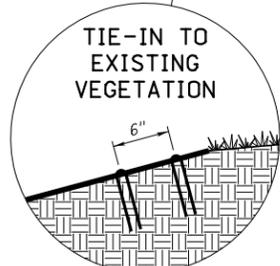




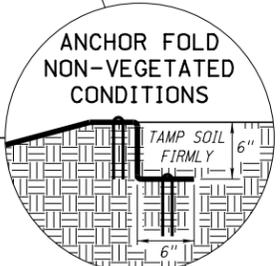
WIRE STAPLE DETAIL



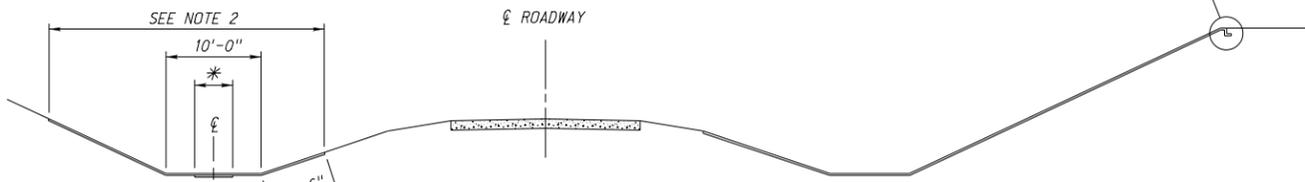
PLAN VIEW STAPLING DIAGRAM



TIE-IN TO EXISTING VEGETATION
STAGGER EVERY 1'-0" ALONG BLANKET EDGE

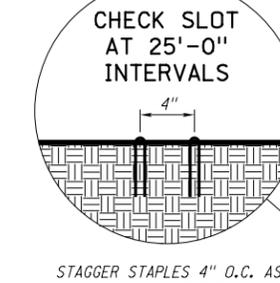
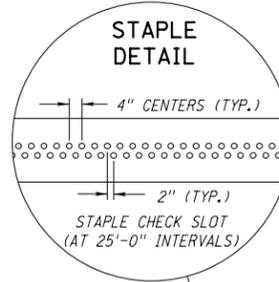


ANCHOR FOLD NON-VEGETATED CONDITIONS
STAPLE EVERY 1'-0" ALONG BLANKET EDGE

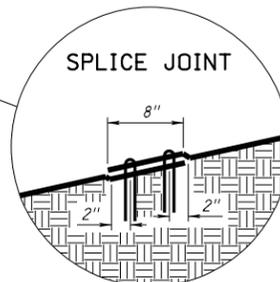


TYPICAL CROSS-SECTION

* THE FIRST ROLL OF BLANKET SHALL BE LAID DOWN THE CENTER OF THE DITCH

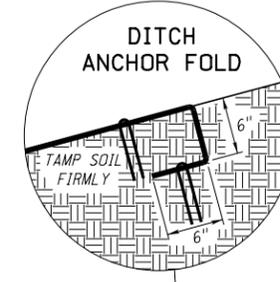


STAPLE DETAIL
SPLICE JOINT
STAGGER STAPLES 4" O.C. AS SHOWN ON STAPLE DETAIL

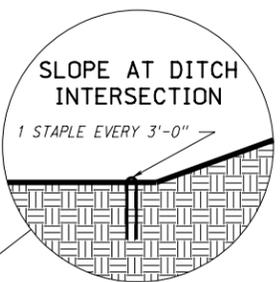


CHECK SLOT AT 25'-0" INTERVALS

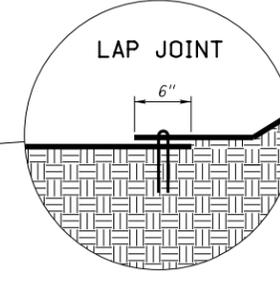
FOR EDGES ADJOINING AREAS TO BE SEEDED STAPLE EVERY 1'-0" ALONG BLANKET EDGE



DITCH ANCHOR FOLD

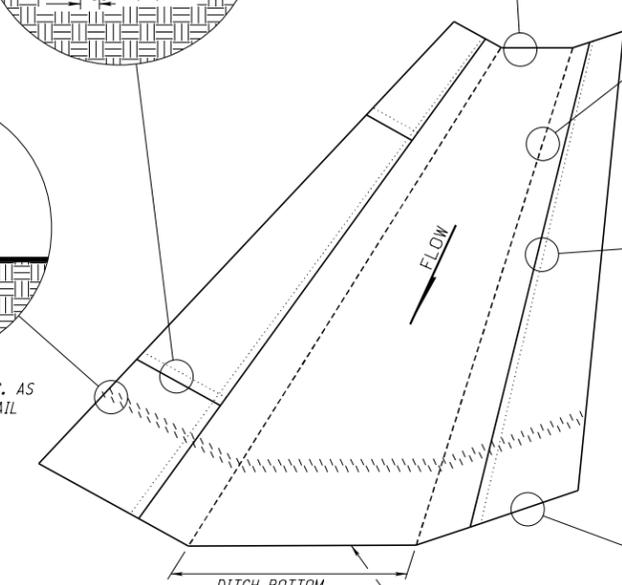


SLOPE AT DITCH INTERSECTION
1 STAPLE EVERY 3'-0"

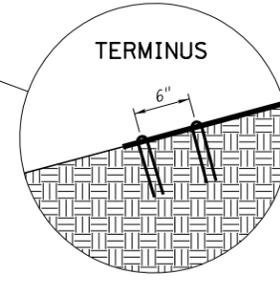


LAP JOINT

STAPLE EVERY 1'-0" ALONG BLANKET EDGE



TYPICAL EROSION CONTROL BLANKET INSTALLATION



TERMINUS

STAGGER EVERY 1'-0" ALONG BLANKET EDGE

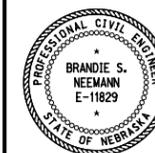
NOTES:

1. THIS PLAN IS APPLICABLE FOR THE FOLLOWING: EROSION CONTROL CLASS 1B, 1C, 1D, 1E, 1F, 2A, 2B & 2C.
2. SOIL RETENTION BLANKET SHALL BE LAID A MINIMUM OF 2'-6" UP THE BACKSLOPE AND FORESLOPE.
3. CHECK SLOTS ARE PLACED PERPENDICULAR TO DITCH CENTER LINE ON 25'-0" INTERVALS.
4. THE MANUFACTURERS' RECOMMENDED STAPLING PATTERNS SHALL GOVERN OVER THE PLANS.

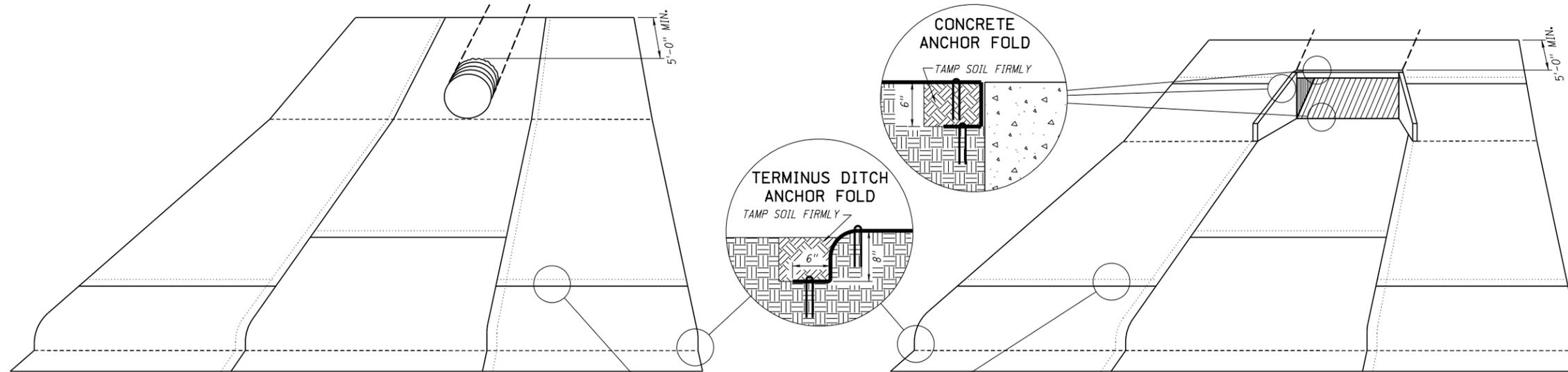
R7	JAN 18	NDOR BORDER TO NDOT BORDER
R6	APR 14	UPDATE INSTALLATION METHOD
R5	OCT 07	EROSION CONTROL AT SPLASH BASIN
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 501-R7
EROSION CONTROL

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

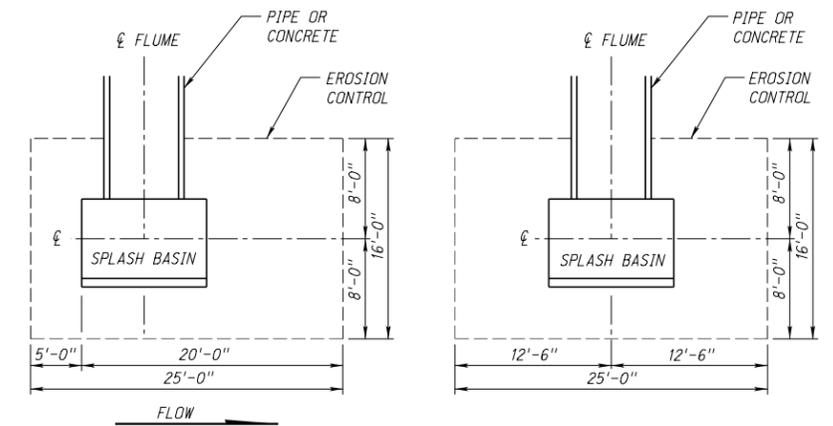
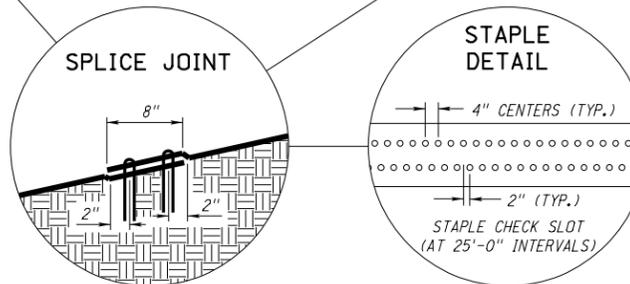


DATE
ORIGINAL:
NOVEMBER 1973
DATE



TYPICAL INSTALLATION AT PIPE CULVERT
(SHOWING STRAIGHT PIPE)

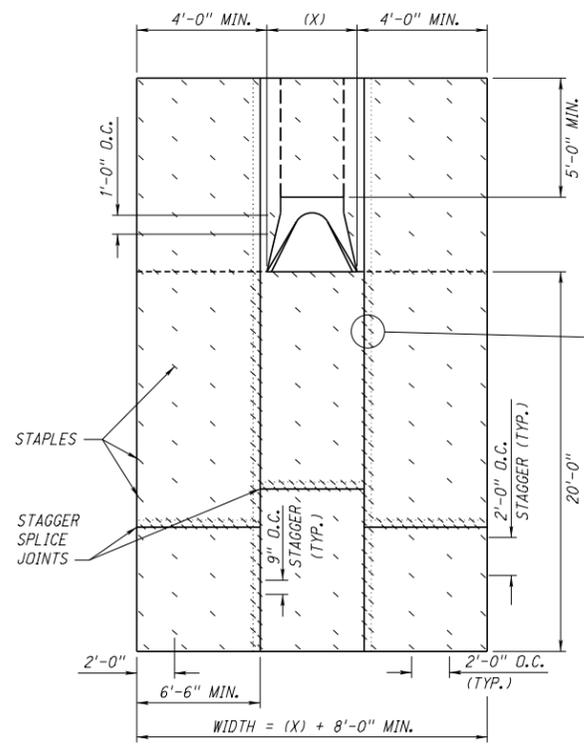
TYPICAL INSTALLATION AT BOX CULVERT



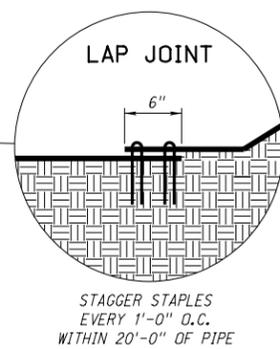
NOTE:
OFFSET EROSION CONTROL PLACEMENT
ALONG THE DRAINAGE PATH

NOTE:
CENTER EROSION CONTROL ON FLUME WHERE
THERE IS NO DEFINED DRAINAGE PATH

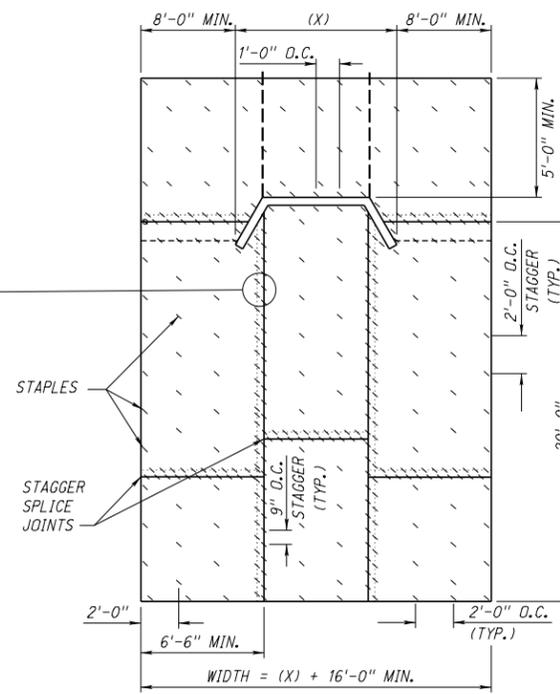
EROSION CONTROL BLANKET PLACEMENT AT SPLASH BASIN



PLAN VIEW STAPLING DIAGRAM
(X) IS EQUAL TO THE OUTSIDE WIDTH
OF THE FLARED END SECTION



STAGGER STAPLES
EVERY 1'-0" O.C.
WITHIN 20'-0" OF PIPE

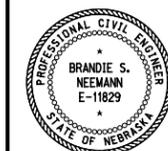


PLAN VIEW STAPLING DIAGRAM
(X) IS EQUAL TO THE OUTSIDE WIDTH
OF THE WING WALLS

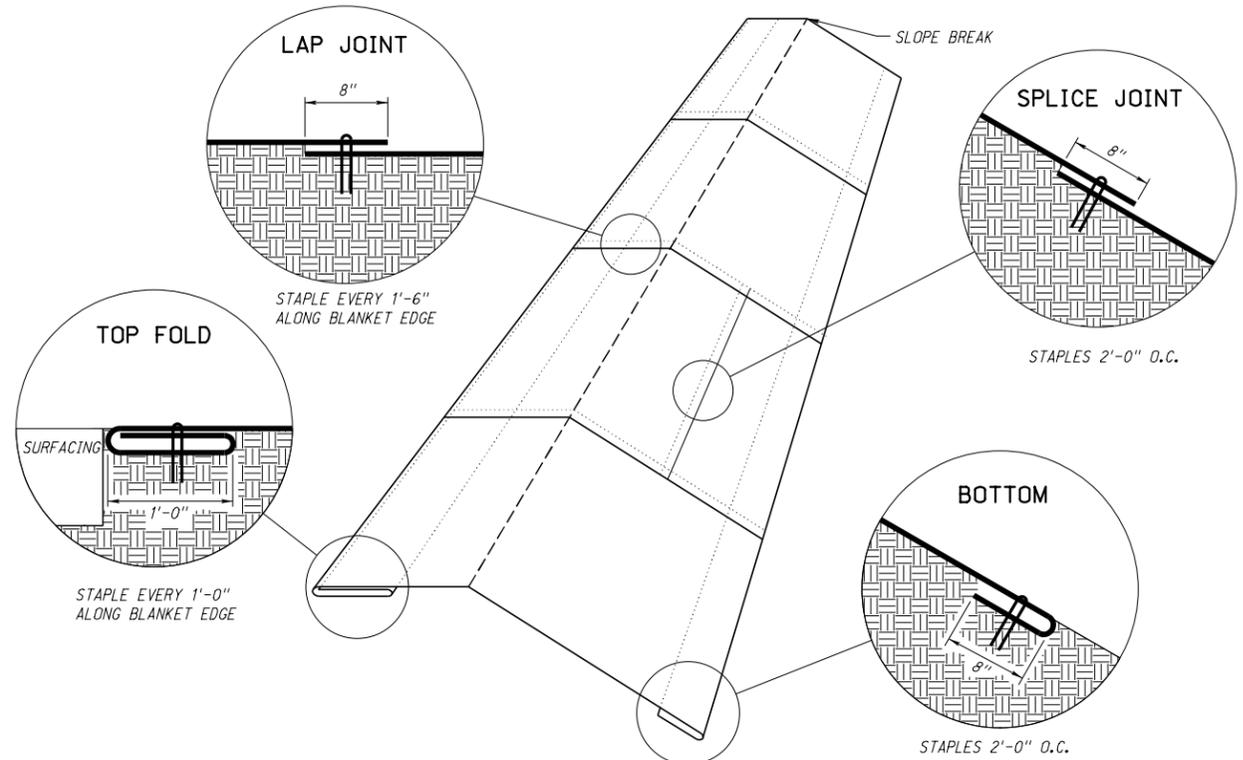
R7	JAN 18	NDOR BORDER TO NDOT BORDER
R6	APR 14	UPDATE INSTALLATION METHOD
R5	OCT 07	EROSION CONTROL AT SPLASH BASIN
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 501-R7
EROSION CONTROL

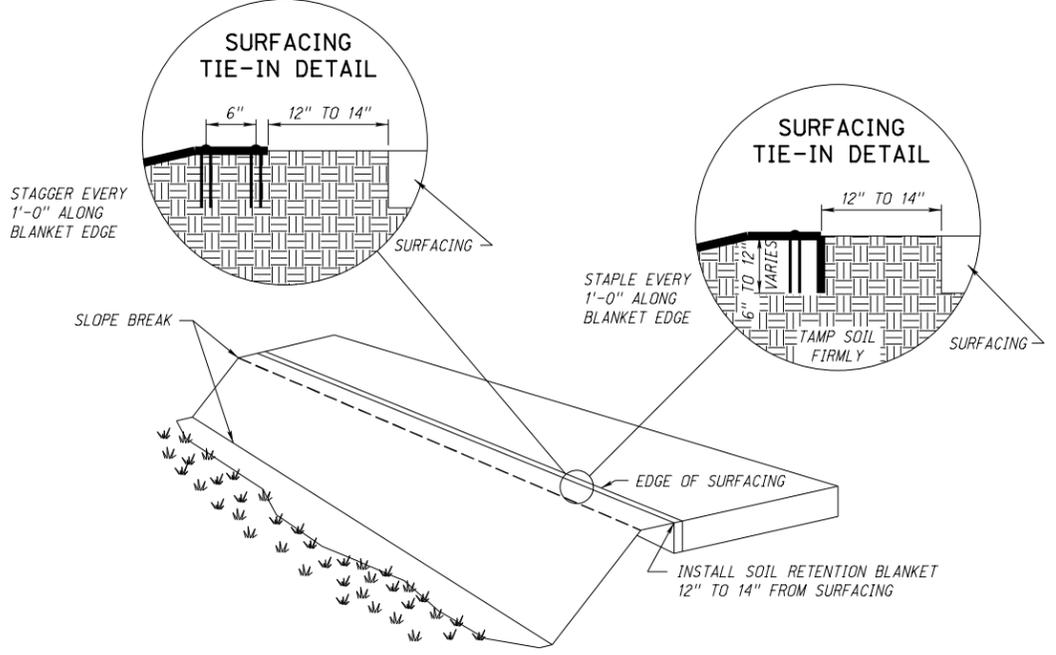
ACCEPTED BY FHWA FOR USE ON THE
NATIONAL HIGHWAY SYSTEM:



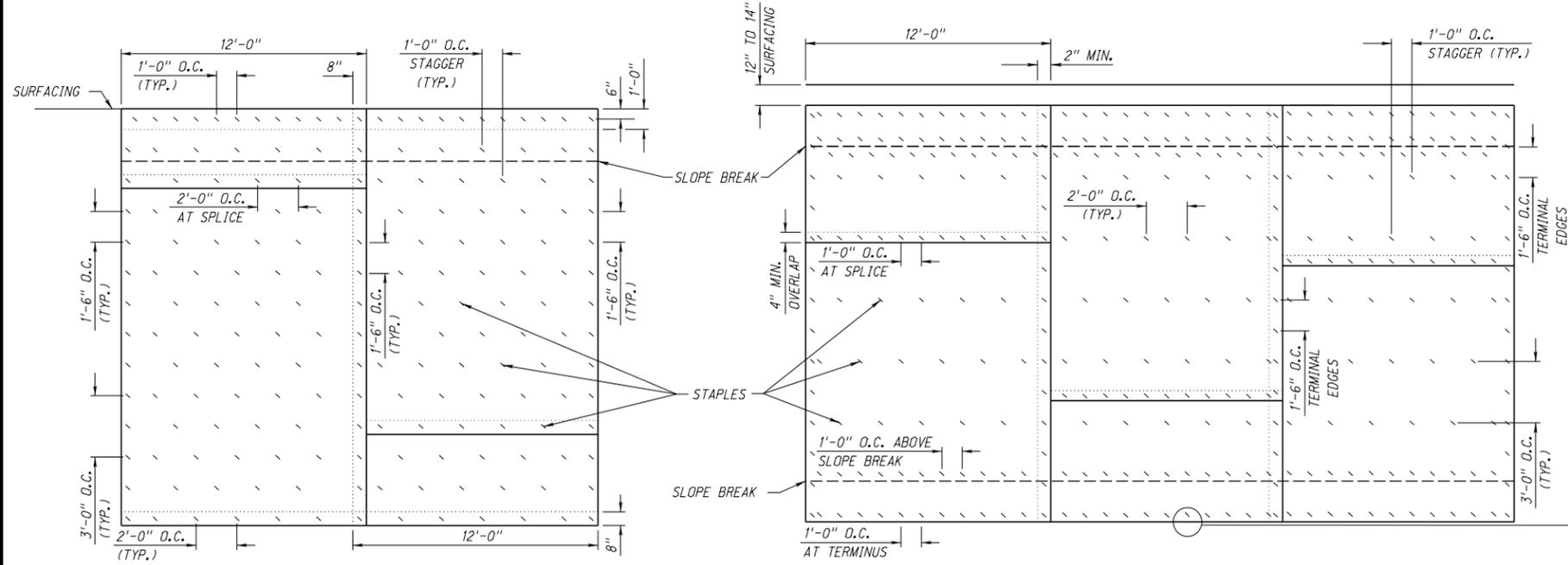
DATE
ORIGINAL:
NOVEMBER 1973
DATE



TYPICAL INSTALLATION
CLASS 1A (SLOPE PROTECTION, SAND)



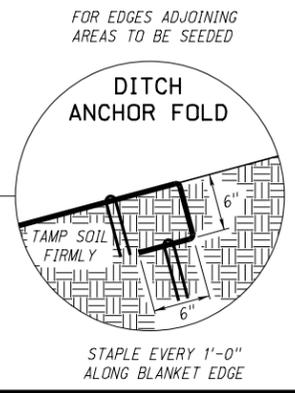
SURFACING INSTALLATION



PLAN VIEW STAPLING DIAGRAM FOR
CLASS 1A (SLOPE PROTECTION, SAND)

PLAN VIEW STAPLING DIAGRAM FOR
CLASS 1B, 1C, 1D, 1E, 1F, 2A, 2B, & 2C

TERMINATE BLANKET AT THE TOE OF SLOPE OR AT UNDISTURBED VEGETATION



NOTES:

1. THE MANUFACTURERS' RECOMMENDED STAPLING PATTERNS SHALL GOVERN OVER THE PLANS.
2. SURFACING INSTALLATION IS APPLICABLE FOR ASPHALT, CONCRETE, OR BEVELLED EDGE.

REV. NO.	DATE	DESCRIPTION OF REVISION
R7	JAN 18	NDOR BORDER TO NDOT BORDER
R6	APR 14	UPDATE INSTALLATION METHOD
R5	OCT 07	EROSION CONTROL AT SPLASH BASIN

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 501-R7
EROSION CONTROL

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

PROFESSIONAL CIVIL ENGINEER
BRANDIE S. NEEMANN
E-11829
STATE OF NEBRASKA

DATE _____ ORIGINAL: NOVEMBER 1973 DATE _____

3 / 3

CHANNELIZATION DEVICES

THE FUNCTION OF CHANNELIZATION DEVICES IS TO WARN ROAD USERS OF CONDITIONS CREATED BY WORK ACTIVITIES IN OR NEAR THE TRAVELED WAY, TO PROTECT WORKERS IN THE TEMPORARY TRAFFIC CONTROL ZONE, AND TO GUIDE DRIVERS AND PEDESTRIANS SAFELY. CHANNELIZATION DEVICES INCLUDE BUT ARE NOT LIMITED TO CONES, TUBULAR POSTS, VERTICAL PANELS, DRUMS, BARRICADES, TRAFFIC LANE DIVIDERS, TEMPORARY RAISED ISLANDS, AND BARRIERS.

DEVICES USED FOR CHANNELIZATION SHOULD PROVIDE FOR SMOOTH AND GRADUAL TRAFFIC MOVEMENT FROM ONE LANE TO ANOTHER, ONTO A BYPASS OR DETOUR, OR TO REDUCE THE WIDTH OF THE TRAVELED WAY. THEY MAY ALSO BE USED TO SEPARATE TRAFFIC FROM THE WORK SPACE, PAVEMENT DROP-OFFS, PEDESTRIAN PATHS, OR OPPOSING DIRECTIONS OF TRAFFIC.

CHANNELIZING DEVICES SHALL MEET THE CRASHWORTHY PERFORMANCE CRITERIA CONTAINED IN THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH). THEY SHOULD BE CONSTRUCTED AND BALLASTED TO PERFORM IN A PREDICTABLE MANNER WHEN INADVERTENTLY STRUCK BY A VEHICLE. IF STRUCK, THE DEVICE SHOULD YIELD OR BREAK AWAY, FRAGMENTS OR OTHER DEBRIS FROM THE DEVICE SHOULD NOT PENETRATE THE PASSENGER COMPARTMENT OF THE VEHICLE OR BE A POTENTIAL HAZARD TO WORKERS OR PEDESTRIANS IN THE IMMEDIATE AREA.

SPACING OF CHANNELIZING DEVICES SHOULD NOT EXCEED A DISTANCE IN FEET EQUAL TO THE SPEED WHEN USED FOR THE TAPER CHANNELIZATION, AND A DISTANCE IN FEET OF TWICE THE SPEED WHEN USED FOR TANGENT CHANNELIZATION.

SPACING OF CHANNELIZATION DEVICES		
SPEED (MPH)	SPACING OF DEVICES (FEET)	
	TAPER	TANGENT
25	25	50
35	35	70
45	45	90
55	55	110
60	60	120
65	65	130
75	75	150

WARNING LIGHTS MAY BE ADDED TO CHANNELIZING DEVICES IN AREAS WITH FREQUENT FOG, SNOW, OR SEVERE ROADWAY CURVATURE, OR WHERE VISUAL DISTRACTIONS ARE PRESENT, EXCEPT FOR THE SEQUENTIAL FLASHING WARNING LIGHTS, WARNING LIGHTS PLACED ON CHANNELIZING DEVICES USED IN A SERIES TO CHANNELIZE ROAD USERS SHALL BE STEADY-BURN.

THE RETROREFLECTIVE MATERIAL USED ON CHANNELIZING DEVICES SHALL HAVE A SMOOTH, SEALED OUTER SURFACE, MEETING THE REQUIREMENTS OF THE ASTM SPECIFICATION D4956, FOR TYPE IV SHEETING OR TYPE V REBOUNDABLE SHEETING (OR GREATER).

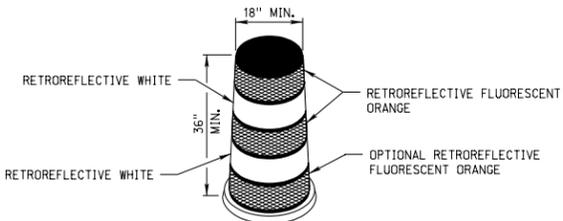
COEFFICIENT OF RETROREFLECTION (CD/LUX/M ²)			
WHITE	ORANGE	RED	YELLOW
250	100	45	170

THE AMERICAN TRAFFIC SAFETY SERVICES ASSOCIATION (ATSSA) "QUALITY GUIDELINES FOR WORK ZONE TRAFFIC CONTROL DEVICES" SHALL BE USED AS A VISUAL GUIDE FOR DETERMINING IF A TRAFFIC CONTROL DEVICE/OR SIGN IS ACCEPTABLE, MARGINAL OR UNACCEPTABLE.

THE NAME AND TELEPHONE NUMBER OF THE AGENCY, CONTRACTOR, OR SUPPLIER MAY BE SHOWN ON THE CHANNELIZING DEVICE BACK OR SUPPORT, BUT NOT ON THE DEVICE FACE. THE LETTERS AND NUMBERS SHALL BE A NON-REFLECTIVE COLOR AND NOT OVER 15 SQUARE INCHES IN TOTAL AREA.

PARTICULAR ATTENTION SHOULD BE GIVEN TO MAINTAINING THE CHANNELIZING DEVICES TO KEEP THEM CLEAN, VISIBLE, AND PROPERLY POSITIONED. DEVICES SHALL BE REPLACED THAT ARE DAMAGED AND/OR HAVE LOST A SIGNIFICANT AMOUNT OF THEIR RETROREFLECTIVITY AND EFFECTIVENESS.

REFLECTORIZED PLASTIC DRUMS



DESIGN

REFLECTORIZED PLASTIC DRUMS USED FOR TRAFFIC WARNING OR CHANNELIZATION SHALL BE CONSTRUCTED OF LIGHTWEIGHT, FLEXIBLE, AND DEFORMABLE MATERIALS AND BE A MINIMUM OF 36 INCHES IN HEIGHT AND HAVE A MINIMUM WIDTH OF AT LEAST A 18 INCHES, REGARDLESS OF ORIENTATION, THE PREDOMINANT COLOR OF THE DRUM SHALL BE ORANGE. METAL DRUMS SHALL NOT BE USED. THE MARKINGS ON DRUMS SHALL BE HORIZONTAL, SHALL BE CIRCUMFERENTIAL, AND SHALL DISPLAY FOUR 6 INCH WIDE BANDS OF RETROREFLECTIVE SHEETING, ALTERNATING FLUORESCENT ORANGE-WHITE-FLUORESCENT ORANGE-WHITE. DRUMS SHALL HAVE CLOSED TOPS THAT WILL NOT ALLOW COLLECTION OF CONSTRUCTION OR OTHER DEBRIS.

APPLICATION

DRUMS ARE MOST COMMONLY USED TO CHANNELIZE OR DELINEATE TRAFFIC FLOW BUT MAY ALSO BE USED INDIVIDUALLY OR IN GROUPS TO MARK SPECIFIC LOCATIONS. DRUMS ARE HIGHLY VISIBLE AND HAVE GOOD TARGET VALUE; THEY GIVE THE APPEARANCE OF BEING FORMIDABLE OBSTACLES AND, THEREFORE, COMMAND THE RESPECT OF ROAD USERS.

BALLAST SHALL NOT BE PLACED ON TOP OF THE DRUM. DRUMS SHOULD NOT BE WEIGHTED WITH SAND, WATER, OR ANY MATERIAL.

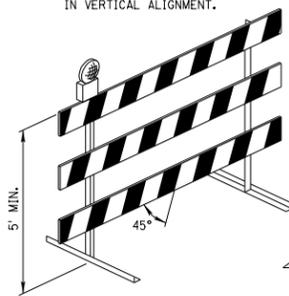
BARRICADES

BARRICADE TYPE	TYPE II	TYPE III
WIDTH OF RAIL*	8 INCHES MIN. - 12 INCHES MAX.	8 INCHES MIN. - 12 INCHES MAX.
LENGTH OF RAIL	36 INCHES	8 FEET**
WIDTH OF STRIPES	6 INCHES	6 INCHES
HEIGHT	36 INCHES	5 FEET
REFLECTIVE SHEETING	TYPE IV	TYPE IV
NUMBER OF REFLECTORIZED RAIL FACES	4 (TWO EACH DIRECTION)	6 (THREE EACH DIRECTION)

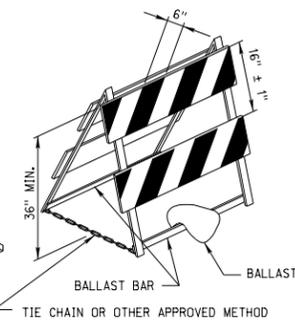
*NOMINAL DIMENSIONS ARE PERMISSIBLE WHEN CONSTRUCTED FROM LUMBER.
**WHEN LATERAL SPACE IS LIMITED, SOME TYPE III BARRICADES WITH A 4 FOOT LENGTH OF RAIL, MAY BE ALLOWED WHEN APPROVED BY THE ENGINEER.

TYPE III BARRICADE

TYPICAL MOUNTING OF FLASHING WARNING LIGHTS. LIGHTS SHALL ALWAYS BE IN VERTICAL ALIGNMENT.



TYPE II BARRICADE



BALLAST SHALL NOT BE PLACED OVER ANY REFLECTIVE DEVICE

DESIGN

A BARRICADE IS A PORTABLE OR FIXED DEVICE HAVING TWO OR THREE RAILS WITH APPROPRIATE MARKINGS. IT IS USED TO CONTROL ROAD USERS BY CLOSING, RESTRICTING, OR DELINEATING ALL OR A PORTION OF THE RIGHT-OF-WAY.

BARRICADES SHALL BE ONE OF TWO TYPES; TYPE II OR TYPE III.

STRIPES ON BARRICADE RAILS SHALL BE ALTERNATING ORANGE AND WHITE RETROREFLECTIVE STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION ROAD USERS ARE TO PASS. THE STRIPES SHALL BE 6 INCHES WIDE. THE MINIMUM RAIL LENGTH FOR A TYPE II BARRICADE IS 36 INCHES.

WHERE BARRICADES EXTEND ENTIRELY ACROSS A ROADWAY, THE STRIPES SHOULD SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH ROAD USERS MUST TURN. WHERE BOTH RIGHT AND LEFT TURNS ARE PROVIDED, THE STRIPES MAY SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE OR BARRICADES. WHERE NO TURNS ARE INTENDED, THE STRIPES SHOULD SLOPE DOWNWARD TOWARD THE CENTER OF THE BARRICADE OR BARRICADES.

BARRICADE RAILS SHOULD BE SUPPORTED IN A MANNER THAT WILL ALLOW THEM TO BE SEEN BY THE ROAD USER, AND IN A MANNER THAT PROVIDES A STABLE SUPPORT THAT IS NOT EASILY BLOWN OVER OR DISPLACED.

ON HIGH-SPEED ROADWAYS OR IN OTHER SITUATIONS WHERE BARRICADES MAY BE SUSCEPTIBLE TO OVERTURNING IN THE WIND, SANDBAGS SHOULD BE USED FOR BALLASTING. SANDBAGS MAY BE PLACED ON LOWER PARTS OF THE FRAME OR STAYS TO PROVIDE THE REQUIRED BALLAST BUT SHALL NOT BE PLACED ON TOP OF ANY STRIPED RAIL. BARRICADES SHALL NOT BE BALLASTED BY HEAVY OBJECTS SUCH AS ROCKS OR CHUNKS OF CONCRETE.

THE BARRICADE OWNERS NAME, NOT TO EXCEED 15 SQUARE INCHES SHALL BE SHOWN ON THE BARRICADE BACK OR SUPPORT BUT NOT ON ITS FACE.

** WHEN LATERAL SPACE IS LIMITED, SOME TYPE III BARRICADES WITH A 4 FOOT LENGTH OF RAIL, MAY BE ALLOWED WHEN APPROVED BY THE ENGINEER.

APPLICATION

TYPE II BARRICADES ARE INTENDED FOR USE IN SITUATIONS WHERE TRAFFIC IS MAINTAINED THROUGH THE TEMPORARY TRAFFIC CONTROL ZONE. THEY MAY BE USED INDIVIDUALLY OR IN GROUPS TO MARK A SPECIFIC CONDITION, OR THEY MAY BE USED IN A SERIES FOR CHANNELIZING TRAFFIC. ON THE INTERSTATE, FREEWAY AND EXPRESSWAY SYSTEM, TYPE II BARRICADES SHALL NOT BE USED FOR CHANNELIZATION.

TYPE III BARRICADES USED AT A ROAD CLOSURE MAY EXTEND COMPLETELY ACROSS A ROADWAY FROM CURB TO CURB. WHERE PROVISION IS MADE FOR ACCESS OF AUTHORIZED EQUIPMENT AND VEHICLES, THE RESPONSIBILITY FOR THE TYPE III BARRICADES SHOULD BE ASSIGNED TO A PERSON WHO SHALL PROVIDE PROPER CLOSURE AT THE END OF EACH WORK DAY.

WHEN A HIGHWAY IS LEGALLY CLOSED BUT ACCESS MUST STILL BE ALLOWED FOR LOCAL TRAFFIC, THE TYPE III BARRICADES MAY NOT BE EXTENDED COMPLETELY ACROSS A ROADWAY. A SIGN WITH THE APPROPRIATE LEGEND CONCERNING PERMISSIBLE USE BY LOCAL TRAFFIC SHALL BE MOUNTED.

NORMALLY PERMANENT SIGNS MOUNTED ON BARRICADES SHALL BE ERRECTED ABOVE THE BARRICADE. THE SIGNS "ROAD CLOSED", OR "ROAD WORK AHEAD", FOR EXAMPLE CAN EFFECTIVELY BE MOUNTED ABOVE THE BARRICADE THAT CLOSSES THE ROADWAY. TYPE III BARRICADES SHALL BE SUPPLEMENTED WITH A LIGHTING DEVICE UNLESS SPECIFICALLY OMITTED BY THE ENGINEER. DETOUR ARROW AND LARGE WARNING ARROW SIGNS SHOULD BE PLACED ON THE FACE OF BARRICADE.

CONES



DESIGN

CONES SHALL BE PREDOMINANTLY ORANGE, FLUORESCENT RED-ORANGE, OR FLUORESCENT YELLOW/ORANGE, NOT LESS THAN 28 INCHES IN HEIGHT, AND SHALL BE MADE OF A MATERIAL THAT CAN BE STRUCK WITHOUT DAMAGING VEHICLES ON IMPACT. CONES WHEN ALLOWED ON THE INTERSTATE, FREEWAY OR EXPRESSWAY SYSTEM SHALL BE A MINIMUM OF 36 INCHES IN HEIGHT.

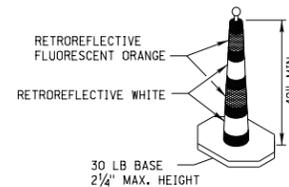
FOR NIGHTTIME USE, CONES SHALL BE RETROREFLECTIVE OR EQUIPPED WITH LIGHTING DEVICES FOR MAXIMUM VISIBILITY. RETROREFLECTION OF 28 INCH OR 36 INCH CONES SHALL BE PROVIDED BY A WHITE BAND 6 INCHES WIDE, NO MORE THAN 4 INCHES FROM THE TOP OF THE CONE, AND AN ADDITIONAL 4 INCH WIDE WHITE BAND A MINIMUM OF 2 INCHES BELOW THE 6 INCH BAND.

APPLICATION

TRAFFIC CONES ARE USED TO CHANNELIZE TRAFFIC, DIVIDE OPPOSING TRAFFIC LANES, DIVIDE TRAFFIC LANES WHEN TWO OR MORE LANES ARE KEPT OPEN IN THE SAME DIRECTION, AND DELINEATE SHORT-DURATION MAINTENANCE AND UTILITY WORK. CONES SHALL NOT BE USED FOR LANE CLOSURE TAPERS OR SHIFTS, CONES SMALLER THAN 42 INCHES SHALL NOT BE USED AT NIGHT ON RURAL HIGHWAYS, UNLESS SHOWN ON THE PLANS OR AS APPROVED OR DIRECTED BY THE ENGINEER.

STEPS SHOULD BE TAKEN TO ENSURE THAT CONES WILL NOT BE BLOWN OVER OR DISPLACED BY WIND OR MOVING TRAFFIC. CONES CAN BE DOUBLED UP TO INCREASE THEIR WEIGHT. SOME CONES ARE CONSTRUCTED WITH BASES THAT CAN BE FILLED WITH BALLAST. OTHERS HAVE SPECIAL WEIGHTED BASES, OR WEIGHTS SUCH AS SANDBAG RINGS THAT CAN BE DROPPED OVER THE CONES AND ONTO THE BASE TO PROVIDE ADDED STABILITY. BALLAST, HOWEVER, SHOULD NOT PRESENT A HAZARD IF THE CONES ARE INADVERTENTLY STRUCK.

42 INCH CONES



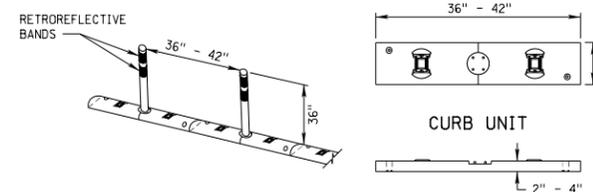
DESIGN

42 INCH CONES SHALL INCLUDE A 30 POUND RUBBER BASE AND DISPLAY FOUR 6 INCH WIDE BANDS OF RETROREFLECTIVE SHEETING, ALTERNATING FLUORESCENT ORANGE-WHITE-FLUORESCENT ORANGE-WHITE.

APPLICATION

WHEN APPROVED BY THE ENGINEER OR SHOWN IN THE PLANS, 42 INCH REFLECTIVE CONES MAY BE USED IN LIEU OF TYPE II BARRICADES OR REFLECTORIZED DRUMS. 42 INCH CONES SHALL NOT BE USED FOR LANE-CLOSURE TAPERS OR SHIFTS. IF A RECTANGULAR BASE IS USED, THE LONG SIDE OF THE BASE SHOULD BE ORIENTED PARALLEL TO THE DIRECTION OF TRAFFIC.

TUBULAR POST AND CURB SYSTEM



DESIGN

TUBULAR POSTS USED IN THE SYSTEM SHALL BE 36 INCHES HIGH AND A MINIMUM OF 2 INCHES WIDE WHEN FACING TRAFFIC. THE TUBULAR POST AND CURB SYSTEM SHALL BE MADE OF A MATERIAL THAT CAN BE STRUCK WITHOUT DAMAGING IMPACTING VEHICLES. THE COLOR SHALL BE AS SHOWN IN THE PLANS.

THE TUBULAR POSTS SHALL BE RETROREFLECTIVE. RETROREFLECTION OF TUBULAR POSTS SHALL BE PROVIDED BY TWO 3-INCH WIDE RETROREFLECTIVE BANDS PLACED A MAXIMUM OF 2 INCHES FROM THE TOP WITH A MAXIMUM OF 6 INCHES BETWEEN THE BANDS. EACH CURB SECTION SHALL CONTAIN ONE RETROREFLECTIVE MARKER FACING EACH DIRECTION OF TRAFFIC. THE COLOR OF THE RETROREFLECTIVE BANDS AND MARKERS SHALL MATCH THE POST/CURB COLOR.

THE CURB SECTIONS SHALL BE CONFIGURED TO ALLOW FOR DRAINAGE FROM THE PAVEMENT SURFACE.

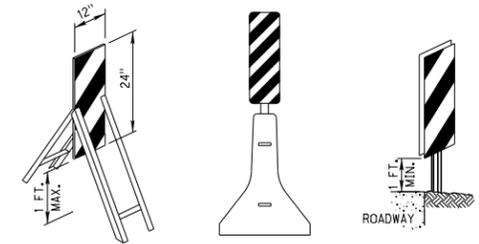
APPLICATION

TUBULAR POST AND CURB SYSTEMS MAY BE USED TO DIVIDE OPPOSING LANES OF TRAFFIC OR TO DIVIDE TRAFFIC LANES WHEN TWO OR MORE LANES ARE KEPT OPEN IN THE SAME DIRECTION.

FASTENING THE CURBS TO THE PAVEMENT WITH ANCHOR BOLTS OR OTHER SUITABLE METHODS AS DIRECTED BY THE MANUFACTURER IS REQUIRED TO MINIMIZE THE CHANCE OF BEING MOVED BY TRAFFIC.

TUBULAR POST AND CURB SYSTEMS SHALL BE INSTALLED IN THE LOCATIONS SHOWN IN THE PLANS OR DIRECTED BY THE ENGINEER.

VERTICAL PANELS



DESIGN

RETROREFLECTIVE MATERIAL ON VERTICAL PANELS SHALL BE 12 INCHES WIDE AND AT LEAST 24 INCHES HIGH. THEY SHALL HAVE ALTERNATING ORANGE AND WHITE STRIPES, WHERE THE HEIGHT OF THE RETROREFLECTIVE MATERIAL ON THE VERTICAL PANEL IS MORE THAN 36 INCHES, A PANEL STRIPE WIDTH OF 6 INCHES SHALL BE USED. WHERE THE HEIGHT OF THE RETROREFLECTIVE MATERIAL ON THE VERTICAL PANEL IS 36 INCHES OR LESS, A PANEL STRIPE WIDTH OF 4 INCHES SHALL BE USED. IF USED FOR TWO-WAY TRAFFIC, BACK-TO-BACK PANELS SHALL BE USED.

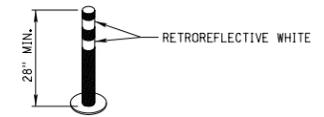
MARKINGS FOR VERTICAL PANELS SHALL BE ALTERNATING ORANGE AND WHITE RETROREFLECTORIZED STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS.

POST MOUNTED VERTICAL PANELS SHALL BE MOUNTED WITH THE BOTTOM A MINIMUM OF 1 FOOT ABOVE THE ROADWAY. VERTICAL PANELS ON A TEMPORARY STAND SHALL BE MOUNTED WITH THE BOTTOM A MAXIMUM OF 1 FOOT ABOVE THE ROADWAY.

APPLICATION

WHERE SPACE IS LIMITED VERTICAL PANELS MAY BE USED TO CHANNEL TRAFFIC, DIVIDE OPPOSING LANES OF TRAFFIC, DIVIDE TRAFFIC LANES OR REPLACE BARRICADES. WHEN APPROVED BY THE ENGINEER, VERTICAL PANELS MAY BE POST-MOUNTED ALONG THE SIDE OF THE ROADWAY.

TUBULAR POSTS



DESIGN

TUBULAR POSTS SHALL BE PREDOMINANTLY ORANGE, NOT LESS THAN 28 INCHES HIGH, BE A MINIMUM OF 2 INCHES WIDE WHEN FACING TRAFFIC, AND MADE OF A MATERIAL THAT CAN BE STRUCK WITHOUT DAMAGING IMPACTING VEHICLES.

TUBULAR POSTS SHALL BE RETROREFLECTIVE. RETROREFLECTION OF TUBULAR POSTS SHALL BE PROVIDED BY TWO 3 INCHES WIDE WHITE BANDS PLACED A MAXIMUM OF 2 INCHES FROM THE TOP, WITH A MAXIMUM OF 6 INCHES BETWEEN THE BANDS. THE BASE SHALL NOT BE WIDER THAN 12 INCHES OR HIGHER THAN 2 INCHES.

APPLICATION

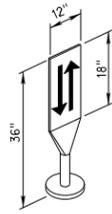
TUBULAR POSTS HAVE LESS VISIBLE AREA THAN OTHER DEVICES AND SHOULD BE USED ONLY WHERE SPACE RESTRICTIONS DO NOT ALLOW FOR THE USE OF OTHER MORE VISIBLE DEVICES. THEY MAY BE USED EFFECTIVELY TO DIVIDE OPPOSING LANES OF TRAFFIC OR TO DIVIDE TRAFFIC LANES WHEN TWO OR MORE LANES ARE KEPT OPEN IN THE SAME DIRECTION.

STEPS SHOULD BE TAKEN TO ASSURE THAT TUBULAR POSTS WILL NOT BE BLOWN OVER OR DISPLACED BY TRAFFIC BY EITHER AFFIXING THEM TO THE PAVEMENT WITH ANCHOR BOLTS OR ADHESIVE, IF A NONCYLINDRICAL DEVICE IS USED, IT SHALL BE ATTACHED TO THE PAVEMENT TO ENSURE THAT THE WIDTH FACING TRAFFIC MEETS THE MINIMUM REQUIREMENTS.

TUBULAR POSTS SHOULD NOT BE USED FOR PEDESTRIAN CHANNELIZATION OR A PEDESTRIAN BARRIERS IN TEMPORARY TRAFFIC CONTROL ZONES ON OR ALONG SIDEWALKS.

R7	JAN 18	NDOR BORDER TO NDOT BORDER
R6	JUN 14	2009 MUTCD UPDATE
R5	OCT 98	REVISE CHANNELIZATION DEVICES, TAPER
REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF TRANSPORTATION STANDARD PLAN NO. 920-R7		
TRAFFIC CONTROL, CONSTRUCTION AND MAINTENANCE		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		
DATE		
ORIGINAL: OCTOBER 1998		
DATE		

OPPOSING TRAFFIC LANE DIVIDERS



DESIGN

OPPOSING TRAFFIC LANE DIVIDERS SHALL BE A TWO SIDED UPRIGHT RETROREFLECTORIZED ORANGE PANEL, WITH A WIDTH OF 12 INCHES AND A HEIGHT OF 18 INCHES. THE TOP OF THE PANEL SHALL BE 36 INCHES ABOVE THE PAVEMENT. THE SYMBOL ON EACH SIDE SHALL BE TWO OPPOSING BLACK ARROWS. THE LANE DIVIDER SHALL BE MADE OF LIGHTWEIGHT MATERIAL THAT WILL YIELD UPON IMPACT BY A VEHICLE. THE LANE DIVIDER BASE SHALL NOT BE WIDER THAN 12 INCHES OR HIGHER THAN 4 INCHES. THE BASE SHALL BE ATTACHED TO THE EXISTING SURFACE BY EPOXY OR OTHER SUITABLE ADHESIVE, TO ENSURE THAT THE PANEL REMAINS FACING TRAFFIC.

APPLICATION

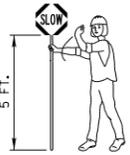
OPPOSING TRAFFIC LANE DIVIDERS ARE DELINEATION DEVICES USED AS CENTER LANE DIVIDERS TO SEPARATE OPPOSING TRAFFIC ON A TWO-LANE, TWO-WAY OPERATION.

FLAGGERS

REQUIRED METHOD



TO STOP TRAFFIC



TRAFFIC PROCEED



TO ALERT AND SLOW TRAFFIC

EMERGENCY USE ONLY



FLAGGER PADDLE

THE STOP/SLOW PADDLE SHALL HAVE AN OCTAGONAL SHAPE ON A RIGID HANDLE. STOP/SLOW PADDLES SHALL BE AT LEAST 18 INCHES WIDE WITH LETTERS AT LEAST 6 INCHES HIGH. IF THE STOP/SLOW PADDLE IS PLACED ON A RIGID STAFF, THE MINIMUM LENGTH OF THE STAFF, MEASURED FROM THE BOTTOM OF THE SIGN TO THE END OF THIS STAFF THAT RESTS ON THE GROUND, SHOULD BE 5 FEET. THE STOP/SLOW PADDLE SHOULD BE THE PRIMARY AND PREFERRED HAND-SIGNALING DEVICE BECAUSE THE STOP/SLOW PADDLE GIVES ROAD USERS MORE POSITIVE GUIDANCE THAN RED FLAGS. USE OF FLAGS SHOULD BE LIMITED TO EMERGENCY SITUATIONS.

FLAGGERS

A FLAGGER MUST BE DRESSED FOR SAFETY. IN ADDITION TO THE REQUIREMENTS OF THE "WORKER VISIBILITY" SECTION LISTED BELOW, FLAGGERS SHALL WEAR:

1. AN ORANGE OR YELLOW/GREEN CAP OR HARD HAT.
2. A SHIRT WITH SLEEVES, PANTS AND SHOES (TANK TOPS, SHORTS OR SANDALS SHALL NOT BE WORN).

FLAGGERS SHALL BE INSTRUCTED IN THE PROPER LOCATION, DUTIES AND PROCEDURES FOR FLAGGING AS OUTLINED IN THE CURRENT MUTCD AND THE DEPARTMENT OF ROADS FLAGGER'S HANDBOOK. AS REQUIRED BY THE DEPARTMENT OF ROADS, THE FLAGGER SHALL BE CERTIFIED, AND HAVE IN THEIR POSSESSION, A VALID FLAGGER CERTIFICATION CARD.

WORKER VISIBILITY

ALL WORKERS WITHIN THE RIGHT-OF-WAY WHO ARE EXPOSED EITHER TO TRAFFIC (VEHICLES USING THE HIGHWAY FOR PURPOSES OF TRAVEL) OR TO CONSTRUCTION EQUIPMENT WITHIN THE WORK AREA SHALL WEAR HIGH-VISIBILITY SAFETY APPAREL. HIGH-VISIBILITY SAFETY APPAREL IS DEFINED TO MEAN PERSONAL PROTECTIVE SAFETY CLOTHING THAT:

1. IS INTENDED TO PROVIDE CONSPICUITY DURING BOTH DAYTIME AND NIGHTTIME USAGE, AND
2. MEETS THE PERFORMANCE CLASS 2 OR CLASS 3 REQUIREMENTS OF THE ANSI/ISEA 107-2004 PUBLICATION ENTITLED "AMERICAN NATIONAL STANDARDS FOR HIGH-VISIBILITY SAFETY APPAREL AND HEADWEAR"

LIGHTING DEVICES

FUNCTION

CONSTRUCTION AND MAINTENANCE ACTIVITIES OFTEN CREATE CONDITIONS ON OR NEAR THE TRAVELED WAY THAT ARE PARTICULARLY HAZARDOUS AT NIGHT. IT IS OFTEN DESIRABLE AND NECESSARY TO SUPPLEMENT THE REFLECTORIZED SIGNS, BARRIERS, AND CHANNELIZING DEVICES WITH LIGHTING DEVICES. STROBE TYPE LIGHTS ARE NOT PERMITTED.

BARRICADE WARNING LIGHTS DESIGN (BATTERY OPERATED)

TYPE "A" LOW INTENSITY FLASHING WARNING LIGHTS ARE MOST COMMONLY MOUNTED ON BARRICADES, OR WITH SIGNS AND ARE INTENDED TO WARN THE DRIVER THAT THEY ARE PROCEEDING IN A HAZARDOUS AREA. THESE LIGHTS SHALL NOT BE USED FOR DELINEATION, AS A SERIES OF FLASHING LIGHTS IN A ROW WOULD TEND TO OBSCURE THE DESIRED PATH.

TYPE "A" HIGH INTENSITY FLASHING WARNING LIGHTS ARE NORMALLY MOUNTED ON THE TYPE III BARRICADE THAT ACCOMPANIES THE ADVANCE WARNING SIGNS.

TYPE "C" STEADY BURN LIGHTS AS USED HEREIN, SHALL MEAN A SERIES OF LOW WATTAGE YELLOW ELECTRIC LIGHTS. WHERE LIGHTS ARE NEEDED TO DELINEATE OR MARK THE TRAVELED WAY THROUGH AND AROUND OBSTRUCTIONS IN A CONSTRUCTION MAINTENANCE AREA, THE DELINEATION SHALL BE ACCOMPLISHED BY USE OF STEADY BURNING LIGHTS. WHEN USED TO SUPPLEMENT CHANNELIZATION, THE MAXIMUM SPACING FOR WARNING LIGHTS SHOULD BE IDENTICAL TO THE CHANNELIZING DEVICE SPACING REQUIREMENTS. WHEN USED TO DELINEATE A CURVE, TYPE "C" WARNING LIGHTS SHOULD ONLY BE USED ON DEVICES ON THE OUTSIDE OF THE CURVE, AND NOT ON THE INSIDE OF THE CURVE.

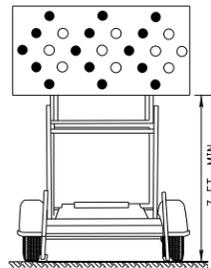
FLASHING ARROW PANEL (DISPLAY)

AN ARROW PANEL IS A SIGN WITH A MATRIX OF ELEMENTS, CAPABLE OF EITHER FLASHING OR SEQUENTIAL DISPLAYS. THIS SIGN SHALL PROVIDE ADDITIONAL WARNING AND DIRECTIONAL INFORMATION TO ASSIST IN MERGING AND CONTROLLING ROAD USERS THROUGH OR AROUND A TEMPORARY TRAFFIC CONTROL ZONE. AN ARROW PANEL SHOULD BE USED IN COMBINATION WITH APPROPRIATE SIGNS, CHANNELIZING DEVICES OR OTHER TRAFFIC CONTROL DEVICES.

DESIGN

ARROW PANELS SHALL MEET THE SIZE AND SPECIFICATIONS OF THE MUTCD FOR TYPE "C" ARROW DISPLAYS.

FLASHING ARROW PANEL SHALL BE RECTANGULAR, OF SOLID APPEARANCE AND FINISHED IN NON-REFLECTIVE BLACK. THE PANEL SHALL BE MOUNTED ON A VEHICLE, TRAILER OR OTHER SUITABLE SUPPORT. MINIMUM MOUNTING HEIGHT MEASURED VERTICALLY FROM THE BOTTOM OF THE PANEL TO THE ROADWAY BELOW IT OR TO THE ELEVATION OF THE NEAR EDGE OF THE ROADWAY, SHALL BE 7 FEET EXCEPT ON VEHICLE-MOUNTED PANELS, WHICH SHOULD BE AS HIGH AS PRACTICAL.



THE FOLLOWING SELECTIONS SHALL BE PROVIDED ON THE ARROW PANEL	
OPERATING MODE	PANEL DISPLAY
FLASHING ARROW	RIGHT SHOWN; LEFT OPPOSITE
SEQUENTIAL ARROW	RIGHT SHOWN; LEFT OPPOSITE
SEQUENTIAL CHEVRON	RIGHT SHOWN; LEFT OPPOSITE
FLASHING DOUBLE ARROW	RIGHT SHOWN; LEFT OPPOSITE
FLASHING OR ALTERNATING CAUTION	OR OR OR ALTERNATING DIAMOND CAUTION

THE ARROW PANEL SHALL HAVE A MINIMUM SIZE OF 96 INCHES WIDE AND 48 INCHES HIGH. THE MINIMUM LEGIBILITY DISTANCE SHALL BE 1 MILE. THE PANEL SHALL CONTAIN 25 LAMP ELEMENTS. ARROW PANEL ELEMENTS SHALL BE CAPABLE OF A MINIMUM 50 PERCENT DIMMING, AUTOMATICALLY WHEN AMBIENT LIGHT FALLS BELOW 50 LUX.

THE MINIMUM ELEMENT "ON TIME" SHALL BE 50 PERCENT FOR THE FLASHING MODE AND EQUAL INTERVALS OF 25 PERCENT FOR EACH SEQUENTIAL CHEVRON PHASE. THE FLASHING RATE SHALL BE NO FEWER THAN 25 NOR MORE THAN 40 FLASHES PER MINUTE.

APPLICATION

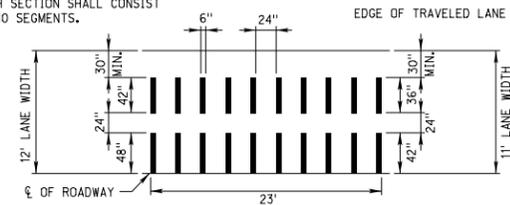
A FLASHING ARROW OR SEQUENTIAL CHEVRON MODE SHALL ONLY BE USED FOR STATIONARY OR MOVING LANE CLOSURES.

FOR SHOULDER WORK BLOCKING THE SHOULDER, FOR ROADSIDE WORK NEAR THE SHOULDER, OR FOR TEMPORARILY CLOSING ONE LANE ON A TWO-LANE, TWO-WAY ROADWAY, AN ARROW PANEL SHALL BE USED ONLY IN THE CAUTION MODE.

AN ARROW DISPLAY MODE SHALL NOT BE USED ON A TWO-LANE TWO-WAY ROADWAY FOR TEMPORARY ONE-LANE OPERATION OR LANE SHIFTS. AN ARROW DISPLAY SHALL NOT BE USED TO LATERALLY SHIFT TRAFFIC.

TEMPORARY RUMBLE STRIPS

EACH SECTION SHALL CONSIST OF 10 SEGMENTS.



DESIGN

TEMPORARY RUMBLE STRIPS MAY BE MADE OF ASPHALT PAVING MATERIAL, EPOXY AND AGGREGATE OR OTHER SUITABLE MATERIAL WHICH WILL MAINTAIN A DESIRABLE RUMBLE EFFECT. THE TEMPORARY RUMBLE STRIP SHOULD HAVE AN INSTALLED HEIGHT OF 3/8". PREFORMED RUMBLE STRIPS MAY BE USED PROVIDED THEY HAVE A MINIMUM 1/2" HEIGHT.

TRAFFIC SIGNALS

TRAFFIC SIGNALS MAY BE ALLOWED AT CERTAIN EQUIPMENT CROSSINGS WHERE THE VOLUME OF FILL MATERIAL AND THE NUMBER OF EQUIPMENT CROSSINGS PER HOUR IS HIGH. TRAFFIC SIGNALS MAY BE ALLOWED AT CERTAIN BRIDGE CONSTRUCTION SITES WHERE A COMBINATION OF ONE-WAY TRAFFIC AND HIGH TRAFFIC VOLUMES WOULD BE BEST SERVED WITH THIS TYPE OF TRAFFIC CONTROL.

ALL TRAFFIC SIGNAL REQUESTS AND METHOD OF INSTALLATION ON THE STATE HIGHWAY SYSTEM SHALL BE IN COMPLIANCE WITH THE MUTCD AND MUST BE APPROVED BY THE STATE TRAFFIC ENGINEER.

IF, AFTER THE SIGNAL ASSEMBLIES ARE ERECTED AND THE ROAD IS OPEN TO PUBLIC TRAVEL, THE SIGNAL SYSTEM IS NOT PUT IMMEDIATELY INTO OPERATION, THE SIGNAL FACES SHALL BE COVERED WITH BURLAP OR OTHER OPAQUE MATERIAL SUBJECT TO THE APPROVAL OF THE ENGINEER. INOPERATIVE SIGNALS ON ROADS OPEN TO THE PUBLIC SHALL ALWAYS BE COVERED. TILTING THE SIGNALS UPWARD IS NOT AN ACCEPTABLE ALTERNATIVE TO COVERING THE HEADS.

FLOODLIGHTS

WHEN NIGHTTIME WORK IS REQUIRED, FLOODLIGHTS SHALL BE USED TO ILLUMINATE FLAGGER STATIONS. FLOODLIGHTS SHOULD BE USED TO ILLUMINATE EQUIPMENT CROSSINGS, AND OTHER AREAS WHERE EXISTING LIGHT IS NOT ADEQUATE FOR THE WORK TO BE PERFORMED SAFELY.

IN NO CASE SHALL FLOODLIGHTING BE PERMITTED TO CREATE A DISABLING GLARE FOR DRIVERS. THE ADEQUACY OF THE FLOODLIGHT PLACEMENT AND ELIMINATION OF POTENTIAL GLARE SHOULD BE CHECKED BY DRIVING THROUGH THE PROJECT.

PAVEMENT MARKING

IT IS INTENDED TO THE EXTENT POSSIBLE, THAT MOTORISTS BE PROVIDED MARKINGS WITHIN A WORK AREA COMPARABLE TO THE MARKINGS NORMALLY MAINTAINED ALONG ADJACENT ROADWAYS, PARTICULARLY AT EITHER END OF THE WORK AREA.

ALL MARKINGS AND DEVICES USED TO DELINEATE VEHICLE AND PEDESTRIAN PATHS SHALL BE CAREFULLY REVIEWED DURING DAYTIME AND NIGHTTIME PERIODS TO AVOID INADVERTENTLY LEADING DRIVERS OR PEDESTRIANS FROM THE INTENDED PATH.

PAVEMENT MARKINGS NO LONGER APPLICABLE SHALL BE REMOVED UNLESS OTHERWISE APPROVED BY THE ENGINEER.

TAPERS

TAPERS ARE CREATED USING A SERIES OF CHANNELIZING DEVICES OR PAVEMENT MARKINGS TO MOVE TRAFFIC OUT OF OR INTO ITS NORMAL PATH.

MERGING TAPER

A MERGING TAPER REQUIRES THE LONGEST DISTANCE BECAUSE DRIVERS ARE REQUIRED TO MERGE INTO COMMON ROAD SPACE. THE TAPER SHOULD BE LONG ENOUGH TO ENABLE MERGING DRIVERS TO HAVE ADEQUATE ADVANCE WARNING AND SUFFICIENT LENGTH TO ADJUST THEIR SPEEDS AND MERGE INTO A SINGLE LANE BEFORE THE DOWNSTREAM END OF THE TRANSITION.

SHIFTING TAPER

A SHIFTING TAPER IS USED WHEN MERGING IS NOT REQUIRED, BUT A LATERAL SHIFT IS NEEDED. APPROXIMATELY ONE-HALF "L" HAS BEEN FOUND TO BE ADEQUATE, WHERE MORE SPACE IS AVAILABLE, IT MAY BE BENEFICIAL TO USE LONGER TAPERS. GUIDANCE FOR CHANGES IN ALIGNMENT MAY ALSO BE ACCOMPLISHED BY USING HORIZONTAL CURVES DESIGNED FOR NORMAL HIGHWAY SPEEDS.

SHOULDER TAPERS

A SHOULDER TAPER MAY BE BENEFICIAL ON HIGH-SPEED ROADWAYS WHERE SHOULDERS ARE PART OF THE ACTIVITY AREA AND ARE CLOSED, OR WHEN IMPROVED SHOULDERS MIGHT BE MISTAKEN AS A DRIVING LANE IN THESE INSTANCES, THE SAME TYPE, BUT ABBREVIATED, CLOSURE PROCEDURES USED ON A NORMAL PORTION OF THE ROADWAY CAN BE USED. IF USED, SHOULDER TAPERS APPROACHING THE ACTIVITY AREA SHOULD HAVE A LENGTH OF ABOUT ONE-THIRD "L".

DOWNSTREAM TAPERS

THE DOWNSTREAM TAPER MAY BE USEFUL IN TERMINATION AREAS TO PROVIDE A VISUAL CUE TO THE DRIVER THAT ACCESS IS AVAILABLE TO THE ORIGINAL LANE OR PATH THAT WAS CLOSED. WHEN USED, IT SHOULD HAVE A MINIMUM LENGTH OF ABOUT 100 FEET PER LANE, WITH DEVICES SPACED ABOUT 20 FEET APART.

ONE LANE, TWO WAY TAPER

THE ONE-LANE, TWO-WAY TAPER IS USED IN ADVANCE OF AN ACTIVITY AREA THAT OCCUPIES PART OF A TWO-WAY ROADWAY IN SUCH A WAY THAT A PORTION OF THE ROAD IS USED ALTERNATELY BY TRAFFIC IN EACH DIRECTION. A SHORT TAPER HAVING A MINIMUM LENGTH OF 50 FEET AND A MAXIMUM LENGTH OF 100 FEET WITH CHANNELIZING DEVICES AT APPROXIMATELY 20 FOOT SPACINGS SHOULD BE USED TO GUIDE TRAFFIC INTO THE ONE-LANE-SECTION AND A DOWNSTREAM TAPER WITH A LENGTH OF APPROXIMATELY 100 FEET SHOULD BE USED TO GUIDE TRAFFIC BACK INTO THEIR ORIGINAL LANE.

TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES	
TYPE OF TAPER	TAPER LENGTH (FEET)
MERGING TAPER	L MINIMUM
SHIFTING TAPER	1/2 L MINIMUM
SHOULDER TAPER	1/3 L MINIMUM
TWO-WAY TAPER	100 FEET MAXIMUM

FORMULAS FOR L	
SPEED	FORMULA
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR GREATER	$L = WS$

L = TAPER LENGTH IN FEET
 W = WIDTH OF OFFSET IN FEET
 S = POSTED SPEED LIMIT PRIOR TO WORK IN MPH

SPEED (MPH)	TAPER LENGTH L (FEET)		
	10 FT.	11 FT.	12 FT.
25	105	115	125
30	150	165	180
35	205	225	245
40	270	295	320
45	450	495	540
50	500	550	600
55	550	605	660
60	600	660	720
65	650	715	780
75	750	825	900

REV. NO.	DATE	DESCRIPTION OF REVISION
R7	JAN 18	NDOR BORDER TO NDOT BORDER
R6	JUN 14	2009 MUTCD UPDATE
R5	OCT 98	REVISE CHANNELIZATION DEVICES, TAPER

NEBRASKA DEPARTMENT OF TRANSPORTATION
 STANDARD PLAN NO. 920-R7
**TRAFFIC CONTROL,
 CONSTRUCTION AND MAINTENANCE**

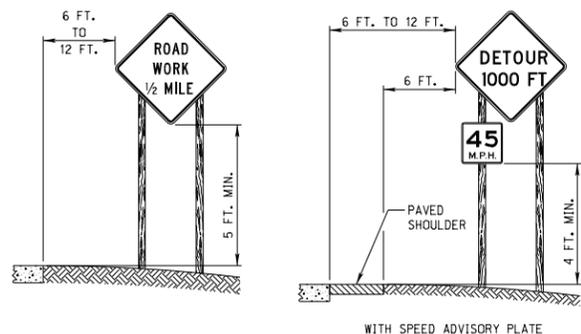
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

DATE _____ ORIGINAL: OCTOBER 1998 DATE _____

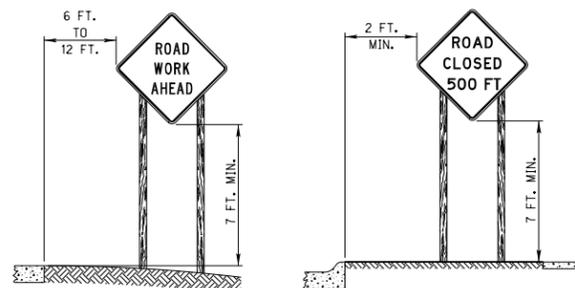
2
3

ROADSIDE SIGNS

**HEIGHT AND LATERAL LOCATION OF SIGNS
RURAL AREA**



URBAN AREA



**TYPICAL FIRST SIGN AT
CONSTRUCTION SITE**

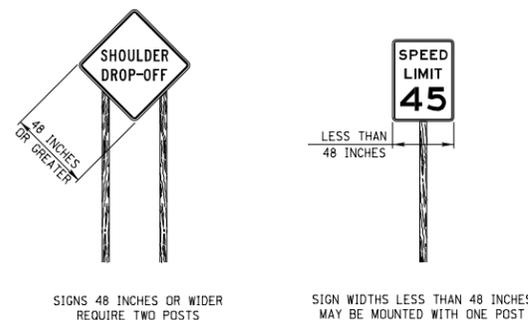


WITH TYPE "A" FLASHING WARNING LIGHT MOUNTED ABOVE TYPE III BARRICADE

**PORTABLE AND
TEMPORARY MOUNTING**



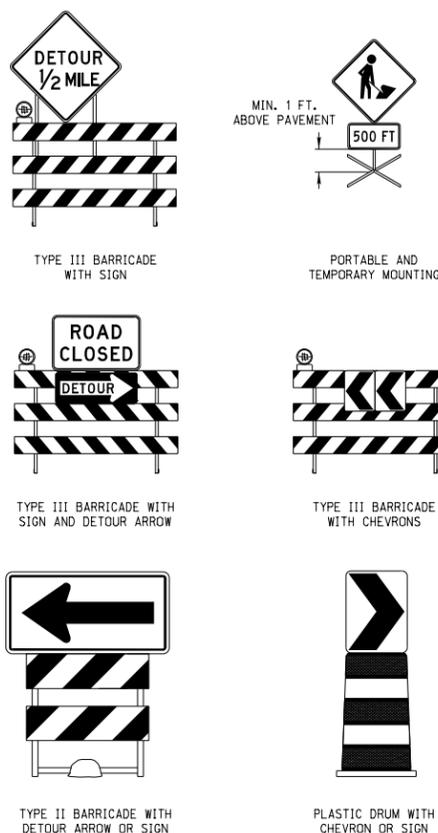
**TYPICAL SIGN MOUNTINGS
POST MOUNTED**



SIGNS 48 INCHES OR WIDER REQUIRE TWO POSTS

SIGN WIDTHS LESS THAN 48 INCHES MAY BE MOUNTED WITH ONE POST

**TYPICAL SIGN MOUNTINGS
OTHER THAN POST MOUNTED**



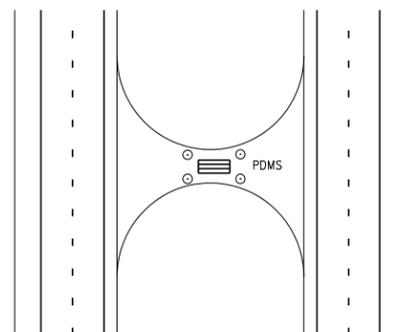
TEMPORARY SIGN SUPPORTS

ALL "TEMPORARY SIGN" SUPPORTS (BASES) SHALL BE NCHRP 350 OR MASH (TL-3) APPROVED.

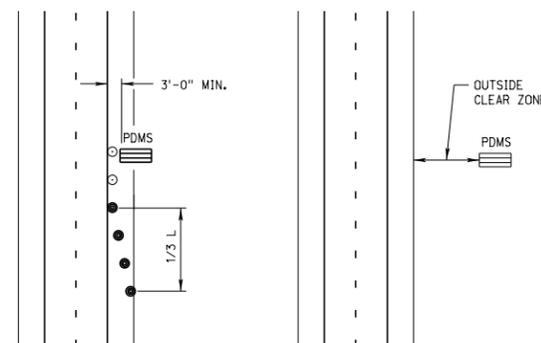
"TEMPORARY SIGNS" ARE ALL TEMPORARILY MOUNTED WORK ZONE SIGNS THAT ARE NOT MOUNTED IN THE GROUND AT THE TYPICAL 5 FOOT MOUNTING HEIGHT. TEMPORARY SIGNS ARE CONSIDERED NCHRP 350 OR MASH CATEGORY 2 DEVICES AND ARE MOUNTED ON TEMPORARY SIGN STANDS. TEMPORARY SIGNS SHALL BE MOUNTED A MINIMUM OF 1 FOOT ABOVE THE GROUND, UNLESS OTHERWISE REQUIRED TO BE MOUNTED AT A HIGHER HEIGHT.

TEMPORARY SIGNS AND THEIR SUPPORTS SHALL NOT BE IN PLACE LONGER THAN 3 DAYS. ANY SIGN THAT IS TO BE IN PLACE LONGER THAN 3 DAYS SHALL BE POST MOUNTED OR MOUNTED TO A DRUM, BARRICADE, OR BARRIER, AS REQUIRED BY THE PLANS OR SPECIFICATIONS.

PORTABLE DYNAMIC MESSAGE SIGN DELINEATION



IN MEDIAN



ON SHOULDER

OFF SHOULDER

PORTABLE DYNAMIC MESSAGE SIGNS (PDMS)

THE PLACEMENT OF PDMS SHOULD BE IN THE FOLLOWING ORDER:

WHENEVER POSSIBLE, PDMS SHOULD BE PLACED OFF OF ANY USABLE PORTION OF THE ROADWAY ON THE RIGHT SIDE OF THE ROADWAY. WHEN PLACED OUTSIDE THE CLEAR ZONE OR BEHIND GUARDRAIL OR CONCRETE PROTECTION BARRIERS, DELINEATION IS NOT REQUIRED.

WHERE FIELD CONDITIONS DO NOT ALLOW FOR THIS PLACEMENT, THE SIGNS MAY BE LOCATED ON THE OUTSIDE SHOULDER OF THE ROADWAY OR WITHIN THE MEDIAN.

- A MINIMUM CLEARANCE OF 3 FEET MEASURED HORIZONTALLY FROM THE EDGE OF THE SIGN TO THE EDGE OF THE TRAVELED WAY IS RECOMMENDED.
- THE PDMS SHOULD HAVE A MINIMUM MOUNTED HEIGHT OF 7 FEET ON FREEWAYS, EXPRESSWAYS AND IN URBAN AREAS.
- ALL OTHER RURAL APPLICATIONS SHOULD HAVE A MINIMUM HEIGHT OF 5 FEET.

THESE HEIGHTS ARE MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE ELEVATION OF THE NEAR EDGE OF THE PAVEMENT.

REFLECTORIZED PLASTIC DRUMS SHOULD BE USED TO DELINEATE EACH SIGN USING A 1/3 L TAPER. THESE DRUMS SHOULD BE POSITIONED ON THE UPSTREAM END OF THE SIGN TO FORM A TAPER LEADING UP TO THE TRAFFIC SIDE OF THE SIGN. FOR A SIGN LOCATED IN THE MEDIAN, THE SIGN SHOULD BE DELINEATED WITH A 42 INCH CONE ON ALL FOUR CORNERS.

WHEN DEPLOYED, THE SIGN SHALL BE SIGHTED AND ALIGNED WITH APPROACHING TRAFFIC TO ENSURE VISIBILITY OF THE MESSAGE. IF MULTIPLE SIGNS ARE USED, THE SIGNS SHOULD BE LOCATED ON THE SAME SIDE OF THE ROAD AND SEPARATED ACCORDING TO PROPER SIGN SPACING.

WHEN PRACTICAL, PDMS SHOULD NOT BE USED TO REPLACE STATIC SIGNS FOR LONG TERM USAGE (OVER 10 DAYS).

WHEN PDMS ARE TO BE DEPLOYED FOR LONG PERIODS, SUCH AS INCIDENT MANAGEMENT ROLES, CONCRETE PADS WITH APPROPRIATE TIE DOWNS SHOULD BE CONSTRUCTED FOR THEIR PLACEMENT.

PDMS NOT ACTIVELY BEING USED IN A CONSTRUCTION OR INCIDENT MANAGEMENT ROLE SHOULD BE REMOVED.

REFER TO NDOT "DMS GUIDELINES" FOR PROPER PDMS MESSAGE INFORMATION.

NOTES

- ALL TRAFFIC CONTROL DEVICES SHALL MEET THE APPLICABLE STANDARDS AND SPECIFICATIONS PRESCRIBED IN PART 6 OF THE LATEST ADOPTED EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, (MUTCD)" AND THE STATE OF NEBRASKA SUPPLEMENT TO THE MUTCD. ALL TRAFFIC CONTROL DEVICES SHALL BE CRASHWORTHY AND QUALIFY AS SUCH ACCORDING TO THE TESTING AND ACCEPTANCE GUIDELINES OF THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
- TRAFFIC CONTROL PLANS AND DEVICES SHOULD FOLLOW THE PRINCIPLES SET FORTH, BUT MAY DEVIATE FROM THE TYPICAL DRAWINGS TO ALLOW FOR CONDITIONS AND REQUIREMENTS OF THE PROJECT.
- TRAFFIC CONTROL DEVICES SHALL BE INSTALLED SO AS NOT TO OBSTRUCT THE VIEW OF OTHER TRAFFIC CONTROL DEVICES.
- THE ENGINEER SHALL HAVE THE AUTHORITY TO REQUIRE THE USE, AND APPROVE THE LOCATION OF ANY OF THE DEVICES SHOWN IN THESE PLANS.

WORK ZONE SPEED LIMIT NOTES

- WORK ZONE SPEED LIMITS SHALL NOT BE INSTALLED WITHOUT A SPEED ZONE AUTHORIZATION COMPLETED BY THE DEPARTMENT.
- REDUCED SPEED LIMITS SHOULD BE USED ONLY IN THE SPECIFIC PORTION OF THE WORK ZONE WHERE CONDITIONS OR RESTRICTIVE FEATURES ARE PRESENT. HOWEVER, FREQUENT CHANGES IN THE SPEED LIMIT SHOULD BE AVOIDED. THE REDUCTION OF SPEED SHOULD BE DESIGNED SO VEHICLES CAN SAFELY TRAVEL THROUGH THE WORK ZONE WITH A SPEED LIMIT REDUCTION OF NO MORE THAN 10 MPH UNLESS OTHERWISE NOTED IN THE PLANS.
- WORK ZONE SPEED LIMITS SHOWN ARE TYPICAL APPLICATIONS ONLY AND ARE NOT TO BE ASSUMED AS THE SPEED LIMITS REQUIRED FOR THE WORK.
- EXISTING SPEED LIMIT SIGNS SHALL BE REMOVED OR COVERED WHEN A REDUCED WORK ZONE SPEED LIMIT IS IN EFFECT IN THE SAME AREA.
- WORK ZONE SPEED LIMIT SIGNS SHALL BE INSTALLED EVERY MILE THROUGH THE WORK AREA WHEN SPEED ZONE IS REDUCED.
- A SPEED LIMIT SIGN ENDING THE REDUCED SPEED ZONE SHALL BE INSTALLED AT THE END OF EACH ZONE.
- DOUBLE FINES AND REDUCED SPEED ZONE SIGNING ARE NOT REQUIRED FOR SHORT-DURATION WORK LESS THAN 12 HOURS.

TAPER FORMULA

$L = S \times W$ FOR SPEEDS OF 45 MPH OR MORE

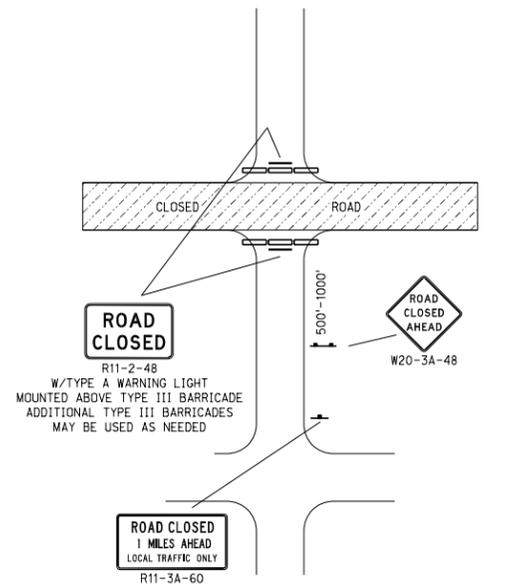
$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40 MPH OR LESS.

LEGEND

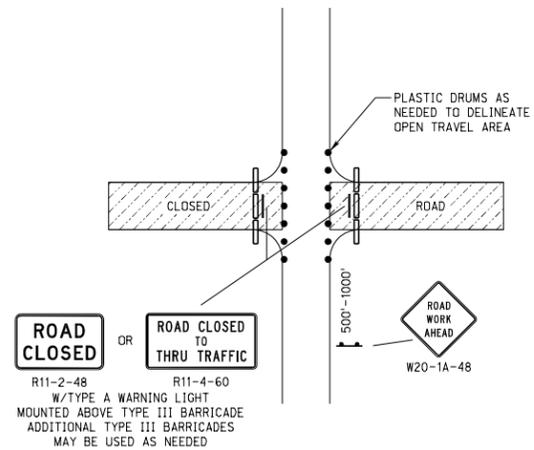
- TYPE III BARRICADE
 - REFLECTORIZED PLASTIC DRUM
 - REFLECTORIZED PLASTIC DRUM OR 42" CONE
 - PORTABLE DYNAMIC MESSAGE SIGN
- WHERE:**
- L** - MINIMUM LENGTH OF TAPER.
 - S** - NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK.
 - W** - WIDTH OF OFFSET (LANE WIDTH).

R7	JAN 18	NDOR BORDER TO NDOT BORDER
R6	JUN 14	2009 MUTCD UPDATE
R5	OCT 98	REVISE CHANNELIZATION DEVICES, TAPER
REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF TRANSPORTATION STANDARD PLAN NO. 920-R7 TRAFFIC CONTROL, CONSTRUCTION AND MAINTENANCE		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		
ORIGINAL: OCTOBER 1998 DATE: _____		

CROSS ROAD INTERSECTING CLOSED ROAD

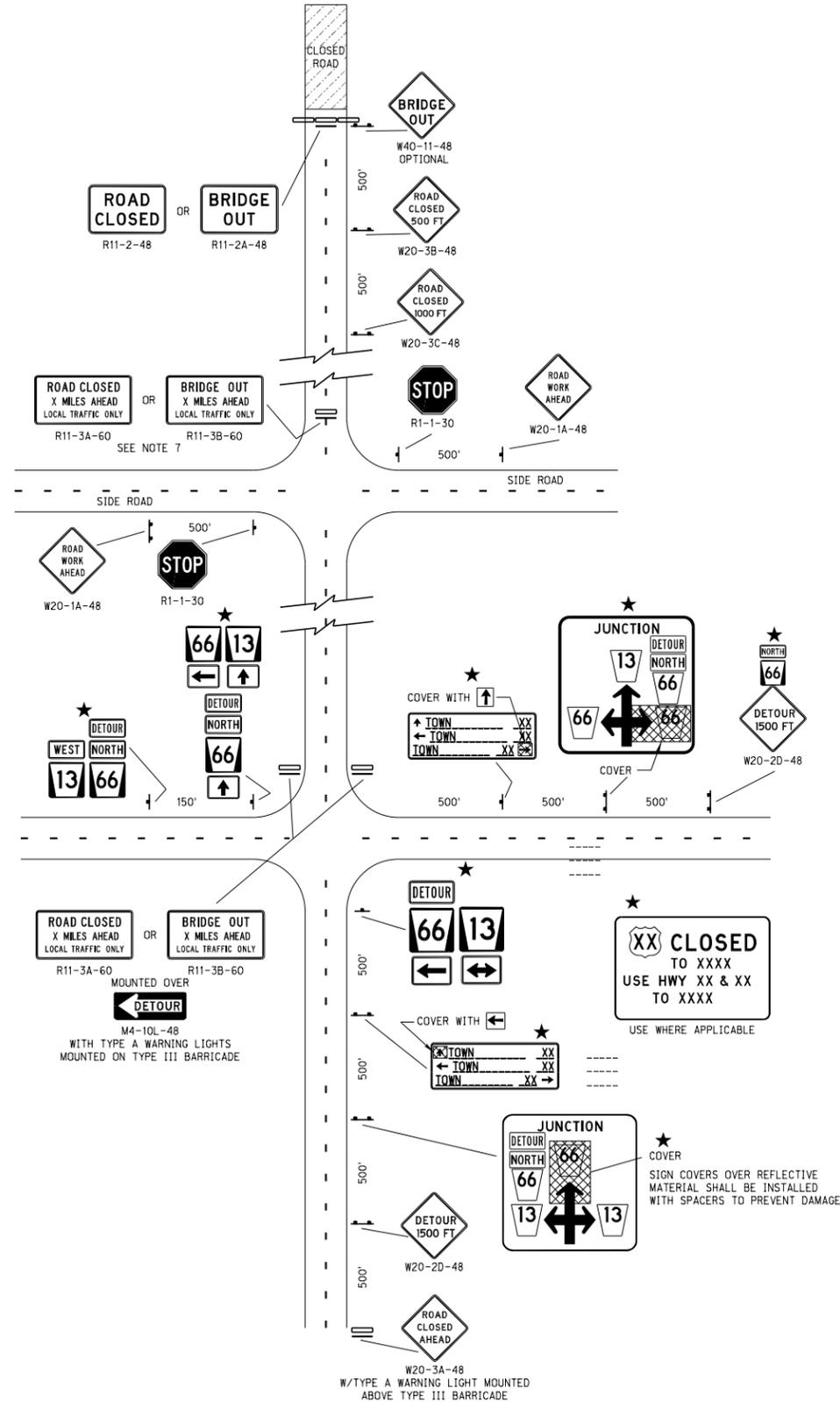


TRAFFIC NOT ALLOWED TO CROSS CLOSED ROAD



TRAFFIC ALLOWED TO CROSS CLOSED ROAD

ROAD CLOSED BEYOND JUNCTION



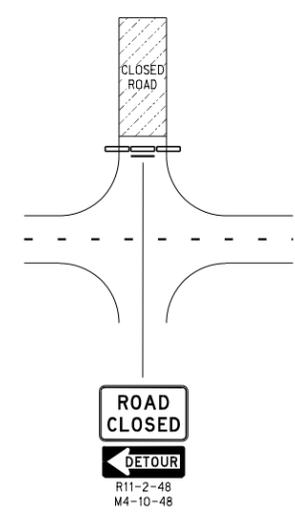
NOTES

1. SIGNS SHOWN ARE USUALLY FOR ONE DIRECTION OF TRAVEL ONLY.
2. THE CONTRACTOR SHALL INSTALL, MAINTAIN, AND REMOVE ALL SIGNS IN ACCORDANCE WITH THE DETAILS OF AND AT THE LOCATIONS SHOWN IN THE PLANS. SIGNS INSTALLED BY THE DEPARTMENT OR OTHER GOVERNMENT AGENCY SHALL BE MAINTAINED AND REMOVED BY THEIR FORCES.
3. WHEN MESSAGE IS NOT PERTINENT, SIGNS SHALL BE TAKEN DOWN, COVERED OR FOLDED. TAPE IS NOT PERMITTED ON THE FACE OF THE SIGN.
4. VEHICLES OR EQUIPMENT SHALL NOT BE PARKED SO AS TO OBSCURE OR DISTRACT FROM TRAFFIC CONTROL DEVICES.
5. FLAGS MAY BE USED TO CALL ATTENTION TO WARNING SIGNS.
6. WHEN APPROPRIATE THE SIGN R11-2B "BRIDGE OUT" MAY BE USED INSTEAD OF R11-2 "ROAD CLOSED".
7. BARRICADE AND SIGN MAY BE PLACED ALONG EDGE OF ROAD IF NEEDED FOR LOCAL TRAFFIC.
8. REFER TO STANDARD PLAN 920 FOR GENERAL INFORMATION NOT SHOWN.

LEGEND

- TYPE III BARRICADE
- REFLECTORIZED PLASTIC DRUM
- SINGLE POSTED SIGN
- DOUBLE POSTED SIGN
- ★ INSTALLED BY OTHERS

ROAD CLOSED AT JUNCTION

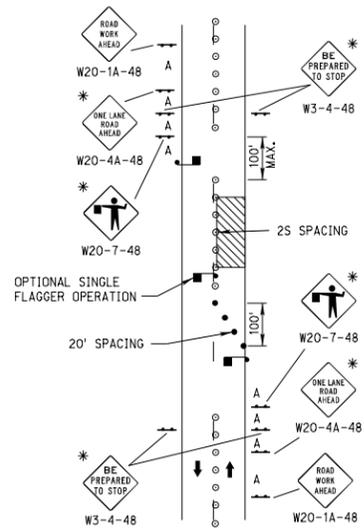


TAPER FORMULA

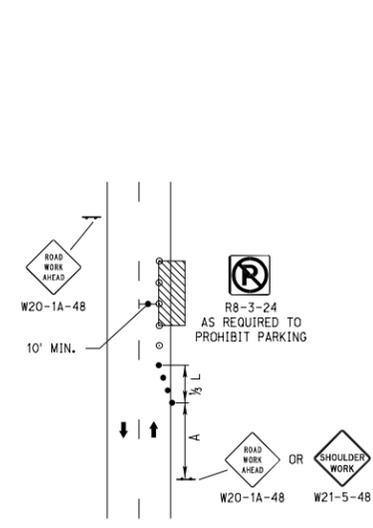
$L = S \times W$ FOR SPEEDS OF 45 MPH OR MORE.
 $L = \frac{WS^2}{60}$ FOR SPEEDS OF 40 MPH OR LESS.

WHERE:
 L - MINIMUM LENGTH OF TAPER.
 S - NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK.
 W - WIDTH OF OFFSET (LANE WIDTH).

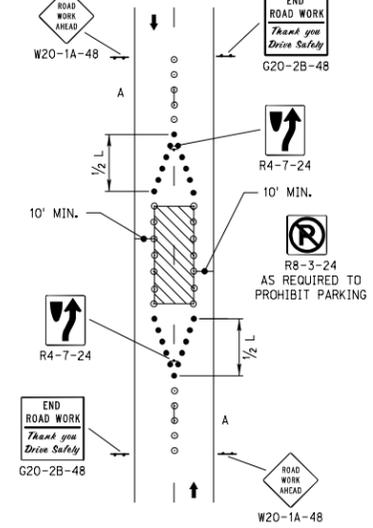
R2	JAN 18	NDOR BORDER TO NDOT BORDER
R1	JUN 14	2009 MUTCD UPDATES
REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF TRANSPORTATION STANDARD PLAN NO. 923-R2		
TRAFFIC CONTROL ROAD CLOSURE		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		
DATE	ORIGINAL: AUGUST 1998 DATE	



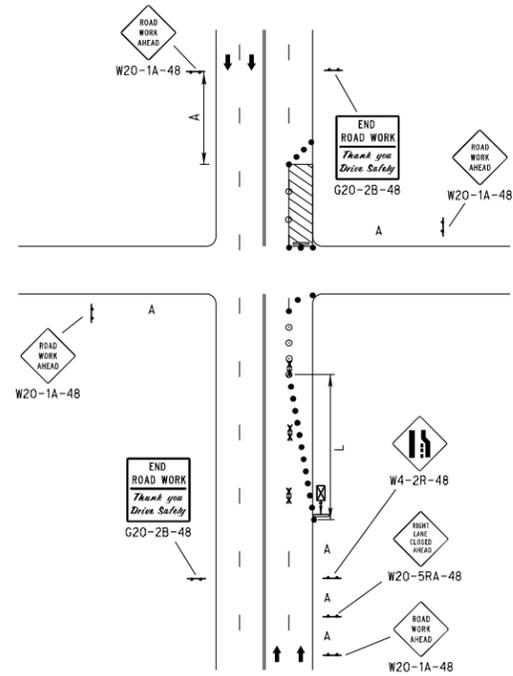
ONE LANE CLOSED WITH FLAGGER
 * SIGNS AND CONES ARE SUBSIDIARY TO THE FLAGGING OPERATION.



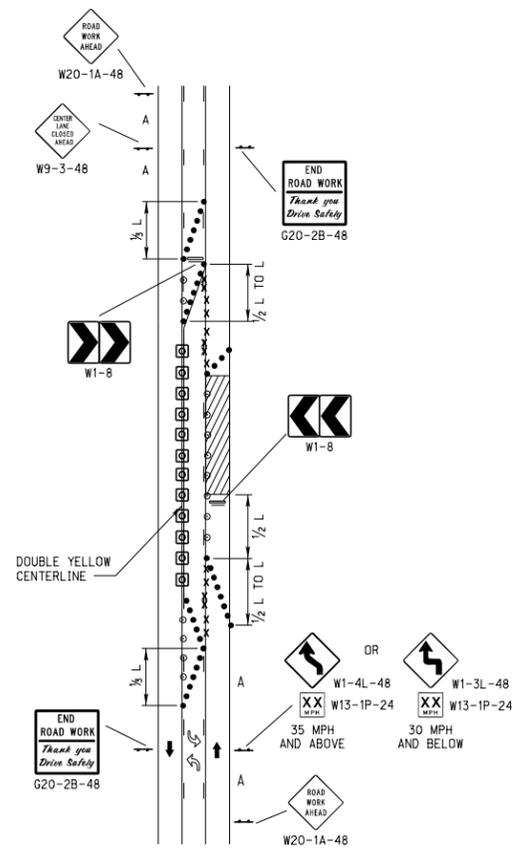
SHOULDER OR PARKING LANE CLOSED



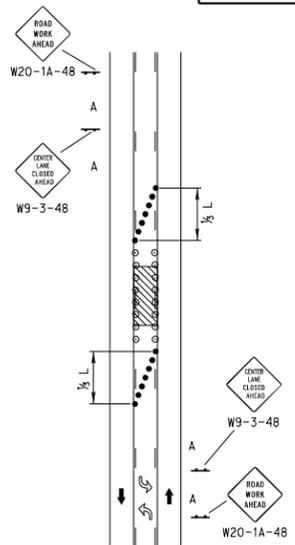
WORK IN CENTER OF ROAD WITH LOW TRAFFIC VOLUMES



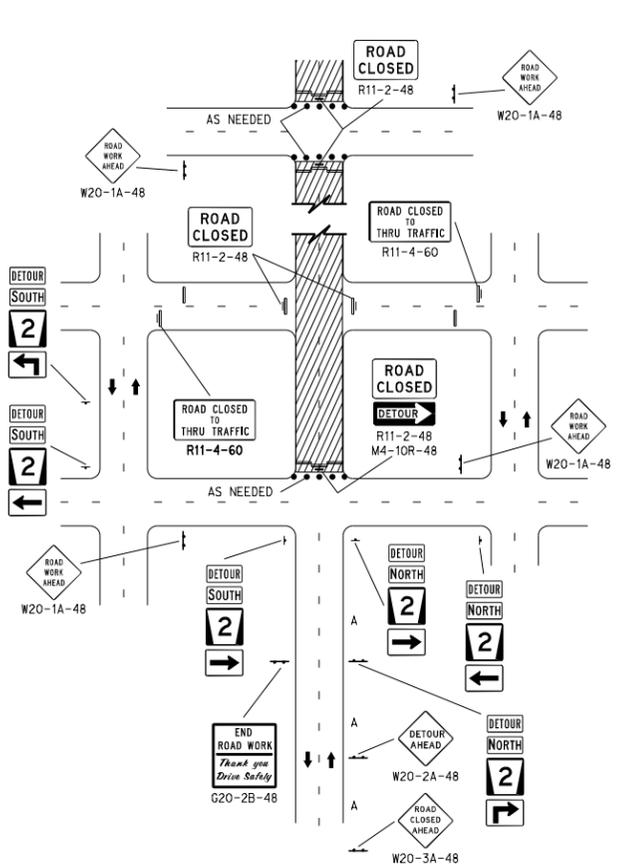
LANE CLOSED NEAR INTERSECTION (RIGHT LANE CLOSED)



3-LANE ROADWAY ONE LANE CLOSED

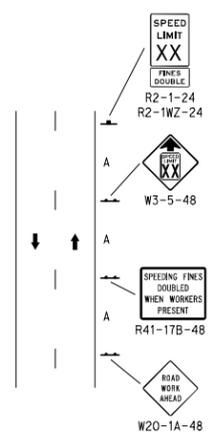


TWO-WAY LEFT TURN LANE CLOSED

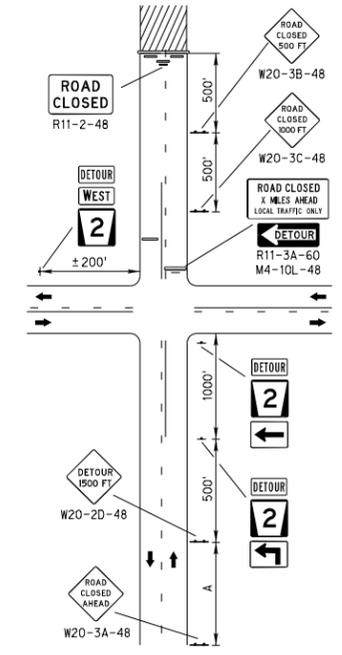


ROAD CLOSED AT DETOUR

ROAD TYPE	MINIMUM DISTANCE BETWEEN SIGNS
URBAN (LOW SPEED - 25 MPH TO 40 MPH)	100'
URBAN (HIGH SPEED - 45 MPH OR HIGHER)	350'



TYPICAL ADVANCED SIGNING



ROAD CLOSED BEYOND DETOUR

- LEGEND**
- ⚡ FLASHING ARROW PANEL
 - TYPE III BARRICADE
 - REFLECTORIZED PLASTIC DRUM
 - ⊠ TUBULAR POST
 - REFLECTORIZED PLASTIC DRUM OR 42" CONE
 - ↑ SINGLE POSTED SIGN
 - ↑↑ DOUBLE POSTED SIGN
 - ⚡ FLAGGER
 - xxxxx PAVEMENT MARKING REMOVAL

TAPER FORMULA

$L = S \times W$ FOR SPEEDS OF 45 MPH OR MORE.

$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40 MPH OR LESS.

WHERE:
 L = MINIMUM LENGTH OF TAPER.
 S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK.
 W = WIDTH OF OFFSET (LANE WIDTH).

NOTES

1. ALL BARRICADE AND SIGN LOCATIONS ON THIS PLAN ARE APPROXIMATE, AND MAY BE ADJUSTED TO FIT FIELD CONDITIONS. THE SIGNS SHALL BE INSTALLED SO AS NOT TO OBSCURE THE VIEW OF OTHER TRAFFIC CONTROL DEVICES.
2. MINIMUM WIDTH OF TRAVELLED LANE SHALL BE AS REQUIRED BY THE ENGINEER.
3. FLASHING ARROW PANEL REQUIRED ON ALL ROADWAYS WITH POSTED SPEED LIMIT 45 MPH OR HIGHER. THE USE OF A FLASHING ARROW PANEL IS OPTIONAL ON ROADWAYS WITH A POSTED SPEED OF 40 MPH OR LOWER.
4. LONG-TERM FLASHING ARROW PANELS IN URBAN RESIDENTIAL AREAS WHERE DIESEL ENGINE NOISE WILL BE DISRUPTIVE TO RESIDENTS, MAY BE REQUIRED TO OPERATE BY 120 VAC, OR IF SIGHT DISTANCE ALLOWS, A SOLAR POWERED ARROW PANEL MAY BE USED.
5. FOR SHORT-TERM WORK (LESS THAN 24 HOURS) SIGN G20-2B-48 (END ROAD WORK, THANK YOU, DRIVE SAFELY) MAY BE OMITTED.
6. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT (S). WHERE CHANNELIZING DEVICES ARE USED ALONG THE WORK AREA, THE SPACING MAY BE INCREASED TO THE DISTANCE IN FEET EQUAL TO THE SPEED LIMIT, DOUBLED (2 x S). SEE "TAPER FORMULA" TABLE FOR MORE INFORMATION.
7. FOR LANE CLOSURES OVER 72 HOURS, ALL CONFLICTING PAVEMENT MARKINGS SHALL BE REMOVED. ON ASPHALT SURFACES, DURABLE PAVEMENT MARKINGS MAY BE COVERED WITH APPROVED BLACK TEMPORARY PAVEMENT MARKING TAPE.
8. DESIGNATION OF SPEED SHOWN ON ADVISORY SPEED SIGNS W13-1P SHALL BE DETERMINED BY THE ENGINEER IN ACCORDANCE WITH MUTCD. THE SPEED DESIGNATION SHALL BE AS HIGH AS PRACTICAL AND FEASIBLE.

R4	JUL 20	ADDED NOTE TO SHEET ONE
R3	JAN 19	TOOK OUT 1/2 L ON SHEET 2
R2	JAN 18	NDOR BORDER TO NDOT BORDER
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF TRANSPORTATION
 STANDARD PLAN NO. 924-R4

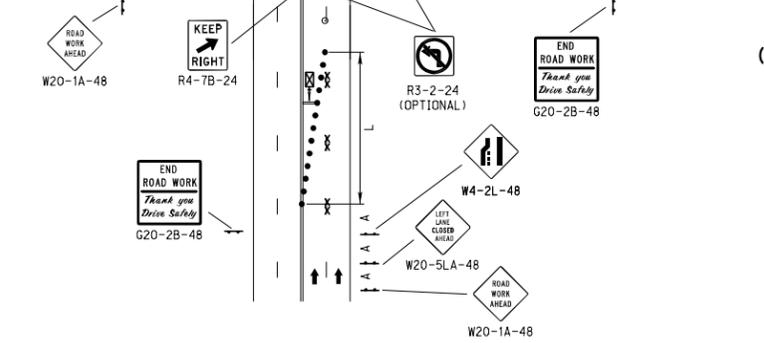
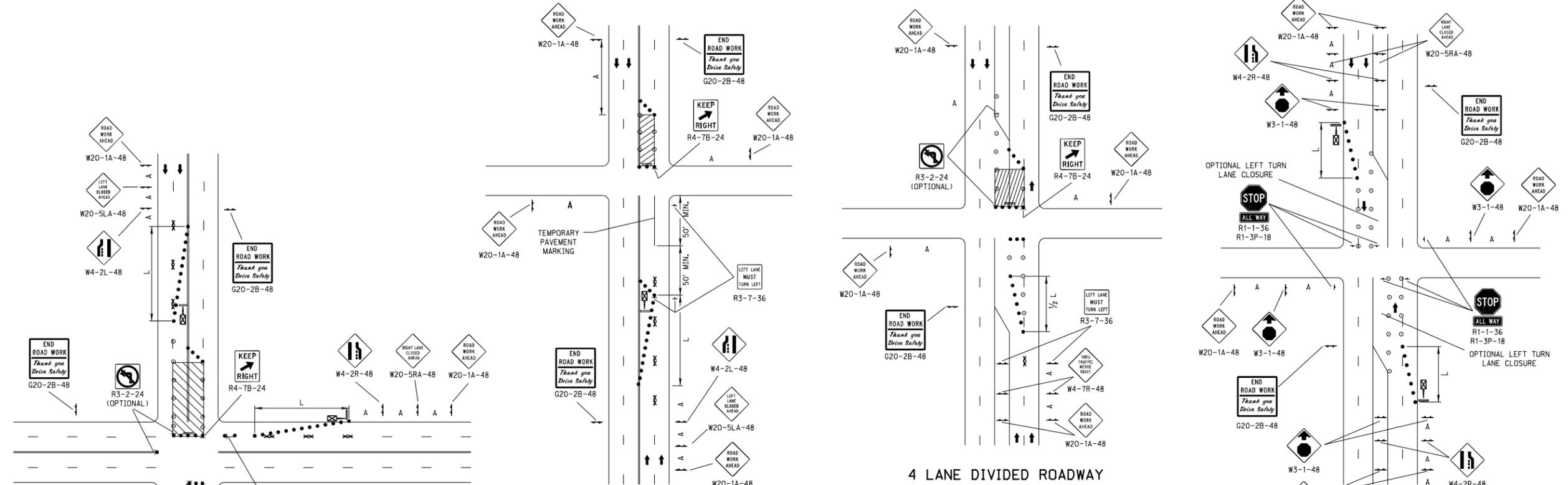
URBAN TRAFFIC CONTROL PLAN

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

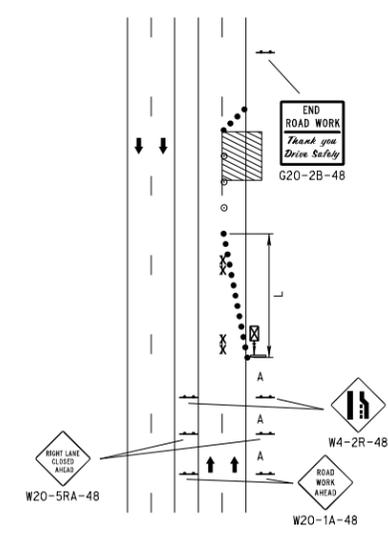
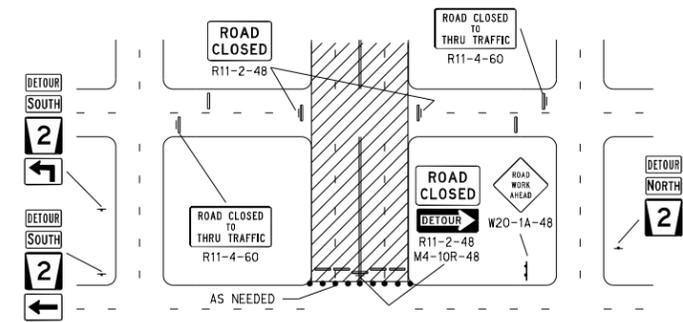
PROFESSIONAL CIVIL ENGINEER
 DANIEL J. WADDE
 E-6289

DATE _____ ORIGINAL: FEBRUARY 1, 2010 DATE _____

1
3



LANE CLOSED NEAR INTERSECTION (LEFT LANE CLOSURE FORMING A TURNBAY)



ROAD TYPE	MINIMUM DISTANCE BETWEEN SIGNS
URBAN (LOW SPEED - 25 MPH TO 40 MPH)	A
URBAN (HIGH SPEED - 45 MPH OR HIGHER)	100'
	350'

- LEGEND**
- ⚡ FLASHING ARROW PANEL
 - ▬ TYPE III BARRICADE
 - REFLECTORIZED PLASTIC DRUM
 - ⊠ TUBULAR POST
 - REFLECTORIZED PLASTIC DRUM OR 42" CONE
 - ↑ SINGLE POSTED SIGN
 - ↑↑ DOUBLE POSTED SIGN
 - ⚡ FLAGGER
 - xxxx PAVEMENT MARKING REMOVAL

TAPER FORMULA

$L = S \times W$ FOR SPEEDS OF 45 MPH OR MORE.

$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40 MPH OR LESS.

WHERE:
 L = MINIMUM LENGTH OF TAPER.
 S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK.
 W = WIDTH OF OFFSET (LANE WIDTH).

R4	JUL 20	ADDED NOTE TO SHEET ONE
R3	JAN 19	TOOK OUT 1/2 L ON SHEET 2
R2	JAN 18	NDOR BORDER TO NDOT BORDER
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF TRANSPORTATION
 STANDARD PLAN NO. 924-R4

URBAN TRAFFIC CONTROL PLAN

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

DANIEL J. WADDE
E-6289

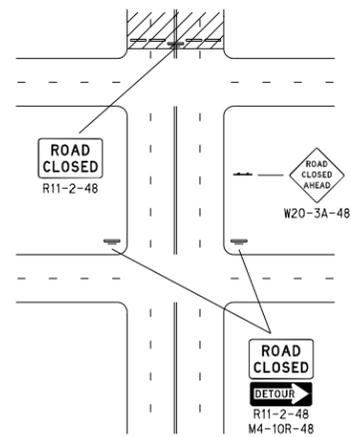
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ORIGINAL: FEBRUARY 1, 2010

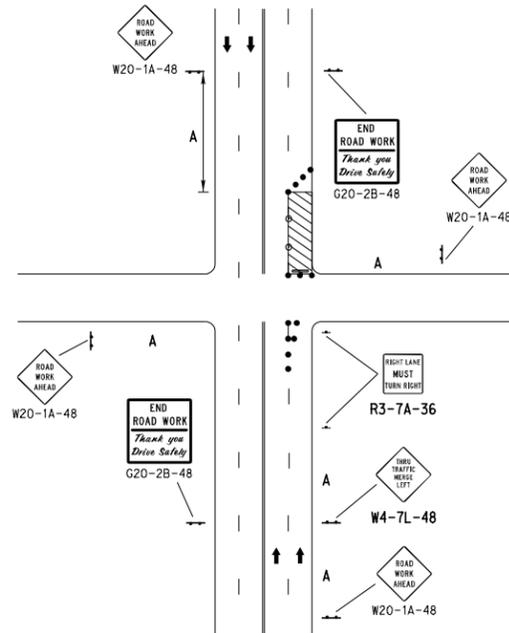
DATE _____

2

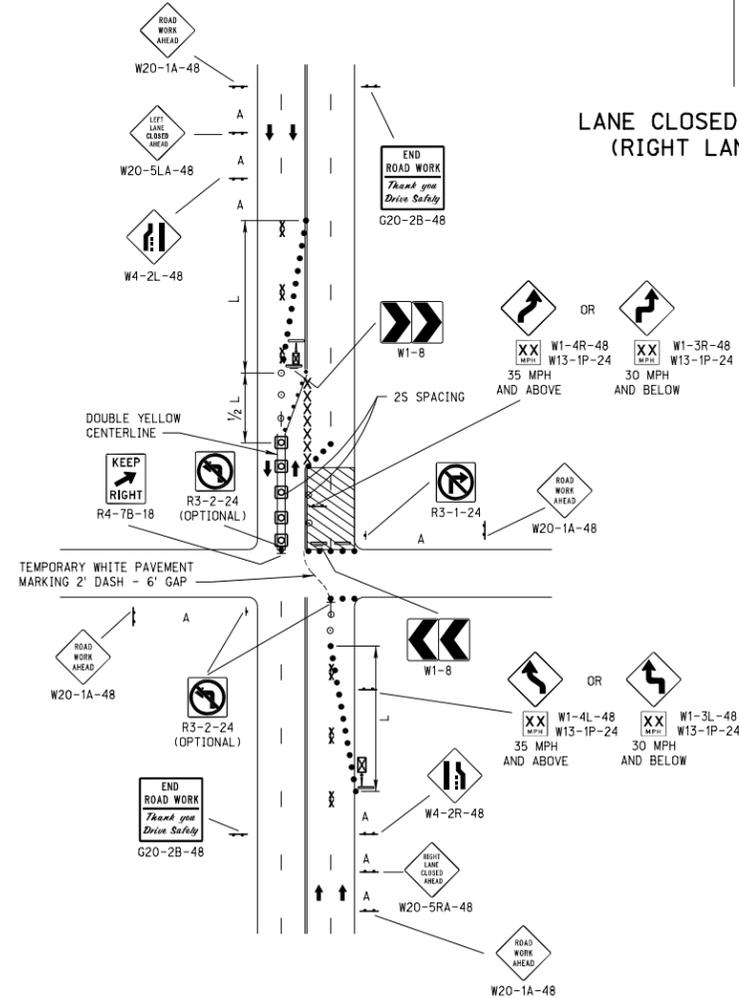
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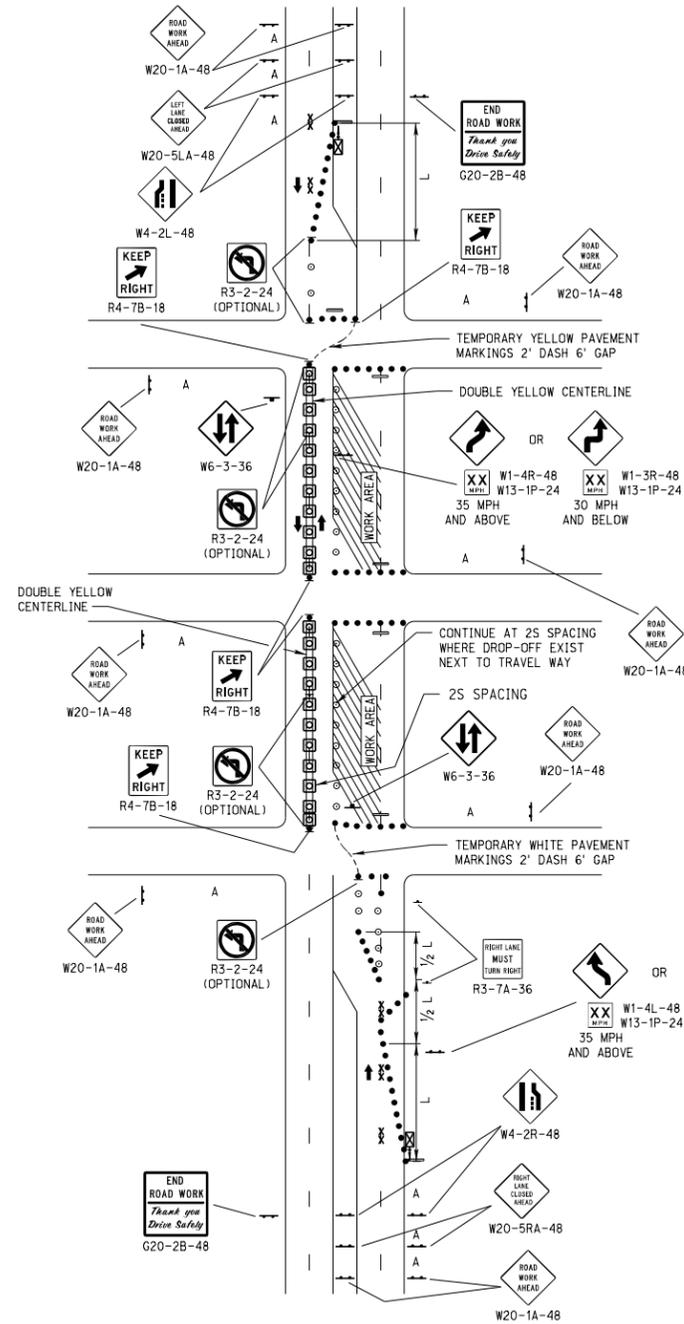
ROAD CLOSED BEYOND DETOUR



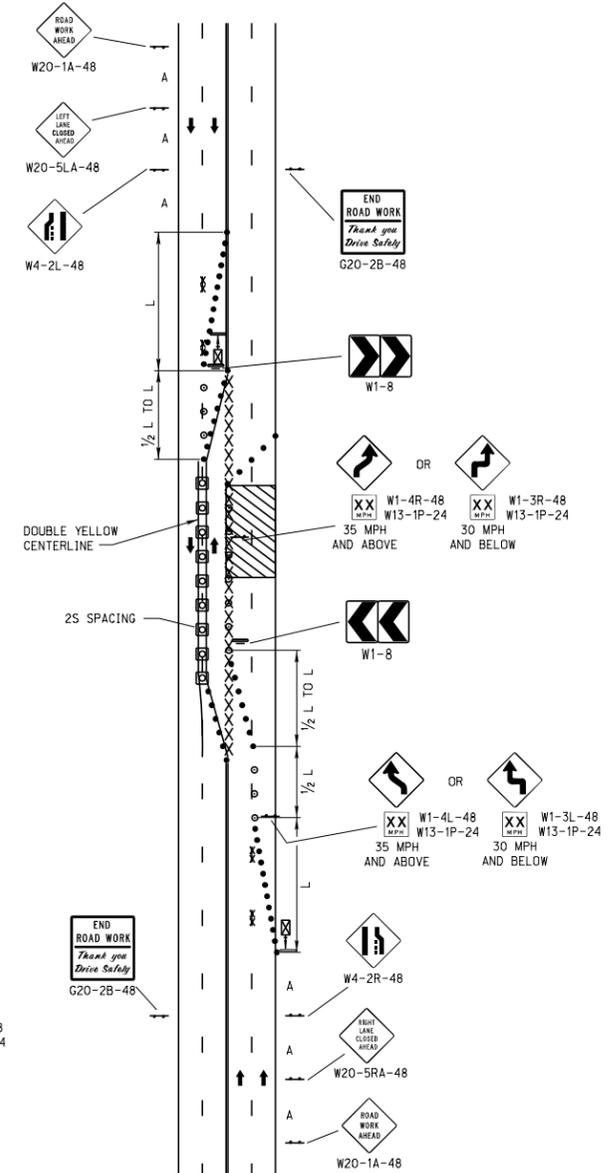
LANE CLOSED NEAR INTERSECTION (RIGHT LANE REMAINS OPEN)



4 LANE UNDIVIDED ROADWAY TWO LANES CLOSED NEAR INTERSECTION



4-LANE DIVIDED HALF CLOSED



4-LANE UNDIVIDED 2 LANES CLOSED

- LEGEND**
- ⚡ FLASHING ARROW PANEL
 - TYPE III BARRICADE
 - REFLECTORIZED PLASTIC DRUM
 - ⊗ TUBULAR POST
 - REFLECTORIZED PLASTIC DRUM OR 42" CONE
 - SINGLE POSTED SIGN
 - DOUBLE POSTED SIGN
 - FLAGGER
 - xxx PAVEMENT MARKING REMOVAL

TAPER FORMULA

$L = S \times W$ FOR SPEEDS OF 45 MPH OR MORE.

$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40 MPH OR LESS.

WHERE:
 L = MINIMUM LENGTH OF TAPER.
 S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK.
 W = WIDTH OF OFFSET (LANE WIDTH).

ROAD TYPE	MINIMUM DISTANCE BETWEEN SIGNS
URBAN (LOW SPEED - 25 MPH TO 40 MPH)	100'
URBAN (HIGH SPEED - 45 MPH OR HIGHER)	350'

REV. NO.	DATE	DESCRIPTION OF REVISION
R4	JUL 20	ADDED NOTE TO SHEET ONE
R3	JAN 19	TOOK OUT 1/2 L ON SHEET 2
R2	JAN 18	NDOR BORDER TO NDOT BORDER

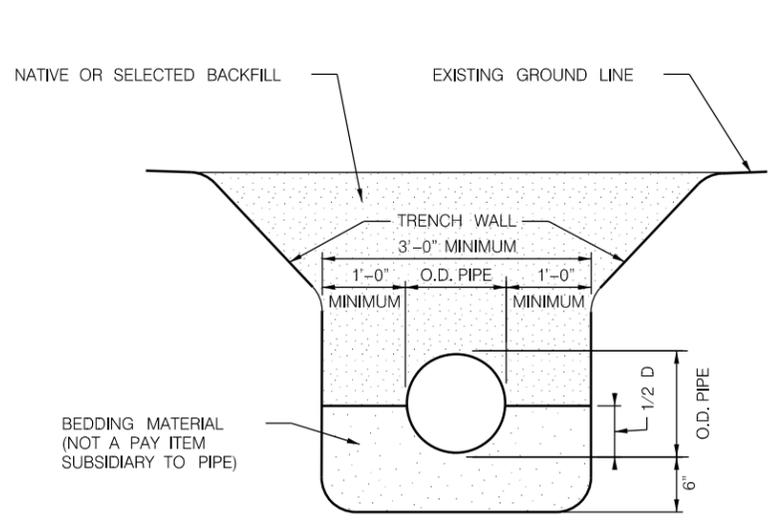
NEBRASKA DEPARTMENT OF TRANSPORTATION
 STANDARD PLAN NO. 924-R4
URBAN TRAFFIC CONTROL PLAN

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

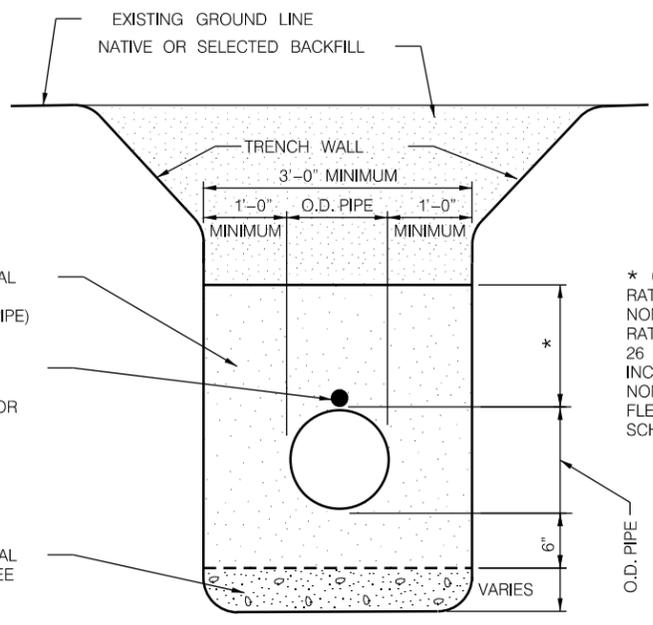


DATE: _____ ORIGINAL: FEBRUARY 1, 2010 DATE: _____

3
3

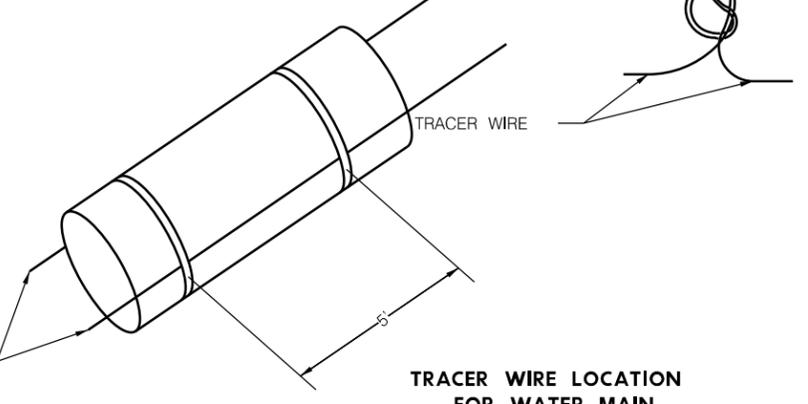
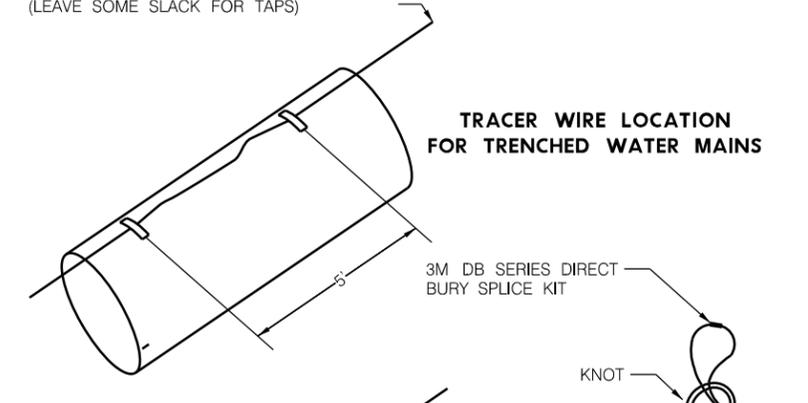


PIPE BEDDING FOR DUCTILE IRON, VITRIFIED CLAY AND REINFORCED CONCRETE PIPE 15" DIAMETER AND LARGER



PIPE BEDDING AND FOUNDATION MATERIAL FOR ALL PIPE EXCEPT DUCTILE IRON, VITRIFIED CLAY, AND REINFORCED CONCRETE

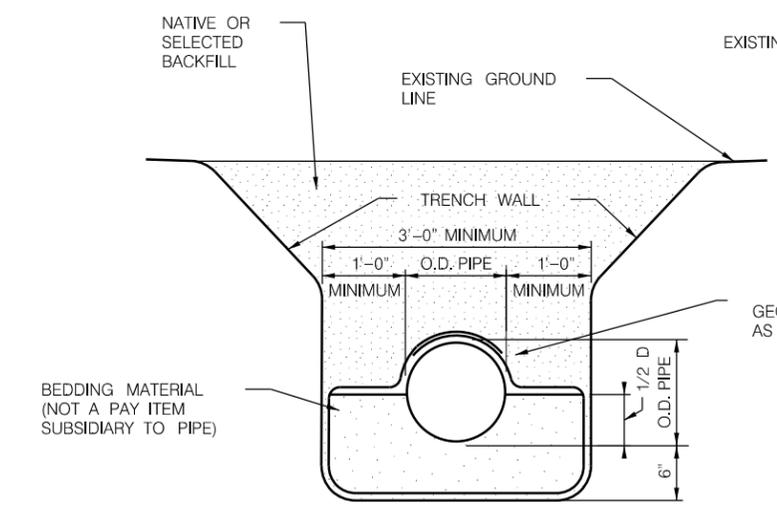
TRACER WIRE (FOR WATER MAINS) TAPE EVERY 5' TO TOP OF PIPE PRIOR TO BACK FILL (LEAVE SOME SLACK FOR TAPS)



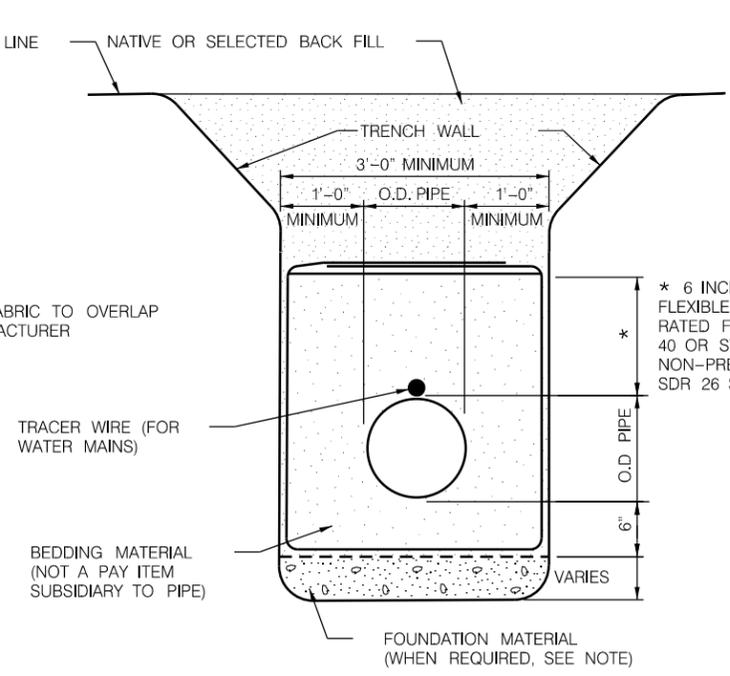
* 6 INCH MIN. FOR ALL PRESSURE RATED FLEXIBLE PIPES (C900) OR NON-PRESSURE RATED FLEXIBLE PIPES THAT ARE SDR 26 SCHEDULE 40 OR STRONGER. 18 INCHES ARE REQUIRED FOR NON-PRESSURE RATED FLEXIBLE PIPE LESS THAN SDR 26 SCHEDULE 40.

TRACER WIRES ON OPPOSITE SIDES OF THE PIPE (FOR WATER MAINS) TAPE EVERY 5' AROUND THE ENTIRE CIRCUMFERENCE PRIOR TO BACK FILL

- GENERAL NOTES:
1. WHEN "FOUNDATION MATERIAL" IS REQUIRED/APPROVED BY THE CONTRACT ADMINISTRATOR, IT SHALL BE PAID AT AN AGREED UNIT PRICE OF \$35 PER CUBIC YARD INSTALLED, BASED ON THE INCREASED DIMENSIONS OF THE MATERIAL ADDED TO STABILIZE THE TRENCH BOTTOM.
 2. WHEN REQUIRED BY THE CITY'S PROJECT MANAGER, WATER SHALL BE ADDED TO THE MATERIAL EXCAVATED FROM THE TRENCH WHEN NECESSARY TO MEET SPECIFICATIONS, DURING COMPACTION, AT THE AGREED UNIT PRICE OF \$50 PER 100 CUBIC FEET OF WATER APPLIED TO COMPLETE THE COMPACTION.
 3. WIRE SPLICES SHALL BE 3M DBR CONNECTORS, SEALED WITH SILICONE SEALANT, OR EQUAL AND COVERED WITH SCOTCH #33 ELECTRICAL TAPE.



PIPE BEDDING FOR DUCTILE IRON AND REINFORCED CONCRETE PIPE 15" DIAMETER AND LARGER WITH GEO-TEXTILE FABRIC

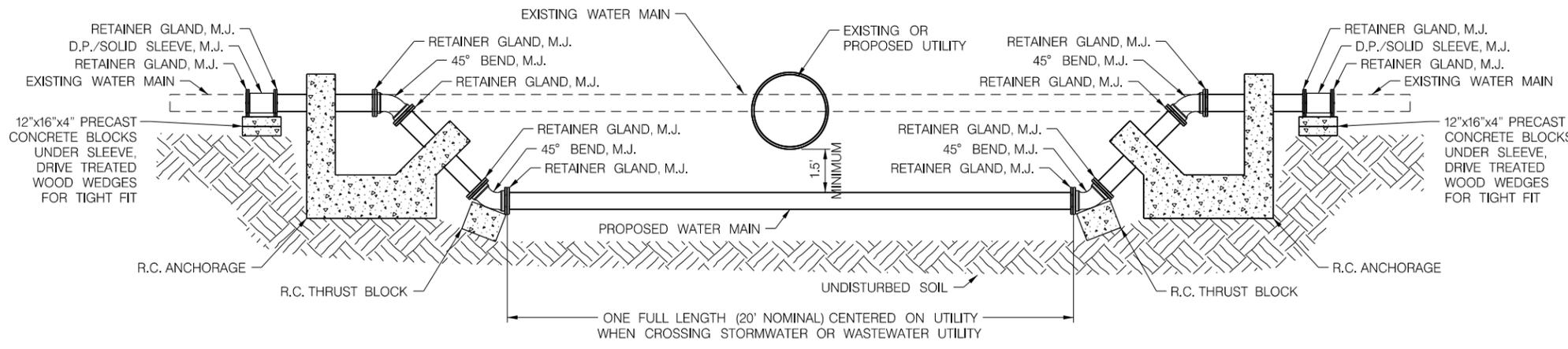


PIPE BEDDING AND FOUNDATION MATERIAL FOR ALL PIPE EXCEPT DUCTILE IRON AND REINFORCED CONCRETE WITH GEO-TEXTILE FABRIC



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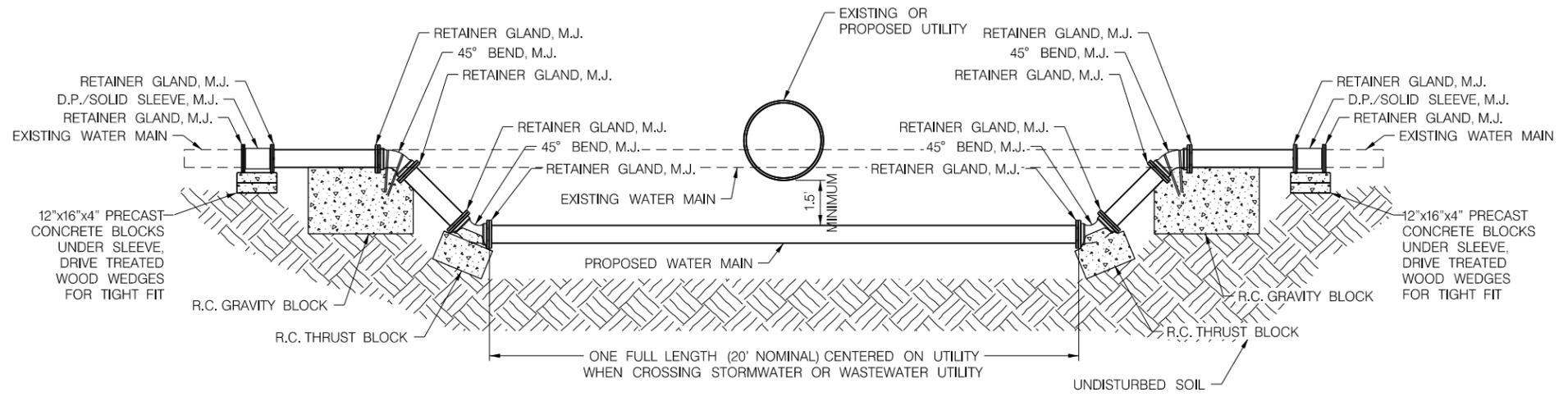
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WATER MAIN RECONSTRUCTION USING BENDS

QUANTITIES USED IN WATER MAIN RECONSTRUCTION USING BENDS

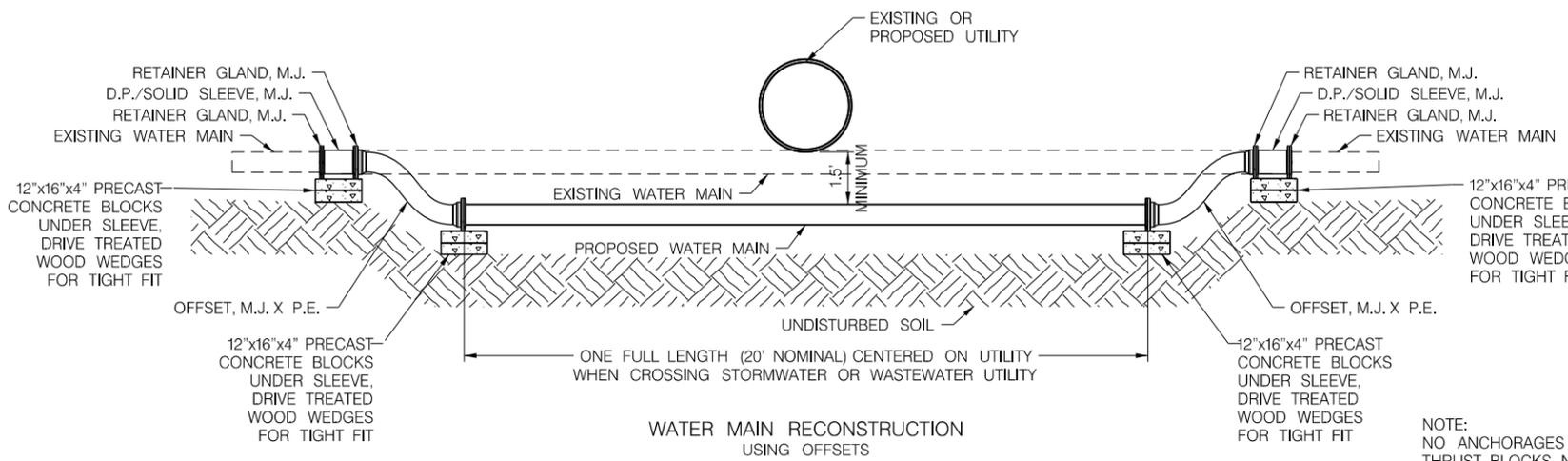
SIZE OF PIPE X 45° BEND, M.J.	4 EA.
SIZE OF PIPE SOLID SLEEVE, M.J. (L=12")	2 EA.
SIZE OF PIPE D.P. SLEEVE, M.J. (TO BE USED WITH A.W.W.A PIPE)	2 EA.
SIZE OF PIPE GRAVITY BLOCK	2 EA.
SIZE OF PIPE R.C. THRUST BLOCK	2 EA.
SIZE OF PIPE WATER MAIN	VARIES L.F.
REMOVE SIZE OF PIPE WATER MAIN	VARIES L.F.
SIZE OF PIPE RETAINER GLANDS, M.J.	12 EA.



WATER MAIN RECONSTRUCTION USING BENDS

QUANTITIES USED IN WATER MAIN RECONSTRUCTION USING BENDS

SIZE OF PIPE x DROP, M.J. x P.E.	4 EA.
SIZE OF PIPE SOLID SLEEVE, M.J. (L=12")	2 EA.
SIZE OF PIPE D.P. SLEEVE, M.J. (TO BE USED WITH A.W.W.A PIPE)	2 EA.
SIZE OF PIPE WATER MAIN	VARIES L.F.
REMOVE SIZE OF PIPE WATER MAIN	VARIES L.F.
SIZE OF PIPE RETAINER GLANDS, M.J.	6 EA.



WATER MAIN RECONSTRUCTION USING OFFSETS

NOTE:
NO ANCHORAGES OR THRUST BLOCKS NEEDED WITH OFFSETS

NOTE:

THE TOTAL LENGTH OF WATER RECONSTRUCTION IS TO BE POLYWRAPPED, IF DUCTILE IRON PIPE. SEE STANDARD SPECIFICATIONS

WHEN PROPOSED UTILITY CROSSING IS 36" IN DIA. OR LARGER, CRUSHED ROCK FOUNDATION MATERIAL SHOULD BE USED AS BACKFILL UNDER PROPOSED UTILITY.

ALL CONCRETE SHALL BE L3500

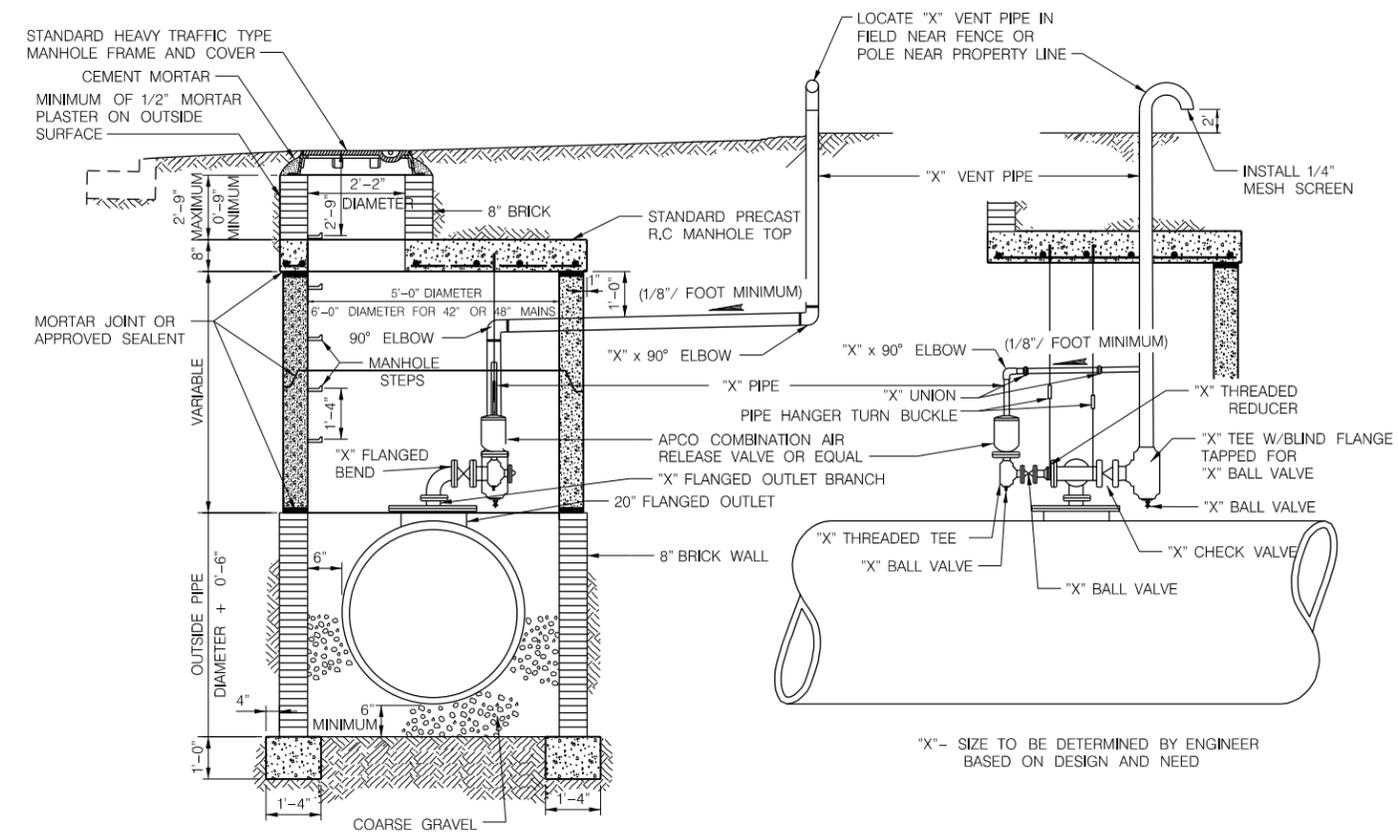
ANY 4" WATER MAIN RECONSTRUCTION IS TO BE COMPLETED USING A MINIMUM OF 6" PIPE AND FITTINGS AND REDUCED TO MEET THE 4" MAIN AT EACH END OF THE RECONSTRUCTION.

WATER PIPE SHALL BE ENCASED WITH FLOWABLE FILL IN SCENARIOS WHERE IT IS RECONSTRUCTED BELOW AN EXISTING OR PROPOSED WASTEWATER LINE.

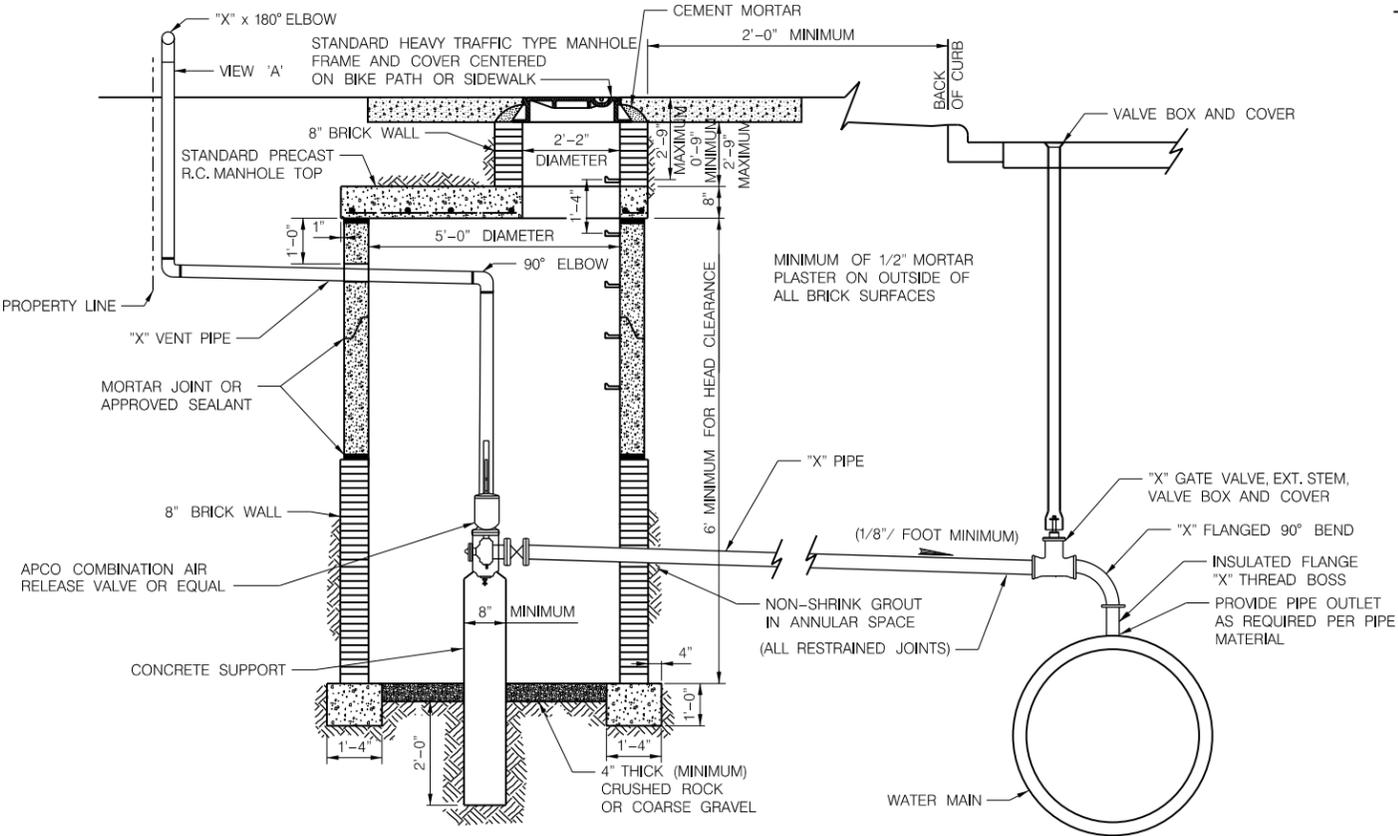
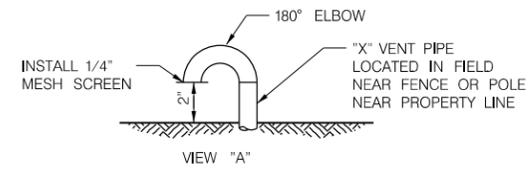


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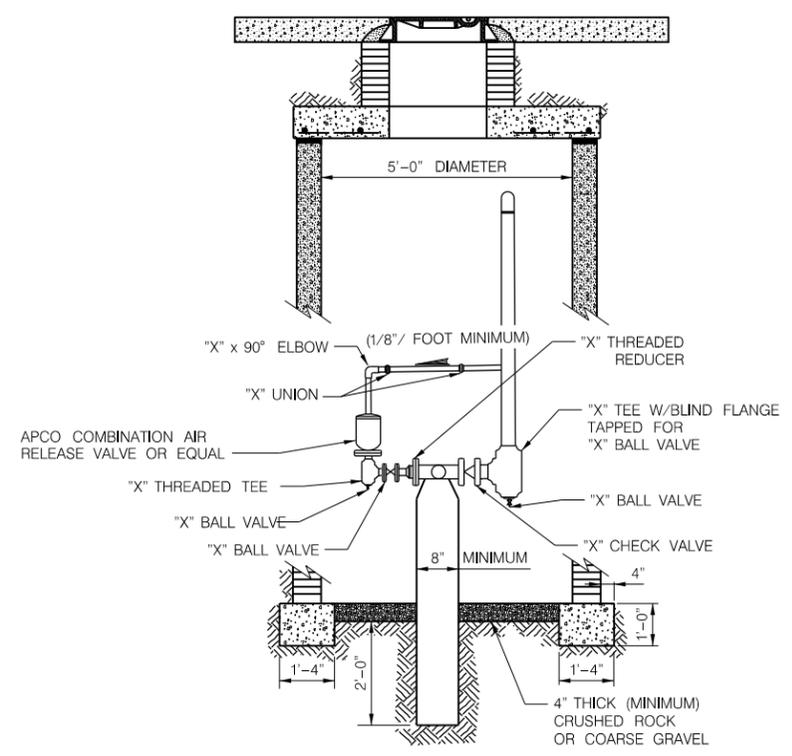
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AUTOMATIC AIR RELIEF VAULT INSTALLATION



AUTOMATIC AIR RELIEF VAULT INSTALLATION FOR MAINS UNDER PAVING



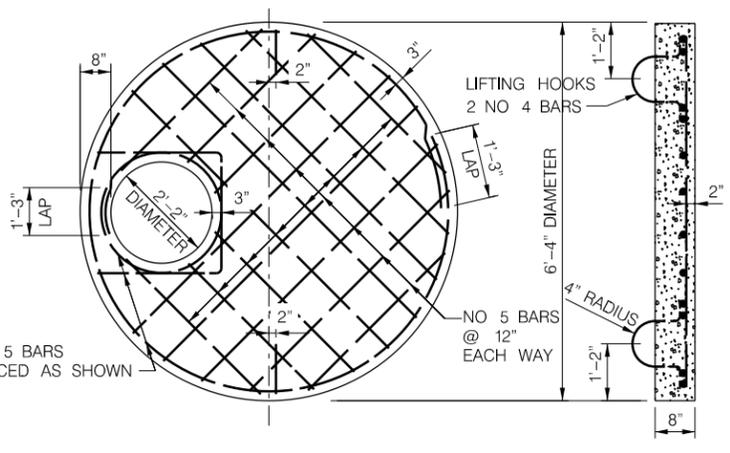
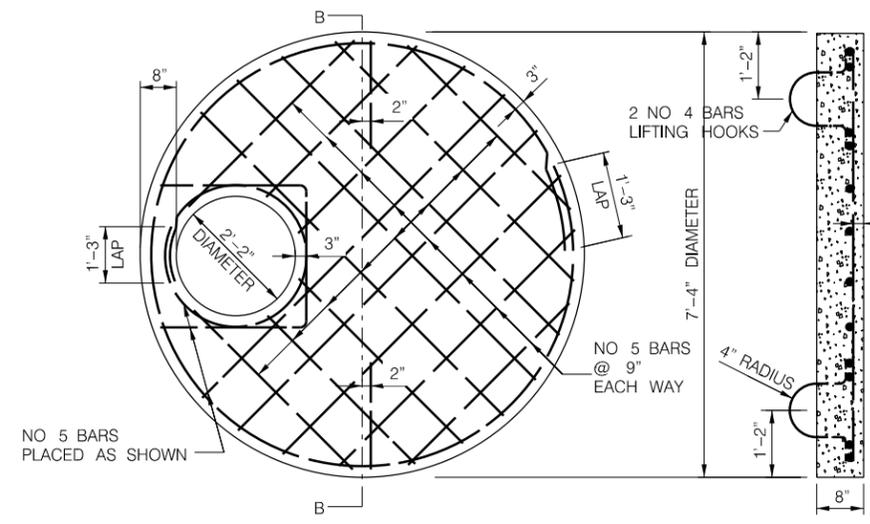
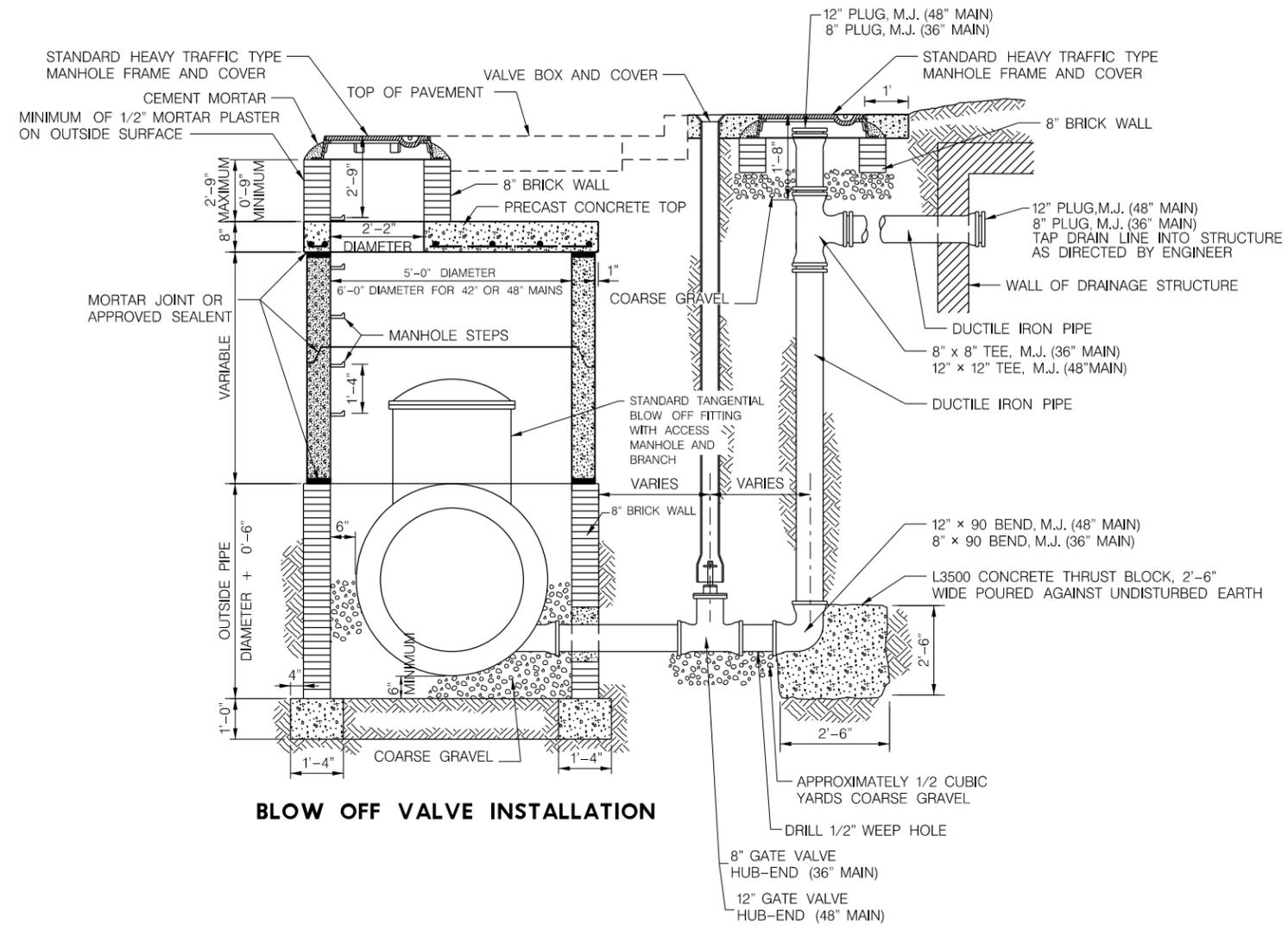
WATER MAIN VALVE MANHOLES, AIR RELIEFS AND BLOW OFFS

NOTES:
 SHUTOFF VALVES SHALL BE CARBON STEEL CONBRACO "APOLLO 88-100 SERIES", NELES-JAMESBURY "SERIES 5000, FIG 5150-11-2200TT", OR POWELL "FIG A224T" BALL VALVES.
 DRAIN VALVES SHALL BE BRASS OR BRONZE CONBRACO "APOLLO 70-100 SERIES" OR STOCKHAM "S-216".
 CHECK VALVES SHALL BE APCO "SERIES 9000 CLASS 150 DOUBLE DOOR CHECK VALVE" OR EQUAL.
 COMBINATION AIR RELEASE VALVES SHALL BE APCO OR EQUAL.
 THE CAST IRON MANHOLE RING SHALL SET IN A BED OF MORTAR, AND CAREFULLY ADJUSTED TO PROPOSED GRADE.
 MANHOLE RING AND COVER SHALL BE CITY OF LINCOLN HEAVY TRAFFIC TYPE. (SEE LSP 162)
 MANHOLE STEPS SHALL BE CITY OF LINCOLN STANDARD MANHOLE STEPS. (SEE LSP 162)
 ALL REINFORCING STEEL SHALL BE EPOXY COATED.
 ANY TAP LARGER THAN 1" SHALL BE INSTALLED BY FACTORY.
 "X"- SIZE AND TYPE TO BE DETERMINED BY ENGINEER BASED ON DESIGN AND NEED



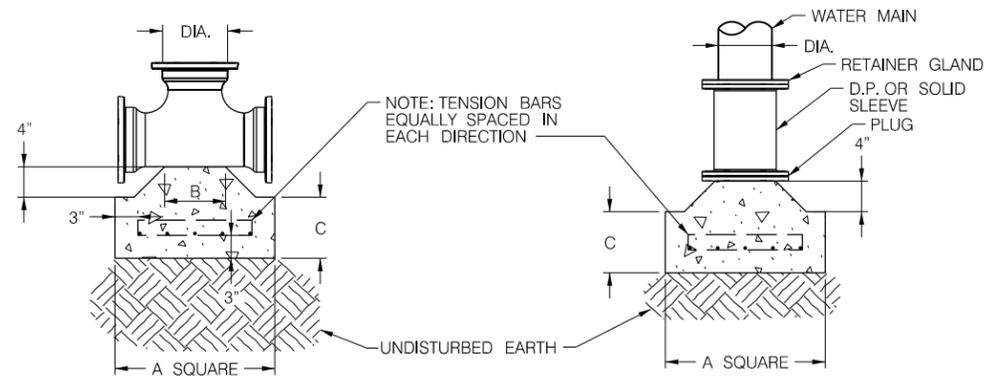
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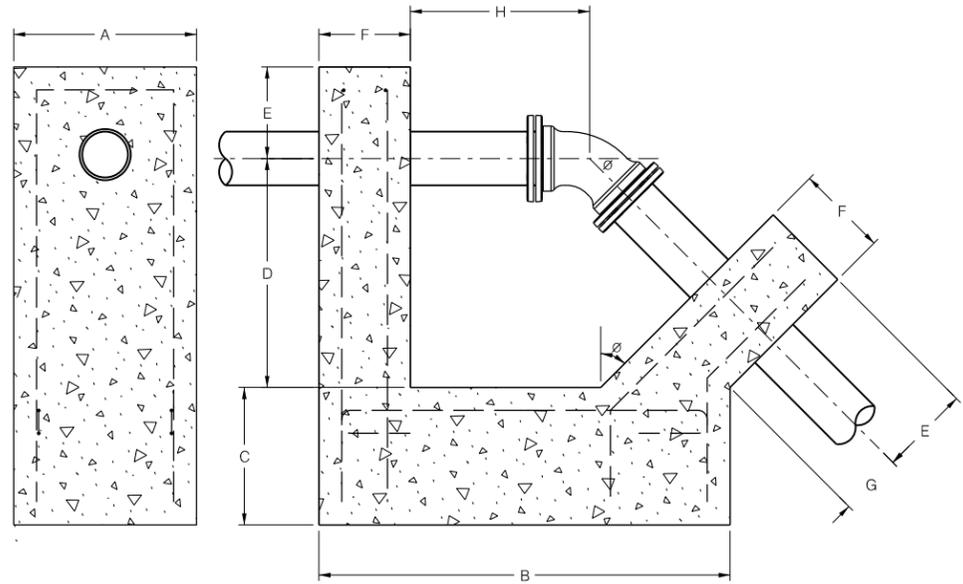
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REINFORCED CONCRETE TEE BLOCK REINFORCED CONCRETE PLUG BLOCK

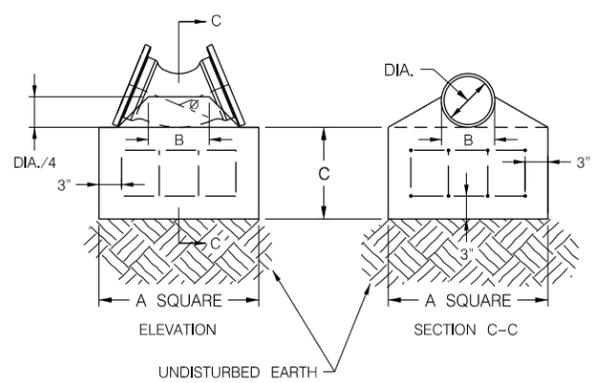
REIN. CONC. TEE BLOCK AND PLUG BLOCK							
DIA.	A	B	C	BAR SIZE	NUMBER OF BARS EACH WAY	STEEL (LBS)	CONCRETE CUBIC YARDS
6	1'-9"	0'-8"	0'-8"	-	-	-	0.1
8	2'-3"	0'-9"	0'-9"	-	-	-	0.2
12	3'-4"	1'-0"	1'-0"	4	6	22.7	0.4
16	4'-6"	1'-3"	1'-3"	4	8	42.8	1.0
20	5'-8"	1'-6"	1'-6"	5	8	86.8	1.9
24	6'-9"	1'-9"	1'-9"	5	11	143.5	3.1
30	8'-6"	2'-6"	2'-0"	5	16	267	5.5
36	10'-0"	3'-0"	2'-6"	6	15	428	9.5
48	13'-6"	4'-0"	3'-0"	7	20	1063	21.2



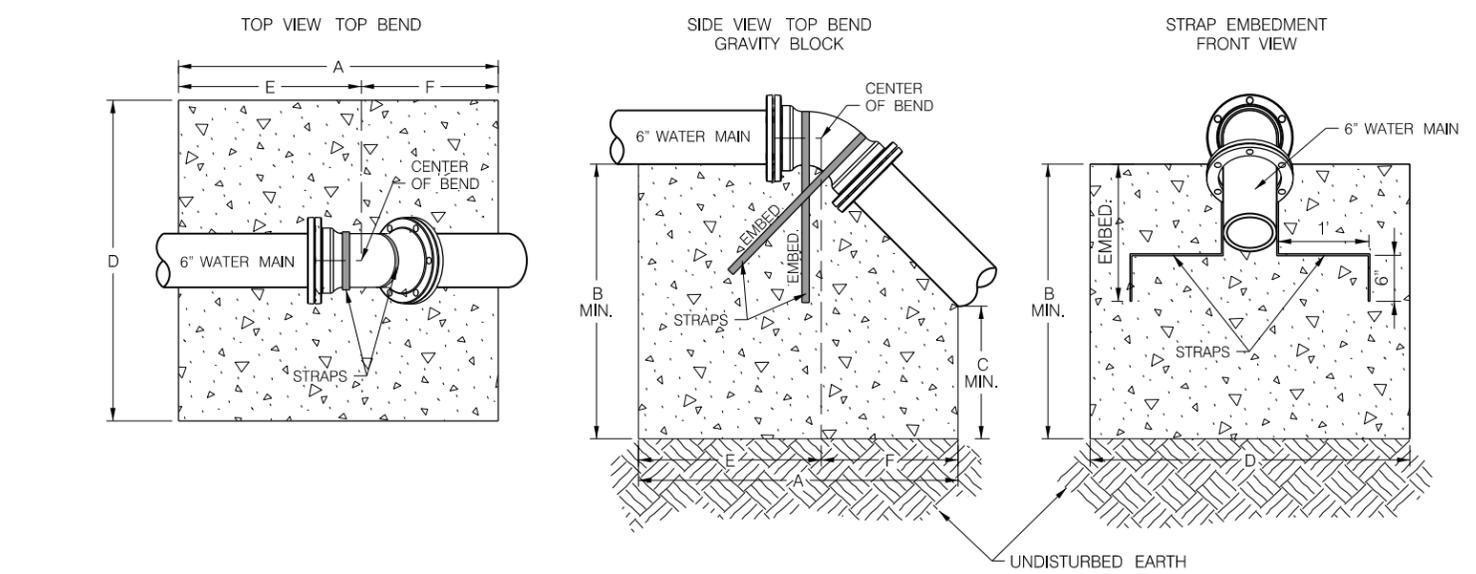
REINFORCED CONCRETE ANCHORAGE

REINFORCED CONCRETE ANCHORAGE																							
$\phi = 45^\circ$										$\phi = 22 \frac{1}{2}^\circ$													
DIA.	A	B	C	D	E	F	G	H	CONCRETE CUBIC YARDS	BAR SIZE	STEEL (LBS)	DIA.	A	B	C	D	E	F	G	H	CONCRETE CUBIC YARDS	BAR SIZE	STEEL (LBS)
6&8	2'-0"	4'-6"	1'-6"	2'-6"	1'-0"	1'-0"	0'-8"	1'-11"	0.94	4	34	6&8	2'-0"	4'-6"	0'-9"	1'-6"	1'-0"	1'-0"	0'-8"	1'-7"	0.54	4	28
10	2'-6"	5'-0"	1'-6"	3'-0"	1'-3"	1'-0"	1'-0"	2'-4"	1.31	4	42	10	2'-6"	5'-0"	0'-9"	1'-9"	1'-3"	1'-0"	0'-9"	1'-8"	0.75	4	32
12	3'-0"	5'-0"	2'-0"	3'-6"	1'-6"	1'-0"	1'-6"	3'-1"	1.98	4	48	12	3'-0"	5'-0"	0'-9"	2'-0"	1'-6"	1'-0"	1'-0"	1'-9"	1.05	4	36
14	3'-0"	6'-0"	2'-6"	4'-0"	1'-6"	1'-0"	1'-6"	3'-1"	2.58	5	83	14	3'-0"	5'-6"	1'-3"	2'-3"	1'-6"	1'-0"	1'-3"	2'-3"	1.40	4	36
16	3'-6"	6'-6"	2'-9"	4'-6"	1'-6"	1'-0"	1'-9"	3'-5"	3.46	5	92	16	3'-0"	6'-6"	2'-0"	2'-9"	1'-6"	1'-0"	1'-6"	2'-9"	1.79	4	47
18	3'-6"	7'-0"	3'-6"	4'-6"	1'-6"	1'-0"	1'-8"	3'-10"	4.29	5	96	18	3'-6"	7'-0"	1'-9"	3'-0"	1'-6"	1'-0"	1'-8"	3'-1"	2.44	4	50
20	4'-0"	7'-6"	3'-6"	5'-0"	1'-6"	1'-0"	2'-0"	4'-4"	5.25	6	146	20	4'-0"	7'-0"	2'-0"	3'-0"	1'-6"	1'-0"	1'-8"	3'-1"	3.04	5	80
24	5'-0"	10'-0"	3'-0"	7'-0"	2'-0"	1'-0"	2'-10"	6'-0"	7.96	7	250	24	4'-6"	9'-0"	1'-9"	4'-0"	2'-0"	1'-0"	2'-3"	4'-2"	4.11	6	143

REINFORCED CONCRETE THRUST BLOCK															
$\phi = 11 \frac{1}{4}^\circ$							$\phi = 22 \frac{1}{2}^\circ$								
DIA.	A	B	C	BAR SIZE	NUMBER OF BARS EACH WAY	STEEL (LBS)	CONCRETE CUBIC YARDS	DIA.	A	B	C	BAR SIZE	NUMBER OF BARS EACH WAY	STEEL (LBS)	CONCRETE CUBIC YARDS
6	1'-3"	0'-9"	1'-0"	-	-	-	0.1	6	1'-6"	0'-9"	1'-0"	-	-	-	0.1
8	1'-6"	1'-0"	1'-0"	-	-	-	0.1	8	1'-6"	1'-0"	1'-0"	-	-	-	0.1
12	1'-6"	1'-0"	1'-0"	4	3	4.0	0.1	12	2'-3"	1'-0"	1'-0"	4	3	7.0	0.2
16	2'-3"	1'-0"	1'-0"	4	3	7.0	0.2	16	3'-0"	1'-0"	1'-0"	4	5	16.7	0.4
20	2'-9"	1'-3"	1'-0"	4	4	12.0	0.4	20	3'-9"	1'-3"	1'-0"	4	7	30.4	0.6
24	3'-3"	1'-6"	1'-0"	4	6	22.0	0.5	24	4'-6"	1'-6"	1'-3"	5	6	50.1	1.1
30	4'-0"	2'-0"	1'-3"	4	7	32.7	0.9	30	5'-6"	2'-0"	1'-6"	5	9	93.9	1.9
36	4'-9"	2'-6"	1'-3"	5	7	62.0	1.3	36	6'-9"	2'-6"	1'-9"	5	12	169.5	3.3
48	6'-6"	3'-3"	1'-6"	5	13	162.7	1.9	48	9'-0"	3'-3"	2'-0"	10	6	438.9	6.7



REINFORCED CONCRETE THRUST BLOCKS



CONCRETE GRAVITY BLOCK

CONCRETE GRAVITY BLOCK										
BEND	DIMENSION						CONC. CY	QTY.	STRAPS	
	A	B MIN.	C MIN.	D	E	F			SIZE	EMBED.
6"x45°	3'-6"	3'-0"	1'-6"	3'-6"	2'-0"	1'-6"	1.43	2	1"x 1/4"	18"
8"x45°	4'-0"	4'-0"	2'-0"	4'-6"	2'-0"	2'-0"	2.33	2	1"x 1/4"	18"
12"x45°	6'-0"	5'-0"	2'-0"	5'-0"	3'-0"	3'-0"	4.72	2	2"x 1/4"	24"
16"x45°	6'-0"	6'-0"	3'-0"	7'-0"	3'-0"	3'-0"	9.33	2	2"x 3/8"	30"
6"x22.5°	2'-0"	3'-3"	3'-0"	3'-0"	1'-3"	0'-9"	0.72	2	1"x 1/4"	18"
8"x22.5°	3'-0"	4'-0"	3'-6"	3'-0"	1'-6"	1'-6"	1.33	2	1"x 1/4"	18"
12"x22.5°	4'-6"	5'-0"	4'-2"	3'-6"	2'-6"	2'-0"	2.88	2	2"x 1/4"	24"
16"x22.5°	5'-6"	5'-6"	4'-6"	4'-6"	3'-0"	2'-6"	5.13	2	2"x 3/8"	30"
6"x11.25°	2'-0"	2'-0"	1'-9"	2'-8"	1'-0"	1'-0"	0.40	2	1"x 1/4"	18"
8"x11.25°	3'-0"	2'-0"	1'-9"	3'-0"	2'-0"	1'-0"	0.56	2	1"x 1/4"	18"
12"x11.25°	3'-0"	3'-0"	2'-9"	3'-6"	2'-0"	1'-0"	1.17	2	2"x 1/4"	24"
16"x11.25°	4'-0"	4'-0"	3'-6"	4'-0"	2'-0"	2'-0"	2.37	2	2"x 3/8"	30"

GENERAL NOTES:

All Reinforcing Steel Shall be Deformed Bars Conforming to A.S.T.M. Serial Designation A-305-507 and Shall Satisfy the Bend Test Requirements for Structural Grade Steel in Accordance with the Requirements

All Concrete Shall be L3500

Minimum Depth of Embedment For Reinforcing Steel to be as Noted.

All Reinforcing Steel Shall be Epoxy Coated.

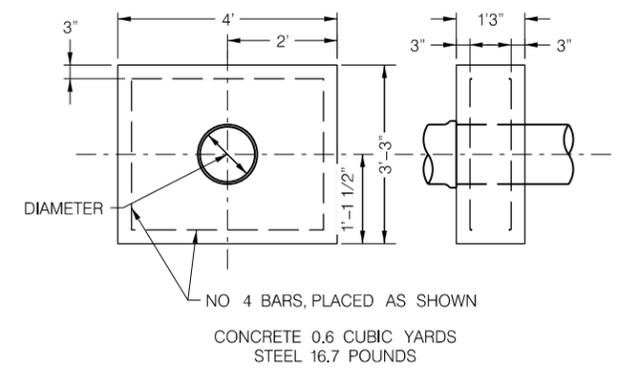
Poured in Place Thrust Blocking Shall be Properly Formed to the Stated Dimensions and Shall Not Encase the M.J. Bolts and Fasteners.



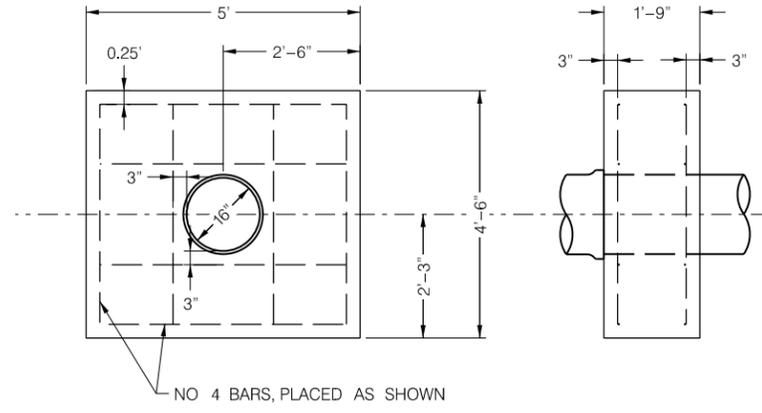
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 DATE: 9/27/2022
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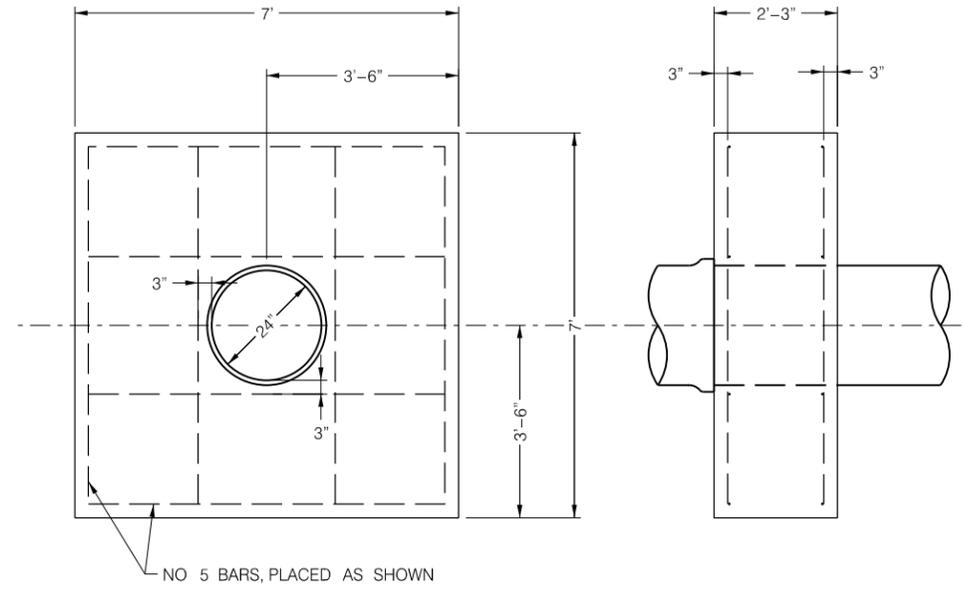
LTU	PLAN NO.	SHEET NO.
	320	2
	Date: 10/1/2022	Drawn: JWH
	Horz. Scale:	Checked: JML Approved: D.B



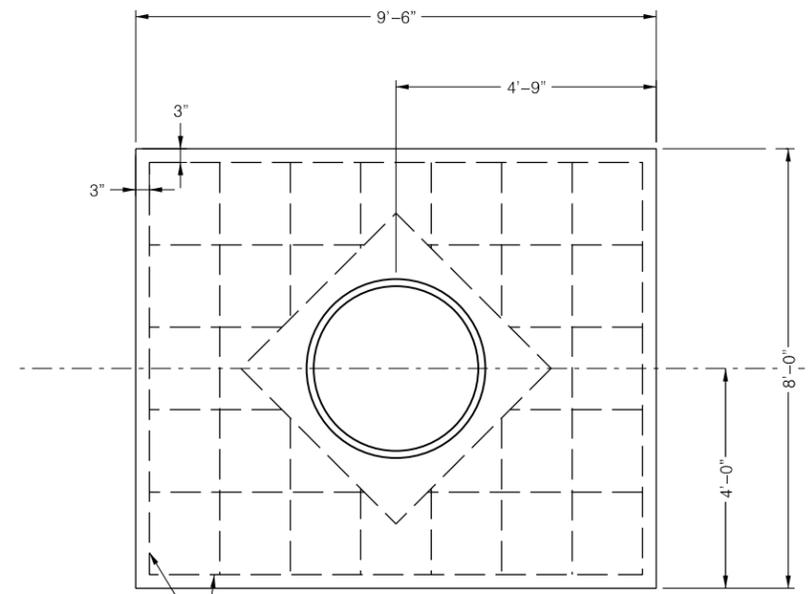
NO 4 BARS, PLACED AS SHOWN
 CONCRETE 0.6 CUBIC YARDS
 STEEL 16.7 POUNDS
12" OR SMALLER WATER MAIN



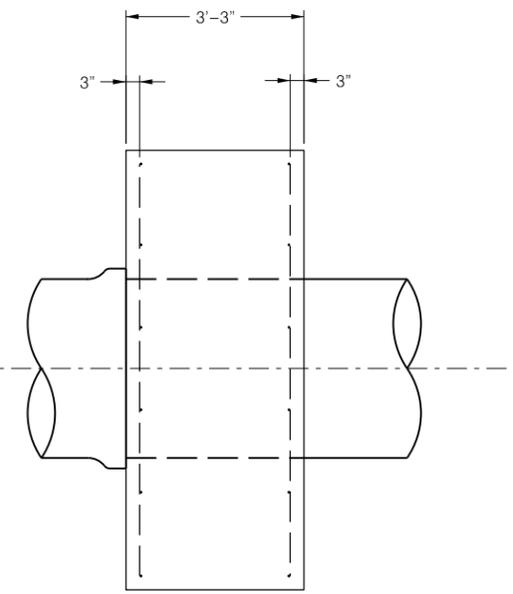
NO 4 BARS, PLACED AS SHOWN
 CONCRETE 1.4 CUBIC YARDS
 STEEL 45.4 POUNDS
16" WATER MAIN



NO 5 BARS, PLACED AS SHOWN
 CONCRETE 3.8 CUBIC YARDS
 STEEL 108.5 POUNDS
24" WATER MAINS

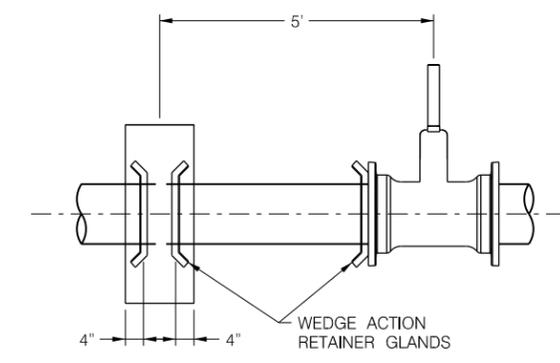


NO 5 BARS, PLACED AS SHOWN
 CONCRETE 8.6 CUBIC YARDS
 STEEL 241.3 POUNDS
30" WATER MAINS



REINFORCED CONCRETE COLLARS

NOTE:
 ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO A.S.T.M. SERIAL DESIGNATION A-305-507 AND SHALL SATISFY THE BEND TEST REQUIREMENTS FOR STRUCTURAL GRADE STEEL IN ACCORDANCE WITH THE REQUIREMENTS.
 ALL REINFORCING STEEL SHALL BE EPOXY COATED.
 ALL CONCRETE SHALL BE L3500.
 ALL CONCRETE COLLARS SHALL BE CONSTRUCTED SUCH THAT THEY ARE ANCHORED AGAINST UNDISTURBED SOIL.



THRUST COLLAR FOR PVC PIPE

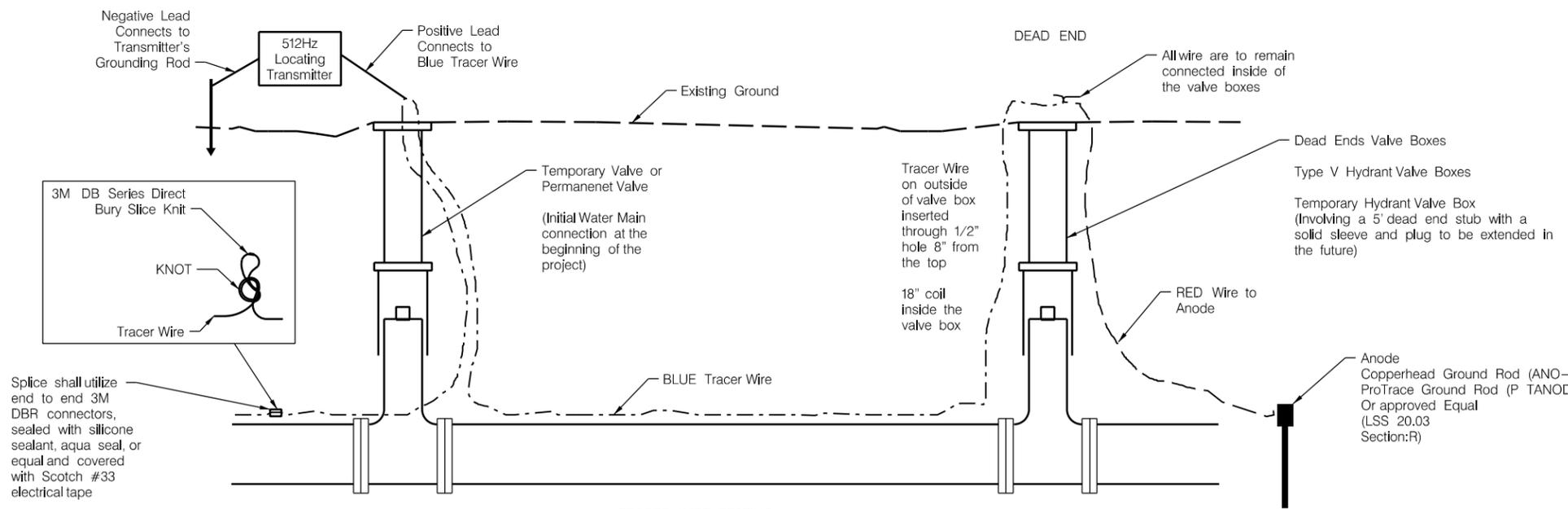
WHENEVER PVC PIPE IS USED FOR WATER MAIN MATERIAL, A THRUST COLLAR SHALL BE INSTALLED 5' FROM EACH LINE VALVE OR REDUCER. TWO WEDGE ACTION RETAINER GLANDS SHALL BE EMBEDDED IN THE THRUST COLLAR, WITH THE GRIPPING WEDGES FACING OPPOSITE DIRECTIONS, TO PROVIDE THRUST RESTRAINT FROM EITHER DIRECTION. A SINGLE WEDGE ACTION RETAINER GLAND SHALL BE INSTALLED ON THE MECHANICAL JOINT ON THE SIDE OF THE VALVE OR REDUCER NEAREST THE THRUST COLLAR. SEE L.S.P. 320 FOR CONCRETE AND REINFORCING STEEL DETAILS.

R.C. THRUST COLLARS FOR REDUCERS SHALL BE INSTALLED ON THE SMALL PIPE SIDE OF A REDUCER, HOWEVER THE SIZE SHALL BE BASED OFF OF THE LARGER DIAMETER PIPE.
 R.C. THRUST COLLARS TO BE BUILT ADJACENT TO VALVES, AT THE SPIGOT SIDE OF LAST PIPE CONNECTION OR ADJACENT TO THE SMALLER DIAMETER SIDE OF M.J. REDUCERS.



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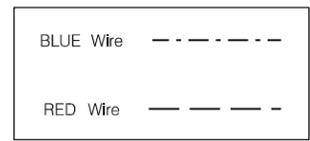
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TRACER WIRE TESTING

CONNECT 512Hz TRANSMITTING DEVICE TO TRACER WIRE AT THE PERMANENT OR TEMPORARY VALVE BOX POSITIONED AT THE INITIAL CONNECTION TO THE WATER MAIN PROJECT

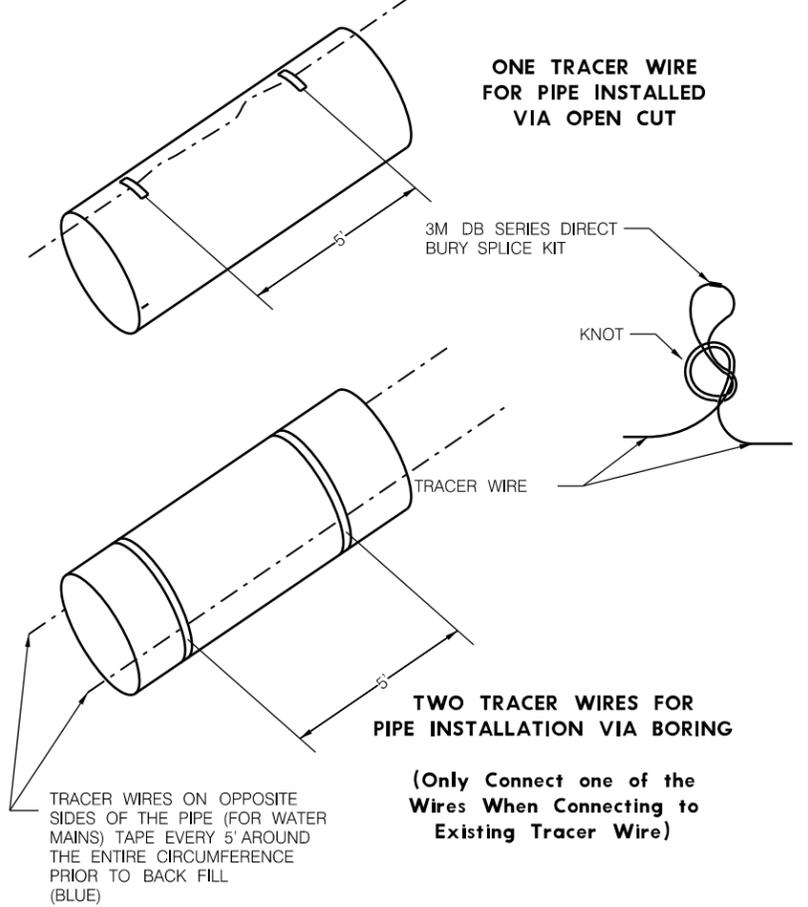
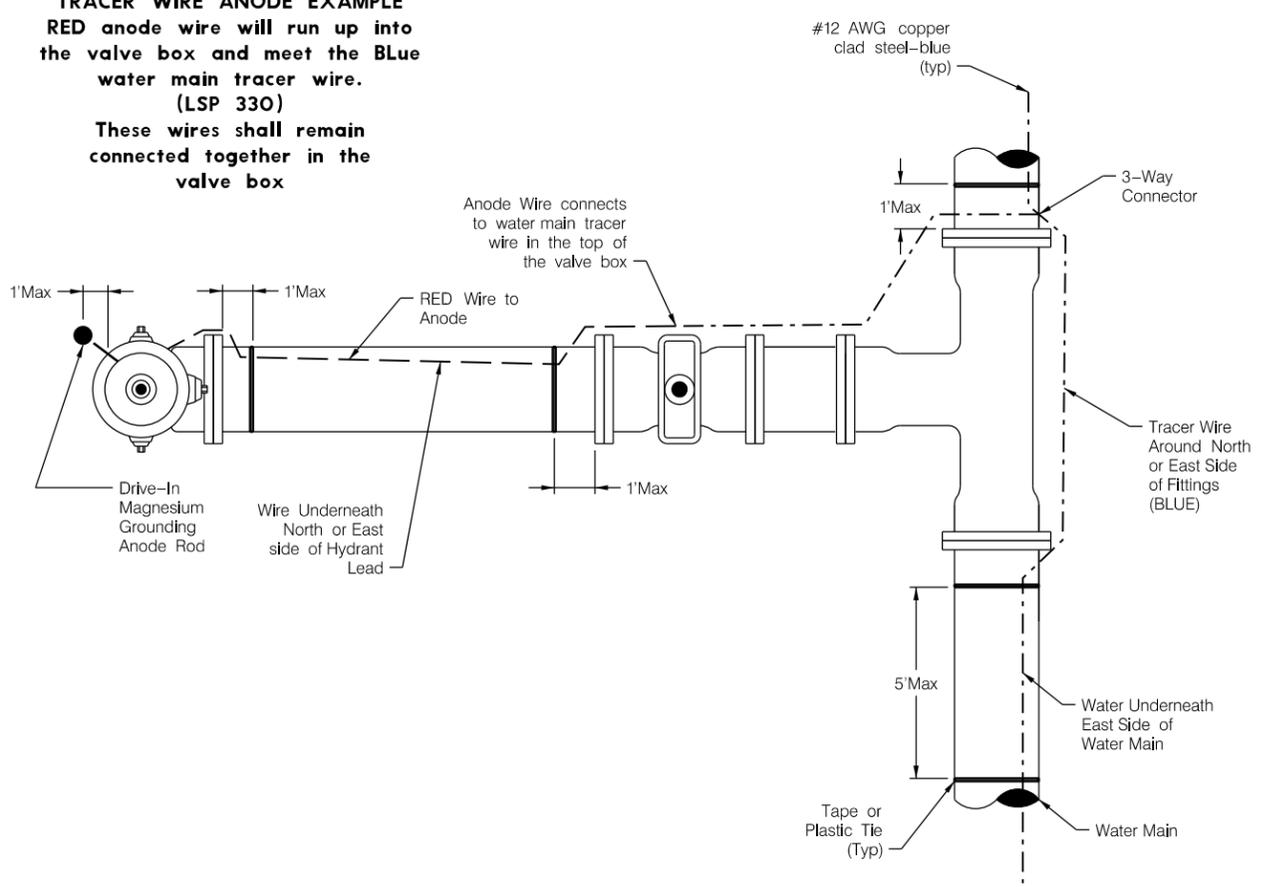
SUCCESSFUL TESTING ACCEPTED WHEN ENTIRE PROJECT IS LOCATED WITH THE TRANSMITTER CONNECTED AT THIS LOCATION WITHOUT MOVING THE TRANSMITTER



TRACER WIRE ANODE EXAMPLE

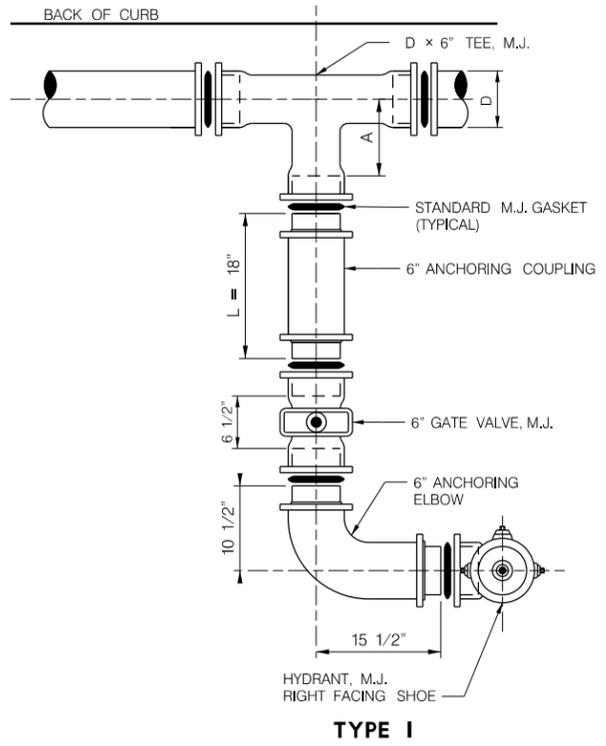
RED anode wire will run up into the valve box and meet the BLUE water main tracer wire. (LSP 330)

These wires shall remain connected together in the valve box

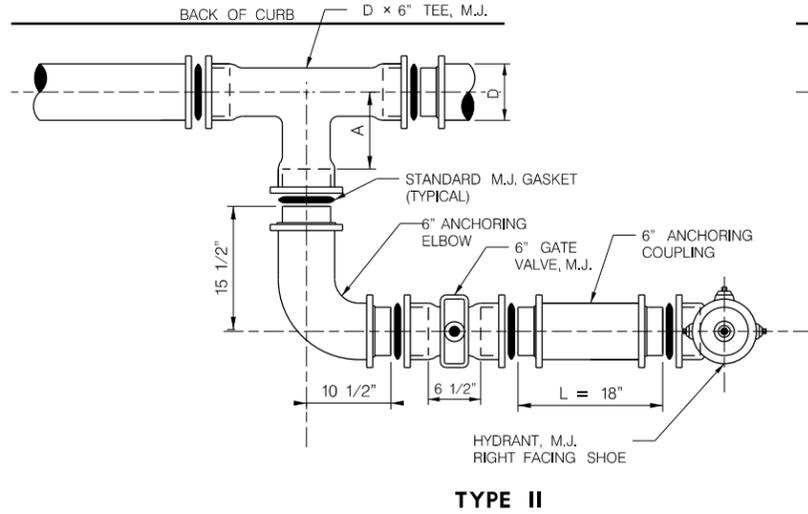


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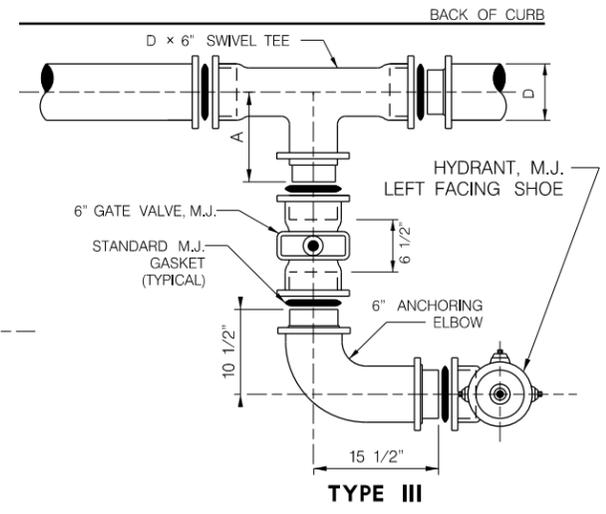
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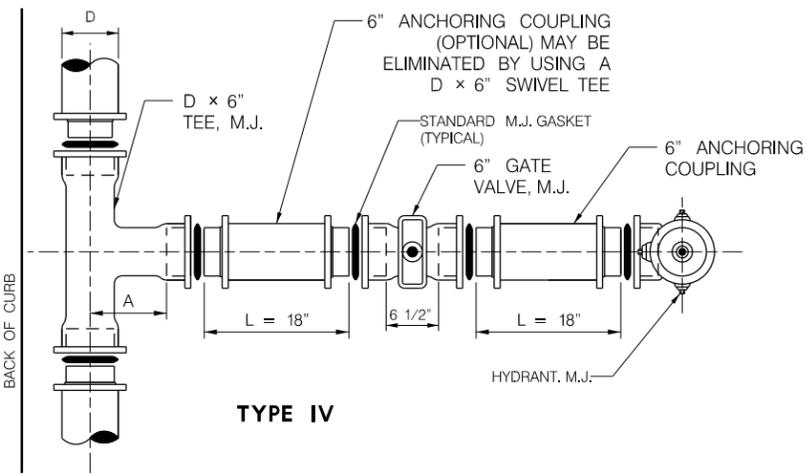
TYPE I



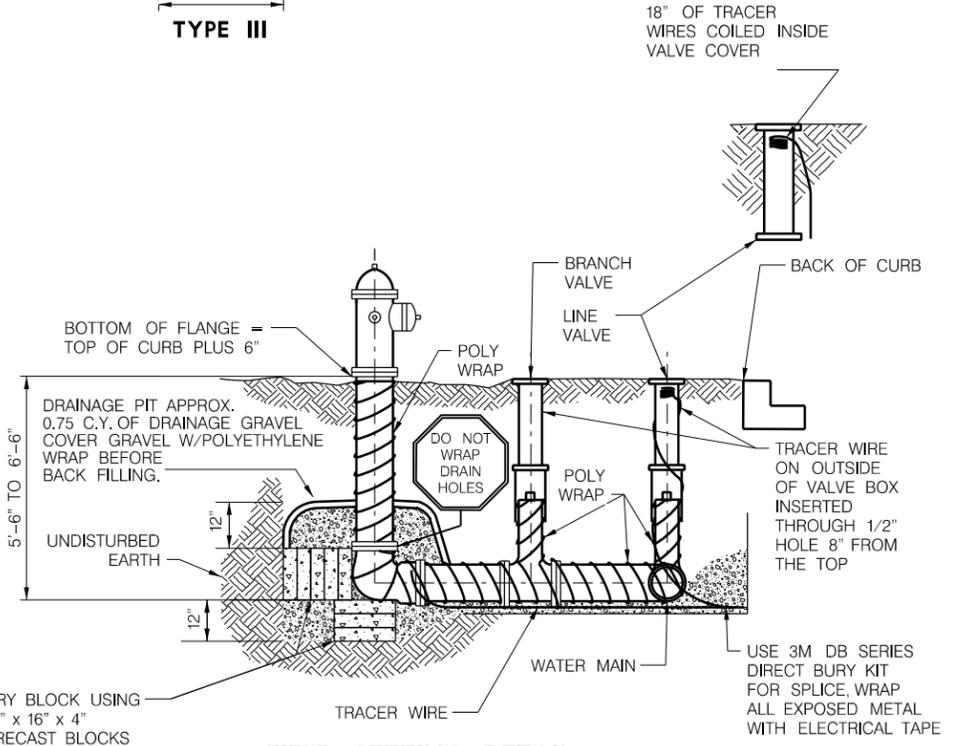
TYPE II



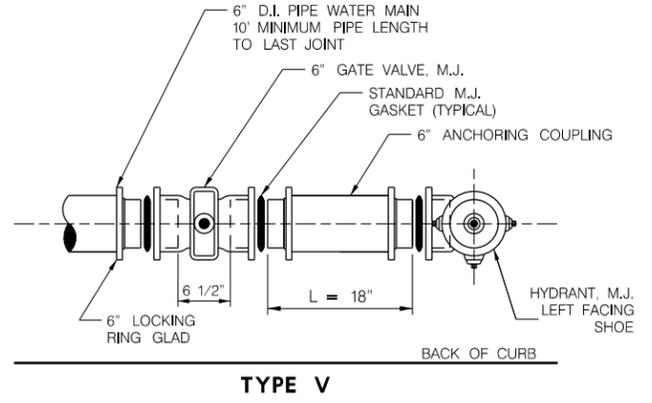
TYPE III



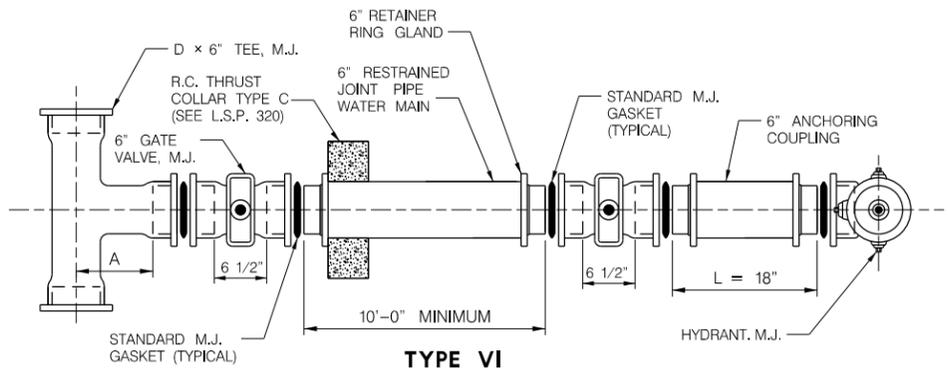
TYPE IV



FIELD SETTING DETAIL



TYPE V



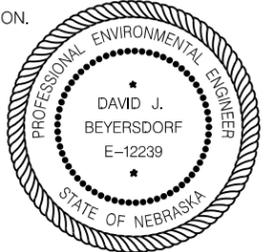
TYPE VI

TEE CONNECTION DIMENSIONS			
MAIN RUN SIZE D	SIZE BRANCH	BRANCH LENGTH SWIVEL TEE A	BRANCH LENGTH A
6"	6"	10.5"	8"
8"	6"	11.5"	9"
12"	6"	14.5"	12"
16"	6"	17.5"	15"
24"	6"	21.5"	19"
30"	6"	24.5"	23"

HYDRANT ASSEMBLY	NUMBER OF FITTINGS REQUIRED						
	5 1/4" PUMPER HYDRANT	6" GATE VALVE, M.J.	6" ANCHORING COUPLING, M.J.	ELBOW, M.J. 6" ANCHORING	D x 6" TEE, M.J.	D x 6" SWIVEL TEE, M.J.	R.C. THRUST COLLAR (TYPE C)
TYPE I	1	1	1	1	1		
TYPE II	1	1	1	1	1		
TYPE III	1	1		1		1	
TYPE IV	1	1	2		1		
TYPE V	1	1	1				
TYPE VI	1	2	1		1		1

NOTES:

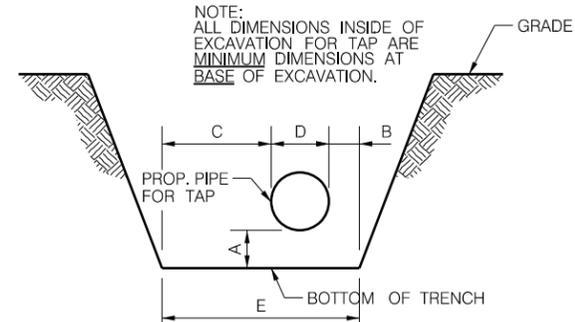
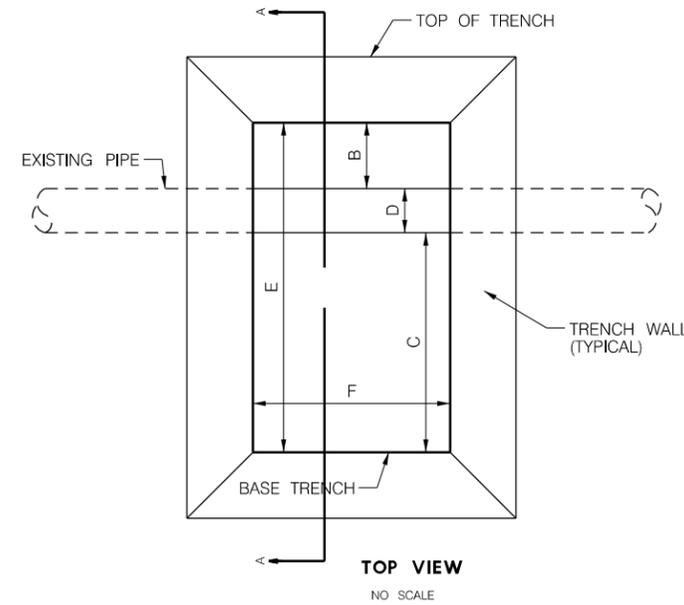
- ALL ANCHORING COUPLINGS SHALL BE 18" IN LENGTH UNLESS PLANS SHOW OTHERWISE
- ALL ANCHORING COUPLINGS AND ANCHORING ELBOWS SHALL BE CAST WITH AN INTEGRAL M.J. GLAND ON ONE END AND A DUCTILE IRON ROTATABLE M.J. GLAND ON THE OTHER END.
- A LOCKING RING FOR A STANDARD ANCHORING COUPLING SHALL BE SUBSTITUTED FOR ONE OF THE STANDARD GLANDS ON THE 6" GATE VALVE FOR THE TYPE V AND TYPE VI INSTALLATIONS.
- BACKFILL OF HYDRANTS AND VALVES SHALL BE COMPACTED BY HAND WITH SUITABLE MECHANICAL EQUIPMENT.
- THERE SHALL BE NO MORE THAN ONE HYDRANT EXTENSION.
- HYDRANT SHALL DRAIN FREELY AFTER INSTALLATION, DRAIN MATERIAL SHALL BE DRAINAGE GRAVEL ONLY, NO LIMESTONE MATERIAL
- THE HYDRANT SHOE SHALL BE DRY BLOCKED, NO POUR IN PLACE BLOCKING
- HYDRANT LINES LONGER THAN TEN (10) FEET SHALL HAVE RESTRAINED JOINT PIPE AND TWO VALVES. VALVE #1 SHALL BE ANCHORED TO THE TEE AND VALVE #2 SHALL BE ANCHORED TO THE HYDRANT.
- HYDRANT BRANCH VALVES SHALL BE OPENED PRIOR TO PRESSURE TESTING WATER MAIN.



HYDRANT INSTALLATIONS

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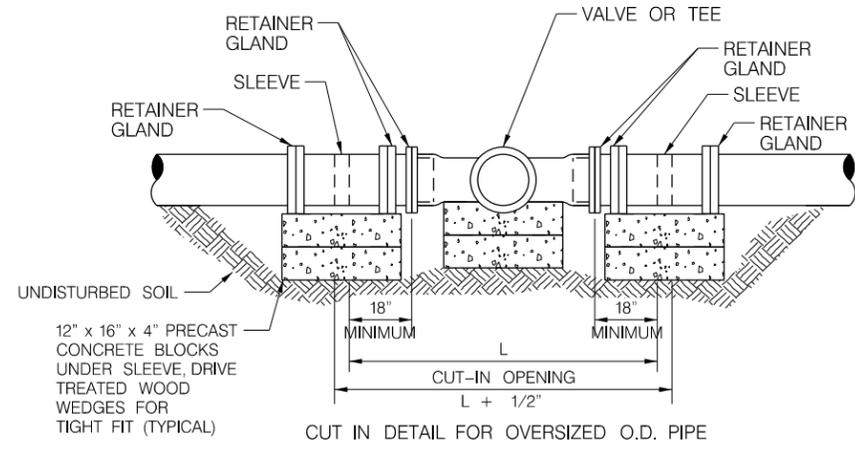


NOTE:
 ALL DIMENSIONS INSIDE OF
 EXCAVATION FOR TAP ARE
 MINIMUM DIMENSIONS AT
 BASE OF EXCAVATION.

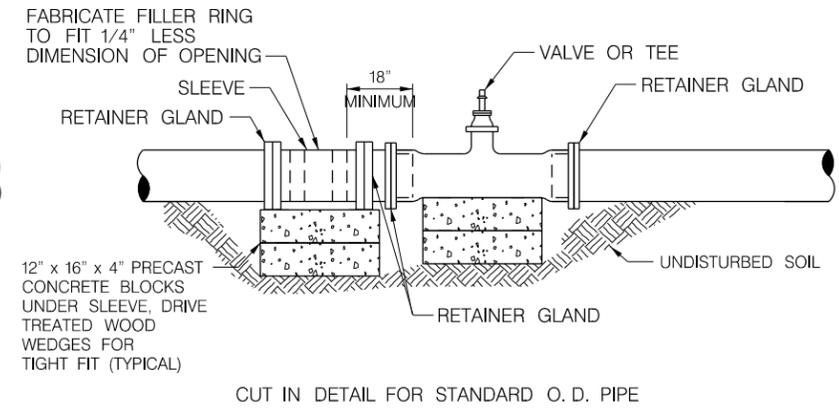
REQUIREMENT:
 SLOPE OF TRENCH WALLS AND/OR
 TRENCH PROTECTION MUST MEET
 O.S.H.A. STANDARDS, NO EXCEPTIONS

SECTION A-A
 NO SCALE

WATER TAPPING EXCAVATION PIT						
	A	B	C	D	E	F
TAPPING SLEEVE AND VALVE	12"	12"	6'-0"	10" OR LESS	8" MINIMUM	4'-0"
			7'-0"	12" OR LESS	9" MINIMUM	
WATER SERVICE TAP	6"	12"	3" MINIMUM	16" OR LESS	5'-0"	3'-0"
WASTEWATER SERVICE TAP	6"	12"	3" MINIMUM	15" OR LESS	5'-0"	3'-0"

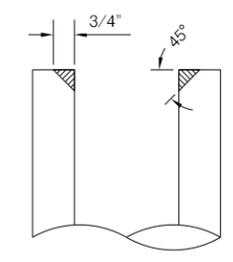


CUT IN DETAIL FOR OVERSIZED O.D. PIPE

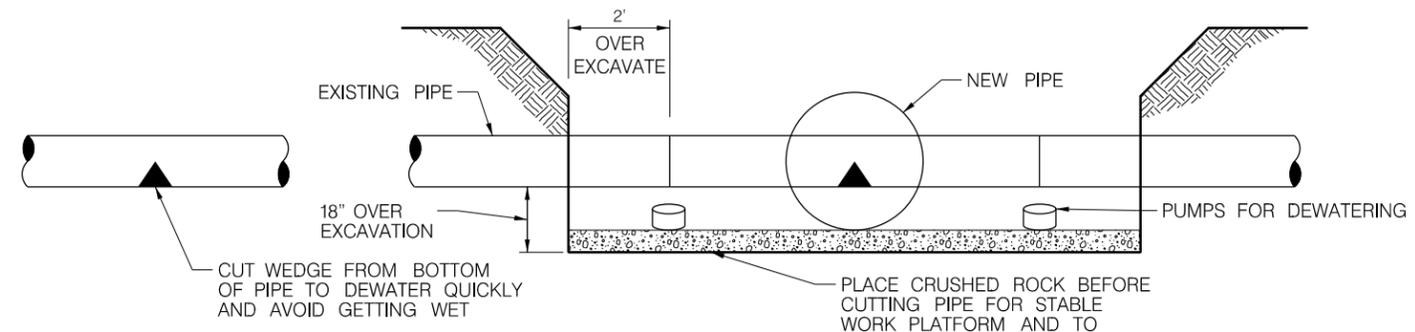
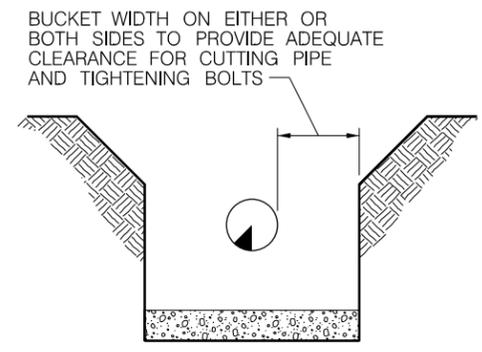


CUT IN DETAIL FOR STANDARD O.D. PIPE

CUT IN FOR VALVES OR FITTINGS



CHAMFER FOR 12" PVC BUTTERFLY VALVE



EXCAVATING AND DEWATER IN FOR TIE-INS
 LINCOLN WATER SYSTEM



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Design with Purpose. Build with Confidence.

Project: Worthman Blvd Water Main
Phase I Cost Estimate

Job No.: SCHEMMER 09336001-A

WORTHMAN BOULEVARD WATER MAIN PHASE I - 100% OPINION OF PROBABLE CONSTRUCTION COSTS

COMPUTED BY: Megan Starnier		DATE: 3/13/2025			
CHECKED BY: Alex Roth		DATE: 3/13/2025			
UPDATES:		DATE:			
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
0005.01	TRAFFIC CONTROL	1	LS	\$5,000.00	\$5,000.00
0030.00	MOBILIZATION (8%)	1	LS	\$9,000.00	\$9,000.00
1009.00	GENERAL CLEARING AND GRUBBING	1	LS	\$5,000.00	\$5,000.00
1030.00	EARTHWORK MEASURED IN EMBANKMENT (ESTABLISHED QUANTITY)	228	CY	\$27.00	\$6,156.00
1995.00	STABILIZED CONSTRUCTION EXIT	1	EA	\$4,000.00	\$4,000.00
L001.02	SEEDING, TYPE B	0.46	AC	\$3,000.00	\$1,380.00
	EROSION CONTROL, CLASS 1A	470	SY	\$3.50	\$1,645.31
W205.12	12" WATER MAIN PIPE	474	LF	\$120.00	\$56,880.00
W205.06	6" WATER MAIN PIPE	7	LF	\$80.00	\$560.00
W219.0	6" GATE VALVE AND BOX	2	EA	\$2,000.00	\$4,000.00
W219.72	12" GATE VALVE AND BOX	1	EA	\$3,500.00	\$3,500.00
W222.06	6" FIRE HYDRANT	2	EA	\$6,000.00	\$12,000.00
	6" ANCHORING COUPLING, 18"	2	EA	\$325.00	\$650.00
	6" ANCHORING ELBOW	1	EA	\$350.00	\$350.00
	12" RETAINER GLAND	14	EA	\$200.00	\$2,800.00
	6" RETAINER GLAND	2	EA	\$90.00	\$180.00
	12" SOLID SLEEVE, M.J.	3	EA	\$550.00	\$1,650.00
	12" PLUG, M.J.	1	EA	\$500.00	\$500.00
W356	12"X6" TEE	2	EA	\$700.00	\$1,400.00
W357	12"X90 DEG BEND	2	EA	\$500.00	\$1,000.00
	CONC FOR PLUG BLOCKS & THRUST BLOCKS	2.4	C.Y.	\$1,000.00	\$2,400.00
	STEEL FOR PLUG BLOCKS & THRUST BLOCKS	116.7	LBS	\$3.00	\$350.10
W750.10	REMOVE FIRE HYDRANT	2	EA	\$750.00	\$1,500.00
	SUBTOTAL CONSTRUCTION				\$121,901.41
	CONSTRUCTION CONTINGENCIES (10% OF CONSTRUCTION)				\$12,190.14
	TOTAL CONSTRUCTION COST				\$134,091.55
ROW (Approximate Impacts and Costs)					
	PERMANENT EASEMENT	0	SF	\$0.00	\$0
	TOTAL RIGHT-OF-WAY COSTS				\$0
	CONSTRUCTION ENGINEERING & INSPECTION	12%			\$16,090.99
	GRAND TOTAL				\$150,182.54

2. Consideration of a Lease Agreement with Nebraska Golf and Turf for a 5-Year Lease on Golf Carts - City Administrator Butcher



QUOTATION
Reference: **COS-36-26-TEMP**

1440 Yolande Ave

Lincoln, Nebraska 68521

800-535-2885

Fax 402-466-8283

PREPARED FOR: City of Seward
Seward, NE 68434

DATE OF QUOTE: January 28, 2025
SALES PERSON: Don Brudny

WE ARE PLEASED TO SUBMIT THE FOLLOWING QUOTATION:

QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
36	2026 Club Car Tempo Gas Golf Car equipped with the following: Color - Standard Canopy Top Standard Seat 2 Sand Bottles Fold Down Windshields Number Decals Information Holders Beverage Cooler Freight 5 Year Lease 6 on / 6 off payments of \$124.00 per car per year All leases are subject to approval Quote does not include any applicable taxes	Included Included Included Included Included Included Included Included Included	Included Included Included Included Included Included Included Included Included
	TOTAL		
<i>TERMS</i> Net 15 Days or Lease	<i>F.O.B.</i> Destination	<i>APPRX DELIVERY DATE</i> Spring 2026	<i>SHIPPED VIA</i> Our Truck

Prices quoted are those in effect at the time of quotation and are guaranteed subject to acceptance within 30 days. Applicable state or local taxes not included. All credit terms must be approved by Nebraska Golf & Turf. prior to delivery. Customer to submit required credit information for credit approval. Delivery lead time of 4 to 6 weeks normally required.

Accepted By: _____
Company: _____
Title: _____
Date: _____

Nebraska Golf & Turf
By: Don Brudny
Title: Sales Manager



**QUOTATION
Reference:**

1440 Yolande Ave

Lincoln, Nebraska 68521

800-535-2885

Fax 402-466-8283

PREPARED FOR: City of Seward
Seward, Ne 68434

DATE OF QUOTE: January 28, 2025
SALES PERSON: Don Brudny

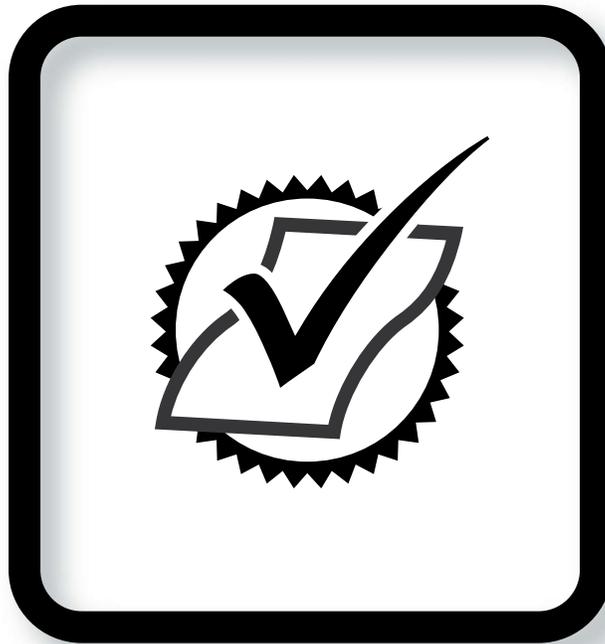
WE ARE PLEASED TO SUBMIT THE FOLLOWING QUOTATION:

QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
	<p>This lease proposals are based on a 4.99% interest rate. The Exchange Bank will lock in an interest rate 90 days before delivery. Your lease payment could be effected by this. The payment will be adjusted at that time.</p>		
		Total	
<p><i>TERMS</i> <i>Net 15 Days or Lease</i></p>	<p><i>F.O.B.</i> <i>Destination</i></p>		<p><i>SHIPPED VIA</i> <i>Our Truck</i></p>

Prices quoted are those in effect at the time of quotation and are guaranteed subject to acceptance within 30 days. Applicable state or local taxes not included. All credit terms must be approved by Nebraska Golf & Turf. prior to delivery. Customer to submit required credit information for credit approval. Delivery lead time of 4 to 6 weeks normally required.

Accepted By: _____
Company: _____
Title: _____
Date: _____

Nebraska Golf & Turf
By: Don Brudny
Title: Sales Manager



11

WARRANTIES

LIMITED WARRANTY**WARRANTY**

Club Car, LLC ("Club Car") hereby warrants to the Original Purchaser or Lessee, as those terms are defined herein, and subject to the provisions, limitations and exclusions in this limited warranty, that its new vehicle or new component purchased from Club Car or an Authorized Dealer or Distributor shall be free from defects in material and workmanship under normal use and service for the periods stated below, subject to the provisions, limitations and exclusions in this limited warranty.

This limited warranty covers material, workmanship and repair labor cost as to those items specifically listed below for the periods specified. Such repair labor shall be performed only by Club Car, its Authorized Dealers or Distributors, or a service agency approved by Club Car. For repairs made by qualified technicians other than Club Car's factory technicians or an Authorized Dealer or Distributor, Club Car will provide only the replacement parts or components.

If the warranty registration form is not completed and returned to Club Car at the time of the original retail sale, the Purchaser must provide proof of date of purchase with any warranty claim.

WARRANTY TIMEFRAME

ITEM	SUB-ITEMS	COVERAGE
VEHICLE MAINFRAME	Not applicable	Limited Lifetime
SUSPENSION	Steering gearbox, steering column, shocks, and leaf springs	4
POWERTRAIN	Engine, transaxle, torque converter (drive and driven)	5
GASOLINE SYSTEMS	Air intake system, exhaust system, and starter generator	3
PEDAL GROUP	Pedal group mechanical assembly, brake cluster assemblies, and brake cables	4
SEATS	Seat bottom, seat back, and armrests	4
CANOPY SYSTEM	Canopy, rear canopy supports, drainage system, and structural accessory module (SAM)	4
BODY GROUP	Beauty panels and front/rear underbody	3
ALL REMAINING COMPONENTS	Solenoid, GCOR, limit switches, voltage regulator, F&R switch, and options and accessories supplied by , including components not specified otherwise	2

EXCLUSIONS

Excluded from any Club Car warranty is damage to a vehicle or component resulting from a cause other than a defect including poor maintenance, neglect, abuse, accident and collision, maintenance adjustments, unreasonable or unintended strain or use, improper installation of accessories, installation of parts or accessories that are not original equipment including Club Car approved or non-

approved GPS systems, non-approved alteration, and acts of God. Also excluded from any Club Car warranty are all fuses, filters, decals (except safety decals), lubricants, routine wear items such as engine mounts, bed floor lining, mats, pads, spark plugs, light bulbs, brake pads, belts, brushes, solenoids, bushings, drive buttons, cosmetic deterioration, and items that deteriorate, fade or fail due to exposure or ordinary wear and tear.

The provisions of this limited warranty shall not apply to failure due to the following conditions:

- Batteries
 - Improper charging of a vehicle due to the use of a battery charger model not approved by Club Car for use with the vehicle.
 - Use of water in batteries, including tap water, that contains impurities. Distilled water or a properly maintained, Club Car approved battery water deionizer and filter system must be used to ensure water quality.
 - Abuse such as overcharging, undercharging, improper fluid levels, loose wiring and fasteners, or rusted or corroded hardware.
 - Use of energy management systems that do not allow a minimum of 12 hours of charge time to assure proper charging.
 - Use of any accessories that do not draw power off the complete system voltage.
 - Neglect, breakage, freezing, fire, explosion, wreckage, melted terminal posts, the addition of any chemical, or the operation of the battery in an uncharged condition (below half charge 1.200 specific gravity); the installation of the batteries in reverse or recharging in reverse, breakage of containers, covers, or terminal post, or batteries used in applications for which they were not designed.
 - A battery damaged by a defective charger or batteries in vehicles that do not receive proper charging.
 - A vehicle not having an operational charger on a circuit that has the parameters specified in the vehicle owner's manual (the number of operational chargers must equal the number of operational vehicles), or use of an unapproved algorithm.
- Lack of proper maintenance such as preventive maintenance checks, proper rotation of vehicles in a fleet application, maintaining proper tire pressure and alignment and tightening loose wire connections as outlined in the owner's manual.
- Damages caused by improper installation of the component.
- Failed semiconductor parts such diodes and fuses that are vulnerable to electrical overloads (including lightning) beyond the control of CLUB CAR.
- Damaged charger AC and DC cord set with plug, which is a wear item and subject to user abuse.
- Use of gasoline containing more than 10 percent ethanol.

Without limiting the generality of the foregoing in any way, and as part of its limited warranty exclusion, Club Car does not warrant that its vehicle or components such as batteries, computer, controller or electrical device are suitable for use in any application other than in its products. As in the use of any vehicle, batteries, computer, controller or electrical device, a prudent owner will read and study the owner's manual, the operator instructions and the warning labels; and will exercise due care in working on or around vehicles, batteries or electrical devices.

Transportation expenses for warranty services are also excluded from this warranty.

VOIDING OF WARRANTY

This and any other warranty shall be void if the vehicle or component is abused or used in an unintended manner or shows indications that it has been altered in any way, including, but not limited to, modification of the speed governor, braking system, steering, transaxle, or other operating systems of the car to cause it to perform outside club car specifications. The warranty is likewise void if the vehicle shows indications that reasonable or necessary maintenance as outlined in the owner's manual and maintenance and service manual was not performed at the time and in the manner specified in such manuals.

SOLE REMEDY

Club Car's liability under this limited warranty or in any action whether based upon warranty, contract, negligence, strict product liability or otherwise, shall be the repair or replacement, at Club Car's option, of the vehicle or component thereof that Club Car deems to be defective. Replacement shall mean furnishing, during the applicable limited warranty period, a new vehicle or factory-reconditioned vehicle or component thereof that is identical or reasonably equivalent to the warranted product or component at no cost to the purchaser. Repair shall mean remedying a defect in the vehicle or component thereof at no cost to the purchaser during the applicable limited warranty period. Club Car reserves the right to test and recharge any component returned for adjustment. If Club Car elects to repair the vehicle or component, it may provide factory-reconditioned parts or components. All parts and components replaced under warranty shall become the property of Club Car.

DISCLAIMER

This limited warranty is exclusive. Club Car makes no other warranty of any kind, expressed or implied. Any implied warranties of merchantability or fitness for a particular purpose are hereby disclaimed by Club Car and excluded from this warranty. The Purchaser and Club Car expressly agree that the sole remedy of the replacement or repair of the defective vehicle or component thereof is the sole remedy of the Purchaser. Club Car makes no other representation or warranty of any kind, and no representative, employee, distributor or dealer of Club Car has the authority to make or imply any representation, promise or agreement, which in any way varies the terms of this warranty.

In the event that another pre-printed warranty document, certificate or both offered by or through Club Car at the time of sale of this vehicle (each an "Additional Warranty Document") is deemed to conflict with the limitations or exclusions contained herein, the limitations and exclusions contained herein shall continue to apply to both this limited warranty statement and, to the maximum extent permitted by law, to each Additional Warranty Document.

NO CONSEQUENTIAL DAMAGES

In no event shall Club Car be liable for any incidental or consequential damages including, but not limited to, loss related to property other than the vehicle, loss of use, loss of time, inconvenience, or any other economic loss.

Some states allow neither limitation on the duration of an implied warranty nor exclusions or limitation of incidental or consequential damages. Therefore, the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

HOW TO MAKE A WARRANTY CLAIM

To make a warranty claim under this limited warranty, you must present the vehicle or defective component with evidence of proof of purchase date and number of amp hours (if applicable) to an authorized Club Car dealer.

For warranty-related communication, contact:

Phone

Within The U.S.A.: 1-800-CLUBCAR (1-800-258-2227)
Outside Of The U.S.A.: +1-706-955-0081

E-mail

cci_warrantyadministration@clubcar.com

Postal Service

Club Car, LLC
Attention: Warranty Services
4125 Washington Rd.
Evans, Georgia 30809
United States Of America

FEDERAL EMISSIONS COMPONENT DEFECT WARRANTY

WARRANTY COVERAGE

This emission warranty is applicable in all States in the United States Of America, except the State of California.

Club Car, LLC ("Club Car") warrant(s) to the initial retail purchaser and each subsequent owner, that this Non-road engine ("engine") has been designed, built, and equipped to conform at the time of initial sale to all applicable regulations of the United States Of America Environmental Protection Agency (EPA), and that the engine is free of defects in materials and workmanship which would cause this engine to fail to conform with EPA regulations during its warranty period.

For the components listed under Parts Covered, the service dealer authorized by Club Car will, at no cost to you, make the necessary diagnosis, repair, or replacement necessary to ensure that the engine complies with applicable EPA regulations.

WARRANTY PERIOD

The warranty period for this engine begins on the date of sale to the initial purchaser and continues for a period of three years.

PARTS COVERED

Listed below are the parts covered by the Emission Components Defect Warranty. Some of the parts listed below may require scheduled maintenance and are warranted up to the first scheduled replacement point for that part.

EXHAUST EMISSIONS

- Fuel Metering System
 - Throttle Body, carburetor, and internal parts (and/or pressure regulator or fuel injection system)
 - Air/fuel ratio feedback and control system, if applicable
 - Cold start enrichment system, if applicable
 - Fuel pump and fuel pressure regulator
 - Fuel tank

- Oil temperature sensor
- Air Induction System
 - Intake manifold, if applicable
 - Air filter
- Ignition System
 - Spark plugs
 - Magneto or electronic ignition system
 - Spark advance/retard system, if applicable
- Catalyst or Thermal Reactor System
 - Exhaust Manifold, if applicable
- Miscellaneous Items Used in Above Systems
 - Electronic controls (ECU), if applicable
 - Hoses, belts, connectors, gaskets, brackets, clamps, accessories, and assemblies used in the above systems.

EVAPORATIVE EMISSIONS

- Fuel Line
- Fuel Line Fittings
- Clamps
- Fuel Tank
- Fuel Cap
- Vapor Hoses
- Carbon Canister
- Carbon Canister Mounting Brackets
- Air Cleaner Purge Port Connector

DISTRIBUTION CENTER

Replacement parts are provided to the market upon request by the customers. Replacement parts distribution center is located at:

Club Car, LLC
Attention: Service Parts Department
4125 Washington Road
Evans, Georgia 30809,
United States Of America

Contact Club Car at 1-800-CLUBCAR (1-800-258-2227) if you have a question regarding your replacement part.

WARRANTY SERVICE

To obtain warranty service, take your engine to the nearest authorized Club Car service dealer. Bring your sales receipts indicating date of purchase for this engine. The service dealer authorized by Club

Car will perform the necessary repairs or adjustments within a reasonable amount of time and furnish you with a copy of the repair order. All parts and accessories replaced under this warranty become the property of Club Car.

For owners located more than 100 miles from an authorized service center, the following will be provided to those applicable owners (excluding the states with high-altitude areas). Club Car will either:

- pay for the shipping costs of replacement parts to and from an authorized service center
- provide for a service technician to come to the owner to make the warranty repair
- pay for the repair to be made at a local non-authorized service center

WHAT IS NOT COVERED

- Conditions resulting from tampering, misuse, improper adjustment (unless they were made by the service dealer authorized by Club Car during a warranty repair), alteration, accident, failure to use the recommended fuel and oil, or not performing required maintenance services.
- The replacement parts used for required maintenance services.
- Consequential damages such as loss of time, inconvenience, loss of use of the engine or equipment, etc.
- Diagnosis and inspection charges that do not result in warranty-eligible service being performed.
- Any non-authorized replacement part, or malfunction of authorized parts due to use of non-authorized parts.

OWNER'S RESPONSIBILITIES

As the engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Club Car recommends that you retain all receipts covering maintenance on your engine, but Club Car cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the engine owner, you should however be aware that Club Car may deny warranty coverage if your engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your engine to the nearest service dealer authorized by Club Car when a problem exists.

If you have any questions regarding your warranty rights and responsibilities, you should contact the Club Car customer service department at 1-800-CLUBCAR (258-2227).

THINGS TO KNOW ABOUT THE EMISSION CONTROL SYSTEM WARRANTY MAINTENANCE AND REPAIRS

You are responsible for the proper maintenance of the engine. You should keep all receipts and maintenance records covering the performance of regular maintenance in the event questions arise. These receipts and maintenance records should be transferred to each subsequent owner of the engine. Club Car reserves the right to deny warranty coverage if the engine has not been properly maintained. Warranty claims will not be denied, however, solely because of the lack of required maintenance or failure to keep maintenance records.

Maintenance, replacement or repair of emission control devices and systems may be performed by any repair establishment or individual; however, warranty repairs must be performed by a service dealer authorized by Club Car. The use of parts that are not equivalent in performance and durability to authorized parts may impair the effectiveness of the emission control system and may have a bearing on the outcome of a warranty claim.

If other than the parts authorized by Club Car are used for maintenance replacements or for the repair of components affecting emission control, you should assure yourself that such parts are warranted by their manufacturer to be equivalent to the parts authorized by Club Car in their performance and durability.

HOW TO MAKE A CLAIM

All repairs qualifying under this limited warranty must be performed by a service dealer authorized by Club Car. In the event that any emission-related part is found to be defective during the warranty period, you shall notify Club Car customer service department at 1-800-CLUBCAR (1-800-258-2227) and you will be advised of the appropriate warranty service dealer or service providers where the warranty repair can be performed.

CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT

WARRANTY RIGHTS AND OBLIGATIONS

The California Air Resources Board ("CARB") and Club Car, LLC ("Club Car") are pleased to explain the emission control system warranty on your 2014 or newer vehicle engine (the "emission warranty"). In California, new small off-road engines ("SORE") must be designed, built and equipped to meet the State's stringent anti-smog standards. Club Car shall warrant the emission control system on the vehicle engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your small off-road engine.

Your emission control system may include parts such as the carburetor or fuel-injection system, the ignition system, the catalytic converter and related hoses, belts, connectors and other emission assemblies or components.

Where a warrantable condition exists, as defined herein, Club Car will repair your vehicle engine at no cost to you including diagnosis, parts and labor.

MANUFACTURER'S WARRANTY COVERAGE

This emission control system is warranted for two years from the vehicles' date of purchase. If any emission-related part on your Club Car small off-road engines ("SORE") is defective, the part will be repaired or replaced by Club Car.

OWNER'S WARRANTY RESPONSIBILITIES

As the vehicle engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Club Car recommends that you retain all receipts covering maintenance on your vehicle engine, but Club Car cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the vehicle engine owner, you should however be aware that Club Car may deny you warranty coverage if vehicle engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting vehicle engine to a Club Car distribution center as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days. If you have any questions regarding your warranty rights and responsibilities, you should contact:

3. Consideration of a Resolution Declaring City Items as Surplus - City Administrator
Butcher

RESOLUTION NO. 2025-6

WHEREAS, the City of Seward, Nebraska has the authority to sell personal property owned by the City; and

WHEREAS, as outlined under Section 44-1.26 of the City Code, in order for the City to sell property having a value of \$5,000 or more, the City Council shall declare said property as surplus property and approve its disposal; and

WHEREAS, as outlined under Section 44-1.26 of the City Code, in order for the City to sell property having a value of \$5,000 or less, a listing of said property shall be posted; and

WHEREAS, the Governing Body determines that the City Administrator should act and that items should be sold and disposed of by the City of Seward; and

WHEREAS, the City of Seward, Nebraska has the following described property:

City of Seward - Surplus Property Items:

Item	Quantity	Department
#1. 1995 Central States Tanker #42	1	<i>Fire</i>
#2. 40' Fiberglass Light Poles	24	<i>Electric</i>
#3. 25' Steel Poles and arms	10	<i>Electric</i>
#4. 15' Cross Walk Poles	2	<i>Electric</i>
#5. Stop light arm poles	2	<i>Electric</i>
#6. Traffic/crosswalk lights	16	<i>Electric</i>
#7. 12' Gator Flood Pump; Dolphin Model	1	<i>Street</i>
#8. Kona 20" Bike (Green)	1	<i>Police</i>
#9. Gary Fisher Wahoo 20" Bike (Blue)	1	<i>Police</i>
#10. A/V Stand (black)	1	<i>Library</i>
#11. Children's Coat Rack	1	<i>Library</i>
#12. Little Tikes Toy Washer/Dryer	1	<i>Library</i>

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF SEWARD, NEBRASKA THAT:

That the above described property be sold or destroyed by the City of Seward in accordance with the procedures set forth in Section 44-1.26 of the Seward City Code.

The Mayor declared the resolution adopted. Dated this 18th day of March 2025.

THE CITY OF SEWARD, NEBRASKA

ATTEST:

Joshua Eickmeier, Mayor

Derek Bargmann, City Clerk

(SEAL)

DISCLAIMER:

All items are sold 'as is' and all sales are final. The bid opening date for items indicated below will be at 10 AM on Friday, April 4, 2025, at City Hall.

Items Declared Surplus by City Council Action on March 18, 2025:

(ITEM #1) 1995 Central States Tanker #42 **(NOT ACCEPTING BIDS)**

(ITEM #2) 40' Fiberglass Light Poles – 24 total **(NOT ACCEPTING BIDS)**

(ITEM #3) 20' Steel Poles and Arms – 10 total **(NOT ACCEPTING BIDS)**

(ITEM #4) 15' Cross Walk Poles – 2 total **(NOT ACCEPTING BIDS)**

(ITEM #5) Stop Light Arm Poles – 2 total **(NOT ACCEPTING BIDS)**

(ITEM #6) Traffic/Cross Walk Lights – 16 total **(NOT ACCEPTING BIDS)**

(ITEM #7) 12' Gator Flood Pump, Dolphin Model **(ACCEPTING BIDS)**



(ITEM #8) Kona 20" Bike (Green) (ACCEPTING BIDS)



(ITEM #9) Gary Fisher Wahoo 20" Bike (ACCEPTING BIDS)



(ITEM #10) A/V Stand (black) (ACCEPTING BIDS)



(ITEM #11) Children's Coat Rack (ACCEPTING BIDS)



(ITEM #12) Set of Children's Toy Washer/Dryer (ACCEPTING BIDS)



4. Update on the Wellness Center - Executive Director Brase
CITY ADMINISTRATOR'S REPORT

CITY ADMINISTRATORS REPORT – 3/18/25

The departments are working on the following projects to name a few:

- Monitoring a number of street projects including: East Seward (final items), design on East Hillcrest, drainage near Park Street & Bradford Street (punch list), Highway 15 Watermain (punch items) and Highway 15 Reconstruction (construction/winter shutdown); design of 5th and Bradford/Roberts Drainage, Design of Lindell and Jackson Reconstruction.
- Water Tower project underway, paint coat issues have led to substantial delays. Painting will likely resume in Spring 2025. Review of plan documents to resolve paint issues. Met with Olsson and Maguire to resolve items in person.
- Working with Wellness Center Executive Director Brase on numerous items and follow ups, construction meeting held.
- Worked with Kelly Hoffschneider to work on a number of real estate items related to the Rail Campus, tower leases, and related legal matters.
- Caselle accounting system project conversion implementation. Met with utility meter teams on numerous issues with billing.
- Met with Electric Department Line Crew Chief regarding open positions.
- Review significant items related to LB 840 application for 6th Street Café. Completed additional follow up items.
- Check in meeting with Building and Zoning Staff.
- Attended Turf project meeting with Dave Kumm and Dr. Josh Fields to meet the Nemaha Team again.
- Had a Safety Committee Meeting Update.
- Fulfilled a public records request related to the Park Avenue Project.
- Spent significant time following up and researching items related to a Flock Camera system installed by the Seward County Sheriff's Office.
- Audit follow up items back to the auditor.
- Attending the Employee and Police Annual Pension Funds Meetings.
- Attended the funeral of former Mayor Roger Glawatz.
- Took Matt Glawatz (Clark Enerson) on a tour of the civic center renovation project while he was in town. Matt was one of the originators of the design renovation.

Police Department

- Meeting with Head Start Director
- Emergency Vehicle Ops Training
- Suicide Prevention Coalition
- Opioid Steering Committee
- SE Region Human Trafficking Task Force meeting
- Police Pension Committee
- Developing July 4th Incident Action Plan

City Clerk/Human Resources/City Hall

- Evaluations: working with Greg to close out 9/30 period
- Annual Appreciation Event: follow-up survey and thank you's to be sent
- Pension Committee Meetings
- 2025 Clerk's Academy: Preparing items for roundtable topic
- 10/1/24-3/31/25 Evaluation forms for each employee
- Establish policy for barricades, trash cans, picnic tables
- Coordinate with Joel to hire PT Wellness Center Staff and Lifeguard hiring

Water/Wastewater Department

- Senior Center Sewer meeting Wednesday

- RO 3rd Skid Progress meeting Thursday
- Lift Station and Generator checks
- Repair fire hydrant on Waverly road near Wellness Center
- Risk and Resilience Assessment
- Water Tower coating Meeting
- NeWarn Meeting
- Jared Hans at Wastewater Certification

Parks and Rec/Cemetery/Golf/Pool

- Meet with new custodian
- Golf Course Opens for season Monday at noon
- Spring sports start on Monday, getting fields ready
- General Employee Pension meeting
- Rebuilding roof on west field third base dugout
- Codr plumbing replacing both toilets in women's restroom at east/west fields
- Putting together and installing new bleachers on west field
- 2 funerals

Civic Center

- Still waiting on some parts for the railings
- Uribe hasn't picked up recycling, called and they came back to get it
- Final elevator inspection on Wednesday
- Sprinkler installers missed some heads/caps and reattaching a can light
- Painter on west side waiting for lift to get the last few spots
- Basement painting is complete, except a few touch ups

Electric Department

- Rebuilding overhead on 100 block N 1st Street
- Work meter issues
- Breaker maintenance Water Tower Sub
- Replace broken pole 407 Northern Heights
- Fix bad underground streetlights N 2nd
- Fix street light wire 100 block N 6th St

Street Department

- Hook up pump at pump station, run pumps
- Sign replacement
- Get street sweeper ready
- Trim trees

Library

- Planning for Summer 2025 including finding program sponsors
- NLA Zoom Meeting
- United Libraries Webinar
- Art class Tuesday
- Library Board Meeting
- Planning Meeting Thursday
- Layne's last day March 14
- Home delivery of library materials to assisted living and others with limited access every Tuesday

Building Inspection/Planning Department

- Dance Studio pot hole opened up again
- Senior Center sewer discussion with Jason Butzke and Wastewater department
- Planning Commission – update special use permit for new Alps Bark Park owner
- Zoning meeting for Dan Briggs
- Sidewalk Cost Share Program – released Wednesday March 19
- Café on 6th Street – working with Fire Marshal on compliance and inspections

Engineering

- GIS Update – CAD files
- Paving to complete sanitary service for 247 N 8th st – Bradford Storm Sewer Improvement
- Worthman Blvd – 90% plan set review
- Rail Campus Watermain Extension – 90% plan set review
- 500k Water Tower – easements for communication tenants, on-site meeting, coating correction plan meeting
- Levee Pump Station – USACE Meeting
- Plum Creek Bridge – public outreach documents on City website
- WWTP Upgrade – WIFIA Letter of Intent
- East Hillcrest Drive – engineering design proposal from Schemmer

Finance Department

- Start balancing February in Caselle
- Airport financials
- TIF payments sent out
- Fix utility bill issues
- Set up NatPay website so employees can access pay stubs and W-2s

Seward Wellness Center

- Punchlist inspection for non-pool areas
- Build out programs, scheduling and costs
- Onboard new full time employees
- Interviews for part-time positions
- Owner training on systems at SWC
- Site Update:
 - Final items
 - Cleaning of areas
 - Tile being grouted. Pool equipment install continues (4wks)
 - Finishing touches and cleaning

**FUTURE REQUESTS FOR COUNCIL AGENDA ITEMS OR ADMINISTRATIVE ACTION
ANNOUNCEMENT OF UPCOMING EVENTS
STRATEGY SESSION**

1. Strategy Session with City Attorney Regarding Real Estate Interests at the Seward Rail Campus - City Attorney Hoffschneider

MOTION TO ADJOURN

I, Derek Bargmann, the duly appointed qualified and acting City Clerk of the City of Seward, Nebraska, hereby certify that the foregoing Notice of Meeting and Agenda for such meeting has been posted in the following places: Seward City Hall, Seward Municipal Building, Seward County Courthouse, Seward Memorial Library and CityofSewardNE.gov

IN WITNESS WHEREOF, I have hereunto set my hand officially and affixed the seal of the City.

Derek Bargmann, City Clerk

Date