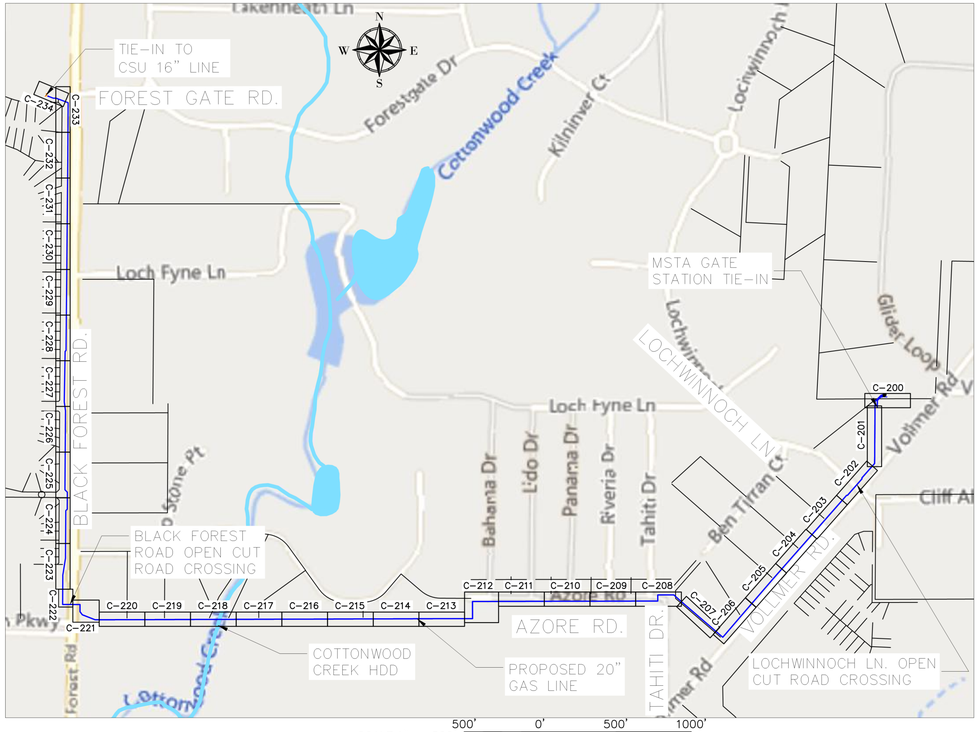
COLORADO SPRINGS UTILITIES
LOCH FYNE 20" GAS PIPELINE

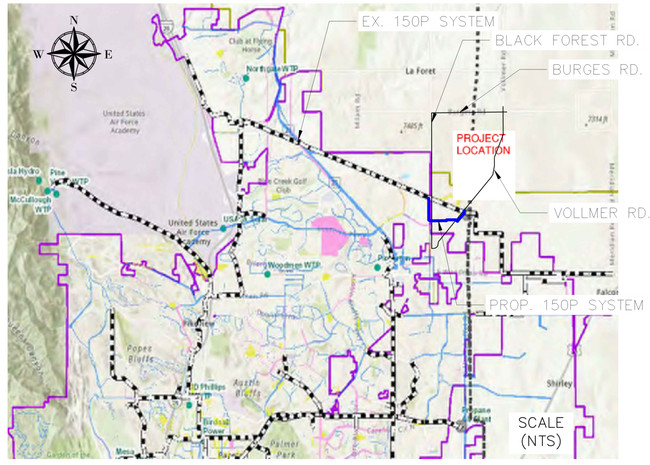
LEGEND

EXISTING GAS LINE	UG
GAS LINE TO BE ABANDONED	
EXISTING GAS VALVE	
PURGE POINT	
PROPOSED GAS LINE	GAS
ROW/PROPERTY LINE	
EDGE OF PAVEMENT/SIDEWALK	
ELECTRIC–OVERHEAD	
ELECTRIC–UNDERGROUND	UGE
PHONE UNDERGROUND ABANDON	UT
FIBER OPTIC	FO
FIBER OPTIC ABANDON	FO
STORM WATER	STRM
WATER	W
FENCE (ALL)	–X–X–X
PERM. GAS EASEMENT	
TEMP. GAS EASEMENT	
UTILITY PEDESTALS & HANDHOLES	C E H W T H
MANHOLE	
POWER POLE	
BOLLARD	
IRON PIN FOUND	
POST	
SIGN	
RIP–RAP	



SCALE 1" = 500'

500' 0' 500' 1000'



CSU SYSTEM MAP
NTS

TOTAL INSTALLED LENGTH: 10,187'

DESIGN PIPE SUMMARY		ABANDONMENT PIPE SUMMARY	
DESIGN QUANTITY	DESCRIPTION	ABANDONED QUANTITY	DESCRIPTION
8802	20" PIPE, STL, 0.375", API 5L-X52, FBE	2464	12" FBE 0.219 WT X-42
1440	20" PIPE, STL, 0.375", API 5L-X52, FBE/ARO	4807	12" TAR COAT
40	10" PIPE, STL, 0.365", API 5L-X52, FBE	1000	16" TAR WRAP
40	2" PIPE, STL, 0.154", ASTM A-105, FBE	5	1" XTRU
		42	3/4" PL
		5	4" XTRU

VALVE INSTALLATION AND ABANDONMENT

INSTALLED	ABANDONED	VALVES TO BE INSTALLED/ABANDONED					
		VALVE NUMBER	LOCATION	ISO	FIRE	SLSV	
X			McCLINTOCH STATION	X			
X			McCLINTOCH STATION	X			
X			McCLINTOCH STATION	X			
	X		16" Buried Q-18	X			
	X		4" Boxed P-18	X			

TOTAL NUMBER OF EMERGENCY/FIRE VALVES INSTALLED ON 150P	0
TOTAL NUMBER OF VALVES ABANDONED ON 150P	2

DRAWING PREPARATION NOTE:

THE DRAWINGS COMPLETED IN THIS PACKAGE WERE PREPARED FROM VARIOUS SOURCES. IN SOME INSTANCES DISCREPANCIES MAY EXIST BETWEEN THE VARIOUS SOURCES, ESPECIALLY RELATED TO LOCATION OF EXISTING UTILITIES THAT MAY EXIST AND THE ACTUAL LOCATIONS WHERE UTILITIES NOT YET INSTALLED ARE PLACED.

PATRICK ENGINEERING COMPLETED A SURVEY OF THE PROJECT INCLUDING POT HOLING UTILITIES WHERE FOUND BY SURVEY AND SUE SOURCES.

THE FOLLOWING SOURCES WERE USED:

CSU PROVIDED DRAWING INFORMATION RELATED TO THE TIE–IN OF THE 16" GAS MAIN THAT THE 20" PIPELINE WILL CONNECT TO, AND THEIR RELOCATION OF THE LOW PRESSURE GAS MAIN ALONG THE EAST SIDE OF BLACK FOREST RD.

CSU PROVIDED DRAWINGS FOR THE PROPOSED PROJECT WORK ALONG VOLLMER RD. PREPARED BY JR ENGINEERING.

TERRA TECHNOLOGIES PROVIDED DRAWINGS RELATED TO REPLACEMENT OF CENTURYLINK'S FIBER AND TELEPHONE RELOCATIONS AT BLACK FOREST ROAD.

THE BLACK FOREST RD. ROAD IMPROVEMENT PROJECT WAS PREPARED AND PROVIDED BY AECOM.

THE WOLF RANCH DEVELOPMENT LANDSCAPE PLAN WAS PROVIDED BY THE DEVELOPER.

PATRICK ENGINEERING DOES NOT TAKE RESPONSIBILITY FOR THESE DESIGNS PROVIDED BY OTHERS. PATRICK ENGINEERING UTILIZED THEM AS THE BEST SOURCE OF INFORMATION TO DETERMINE THE ROUTE OF THE GAS MAIN.

CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES, AND UTILITIES THAT ARE NOT INSTALLED YET, BUT ARE EXPECTED TO BE IN PLACE PRIOR TO THE CONSTRUCTION OF THE GAS MAIN.

IF THERE ARE ANY CONFLICTS FOUND THAT CANNOT BE ADJUSTED IN THE FIELD THAT REQUIRE AN ENGINEERING EVALUATION, CONTACT PATRICK ENGINEERING.

TRANSITION WELDS – CONNECTION METHOD NOTE:

IF WALL THICKNESS BETWEEN PIPE ENDS OR PIPE FITTING ENDS EXCEED 3/32" OR 0.09375". REQUEST FOR ENGINEERING APPROVAL OF A TRANSITION PIPE WHEN AVAILABLE TO ELIMINATE THE NEED FOR BACK WELDING AND TAPER BORES. WHEN BACK WELDING AND/OR TAPER BORE IS REQUIRED INDICATE LOCATION AND METHOD OF EACH CONNECTION MADE ON THE WELD DIAGRAM NEXT TO THE WELD NO.

GPS WELDS NOTE:

GPS ALL NEW WELDS AND EXISTING WELDS THAT ARE UNCOVERED IN THE TRENCH DURING CONSTRUCTION. ENSURE ALL WALL THICKNESS, AND OTHER PIPE INFORMATION AND WELD INFORMATION IS RECORDED.

Design Engineer's Statement:

These detailed plans and specifications were prepared under my direction and supervision. Said plans and specifications have been prepared according to criteria established by the County for detailed roadway, drainage, grading and erosion control plans and specifications, and said plans and specifications are in conformity with applicable master drainage plans and master transportation plans. Said plans and specifications meet the purpose for which the particular roadway and drainage facilities are designed and are correct to the best of my knowledge and belief. I accept responsibility for any liability caused by my negligent acts, errors or omissions on my part in the preparation of these plans and specifications.

_____ Date: 03/23/2023

Jeremiah M. Smith, P.E.
Sr. Manager Pipeline Engineering P.E. # PE.0059747

Owner/Developer's State:

I, the owner/developer have read and will comply with the requirements of the grading and erosion control plan and all of the requirements specified in these detailed plans and specifications.

_____ Date: 3/24/2023

Melissa Lingo, PMP
Sr. Technical Project Manager

Colorado Springs Utilities
1521 Hancock Expressway
Colorado Springs, CO 80903

El Paso County:

County plan review is provided only for general conformance with County Design Criteria. The County is not responsible for accuracy and adequacy of the design, dimensions, and/or elevations which shall conform to the job site. The County through the approval of this document assumes no responsibility for completeness or accuracy of this document.

Filed in accordance with the requirements of the El Paso Land Development Code, Drainage Criteria Manual, Volumes 1 and 2, and Engineering Criteria Manual as amended,

In accordance with ECM Section 1.12, these construction documents will be valid for a period of 2 years from the date signed by the El Paso County Engineer. If construction has not started within those 2 years, the plans will need to be resubmitted for approval, including payment or review fees at the Planning and Community Development Director's discretion.

_____ Date: _____

Joshua Palmer, P.E.
County Engineer/ECM Administrator

Approved
By: Elizabeth Nijkamp, PE
Date:04/19/2023
El Paso County Department of Public Works

PCD FILE NO. CDR–231

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

Colorado Springs Utilities
It's how we're all connected

COLORADO LICENSED JEREMIAH SMITH Jeremiah Matthew Smith PE.0059747 2023.03.24 16:51:44 -04'00' PROFESSIONAL ENGINEER
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS		BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	JMS	3/16/23	
5	ISSUED FOR CONSTRUCTION	NEW	JMS	11/14/22	
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	JMS	10/14/22	

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 31, 32, 33	R–18, R–19, Q–19, P–17, P–18, P–19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	
DISTRIBUTION:	X
FEEDER:	
TRANS. BY DEF.	
TRANS v 20%:	

W/O #: 3747144

RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668–8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668–8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668–3675
SHEET NO. 1 OF 60	SCALE: NTS		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
COVER SHEET

DWG. NO: **COVER**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 – Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC–C3D–CSU.dwg LAYOUT NAME: COVER PLOTTED: Wednesday, March 22, 2023 – 4:27pm USER: nwest

STANDARD NOTES FOR EL PASO COUNTY CONSTRUCTION PLANS

1. ALL DRAINAGE AND ROADWAY CONSTRUCTION SHALL MEET THE STANDARDS AND
2. SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL VOLUMES 1 AND 2, AND THE EL PASO COUNTY ENGINEERING MANUAL.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR THE NOTIFICATION AND FIELD NOTIFICATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OF NOT BEFORE BEGINNING CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CALL 811 TO CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC),
4. CONTRACTOR SHALL KEEP A COPY OF THESE APPROVED PLANS, THE GRADING AND EROSION CONTROL PLAN, THE STORMWATER MANAGEMENT PLAN (SWMP), THE SOILS AND GEOTECHNICAL REPORT, AND THE APPROPRIATE DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS AT THE JOB SITE.
   -EL PASO COUNTY ENGINEERING CRITERIA MANUAL (ECM)
   -CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2
   -COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
   -CDOT M & S STANDARDS
5. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHICS, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUITEMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS FROM REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED IN WRITING. ANY MODIFICATIONS NECESSARY TO MEET CRITERIA AFTER-THE-FACT WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY
6. IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO ACCURATELY SHOW EXISTING CONDITIONS, BOTH ONSITE AND OFFSITE, ON THE CONSTRUCTION PLANS. ANY MODIFICATIONS NECESSARY DUE TO CONFLICTS, OMISSIONS, OR CHANGED CONDITIONS WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
7. CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (PCD) – INSPECTIONS PRIOR TO STARTING CONSTRUCTION.
8. IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND THE REQUIREMENTS OF ALL JURISDICTIONAL AGENCIES AND TO OBTAIN ALL REQUIRED PERMITS, INCLUDING BUT NOT LIMITED TO EL PASO COUNTY EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP), REGIONAL BUILDING FLOODPLAIN DEVELOPMENT PERMIT, U.S. ARMY CORPS OF ENGINEERS-ISSUED 401 AND/OR 404 PERMITS, AND COUNTY AND STATE FUGITIVE DUST PERMITS.
9. CONTRACTOR SHALL NOT DEVIATE FROM THE PLANS WITHOUT FIRST OBTAINING WRITTEN APPROVAL FROM THE DESIGN ENGINEER AND PCD. CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IMMEDIATELY OF ANY ERRORS OF INCONSISTENCIES.
10. ALL STORM DRAIN PIPE SHALL BE CLASS III RCP UNLESS OTHERWISE APPROVED BY PCD.
11. CONTRACTOR SHALL COORDINATE GEOTECHNICAL TESTING PER ECM STANDARDS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY PCD PRIOR TO PLACEMENT OF CURB AND GUTTER AND PAVEMENT.
12. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
13. SIGHT VISIBILITY TRIANGLES AS IDENTIFIED IN THE PLANS SHALL BE PROVIDED AT INTERSECTIONS. OBSTRUCTIONS GREATER THAN 18 INCHES ABOVE FLOWLINE ARE NOT ALLOWED WITHIN SIGHT TRIANGLES.
14. SIGNING AND STRIPING SHALL COMPLY WITH EL PASO COUNTY DOT AND MUTCD CRITERIA. (IF APPLICABLE, ADDITIONAL SIGNING AND STRIPING NOTES SHALL BE PROVIDED.)
15. CONTRACTOR SHALL OBTAIN ANY PERMITS REQUIRED BY EL PASO COUNTY DOT, INCLUDING WORK WITHIN THE RIGHT-WAY AND SPECIAL TRANSPORT PERMITS.
16. THE LIMITS OF CONSTRUCTION SHALL REMAIN WITHIN THE PROPERTY LINE UNLESS OTHERWISE NOTED. THE OWNER/DEVELOPER SHALL OBTAIN WRITTEN PERMISSION AND EASEMENTS, WHERE REQUIRED, FROM ADJOINING PROPERTY OWNER(S) PRIOR TO ANY OFF-SITE DISTURBANCE, GRADING, OR CONSTRUCTION.

DISTURBED AREA CALCULATIONS

STATION	STATION	LENGTH (FT)	WIDTH (FT)	AREA (SF)	AREA (AC)	EASEMENT TYPE
1+62	5+54	VARIES*	VARIES*	14,613	0.34	4974-LOT 102 EX A-B-C FIMS SIGNED 720810 PERMANENT PRIVATE EASEMENT
5+72	20+97	1,525	60	91,500	2.10	VOLLMER RD. ROW
20+85	25+09	VARIES*	VARIES*	16,122	0.37	4974-LOT 97 EX A-B-C SIGNED FIMS 720809 PERMANENT PRIVATE EASEMENT
25+09	25+41	VARIES*	VARIES*	1,225	0.03	4974-TRACT D EX A-B-C SIGNED FIMS 720812 PERMANENT PRIVATE EASEMENT
25+41	26+30	89	60	5,340	0.12	TAHITI DRIVE ROW
26+15	38+38	1,223	60	73,380	1.68	AZORE RD. ROW
26+15	38+04	VARIES*	VARIES*	48,817	1.12	EASEMENT #9 12-MOA_PE_TE_CSU_FINAL_TURKEY CANYON CREEK PARCEL 2 (TEMPORARY-PRIVATE)
28+15	31+90	VARIES*	VARIES*	15,000	0.34	EASEMENT #9 12-MOA_PE_TE_CSU_FINAL_TURKEY CANYON CREEK PARCEL 1 (TEMPORARY-PRIVATE)
31+90	38+04	VARIES*	VARIES*	24,799	0.57	EASEMENT #7 8-ACTIVITY 293179-EASEMENT (TEMPORARY-PRIVATE)
38+48	38+51	VARIES*	VARIES*	6,105	0.14	EASEMENT #7 8-ACTIVITY 293179-EASEMENT (PERMANENT-PRIVATE)
39+62	64+71	2,509	60	150,540	3.46	MARKSHEFFEL ROAD ROW
64+71	66+05	134	40	5,360	0.12	DRAINAGE & UTILITY EASEMENT
66+05	101+87	3,582	60	214,920	4.93	BLACK FOREST ROW
				667,721	15.3	TOTAL DISTURBED AREA

*THE LENGTHS AND WIDTHS OF THE PLOTTED EASEMENTS VARY BASED ON THE CONFIGURATION OF THE EASEMENTS. REFER TO THE EASEMENT DOCUMENT FOR THIS INFORMATION.

SHEET INDEX

PROJECT INSPECTION & OVERSIGHT VERIFIED BY SIGNATURES

I HAVE PERFORMED INSPECTION AND OVERSIGHT FOR THE INSPECTION WORK ASSIGNED TO ME, VERIFYING THAT THE WORK COMPLETED BY CONTRACTOR, AND WITNESSED BY ME, HAS COMPLIED WITH THE DESIGN REQUIREMENTS, PERMIT REQUIREMENTS, FEDERAL, STATE, COUNTY, AND CITY REQUIREMENTS, AND IN ACCORDANCE WITH CSU' STANDARDS, PROCEDURES, STANDARDS, AND OTHER CONTRACT DOCUMENTS.

CONSTRUCTION LEAD	PERFORMED BY ______ SIGNATURE ______	DATE ______
WELD/NDT INSPECTOR	PERFORMED BY ______ SIGNATURE ______	DATE ______
HDD INSPECTOR	PERFORMED BY ______ SIGNATURE ______	DATE ______
TEST INSPECTOR	PERFORMED BY ______ SIGNATURE ______	DATE ______
UTILITY INSPECTOR 1	PERFORMED BY ______ SIGNATURE ______	DATE ______
UTILITY INSPECTOR 2	PERFORMED BY ______ SIGNATURE ______	DATE ______

ONE PERSON MAY BE ASSIGNED TO ONE OR MORE OF THESE INSPECTIONS ROLLS. THE PERSON SHALL BE REQUIRED TO SIGN OFF ON EACH ROLL THEY ARE ASSIGNED TO.

CONSTRUCTION LEAD HAS THE ROLL TO VERIFY THAT ALL THE INSPECTIONS SERVICES HAVE BEEN COMPLETED AND VERIFY THAT THE ASSIGNED INSPECTOR FOR EACH ROLL HAS COMPLETED ALL DOCUMENTATION, REQUIRED AND HAVE THEM SIGNED OFF ABOVE TO ATTEST THAT THE ALL WORK HAS BEEN COMPLETED AS REQUIRED.

CONSTRUCTION LEAD SHALL INCORPORATE NOTES FROM ALL INSPECTORS, OR OTHER SOURCES ON THIS SHEET.

PRESSURE TEST PERFORMED AND VERIFIED BY SIGNATURES

I HAVE PERFORMED THE PRESSURE TESTS AS SHOWN ON THE AS-BUILT AND IN ACCORDANCE WITH THE OPERATIONS MANUAL
I HAVE VALIDATED THE PRESSURE TESTS AS SHOWN ON THE AS-BUILT AND IN ACCORDANCE WITH THE OPERATIONS MANUAL

PRESSURE TEST #______	PERFORMED BY ______ VALIDATED BY ______	DATE ______ DATE ______
PRESSURE TEST #______	PERFORMED BY ______ VALIDATED BY ______	DATE ______ DATE ______
PRESSURE TEST #______	PERFORMED BY ______ VALIDATED BY ______	DATE ______ DATE ______
PRESSURE TEST #______	PERFORMED BY ______ VALIDATED BY ______	DATE ______ DATE ______
PRESSURE TEST #______	PERFORMED BY ______ VALIDATED BY ______	DATE ______ DATE ______

PURGE PLAN PERFORMED BY SIGNATURE

PURGE PLAN WAS COMPLETED IN ACCORDANCE WITH THE OPERATIONS MANUAL

PERFORMED BY ______ DATE ______ SHEET# ______
LOCATION ______

PIPE JOINER VISUAL INSPECTION CERTIFICATION

I HAVE VISUALLY INSPECTED ALL HEATED FUSIONS, SOLVENT, CEMENT MECHANICAL JOINTS AND WELDS THAT I HAVE PERFORMED

NAME ______ WELDER# ______

EPC 4/19/23

COLORADO 811
Colorado Springs Utilities
It's how we're all connected

COLORADO LICENSED PROFESSIONAL ENGINEER — JEREMIAH SMITH
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

REVISIONS				
5	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
4	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
3	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 31, 32, 33	R-18, R-19, Q-19, P-18, P-19

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20%: ☐

W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN		PHONE: (719) 668-8196
PROJECT MANAGER: MELISSA LINGO		PHONE: (719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD		PHONE: (719) 668-3675
SHEET NO. 2 OF 60	SCALE: NTS	
PATRICK ENGINEERING TEAM		
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
SIGNATURES SHEET

DWG. NO: **C-100**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-C3D-CSU.dwg LAYOUT NAME: C-100 PLOTTED: Thursday, March 23, 2023 - 8:27am USER: nwest

MAINLINE AIR TEST DETAIL & PROCEDURE TM2

COLORADO SPRINGS UTILITIES

Designer instructions PLEASE ENTER THE DATA REQUESTED ON THE HIGHLIGHTED CELLS IN SECTIONS I THROUGH IV OF THIS FORM. DESIGN PRESSURE OF WEAKEST PIPE/COMPONENT MUST EQUAL OR EXCEED DESIRED MAOP.

RECORD OF STEEL PIPELINES FOR 145 PSIG MOP OPERATION

I. JOB DESCRIPTION/LOCATION: Loch Fyne 20" Gas Line Relocation — GRID: R-18
TEST DETAIL (IF APPLICABLE): TEST 1 McClintock Station to Station 2+00 20" Piping and 10" and 2" LP System Tie-in.

A. CLASS LOCATION	3	F. TEST DURATION REQUIRED	2 HR	W.R. #	3747144
B. MOP	145	G. TEST MEDIUM REQUIRED:	Air	RELATED W.R. #	
C. DESIRED MAOP	275				
D. TEST PRESSURE (MIN)	413	H. TEST PRESS (MIN) MULTIPLIEF	1.5		
E. TEST PRESSURE (MAX)	433	I. TEST PRES (MAX) ADJUSTER:	20		

II. ITEMS LISTED IN THIS SECTION MUST BE PRESSURE TESTED

II. A. DESIGN PRESSURE FOR PIPE/BUTT-WELD FITTING, P=(2St/D) FET; Where E = 1.0, T = 1.0 HOOP STRESS EQUATION, $\sigma_h = PD/2t$

Insert/Delete Selected Row :

PLAN REF NO.	ITEM NO.	DESIGN QTY	TESTED QTY	LT QTY	COMPONENT SPECIFICATION	SMYS	WT (t)	D	F	E	T	P	AT MOP σ_h	AT MOP %SMYS	AT MAOP σ_h	AT MAOP %SMYS	DURING TEST MINIMUM σ_h	DURING TEST MINIMUM SMYS%	DURING TEST MAXIMUM σ_h	DURING TEST MAXIMUM SMYS%
1	240-375-920	200			20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
7	240-154-238	40			2" PIPE, STL, 0154" WT, API 5L-X52, FBE	35000	0.154	2.375	0.5	1	1	975	1118	3.2	2121	6.1	3181	9.1	3335	9.5
6	240-365-910	40			10" PIPE, STL, 0.365" WT, API 5L-X52, FBE	52000	0.365	10.750	0.5	1	1	975	2135	4.1	4050	7.8	6074	11.7	6389	12.2
3	220-647-920	4			20" ELBOW, 0.375 WT, STL, 45 DEG, 3R, WPHY 52	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
4	220-692-920	2			20" ELBOW, 0.375 WT, STL, 90 DEG, 3R, WPHY 52	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
8	220-692-910	1			10" ELBOW, 0.365 WT, STL, 90 DEG, 3R, WPHY 52	52000	0.365	10.750	0.5	1	1	1766	2135	4.1	4050	7.8	6074	11.7	6369	12.2
10	215-790-100	1			REDUCER, CONC. 12"x10", 0.375"x0.365", WPHY-52	52000	0.375	12.750	0.5	1	1	1529	2465	4.7	4675	9.0	7013	13.5	7353	14.1
9	215-792-920	1			REDUCER, CONC. 20"x12", 0.375"x0.375", WPHY-52	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
11	280-700-920	1			20", TEE, WELD WT, 0.375", CS,WPHY-52	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
TARE 1	209-700-920	2			20" CAP, WELD, WPHY52, CARBON STEEL, 0.375" WT	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
TARE 2	209-700-200	1			2" CAP, WELD, WPHY52, CARBON STEEL, 0.154" W	52000	0.154	2.375	0.5	1	1	3372	1118	2.2	2121	4.1	3181	6.1	3335	6.4
TARE 3	209-700-910	1			10" CAP, WELD, WPHY52, CARBON STEEL, 0.365" WT	52000	0.365	10.750	0.5	1	1	1766	2135	4.1	4050	7.8	6074	11.7	6369	12.2

II. B. VALVES, REGULATORS, COMPONENTS AND OTHER FITTINGS INSERT/DELETE ROWS:

PLAN REF NO.	ITEM NO.	DESIGN QTY	TESTED QTY	ASBUI LT QTY	PRE-CERTIFIED COMPONENTS(S)	MANUFACTURER'S PRESSURE RATING (PSIG)	MANUFACTURER'S TEST PRESSURE (PSIG)
12	254-960-055	1			WELD-O-LET 2"X20", CS, ASTM A105	3000	
13	290-100-920	1			VALVE, BALL, 20", API6D CL150, VERTICAL GEAR OPER., FULL POR	285	450
14	290-100-911	1			VALVE, BALL, 10", API6D CL150, VERTICAL GEAR OPER., FULL POR	285	450
15	290-100-200	1			VALVE, BALL, CL 150, VERTICAL GEAR OPER., WELD END, 2" 0.154'	285	450

III. ITEMS LISTED IS THIS SECTION ARE SINGLE PRE-CERTIFIED COMPONENT INSTALL ONLY. PRESSURE TEST NOT REQUIRED. SOAP TEST REQUIRED.

III. A. DESIGN PRESSURE FOR PIPE/BUTT-WELD FITTING, P=(2St/D) FET; Where E = 1.0, T = 1.0 HOOP STRESS EQUATION, σh = PD/2t

PLAN REF NO.	ITEM NO.	DESIGN QTY	ASBUILT QTY	PRE-CERTIFIED COMPONENTS(S)	SMYS	WT (t)	D	F	E	T	P	AT MOP σ_h	AT MOP %SMYS	AT MAOP σ_h	AT MAOP %SMYS

III. B. VALVES, REGULATORS, COMPONENTS AND OTHER FITTINGS

PLAN REF NO.	ITEM NO.	DESIGN QTY	ASBUILT QTY	PRE-CERTIFIED COMPONENTS(S)	MANUFACTURER'S PRESSURE RATING (PSIG)	MANUFACTURER'S TEST PRESSURE (PSIG)

IF, DURING THE TEST, THE PIPELINE IS TO BE STRESSED TO **20% OF SMYS OR GREATER** AND THE TEST MEDIUM IS OTHER THAN WATER, A SPECIAL LEAK SURVEY OR LEAK TEST IS **REQUIRED**.
IF APPLICABLE, CONDUCT THE SPECIAL LEAK TEST OR SURVEY AT **100 PSIG** AND HOLD PRESSURE AT THIS LEVEL FOR A MINIUM OF **10 MIN**. **CONDUCT LEAK SURVEY IF NATURAL GAS IS USED**.
SUBSTITUTION OR **ADDITION** OF MATERIAL LISTED ON THIS SHEET **IS NOT PERMITTED** UNLESS APPROVED BY ENGINEERING SUPERVISOR.

CALC/ANALYSIS BY: _____ DATE: 03/23/2023 ENGINEERING SUPERVISOR'S APPROVAL: _____ DATE: _____

ENGINEERING REMARKS: _____

IV. INFORMATION TO BE SUPPLIED BY TEST PERSONNEL

A. TEST PERFORMED BY: _____ COMPANY: _____ TEST # _____
B. (SIGNATURE): _____ TEST DATE: _____
C. LOCATION OF TEST: _____
D. FACILITY TESTED: [ ] REGULATOR STATIO [ ] SPOOL (FAB SHOP) [ ] MAIN [ ] OTHER (SPECIFY IN REMARKS)
E. TEST MEDIUM (CHECK): [ ] AIR [ ] NATURAL GAS [ ] INERT GAS (NITROGEN) [ ] WATER
F. TEST PRESSURE: MAX (PSIG): _____ MIN (PSIG): _____
G. TEST DURATION: START TIME: _____ END TIME: _____ DURATION (HR/MIN): _____
H. TEST PRESSURE DOC'D ON: [ ] MECHANICAL CHART [ ] GAUGE [ ] OTHER
I. RECORDING DEVICE NO: _____ CALIBRATION DUE DATE: _____
J. LEAK TEST CONDUCTED: [ ] YES* IF YES, IDENTIFY METHOD(S) [ ] LEAK SURVEY [ ] SOAP TEST [ ] INTERMEDIATE LEAK TEST (100 PSIG MINIMUM) [ ] NO
K. PIPE MANUFACTURER'S NAME: _____ P.O. NO.: _____ HEAT CODE NO: _____
L. WELDING ELECTRODE MFR: _____ PART NUMBER: _____ LOT NUMBER: _____

REMARKS: _____

CSU REPRESENTATIVE (Sign/Print): _____ DATE: _____

DETAIL NOTES
1. TEST THE VALVES IN THE OPEN POSITION..

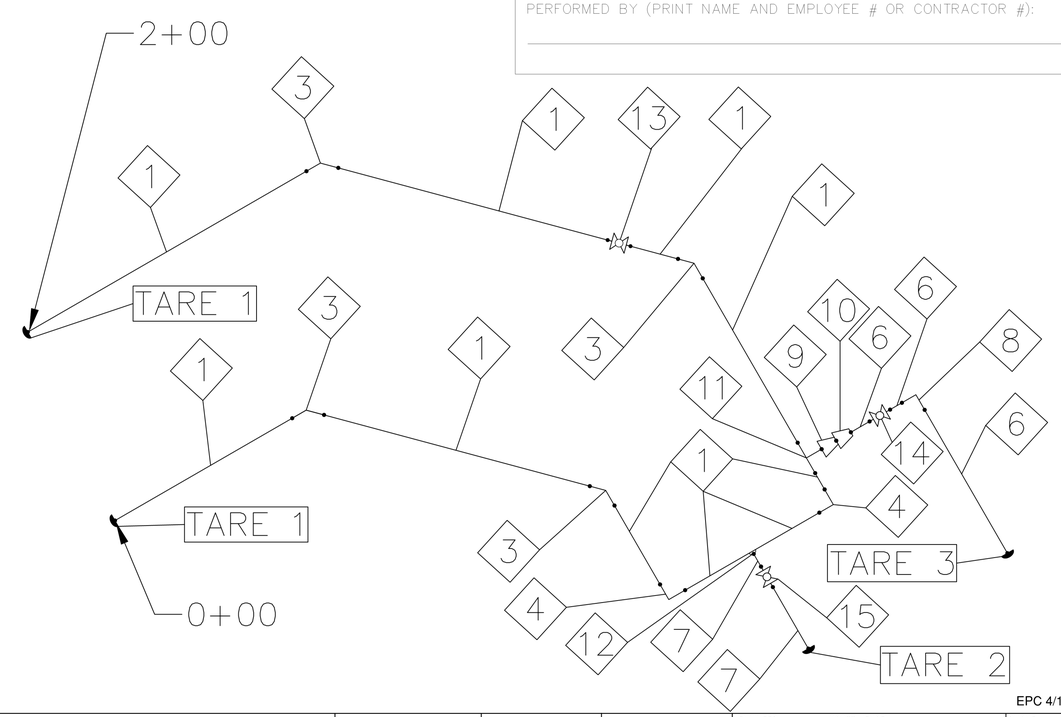
MAOP DETERMINED USING THE FOLLOWING TEST METHODS FOR SPECIFIED SECTIONS
- TM1 TEST PRESSURE EXCEEDING OF EQUAL TO 150% MAOP, TESTED WITH WATER (150 HYDRO)
- TM2 TEST PRESSURE EXCEEDING OF EQUAL TO 150% MAOP, TESTED WITH AIR, NITROGEN, OR NATURAL GAS (150 OTHER)

AS-BUILT DRAWING-PRESSURE TEST DATA TEST # _____

DESCRIPTION: _____

TEST MEDIUM: ☐ AIR ☐ NITROGEN ☐ WATER ☐ NATURAL GAS
TEST METHOD: ☐ GAUGE ☐ CHART ☐ SOAP

DESCRIPTION POINTS _____
PIPE DIA. _____ GAUGE SN# _____
TOTAL LENGTH _____ PRESSURE REC SN# _____
PRESSURE (ALL TESTS) (START)_____ (STOP)_____
PRESSURE (CHART ONLY) (MIN)_____ (MAX)_____
TIME (START)_____ (STOP)_____
DATE (START)_____ (STOP)_____
INTERMEDIATE LEAK TEST YES ☐ NO ☐
LEAK SURVEY WR# (NATURAL GAS TEST ONLY) _____
ANY LEAKS OR FAILURES ON A TEST YES ☐ NO ☐
IF YES, NOTE THE LEAKS AND FAILURES AND THEIR DISPOSITION:
_____
PERFORMED BY (PRINT NAME AND EMPLOYEE # OR CONTRACTOR #):
_____



EPC 4/19/23

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
5	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
4	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
3	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTION 33	R-18

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 3 OF 60	SCALE: NTS		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PRESSURE TEST SHEET (TEST 1)
DWG. NO: **C-101**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 – Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-CSD-CSU.dwg LAYOUT NAME: C-101 PLOTTED: Wednesday, March 22, 2023 – 4:27pm USER: rwest

MAINLINE AIR TEST DETAIL & PROCEDURE TM2

MAOP DETERMINED USING THE FOLLOWING TEST METHODS FOR SPECIFIED SECTIONS

- TM1 — TEST PRESSURE EXCEEDING OF EQUAL TO 150% MAOP, TESTED WITH WATER (150 HYDRO)
- TM2 — TEST PRESSURE EXCEEDING OF EQUAL TO 150% MAOP, TESTED WITH AIR, NITROGEN, OR NATURAL GAS (150 OTHER)

COLORADO SPRINGS UTILITIES

Designer instructions PLEASE ENTER THE DATA REQUESTED ON THE HIGHLIGHTED CELLS IN SECTIONS I THROUGH IV OF THIS FORM. DESIGN PRESSURE OF WEAKEST PIPE/COMPONENT MUST EQUAL OR EXCEED DESIRED MAOP.

RECORD OF STEEL PIPELINES FOR 145 PSIG MOP OPERATION

I. JOB DESCRIPTION/LOCATION: Loch Fyne 20" Gas Line Relocation — GRID: Q-19 & R-19
TEST DETAIL (IF APPLICABLE): TEST 2 From 2+00 to 46+60

A. CLASS LOCATION	3	F. TEST DURATION REQUIRED	24 HR
B. MOP	145	G. TEST MEDIUM REQUIRED:	Air
C. DESIRED MAOP	275		
D. TEST PRESSURE (MIN)	413	H. TEST PRESS (MIN) MULTIPLIEF	1.5
E. TEST PRESSURE (MAX)	433	I. TEST PRES (MAX) ADJUSTER:	20

W.R. # 3747144
RELATED W.R. #

II. ITEMS LISTED IN THIS SECTION MUST BE PRESSURE TESTED

II. A. DESIGN PRESSURE FOR PIPE/BUTT-WELD FITTING, P=(2St/D) FET; Where E = 1.0, T = 1.0 HOOP STRESS EQUATION, $\sigma_h = PD/2t$

Insert/Delete Selected Row :

PLAN REF NO.	ITEM NO.	DESIGN QTY	TESTED QTY	ASBUILT QTY	COMPONENT SPECIFICATION	SMYS	WT (t)	D	F	E	T	P	AT MOP σ_h	AT MOP %SMYS	AT MAOP σ_h	AT MAOP %SMYS	DURING TEST MINIMUM σ_h	DURING TEST MINIMUM SMYS%	DURING TEST MAXIMUM σ_h	DURING TEST MAXIMUM SMYS%
1	240-375-920	4535			20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
3	220-647-920	6			20" ELBOW, 0.375 WT, STL, 45 DEG, 3R, WPHY 52	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
4	220-692-920	6			20" EILBOW, 0.375 WT, STL, 90 DEG, 3R, WPHY 52	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
TARE 1	209-700-920	2			20" CAP, WELD, WPHY52, CARBON STEEL, 0.375"	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2

II. B. VALVES, REGULATORS, COMPONENTS AND OTHER FITTINGS INSERT/DELETE ROWS:

PLAN REF NO.	ITEM NO.	DESIGN QTY	TESTED QTY	ASBUILT QTY	PRE-CERTIFIED COMPONENTS(S)	MANUFACTURER'S PRESSURE RATING	MANUFACTURER'S TEST PRESSURE (PSIG)

III. ITEMS LISTED IS THIS SECTION ARE SINGLE PRE-CERTIFIED COMPONENT INSTALL ONLY. PRESSURE TEST NOT REQUIRED. SOAP TEST REQUIRED.

III. A. DESIGN PRESSURE FOR PIPE/BUTT-WELD FITTING, P=(2St/D) FET; Where E = 1.0, T = 1.0 HOOP STRESS EQUATION, $\sigma h = PD/2t$

PLAN REF NO.	ITEM NO.	DESIGN QTY	ASBUILT QTY	PRE-CERTIFIED COMPONENTS(S)	SMYS	WT (t)	D	F	E	T	P	AT MOP σ_h	AT MOP %SMYS	AT MAOP σ_h	AT MAOP %SMYS

III. B. VALVES, REGULATORS, COMPONENTS AND OTHER FITTINGS

PLAN REF NO.	ITEM NO.	DESIGN QTY	ASBUILT QTY	PRE-CERTIFIED COMPONENTS(S)	MANUFACTURER'S PRESSURE RATING (PSIG)	MANUFACTURER'S TEST PRESSURE (PSIG)

IF, DURING THE TEST, THE PIPELINE IS TO BE STRESSED TO **20% OF SMYS OR GREATER** AND THE TEST MEDIUM IS OTHER THAN WATER, A SPECIAL LEAK SURVEY OR LEAK TEST IS **REQUIRED**. IF APPLICABLE, CONDUCT THE SPECIAL LEAK TEST OR SURVEY AT **100 PSIG** AND HOLD PRESSURE AT THIS LEVEL FOR A MINIUM OF **10 MIN**. **CONDUCT LEAK SURVEY IF NATURAL GAS IS USED**. **SUBSTITUTION** OR **ADDITION** OF MATERIAL LISTED ON THIS SHEET **IS NOT PERMITTED** UNLESS APPROVED BY ENGINEERING SUPERVISOR.

CALC/ANALYSIS BY: _____ DATE: 03/23/2023 ENGINEERING SUPERVISOR'S APPROVAL: _____ DATE: _____

ENGINEERING REMARKS: _____

IV. INFORMATION TO BE SUPPLIED BY TEST PERSONNEL

A. TEST PERFORMED BY: _____ COMPANY: _____ TEST # _____

B. (SIGNATURE): _____ TEST DATE: _____

C. LOCATION OF TEST: _____

D. FACILITY TESTED: [ ] REGULATOR STATION ([ ] SPOOL (FAB SHOP) [ ] MAIN [ ] OTHER (SPECIFY IN REMARKS)

E. TEST MEDIUM (CHECK): [ ] AIR [ ] NATURAL GAS [ ] INERT GAS (NITROGEN) [ ] WATER

F. TEST PRESSURE: MAX (PSIG): _____ MIN (PSIG): _____

G. TEST DURATION: START TIME: _____ END TIME: _____ DURATION (HR/MIN): _____

H. TEST PRESSURE DOC'D ([ ] MECHANICAL CHART [ ] GAUGE [ ] OTHER

I. RECORDING DEVICE NO: _____ CALIBRATION DUE DATE: _____

J. LEAK TEST CONDUCTED: [ ] YES* IF YES, IDENTIFY METHOD(S) [ ] LEAK SURVEY [ ] SOAP TEST [ ] INTERMEDIATE LEAK TEST (100 PSIG MINIMUM) [ ] NO

K. PIPE MANUFACTURER'S NAME: _____ P.O. NO.: _____ HEAT CODE NO: _____

L. WELDING ELECTRODE MFR: _____ PART NUMBER: _____ LOT NUMBER: _____

REMARKS: _____

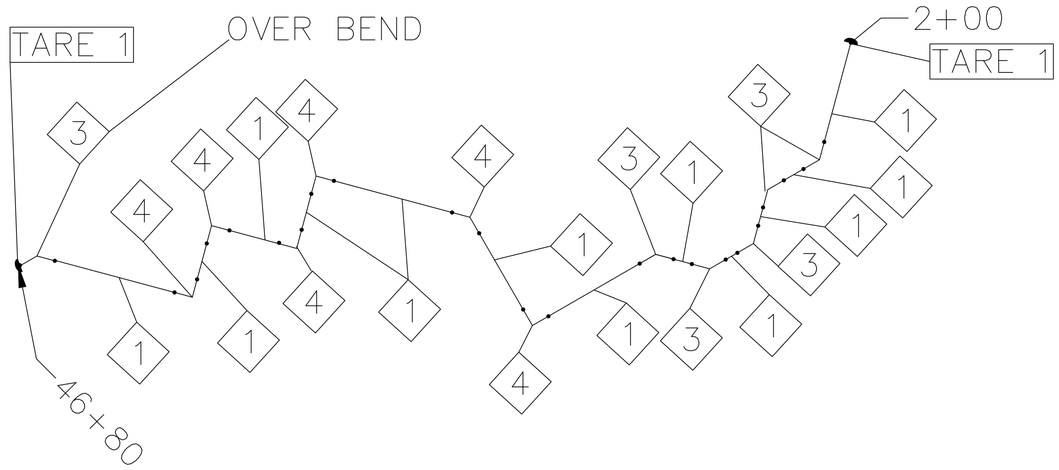
CSU REPRESENTATIVE (Sign/Print): _____ DATE: _____

AS-BUILT DRAWING-PRESSURE TEST DATA TEST # _____

DESCRIPTION:

TEST MEDIUM: ☐ AIR ☐ NITROGEN ☐ WATER ☐ NATURAL GAS
TEST METHOD: ☐ GAUGE ☐ CHART ☐ SOAP

DESCRIPTION POINTS _____
PIPE DIA. _____ GAUGE SN# _____
TOTAL LENGTH _____ PRESSURE REC SN# _____
PRESSURE (ALL TESTS) (START)_____ (STOP)_____
PRESSURE (CHART ONLY) (MIN)_____ (MAX)_____
TIME (START)_____ (STOP)_____
DATE (START)_____ (STOP)_____
INTERMEDIATE LEAK TEST YES ☐ NO ☐
LEAK SURVEY WR# (NATURAL GAS TEST ONLY) _____
ANY LEAKS OR FAILURES ON A TEST YES ☐ NO ☐
IF YES, NOTE THE LEAKS AND FAILURES AND THEIR DISPOSITION:
_____
PERFORMED BY (PRINT NAME AND EMPLOYEE # OR CONTRACTOR #):
_____



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COLORADO LICENSED — JEREMIAH SMITH — PROFESSIONAL ENGINEER
Jeremiah Mathew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
5	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
4	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
3	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
	N/A			

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 33	R-19, Q-19

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN	PHONE: (719) 668-8196		
PROJECT MANAGER: MELISSA LINGO	PHONE: (719) 668-8794		
CONSTRUCTION LEAD: JOSH RICHARD	PHONE: (719) 668-3675		
SHEET NO. 4 OF 60	SCALE: NTS		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH	

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PRESSURE TEST SHEET (TEST 2)

DWG. NO: **C-102**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_UFC-C3D-CSU.dwg LAYOUT NAME: C-102 PLOTTED: Wednesday, March 22, 2023 - 4:27pm USER: rwest

MAINLINE AIR TEST DETAIL & PROCEDURE (TM2)

COLORADO SPRINGS UTILITIES

Designer Instructions PLEASE ENTER THE DATA REQUESTED ON THE HIGHLIGHTED CELLS IN SECTIONS I THROUGH IV OF THIS FORM. DESIGN PRESSURE OF WEAKEST PIPE/COMPONENT MUST EQUAL OR EXCEED DESIRED MAOP.

RECORD OF STEEL PIPELINES FOR 145 PSIG MOP OPERATION

I. JOB DESCRIPTION/LOCATION: Loch Fyne 20" Gas Line Relocation GRID: Q-19
TEST DETAIL (IF APPLICABLE): Pre-HDD Pullback Pipe String

A. CLASS LOCATION	3	F. TEST DURATION REQUIRED	N/A
B. MOP	145	G. TEST MEDIUM REQUIRED:	Air
C. DESIRED MAOP	275		
D. TEST PRESSURE (MIN)	413	H. TEST PRESS (MIN) MULTIPLIEF	1.5
E. TEST PRESSURE (MAX)	433	I. TEST PRES (MAX) ADJUSTER:	20

W.R. # 3747144
RELATED W.R. #

II. ITEMS LISTED IN THIS SECTION MUST BE PRESSURE TESTED

II. A. DESIGN PRESSURE FOR PIPE/BUTT-WELD FITTING, P=(2St/D) FET; Where F = 1.0, T = 1.0 HOOP STRESS EQUATION, σ_h = PD/2t

Insert/Delete Selected Row:

PLAN REF NO.	ITEM NO.	DESIGN QTY	TESTED QTY	ASBUILT QTY	COMPONENT SPECIFICATION	SMYS	WT (t)	D	F	E	T	P	AT MOP σ_h	AT MOP %SMYS	AT MAOP σ_h	AT MAOP %SMYS	DURING TEST MINIMUM σ_h	DURING TEST MINIMUM SMYS%	DURING TEST MAXIMUM σ_h	DURING TEST MAXIMUM SMYS%
2	241-375-920	1530			20" Pipe, STL, 0.375" WT, API 5L-X52, FBE/ARO	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
TARE 1	209-700-920	2			20" CAP, WELD, WPHY52, CARBON STEEL, 0.375" WT	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2

II. B. VALVES, REGULATORS, COMPONENTS AND OTHER FITTINGS INSERT/DELETE ROWS:

PLAN REF NO.	ITEM NO.	DESIGN QTY	TESTED QTY	ASBUILT QTY	PRE-CERTIFIED COMPONENTS(S)	MANUFACTURER'S PRESSURE RATING	MANUFACTURER'S TEST PRESSURE (PSIG)

III. ITEMS LISTED IS THIS SECTION ARE SINGLE PRE-CERTIFIED COMPONENT INSTALL ONLY. PRESSURE TEST NOT REQUIRED. SOAP TEST REQUIRED.

III. A. DESIGN PRESSURE FOR PIPE/BUTT-WELD FITTING, P=(2St/D) FET; Where E = 1.0, T = 1.0 HOOP STRESS EQUATION, σh = PD/2t

PLAN REF NO.	ITEM NO.	DESIGN QTY	ASBUILT QTY	PRE-CERTIFIED COMPONENTS(S)	SMYS	WT (t)	D	F	E	T	P	AT MOP σ_h	AT MOP %SMYS	AT MAOP σ_h	AT MAOP %SMYS

III. B. VALVES, REGULATORS, COMPONENTS AND OTHER FITTINGS

PLAN REF NO.	ITEM NO.	DESIGN QTY	ASBUILT QTY	PRE-CERTIFIED COMPONENTS(S)	MANUFACTURER'S PRESSURE RATING (PSIG)	MANUFACTURER'S TEST PRESSURE (PSIG)

IF, DURING THE TEST, THE PIPELINE IS TO BE STRESSED TO **20% OF SMYS OR GREATER** AND THE TEST MEDIUM IS OTHER THAN WATER, A SPECIAL LEAK SURVEY OR LEAK TEST IS **REQUIRED**.
IF APPLICABLE, CONDUCT THE SPECIAL LEAK TEST OR SURVEY AT **100 PSIG** AND HOLD PRESSURE AT THIS LEVEL FOR A MINIUM OF **10 MIN**. **CONDUCT LEAK SURVEY IF NATURAL GAS IS USED**.
SUBSTITUTION OR **ADDITION** OF MATERIAL LISTED ON THIS SHEET **IS NOT PERMITTED** UNLESS APPROVED BY ENGINEERING SUPERVISOR.

CALC/ANALYSIS BY: _____ DATE: 03/23/2023 ENGINEERING SUPERVISOR'S APPROVAL: _____ DATE: _____

ENGINEERING REMARKS: _____

IV. INFORMATION TO BE SUPPLIED BY TEST PERSONNEL

A. TEST PERFORMED BY: _____ COMPANY: _____ TEST # _____
B. (SIGNATURE): _____ TEST DATE: _____
C. LOCATION OF TEST: _____
D. FACILITY TESTED: [ ] REGULATOR STATION ([ ] SPOOL (FAB SHOP) [ ] MAIN [ ] OTHER (SPECIFY IN REMARKS)
E. TEST MEDIUM (CHECK): [ ] AIR [ ] NATURAL GAS [ ] INERT GAS (NITROGEN) [ ] WATER
F. TEST PRESSURE: MAX (PSIG): _____ MIN (PSIG): _____
G. TEST DURATION: START TIME: _____ END TIME: _____ DURATION (HR/MIN): _____
H. TEST PRESSURE DOC [ ] MECHANICAL CHART [ ] GAUGE [ ] OTHER
I. RECORDING DEVICE NO: _____ CALIBRATION DUE DATE: _____
J. LEAK TEST CONDUCTED: [ ] YES* IF YES, IDENTIFY METHOD(S) [ ] LEAK SURVEY [ ] SOAP TEST [ ] INTERMEDIATE LEAK TEST (100 PSIG MINIMUM) [ ] NO
K. PIPE MANUFACTURER'S NAME: _____ P.O. NO.: _____ HEAT CODE NO: _____
L. WELDING ELECTRODE MFR: _____ PART NUMBER: _____ LOT NUMBER: _____

REMARKS: _____

CSU REPRESENTATIVE (Sign/Print): _____ DATE: _____

MAOP DETERMINED USING THE FOLLOWING TEST METHODS FOR SPECIFIED SECTIONS

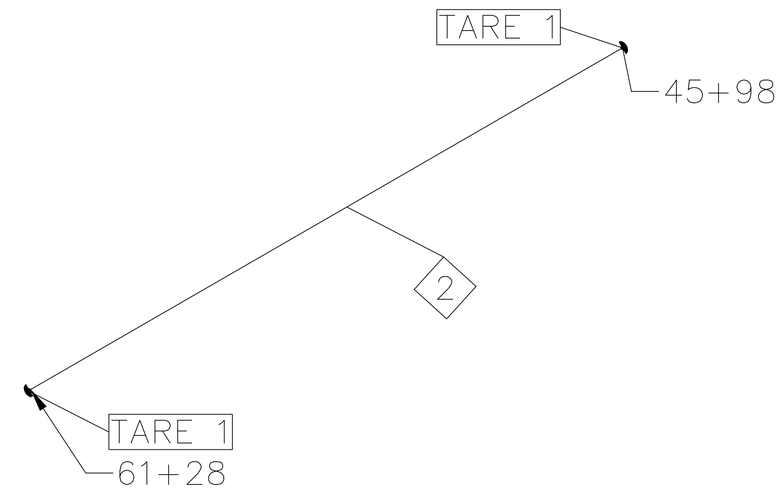
(TM1) TEST PRESSURE EXCEEDING OF EQUAL TO 150% MAOP, TESTED WITH WATER (150 HYDRO)
(TM2) TEST PRESSURE EXCEEDING OF EQUAL TO 150% MAOP, TESTED WITH AIR, NITROGEN, OR NATURAL GAS (150 OTHER)

AS-BUILT DRAWING-PRESSURE TEST DATA TEST # _____

DESCRIPTION:

TEST MEDIUM: ☐ AIR ☐ NITROGEN ☐ WATER ☐ NATURAL GAS
TEST METHOD: ☐ GAUGE ☐ CHART ☐ SOAP

DESCRIPTION POINTS _____
PIPE DIA. _____ GAUGE SN# _____
TOTAL LENGTH _____ PRESSURE REC SN# _____
PRESSURE (ALL TESTS) (START)_____ (STOP)_____
PRESSURE (CHART ONLY) (MIN)_____ (MAX)_____
TIME (START)_____ (STOP)_____
DATE (START)_____ (STOP)_____
INTERMEDIATE LEAK TEST YES ☐ NO ☐
LEAK SURVEY WR# (NATURAL GAS TEST ONLY) _____
ANY LEAKS OR FAILURES ON A TEST YES ☐ NO ☐
IF YES, NOTE THE LEAKS AND FAILURES AND THEIR DISPOSITION:
_____
PERFORMED BY (PRINT NAME AND EMPLOYEE # OR CONTRACTOR #):
_____



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Jeremiah Matthew Smith
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Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
5	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
4	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
3	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 32	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 5 OF 60	SCALE: NTS		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PRESSURE TEST SHEET (HDD PRE-TEST)
DWG. NO: **C-103**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-C3D-CSU.dwg LAYOUT NAME: C-103 PLOTTED: Wednesday, March 22, 2023 - 4:27pm USER: nwest

MAINLINE AIR TEST DETAIL & PROCEDURE (TM2)

COLORADO SPRINGS UTILITIES

Designer instructions PLEASE ENTER THE DATA REQUESTED ON THE HIGHLIGHTED CELLS IN SECTIONS I THROUGH IV OF THIS FORM. DESIGN PRESSURE OF WEAKEST PIPE/COMPONENT MUST EQUAL OR EXCEED DESIRED MAOP.

RECORD OF STEEL PIPELINES FOR 145 PSIG MOP OPERATION

I. JOB DESCRIPTION/LOCATION: Loch Fyne 20" Gas Line Relocation — GRID: Q-19
TEST DETAIL (IF APPLICABLE): TEST 3 HDD section for Cottonwood Creek

A. CLASS LOCATION	3	F. TEST DURATION REQUIRED	8 HR	W.R. #	3747144
B. MOP	145	G. TEST MEDIUM REQUIRED:	Air	RELATED W.R. #	
C. DESIRED MAOP	275				
D. TEST PRESSURE (MIN)	413	H. TEST PRESS (MIN) MULTIPLIEF	1.5		
E. TEST PRESSURE (MAX)	433	I. TEST PRES (MAX) ADJUSTER:	20		

II. ITEMS LISTED IN THIS SECTION MUST BE PRESSURE TESTED

II. A. DESIGN PRESSURE FOR PIPE/BUTT-WELD FITTING, P=(2St/D) FET; Where E = 1.0, T = 1.0 HOOP STRESS EQUATION, $\sigma_h = PD/2t$

Insert/Delete Selected Row :

PLAN REF NO.	ITEM NO.	DESIGN QTY	TESTED QTY	ASBUILT QTY	COMPONENT SPECIFICATION	SMYS	WT (t)	D	F	E	T	P	AT MOP σ_h	AT MOP %SMYS	AT MAOP σ_h	AT MAOP %SMYS	DURING TEST MINIMUM σ_h	DURING TEST MINIMUM SMYS%	DURING TEST MAXIMUM σ_h	DURING TEST MAXIMUM SMYS%
2	241-375-920	1530			20" Pipe, STL, 0.375" WT, API 5L-X52, FBE/ARO	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
TARE 1	209-700-920	2			20" CAP, WELD, WPHY52, CARBON STEEL, 0.375" WT	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2

II. B. VALVES, REGULATORS, COMPONENTS AND OTHER FITTINGS INSERT/DELETE ROWS:

PLAN REF NO.	ITEM NO.	DESIGN QTY	TESTED QTY	ASBUILT QTY	PRE-CERTIFIED COMPONENTS(S)	MANUFACTURER'S PRESSURE RATING	MANUFACTURER'S TEST PRESSURE (PSIG)

III. ITEMS LISTED IS THIS SECTION ARE SINGLE PRE-CERTIFIED COMPONENT INSTALL ONLY. PRESSURE TEST NOT REQUIRED. SOAP TEST REQUIRED.

III. A. DESIGN PRESSURE FOR PIPE/BUTT-WELD FITTING, P=(2St/D) FET; Where E = 1.0, T = 1.0 HOOP STRESS EQUATION, $\sigma h = PD/2t$

PLAN REF NO.	ITEM NO.	DESIGN QTY	ASBUILT QTY	PRE-CERTIFIED COMPONENTS(S)	SMYS	WT (t)	D	F	E	T	P	AT MOP σ_h	AT MOP %SMYS	AT MAOP σ_h	AT MAOP %SMYS

III. B. VALVES, REGULATORS, COMPONENTS AND OTHER FITTINGS

PLAN REF NO.	ITEM NO.	DESIGN QTY	ASBUILT QTY	PRE-CERTIFIED COMPONENTS(S)	MANUFACTURER'S PRESSURE RATING (PSIG)	MANUFACTURER'S TEST PRESSURE (PSIG)

IF, DURING THE TEST, THE PIPELINE IS TO BE STRESSED TO **20% OF SMYS OR GREATER** AND THE TEST MEDIUM IS OTHER THAN WATER, A SPECIAL LEAK SURVEY OR LEAK TEST IS **REQUIRED**.
IF APPLICABLE, CONDUCT THE SPECIAL LEAK TEST OR SURVEY AT **100 PSIG** AND HOLD PRESSURE AT THIS LEVEL FOR A MINIUM OF **10 MIN**. **CONDUCT LEAK SURVEY IF NATURAL GAS IS USED**.
SUBSTITUTION OR **ADDITION** OF MATERIAL LISTED ON THIS SHEET **IS NOT PERMITTED** UNLESS APPROVED BY ENGINEERING SUPERVISOR.

CALC/ANALYSIS BY: _____ DATE: 03/23/2023 ENGINEERING SUPERVISOR'S APPROVAL: _____ DATE: _____

ENGINEERING REMARKS: _____

IV. INFORMATION TO BE SUPPLIED BY TEST PERSONNEL

A. TEST PERFORMED BY: _____ COMPANY: _____ TEST # _____
B. (SIGNATURE): _____ TEST DATE: _____
C. LOCATION OF TEST: _____
D. FACILITY TESTED: [ ] REGULATOR STATION (I [ ] SPOOL (FAB SHOP) [ ] MAIN [ ] OTHER (SPECIFY IN REMARKS)
E. TEST MEDIUM (CHECK): [ ] AIR [ ] NATURAL GAS [ ] INERT GAS (NITROGEN) [ ] WATER
F. TEST PRESSURE: MAX (PSIG): _____ MIN (PSIG): _____
G. TEST DURATION: START TIME: _____ END TIME: _____ DURATION (HR/MIN): _____
H. TEST PRESSURE DOC'D [ ] MECHANICAL CHART [ ] GAUGE [ ] OTHER
I. RECORDING DEVICE NO: _____ CALIBRATION DUE DATE: _____
J. LEAK TEST CONDUCTED: [ ] YES* IF YES, IDENTIFY METHOD(S) [ ] LEAK SURVEY [ ] SOAP TEST [ ] INTERMEDIATE LEAK TEST (100 PSIG MINIMUM) [ ] NO
K. PIPE MANUFACTURER'S NAME: _____ P.O. NO.: _____ HEAT CODE NO. _____
L. WELDING ELECTRODE MFR: _____ PART NUMBER: _____ LOT NUMBER: _____

REMARKS: _____

CSU REPRESENTATIVE (Sign/Print): _____ DATE: _____

MAOP DETERMINED USING THE FOLLOWING TEST METHODS FOR SPECIFIED SECTIONS

(TM1) TEST PRESSURE EXCEEDING OF EQUAL TO 150% MAOP, TESTED WITH WATER (150 HYDRO)

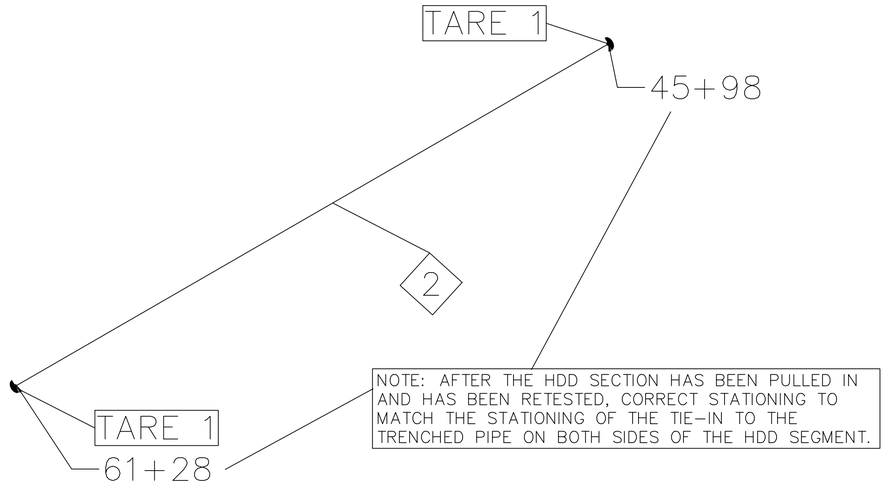
(TM2) TEST PRESSURE EXCEEDING OF EQUAL TO 150% MAOP, TESTED WITH AIR, NITROGEN, OR NATURAL GAS (150 OTHER)

AS-BUILT DRAWING-PRESSURE TEST DATA TEST # _____

DESCRIPTION:

TEST MEDIUM: ☐ AIR ☐ NITROGEN ☐ WATER ☐ NATURAL GAS
TEST METHOD: ☐ GAUGE ☐ CHART ☐ SOAP

DESCRIPTION POINTS _____
PIPE DIA. _____ GAUGE SN# _____
TOTAL LENGTH _____ PRESSURE REC SN# _____
PRESSURE (ALL TESTS) (START)_____ (STOP)_____
PRESSURE (CHART ONLY) (MIN)_____ (MAX)_____
TIME (START)_____ (STOP)_____
DATE (START)_____ (STOP)_____
INTERMEDIATE LEAK TEST YES ☐ NO ☐
LEAK SURVEY WR# (NATURAL GAS TEST ONLY) _____
ANY LEAKS OR FAILURES ON A TEST YES ☐ NO ☐
IF YES, NOTE THE LEAKS AND FAILURES AND THEIR DISPOSITION:
_____
PERFORMED BY (PRINT NAME AND EMPLOYEE # OR CONTRACTOR #):
_____



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Colorado Springs Utilities
It's how we're all connected

COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Mathew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
5	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
4	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
3	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 32	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 6 OF 60	SCALE: NTS		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PRESSURE TEST SHEET (POST PULLBACK HDD)

DWG. NO: **C-104**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-CSU.dwg LAYOUT NAME: C-104 PLOTTED: Wednesday, March 22, 2023 - 4:27pm USER: nwest

MAINLINE AIR TEST DETAIL & PROCEDURE (TM2)

MAOP DETERMINED USING THE FOLLOWING TEST METHODS FOR SPECIFIED SECTIONS

- (TM1) TEST PRESSURE EXCEEDING OF EQUAL TO 150% MAOP, TESTED WITH WATER (150 HYDRO)
- (TM2) TEST PRESSURE EXCEEDING OF EQUAL TO 150% MAOP, TESTED WITH AIR, NITROGEN, OR NATURAL GAS (150 OTHER)

COLORADO SPRINGS UTILITIES

Designer instructions PLEASE ENTER THE DATA REQUESTED ON THE HIGHLIGHTED CELLS IN SECTIONS I THROUGH IV OF THIS FORM. DESIGN PRESSURE OF WEAKEST PIPE/COMPONENT MUST EQUAL OR EXCEED DESIRED MAOP.

RECORD OF STEEL PIPELINES FOR 145 PSIG MOP OPERATION

I. JOB DESCRIPTION/LOCATION: Loch Fyne 20" Gas Line Relocation GRID: P-18, P-19, Q-19
TEST DETAIL (IF APPLICABLE): TEST 4 60+90 to 101+67

A. CLASS LOCATION	3	F. TEST DURATION REQUIRED	21 HR	W.R. # 3747144
B. MOP	145	G. TEST MEDIUM REQUIRED:	Air	RELATED W.R. #
C. DESIRED MAOP	275			
D. TEST PRESSURE (MIN)	413	H. TEST PRESS (MIN) MULTIPLIER	1.5	
E. TEST PRESSURE (MAX)	433	I. TEST PRES (MAX) ADJUSTER:	20	

II. ITEMS LISTED IN THIS SECTION MUST BE PRESSURE TESTED

II. A. DESIGN PRESSURE FOR PIPE/BUTT-WELD FITTING, P=(2St/D) FET; Where E = 1.0, T = 1.0 HOOP STRESS EQUATION, σ_h = PD/2t

Insert/Delete Selected Row :

PLAN REF NO.	ITEM NO.	DESIGN QTY	TESTED QTY	ASBUILT QTY	COMPONENT SPECIFICATION	SMYS	WT (t)	D	F	E	T	P	AT MOP σ_h	AT MOP %SMYS	AT MAOP σ_h	AT MAOP %SMYS	DURING TEST MINIMUM σ_h	MINIMUM SMYS%	MAXIMUM σ_h	MAXIMUM SMYS%
1	240-375-920	4107			20" Pipe, STL, 0.375" WT, API 5L-X52, FBE	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
3	220-647-920	40			20" Elbow, 0.375 WT, STL, 45 Deg, 3R, WPHY 52	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
4	220-692-920	3			20" Elbow, 0.375 WT, STL, 90 Deg, 3R, WPHY 52	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
5	215-796-920	1			REDUCER, CONC. 20"x16", 0.375"x0.375", WPHY-52	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
TARE 1	209-700-920	1			20" CAP, WELD, WPHY52, CARBON STEEL, 0.375" WT	52000	0.375	20.000	0.5	1	1	975	3867	7.4	7333	14.1	11000	21.2	11533	22.2
TARE 4	209-700-916	1			16" CAP, WELD, WPHY52, CARBON STEEL, 0.375" WT	52000	0.375	16.000	0.5	1	1	1219	3093	5.9	5867	11.3	8800	16.9	9227	17.7

II. B. VALVES, REGULATORS, COMPONENTS AND OTHER FITTINGS INSERT/DELETE ROWS:

PLAN REF NO.	ITEM NO.	DESIGN QTY	TESTED QTY	ASBUILT QTY	PRE-CERTIFIED COMPONENTS(S)	MANUFACTURER'S PRESSURE RATING	MANUFACTURER'S TEST PRESSURE (PSIG)

III. ITEMS LISTED IS THIS SECTION ARE SINGLE PRE-CERTIFIED COMPONENT INSTALL ONLY. PRESSURE TEST NOT REQUIRED. SOAP TEST REQUIRED.

III. A. DESIGN PRESSURE FOR PIPE/BUTT-WELD FITTING, P=(2St/D) FET; Where E = 1.0, T = 1.0 HOOP STRESS EQUATION, σ_h = PD/2t

PLAN REF NO.	ITEM NO.	DESIGN QTY	ASBUILT QTY	PRE-CERTIFIED COMPONENTS(S)	SMYS	WT (t)	D	F	E	T	P	AT MOP σ_h	AT MOP %SMYS	AT MAOP σ_h	AT MAOP %SMYS

III. B. VALVES, REGULATORS, COMPONENTS AND OTHER FITTINGS

PLAN REF NO.	ITEM NO.	DESIGN QTY	ASBUILT QTY	PRE-CERTIFIED COMPONENTS(S)	MANUFACTURER'S PRESSURE RATING (PSIG)	MANUFACTURER'S TEST PRESSURE (PSIG)

IF, DURING THE TEST, THE PIPELINE IS TO BE STRESSED TO **20% OF SMYS OR GREATER** AND THE TEST MEDIUM IS OTHER THAN WATER, A SPECIAL LEAK SURVEY OR LEAK TEST IS **REQUIRED**. IF APPLICABLE, CONDUCT THE SPECIAL LEAK TEST OR SURVEY AT **100 PSIG** AND HOLD PRESSURE AT THIS LEVEL FOR A MINIUM OF **10 MIN**. **CONDUCT LEAK SURVEY IF NATURAL GAS IS USED**. **SUBSTITUTION** OR **ADDITION** OF MATERIAL LISTED ON THIS SHEET **IS NOT PERMITTED** UNLESS APPROVED BY ENGINEERING SUPERVISOR.

CALC/ANALYSIS BY: [signature] DATE: 03/23/2023 ENGINEERING SUPERVISOR'S APPROVAL: ____ DATE: ____

ENGINEERING REMARKS: ____

IV. INFORMATION TO BE SUPPLIED BY TEST PERSONNEL

A. TEST PERFORMED BY: ____ COMPANY: ____ TEST # ____

B. (SIGNATURE): ____ TEST DATE: ____

C. LOCATION OF TEST: ____

D. FACILITY TESTED: [ ] REGULATOR STATION ([ ] SPOOL (FAB SHOP) [ ] MAIN [ ] OTHER (SPECIFY IN REMARKS)

E. TEST MEDIUM (CHECK): [ ] AIR [ ] NATURAL GAS [ ] INERT GAS (NITROGEN) [ ] WATER

F. TEST PRESSURE: MAX (PSIG): ____ MIN (PSIG): ____

G. TEST DURATION: START TIME: ____ END TIME: ____ DURATION (HR/MIN): ____

H. TEST PRESSURE DOC'D [ ] MECHANICAL CHART [ ] GAUGE [ ] OTHER

I. RECORDING DEVICE NO: ____ CALIBRATION DUE DATE: ____

J. LEAK TEST CONDUCTED: [ ] YES* IF YES, IDENTIFY METHOD(S) [ ] NO [ ] LEAK SURVEY [ ] SOAP TEST [ ] INTERMEDIATE LEAK TEST (100 PSIG MINIMUM)

K. PIPE MANUFACTURER'S NAME: ____ P.O. NO.: ____ HEAT CODE NO: ____

L. WELDING ELECTRODE MFR: ____ PART NUMBER: ____ LOT NUMBER: ____

REMARKS: ____

CSU REPRESENTATIVE (Sign/Print): ____ DATE: ____

AS-BUILT DRAWING-PRESSURE TEST DATA TEST # ____

DESCRIPTION: TEST MEDIUM: ☐ AIR ☐ NITROGEN ☐ WATER ☐ NATURAL GAS TEST METHOD: ☐ GAUGE ☐ CHART ☐ SOAP

DESCRIPTION POINTS ____

PIPE DIA. ____ GAUGE SN# ____

TOTAL LENGTH ____ PRESSURE REC SN# ____

PRESSURE (ALL TESTS) (START) ____ (STOP) ____

PRESSURE (CHART ONLY) (MIN) ____ (MAX) ____

TIME (START) ____ (STOP) ____

DATE (START) ____ (STOP) ____

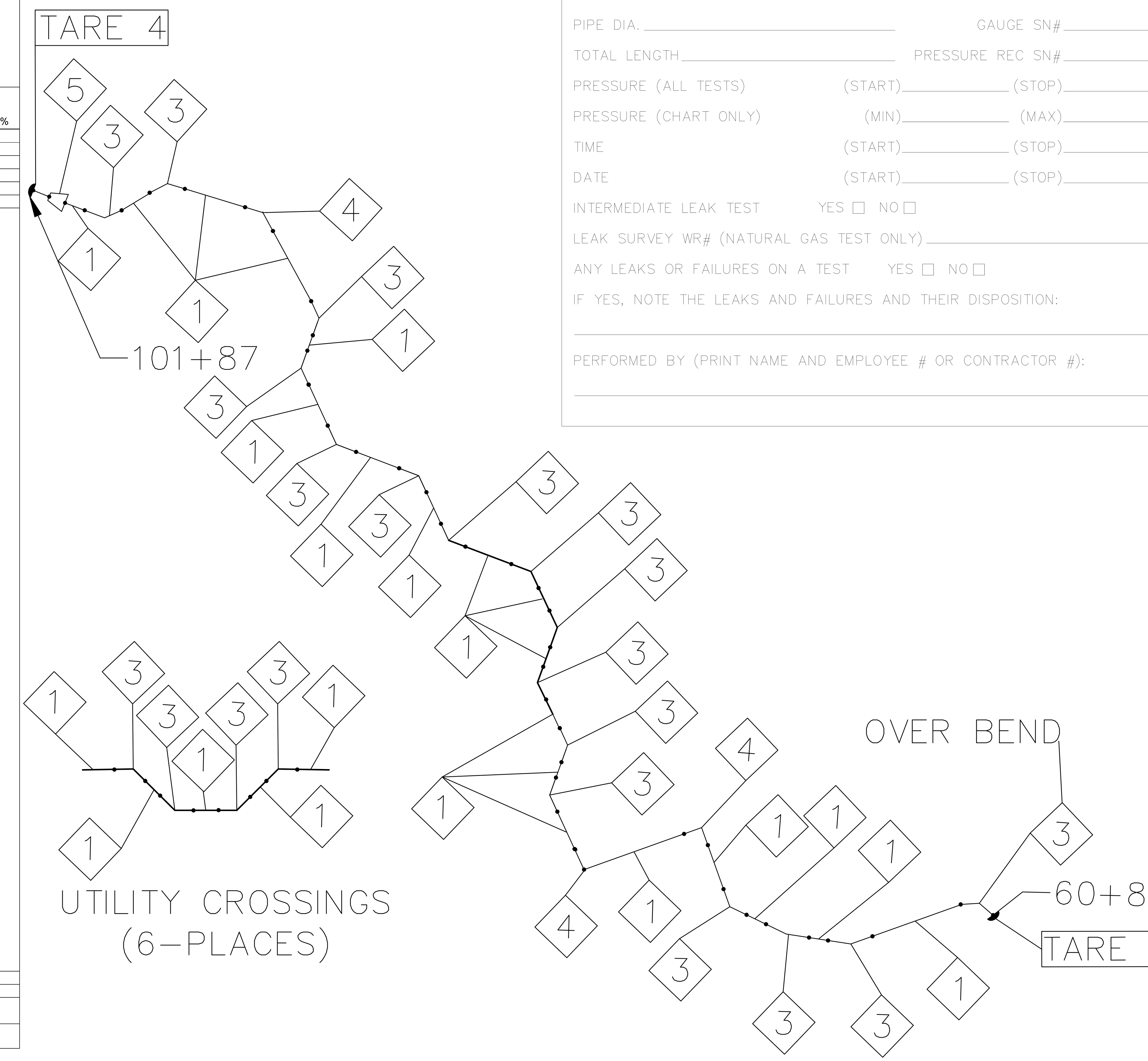
INTERMEDIATE LEAK TEST YES ☐ NO ☐

LEAK SURVEY WR# (NATURAL GAS TEST ONLY) ____

ANY LEAKS OR FAILURES ON A TEST YES ☐ NO ☐

IF YES, NOTE THE LEAKS AND FAILURES AND THEIR DISPOSITION:

PERFORMED BY (PRINT NAME AND EMPLOYEE # OR CONTRACTOR #):



Colorado 811
Colorado Springs Utilities *It's how we're all connected*

COLORADO LICENSED PROFESSIONAL ENGINEER JEREMIAH SMITH — Jeremiah Matthew Smith 2023.03.24 16:47:06-04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
5	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
4	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
3	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 31, 32, 33	Q-19, P-18, P-19

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE: HP SERVICE: ☐ DISTRIBUTION: ☒ FEEDER: ☐ TRANS. BY DEF. ☐ TRANS v 20%: ☐

W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN		PHONE:	(719) 668-8196
PROJECT MANAGER: MELISSA LINGO		PHONE:	(719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD		PHONE:	(719) 668-3675
SHEET NO. 7 OF 60	SCALE: NTS		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH	

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PRESSURE TEST SHEET (TEST 4)
DWG. NO: **C-105**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-C30-CSU.dwg LAYOUT NAME: C-105 PLOTTED: Thursday, March 23, 2023 - 8:29am USER: nwest

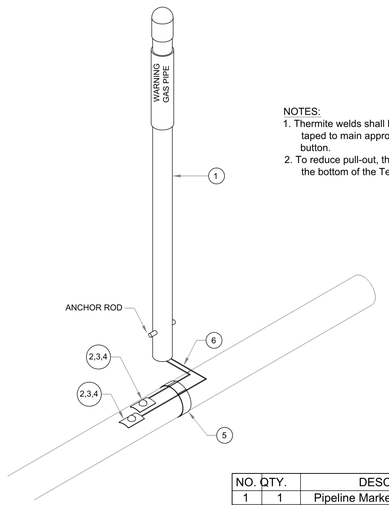
TIE-IN PROCEDURES		
STEP NO.	**CHECK COMPLETE**	**PROCEDURE**
1		INSTALL ALL MAINS AND FITTINGS PER DRAWINGS
2		INSTALL TEMPORARY 20", 16", 10" AND 2" STEEL END CAPS AS NEEDED FOR PRESSURE TESTING. PRESSURE TEST THROUGH END CAP FITTINGS
3		PRESSURE TEST ALL NEW PIPING IN SEGMENTS PER PRESSURE TEST SHEETS
4		LEAVE APPROX 50 PSIG OF AIR PRESSURE ON COMPLETED SEGMENTS UNTIL READY TO MAKE TIE-INS
5		COMPLETE TIE-INS OF ALL NEW PIPELINE SEGMENTS AFTER ALL PRESSURE TESTS HAVE BEEN COMPLETED
6		WITH THE EXISTING 20" VALVE CLOSED, COMPLETE 20" TIE-IN AT MCCLINTOCK STATION (SHEET C-200)
7		INSTALL BYPASS AND PURGE AND DE-GAS THE EXISTING 10" LINE, AND COMPLETE 10" STEEL TIE-IN AT MCCLINTOCK STATION (SHEET C-200)
8		PURGE AND DE-GAS THE 2" LINE, AND COMPLETE 2" STEEL TIE-IN AT MCLINTOCK STATION (SHEET C-200)
9		COMPLETE TIE-IN OF THE NEW 20" LINE TO THE EXISTING 16" LINE AT FORESTGATE DR. WEST OF BLACK FOREST RD. (SHEET C-234)
10		VERIFY ODORIZER SET UP FOR PURGE OF NEW STEEL PIPE HAS BEEN COMPLETED (SHEET C-200)
11		INSTALL GROUNDED PURGE STACK AT TIE-IN POINT ON FORESTGATE DR WEST OF BLACK FOREST RD. TO BE MANNED BY A QUALIFIED STATION TECHNICIAN WITH CGI AND RADIO. (SHEET C-234)
12		PRIOR TO STARTING PURGE OF THE 20", COMPLETE A TAILGATE MEETING WITH PURGE TEAM ABOUT THE PURGE PROCEDURE, AND COMPLETE A RADIO CHECK.
13		INFORM TECHNICIAN AT THE PURGE LOCATION THAT THE PURGE IS BEGINNING THEN SLOWLY OPEN THE 20' VALVE AT MCCLINTOCK TIE-IN. THROTTLE THROUGH THE VALVE TO CONTROL PUGE RATE (SHEET C-200)
14		TECHNICIAN TO MONITOR PURGE WITH CGI AT FORESTGATE DR AND BLACK FOREST RD, AND VERIFY THAT AT 2 READINGS OF AT LEAST 80% GAS IS RECORDED. TECHNICIAN SHALL INFORM PURGE TEAM THAT PURGE CAN BE COMPLETED, AND CLOSE THE PURGE VENT.
15		VERIFY SUFFICIENT PICKLING OF NEW STEEL PIPE HAS BEEN ACHIEVED
16		VERIFY 20" VALVE AT MCCLIINTOCK STATION TIE IN IS FULLY OPEN (SHEET C-200)
17		VERIFY THAT PRESSURE IN THE NEW 20" LOCH FYNE PIPELINE HAS STABILIZED
18		COMPLETE THE TAP ON THE 16" SPHERICAL TEE AT THE WEST TIE-IN TO COMPLETE THE CONNECTION OF THE 20" PIPELINE TO THE 16" PIPELINE (SHEET C-234)
19		INSTALL GROUNDED PURGE VENT AND PURGE AIR FROM THE NEW 10" STEEL LINE AT MCCLINTOCK STATION (SHEET C-200)
20		INSTALL GROUNDED PURGE VENT AND PURGE AIR FROM NEW 2" STEEL LINE AT MCCLINTOCK STATION (SHEET C-200)
21		VERIFY ALL MAINS ARE LOCATABLE

ANY DEVIATIONS FROM PROCEDURES MUST BE COMMUMINCATED TO GPD (SCOTT JENSEN 605-430-4798)
-CREW SUPERVISOR TO CHECK OF EACH STEP OF THE PROCEDURE AS IT IS COMPLETED IN THE FIELD
-VERIFY AND ADD TEST STATIONS ACCORDING TO CATHOIC PROTECTION NOTES

TIE-IN PROCEDURE APPROVED BY			
NAME	TITLE	SIGNATURE	DATE
SCOTT JENSEN	ENGINEER		
JOSH RICHARD	CONSTRUCTION LEAD		
TIE-IN COMPLETED			
NAME	TITLE	SIGNATURE	DATE
SCOTT JENSEN	ENGINEER		
JOSH RICHARD	CONSTRUCTION LEAD		

CATHODIC PROTECTION NOTES	
1 CP	INSTALL TEST STATIONS AT LOCATIONS SHOWN IN THE DESIGN PACKAGE.
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003
3 CP	TEST STATIONS SHALL BE ATTACHED PER THE DETAIL BELOW.

PIPELINE MARKER AND TEST STATION ON STEEL MAIN WITHOUT ANODE



NOTES:
1. Thermite welds shall be coated and, if accesible, wire taped to main approximately 6" from thermite weld button.
2. To reduce pull-out, the anchor rod must be inserted at the bottom of the Test Station.

NO.	QTY.	DESCRIPTION
1	1	Pipeline Marker and Test Station
2	2	Exothermic Weld Patch
3	2	Integrated Exothermic Weld
4	2	Sleeve, Copper
5	-	2" Tape
6	-	12 Ga. Wire, Solid

GAS DISTRIBUTION CONSTRUCTION STANDARDS
Colorado Springs Utilities
It's how we're all connected
APPROVED AS OF: 3/31/2017 | TEST STATION ON STEEL MAIN | 8-5 | PG. 1/3
TCD-21620

CONSTRUCTION NOTES	
1	ALL WORK SHALL BE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, COUNTY, AND CITY LAWS AND STANDARDS
2	ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH APPLICABLE CSU STANDARDS AND SPECIFICATIONS.
3	ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH PERMITS ISSUED FOR THE PROJECT
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
5	IF ROCK IS ENCOUNTERED IN THE TRENCH, CONTRACTOR SHALL INCREASE TRENCH DEPTH BY 1' IN ORDER TO PLACE 12" OF ROCK-FREE PADDING SOIL PRIOR TO LOWERING THE PIPELINE INTO THE TRENCH.
6	THE PIPELINE SHALL MEET THE MINIMUM HORIZONTAL SEPARATION FROM PARALLEL UTILITIES.
7	PRIOR TO BACKFILLING THE TRENCH WHERE ROCK IS PRESENT IN THE BACKFILL, 12" OF ROCK-FREE SOIL SHALL BE FILLED OVER THE TOP OF THE PIPELINE. NO ROCK GREATER THAN 6" WILL BE ALLOWED IN THE REMAINING BACKFILL. NO ROCK WILL BE ALLOWED IN THE TOP 12" OF THE TRENCH.
8	PREFERRED METHOD OF BACKFILLING THE TWO ROAD CROSSING IS USING A CDOT APPROVED EXCAVATABLE FLOWABLE FILL. OTHERWISE THE BACKFILL WILL NEED TO BE COMPACTED IN 6" MAXIMUM LEFTS AND COMPACTED TO 98% PROCTOR READING
9	FOR BOTH ROAD CROSSING, PAVEMENT SHALL BE THE SAME AS THE EXISTING CROSSING.
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
12	THE COTTONWOOD CREEK SHALL BE COMPLETED USING AN HDD IN ACCORDANCE WITH THE HDD DESIGN THAT IS PART OF THIS DESIGN.
13	PRIOR TO PULLING IN THE HDD PIPE STRING, AN AIR TEST WILL BE COMPLETED ON THE PIPE, AFTER PULL BACK, THE PIPE SEGMENT WILL BE AIR TESTED AGAIN.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_UFC-C3D-CSU.dwg LAYOUT NAME: C-106 PLOTTED: Wednesday, March 22, 2023 - 4:27pm USER: rwest

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Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

REVISIONS				
5	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
4	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
3	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 31, 32, 33	Q-19, P-18, P-19

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN		PHONE:	(719) 668-8196
PROJECT MANAGER: MELISSA LINGO		PHONE:	(719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD		PHONE:	(719) 668-3675
SHEET NO. 7 OF 60	SCALE: NTS		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
CONSTRUCTION NOTES
DWG. NO: **C-106**

TRAFFIC CONTROL FOR STREET CONSTRUCTION, UTILITY WORK AND MAINTENANCE OPERATIONS

CITY OF COLORADO SPRINGS

SPECIFIC REQUIREMENTS

Temporary Traffic Barrier:

The Contractor shall install Pre-cast Type 7F concrete, Type IV concrete, or Plastic Water Filled barrier between any lanes carrying public traffic and any excavation, obstacle, or storage area when the following conditions exist:

- When an excavation is 12 inches or greater in depth a minimum clear zone (CZ) in feet shall be required for the following design speeds:

30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH
12' CZ	14' CZ	16' CZ	20' CZ	22' CZ	24' CZ	30' CZ

- If the minimum Clear Zone cannot be maintained, then a temporary traffic barrier shall be required for work site protection.
- A temporary traffic barrier shall be supplemented with standard delineation (reflectors), pavement markings, or channelizing devices to provide nighttime visibility for vehicle traffic. The delineation or pavement marking color shall conform to the latest edition of the MUTCD.
- Temporary traffic barrier ends shall be installed in accordance with AASHTO's "Roadside Design Guide" by flaring until the end is outside the acceptable clear zone (clear zone is based on 85th percentile speed) or by providing crashworthy end treatments that meet or exceed MASH 350 Report.
- A temporary traffic barrier is required when the contractor has installed a permanent obstacle and the protective system, such as guardrail has not been installed or when a portion of an existing protective guardrail has been removed.
- A temporary traffic barrier is required when materials or equipment are stored within the clear zone of the work site.
- The use of a 12 ft. transition section is allowed at the downstream end of the installation pointing away from approaching traffic out of the clear zone, or at locations outside the clear zone, generally more than 30 ft. from the high speed travel lane edge.
- Glare Screens may be required, if used the blade height shall be 24".

Excavation and Trenches:

Excavations and/or trenches, which cannot be properly back-filled and patched prior to the end of the work day, shall be bridged to permit unobstructed traffic flow. Trench walls and adjacent soils shall be sufficiently stabilized prior to the use of steel plates for bridging.

Where traffic must cross trenches:

- The use of steel plates shall be approved by City Traffic Engineering prior to installation.
- The Colorado Springs Fire Department – Heavy Rescue Response Group shall be notified when the excavation or trench is 5 feet or greater in depth.
- Steel Trench Plate width and thickness requirements:

18" or less in width	Minimum thickness of ¾"
> 18" in width to 72" in width	Minimum thickness of 1"

- The thickness of Steel Plates for trench widths exceeding 72" a structural design shall be prepared by a Licensed Professional Engineer Registered in Colorado.
- Steel Plates can be installed in two ways. First, the Steel Plates can be installed flush with the existing pavement, milling out the pavement surface to ensure that the top of plate elevation matches the existing elevations of adjacent pavement surface. Second, the Steel Plates can be installed on top of the asphalt with transitional ramps (cold mix) on all four sides of the plates, with feathered edges to match the existing asphalt (8% or a lesser slope).
- The Steel Plates shall extend beyond the edge of the trench a minimum of 18" but no more than 30"on both sides.
- A non-skid surface treatment shall be applied to the entire surface area of the plate in the direction of traffic flow.
- The contractor should avoid using a long series of plates that run parallel to traffic wheel paths. If allowed, the length of a series of plates running parallel to traffic wheel paths shall not exceed 30'.
- The trench shall be adequately shored to support the steel plates and traffic loads.
- Steel Plates shall be installed to operate with minimum noise.
- All Steel Plates within the right-of-way, whether used in or out of the traveled way, shall be without deformation (free from any clips, chains, attachments, weldments, or surface irregularities).
- No one is allowed in the trench while covered by the Steel Plate.
- The use of Steel Plates shall not exceed four weeks and Rough Road or Bump signs shall be required during this period of time.

Arrow Boards:

Arrow Boards shall be furnished as required by project conditions and shall meet the following requirements:

Type	Minimum Size	Min. # of Panel Lamps	Min. Legibility Distance
A	48" x 24"	12	½ mile
B	60" x 30"	13	¾ mile
C	96" x 48"	15	1 mile

(Example: length of arrow equals 48"; width of arrowhead equals 24")

An arrow panel is a sign with a matrix of elements capable of flashing or showing sequential displays. This sign shall provide additional warning and directional information to assist in merging and channeling road users through or around a temporary traffic control zone. The panel face shall be rectangle in shape, solid construction and finished in non-reflective black. The arrow panel shall have the capability of the following mode selection: left arrow, right arrow, left and right arrow and caution. The caution mode consists of four or more flashing lamps arranged in a pattern which does not indicate a direction. Arrow panels shall include an automatic photocell sensor type signal lamp dimmer with manual override and shall be capable of a minimum of 50 percent dimming from rated lamp voltage.

Portable Variable Message Signs:

Variable Message Signs (VMS) are temporary traffic control devices with the flexibility to display a variety of messages. Each message shall consist of one or two phases. A phase consists of up to three lines of eight characters per line. Each character module shall use at least five wide and seven high pixel matrixes.

- VMS's shall be used on all major residential collector streets and higher classification of roadways, including roadway closures and detour routes. Also, VMS's shall be used when lane reductions can not handle the normal volume of traffic (no greater than 1,000 vehicles per lane per hour).
- VMS's shall be used to advise vehicular traffic of alternate routes and expected delays due to construction activity.
- VMS's shall be used to notify the general public of upcoming construction activities up to two weeks prior to start of construction.
- VMS's shall be solar powered or a non-internal combustion device.
- VMS's shall be equipped with a power source and a battery back-up to provide continuous operation when failure of the primary power source occurs.
- VMS's shall be capable of 360 degree rotation and elevated so the bottom of the sign is 5 feet above the ground.
- The sign shall be visible from one-half mile during both daytime and nighttime conditions.
- The message shall be legible from a minimum of 650 feet.
- The sign shall automatically adjust its light source to meet nighttime legibility requirements.

DETAIL NOTES

1. THE DETAILS ON THE NEXT FOUR SHEETS ARE FROM EL PASO COUNTY DEPARTMENT OF TRANSPORTATION "ENGINEERING CRITERIA MANUAL", THE CITY OF COLORADO SPRINGS "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", AND OTHER ONLINE DETAIL DRAWINGS FROM THE CITY OF COLORADO SPRINGS PUBLIC WORKS DEPARTMENT.
2. ONLY THOSE DETAILS THAT APPEAR TO BE MOST APPLICABLE TO THIS PROJECT ARE ATTACHED. HOWEVER, THIS DOED NOT RELIEVE THE CONTRACTOR FROM OBTAINING THESE MANUALS FOR REVIEW FOR OTHER APPLICABLE STANDARDS.
3. THERE ARE TWO PAVED ROADS ON THIS PROJECT THAT ARE EXPECTED TO OPEN CUT. THEREFORE, THE DRAWINGS RELATED TO TRENCHING OPERATIONS UNDER THE ROADS, AND PAVEMENT REPAIR AND REPLACEMENT ARE PROVIDED. REFER TO DETAILS ON SHEET D-102. IF CONTROLLED LOW-STRENGTH MATERIAL (CLSM) IS APPROVED FOR TRENCH BACKFILL, REFER TO SHEET D-105.
4. IF WORK IN THE ROADWAY RIGHT-OF-WAY IS REQUIRED, CONTRACTOR SHALL CONSULT ADDITIONAL MAINTENANCE OF TRAFFIC (MOT) DRAWINGS ON SHEET D-101 WHERE REQUIRED FOR LANE CLOSURES, DETOURS AND TRAFFIC CONTROL DEVICES. IF ADDITIONAL MOT CONFIGURATIONS ARE REQUIRED, CONSULT THE EL PASO COUNTY DOT AND MANUAL UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
5. THE ENVIRONMENTAL DETAILS ON SHEETS D-103 AND D-104 WERE DETERMINED TO BE THE MOST APPLICABLE DRAWINGS FOR THIS PROJECT. IF THERE ARE CIRCUMSTANCES THAT ARE NOT COVERED BY THESE STANDARDS, THE CONTRACTOR SHALL WORK WITH CSU TO PROVIDE ADEQUATE BEST MANAGEMENT PRACTICES.

APPENDIX D

LETTER CODES & FORMULAS

LETTER CODES

Road Type	Distance between Signs in Ft (metric) A	B	C
Urban (low speed)	100 (30)	100 (30)	100 (30)
Urban (high speed)	350 (100)	350 (100)	350 (100)
Rural	500 (150)	500 (150)	500 (150)
Expressway / Freeway	1000 (300)	1500 (450)	2640 (800)

Type of Taper	Taper Length (L)*
Merging Taper	At least L
Shifting Taper	At least 0.5 L
Shoulder Taper	At least 0.33 L
One-Lane, Two-Way Traffic Taper	100 ft (30m) maximum
Downstream Taper	100 ft (30m) per lane

FORMULAS

Speed Limits of 40 mph (60 km/h) or less / Speed Limits of 45 mph (70 km/h) or >:

L=WS^2 / 60 **(L=WS^2) / 155** **L=WS** **(L=WS) / 1.6**

Lane Width	Speed in MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH
10 ft. Merging Taper		105'	150'	205'	270'	450'	500'	550'		600' 650'
11 ft. Merging Taper		115'	165'	225'	294'	495'	550'	605'		660' 715'
12 ft. Merging Taper		125'	180'	245'	320'	540'	600'	660'		720' 780'

Where: L = Taper length in feet (meters)
W = Width of offset in feet (meters)
S = Posted speed limit, or off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph (km/h)

* Distances are shown in feet (meters)

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Colorado Springs Utilities
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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 31, 32, 33	R-18, R-19, Q-19, P-18, P-19

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

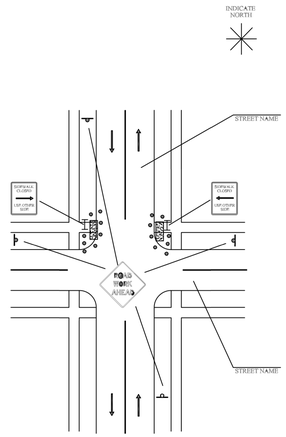
JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

W/O #: 3747144
RELATED W/O #s: 3789816

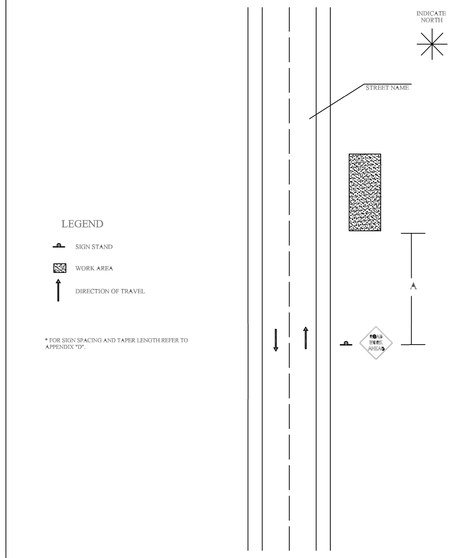
ENGINEER: SCOTT JENSEN		PHONE:	(719) 668-8196
PROJECT MANAGER: MELISSA LINGO		PHONE:	(719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD		PHONE:	(719) 668-3675
SHEET NO. 9 OF 60	SCALE: NTS		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
TRAFFIC CONTROL NOTES
DWG. NO: **D-100**

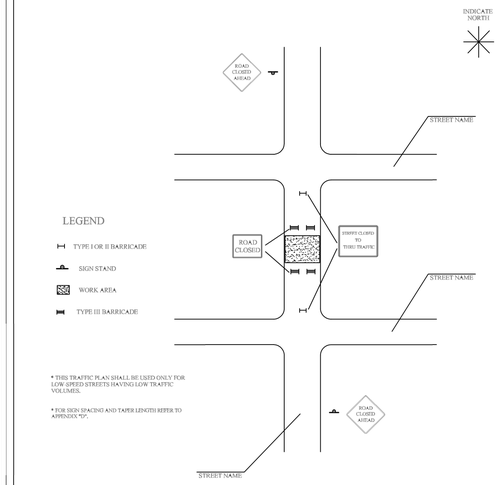
FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_#C-C3D-CSU.dwg LAYOUT NAME: D-100 PLOTTED: Wednesday, March 22, 2023 - 4:27pm USER: rwest



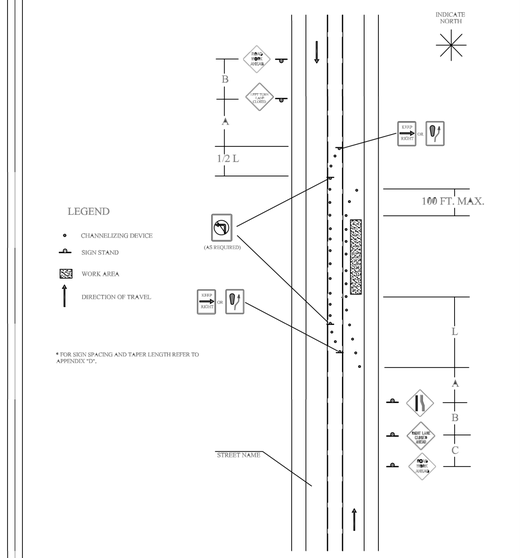
CITY OF COLORADO SPRINGS TRAFFIC ENGINEERING	TRAFFIC CONTROLS FOR STREET CONSTRUCTION, UTILITY WORK, AND MAINTENANCE OPERATIONS	T.A. #4- RAMP CLOSURE PEDESTRIAN DETOUR REVISED 2.04.05



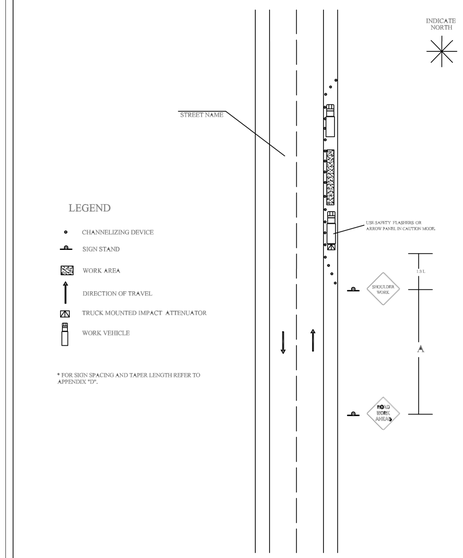
CITY OF COLORADO SPRINGS TRAFFIC ENGINEERING	TRAFFIC CONTROLS FOR STREET CONSTRUCTION, UTILITY WORK, AND MAINTENANCE OPERATIONS	T.A. #5- WORK BEYOND THE SHOULDER MUTCD FIG. #6H-1 REVISED 2.04.05



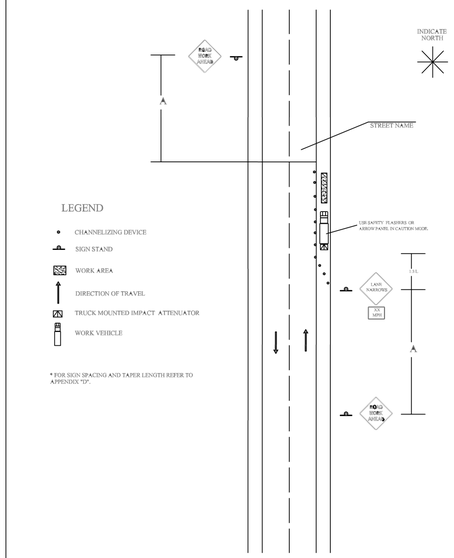
CITY OF COLORADO SPRINGS TRAFFIC ENGINEERING	TRAFFIC CONTROLS FOR STREET CONSTRUCTION, UTILITY WORK, AND MAINTENANCE OPERATIONS	T.A. #30- LOCAL ROAD CLOSURE REVISED 2/15/05



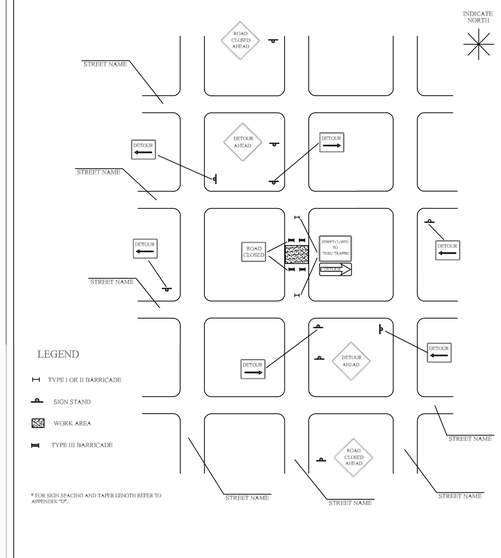
CITY OF COLORADO SPRINGS TRAFFIC ENGINEERING	TRAFFIC CONTROLS FOR STREET CONSTRUCTION, UTILITY WORK, AND MAINTENANCE OPERATIONS	T.A. #36- LANE CLOSURE SHIFTING TRAFFIC INTO THE CONTINUOUS REVISED 2/16/05



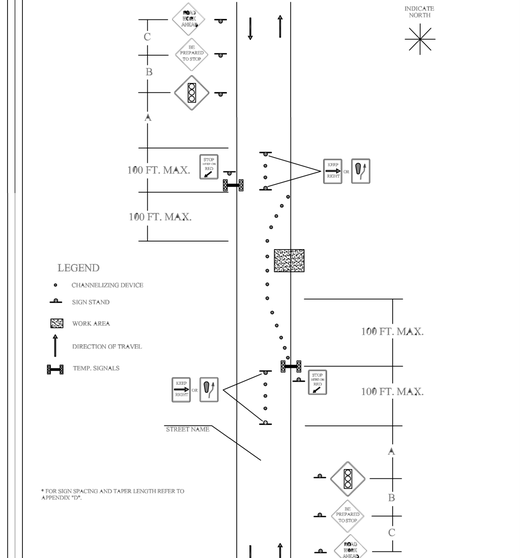
CITY OF COLORADO SPRINGS TRAFFIC ENGINEERING	TRAFFIC CONTROLS FOR STREET CONSTRUCTION, UTILITY WORK, AND MAINTENANCE OPERATIONS	T.A. #6- WORK ON THE SHOULDER REVISED 2.04.05



CITY OF COLORADO SPRINGS TRAFFIC ENGINEERING	TRAFFIC CONTROLS FOR STREET CONSTRUCTION, UTILITY WORK, AND MAINTENANCE OPERATIONS	T.A. #7- SHOULDER WORK WITH MINOR ENCROACHMENT MUTCD FIG. #6H-6 REVISED 2.04.05



CITY OF COLORADO SPRINGS TRAFFIC ENGINEERING	TRAFFIC CONTROLS FOR STREET CONSTRUCTION, UTILITY WORK, AND MAINTENANCE OPERATIONS	T.A. #28- OVERLAPPING ROUTES WITH DETOUR MUTCD FIG.#6H-9 REVISED 2/11/05



CITY OF COLORADO SPRINGS TRAFFIC ENGINEERING	TRAFFIC CONTROLS FOR STREET CONSTRUCTION, UTILITY WORK, AND MAINTENANCE OPERATIONS	T.A. #43- ONE LANE ROAD WITH TEMP. SIGNALS REVISED 2.23.05

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_#FC-C3D-CSU.dwg LAYOUT NAME: D-101 PLOTTED: Wednesday, March 22, 2023 - 4:27pm USER: rwest

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Colorado Springs Utilities
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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
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PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
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5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 31, 32, 33	R-18, R-19, Q-19, P-18, P-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:	
HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN		PHONE:	(719) 668-8196
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CONSTRUCTION LEAD: JOSH RICHARD		PHONE:	(719) 668-3675
SHEET NO. 10 OF 60	SCALE: NTS		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
MAINTENANCE OF TRAFFIC DETAILS

DWG. NO: D-101

General Notes:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CURRENT CITY OF COLORADO SPRINGS ENGINEERING DIVISION (THE CITY) STANDARD SPECIFICATIONS.
2. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS. FOR CITY PERMITS CONTRACTORS SHALL USE THE ACCELA ON-LINE PERMIT SYSTEM. ONCE CITY PERMITS ARE APPROVED AND PAID, THEN APPROPRIATE SCHEDULING AND NOTIFICATIONS SHALL BE IN ACCELA.
3. PRIOR TO CUTTING INTO A ROADWAY, A MEETING IS REQUIRED WITH CITY INSPECTOR.
4. EXISTING PAVEMENT MAY BE INITIALLY ROUGH CUT. A SQUARE, VERTICAL CUT SHALL BE MADE IN THE EXISTING ASPHALT PAVEMENT PRIOR TO PAVEMENT PLACEMENT.
5. BACKFILL SHALL BE COMPACTED WITH SECTION 206 OF CITY STANDARD SPECIFICATIONS.
6. CLSM (FLOW-FILL) IS REQUIRED AS BACKFILL FOR TRENCHES LESS THAN 1-FOOT IN WIDTH. CLSM SHALL NOT EXTEND INTO PAVEMENT SECTION.
7. CLSM SHALL BE USED WHERE PAVEMENT SECTION IS LESS THAN 5-YEARS OLD.
8. HOT MIX ASPHALT (ASPHALT PAVING MATERIAL) SHALL MEET THE REQUIREMENTS OF THE PIKES PEAK ASPHALT SPECIFICATION AND BE APPROVED BY CITY ENGINEERING.
9. NEW ASPHALT SHALL NOT BE PLACED AGAINST FRESHLY POURED CONCRETE. CONCRETE SHALL BE 5-DAYS OLD OR HAVE REACHED A COMPRESSIVE STRENGTH OF 3,200 PSI AS DEMONSTRATED BY FIELD CURE CYLINDERS.
10. A TACK COAT SHALL BE APPLIED TO ALL VERTICAL EDGES INCLUDING CONCRETE EDGES. THE TACK COAT SHALL HAVE 100% COVERAGE AND BE APPLIED BETWEEN LIFTS.
11. A MINIMUM PAVEMENT SECTION OF:

    A) RESIDENTIAL/COLLECTOR...SHALL MATCH EXISTING OR A MINIMUM 6-INCHES OF CLASS 6 AGGREGATE BASE COURSE WITH 6-INCHES OF HOT-MIX ASPHALT (ASPHALT PAVING MATERIAL);

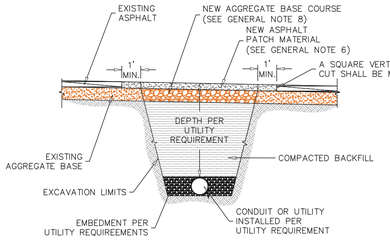
    B) ARTERIAL...12-INCHES OF CLASS 6 AGGREGATE BASE COURSE WITH 8-INCHES OF HOT-MIX ASPHALT (ASPHALT PAVING MATERIAL).

12. THE NEW PAVEMENT SECTION SHALL MATCH EXISTING PAVEMENT REPORT. FOR ROADWAYS WHERE THE SUBGRADE IS CHEMICALLY TREATED (CTS), CTS OR FLOW-FILL SHALL BE EQUIVALENT TO THE REQUIREMENT IN THE PAVEMENT DESIGN REPORT.
13. ALTERNATE REPAIR SECTIONS MAY BE APPROVED PROVIDED THEY ARE COMPLETED BY THE PAVEMENT DESIGN GEOTECHNICAL ENGINEER, AND APPROVED BY CITY ENGINEERING.
14. NEW HOT-MIXED ASPHALT (ASPHALT PAVING MATERIAL) SHALL BE FLUSH TO EXISTING ASPHALT AND CONCRETE EDGES AND SHALL NOT HAVE HUMPS OR VALLEYS.
15. WHERE CONCRETE PAVEMENT EXISTS BELOW THE ASPHALT, NEW CONCRETE SHALL BE PLACED TO MATCH THE EXISTING CONCRETE THICKNESS UNLESS OTHERWSE APPROVED BY CITY ENGINEERING.
16. IF A PLATE TAMPER IS USED FOR COMPACTION OF ASPHALT, THE MAXIMUM LOOSE LIFT THICKNESS SHALL BE 2-INCHES.
17. THESE DETAILS ARE FOR PAVEMENT CUTS LESS THAN 200-SF. CUTS GREATER THAN 200-SF SHALL BE IN CONFORMANCE WITH AN ENGINEERED DESIGN.
18. ANY DISTURBED PAVEMENT MARKINGS SHALL BE RESTORED TO CITY STANDARDS.

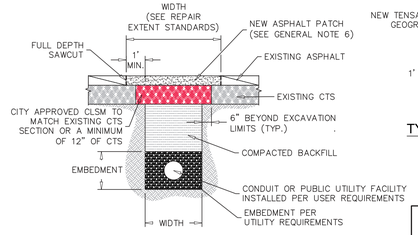
UTILITY TRENCH REPAIR GENERAL NOTES

APPROVED: CITY ENGINEER

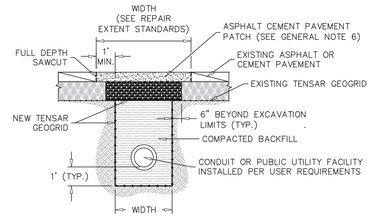
ISSUED: 11/2/20 | REVISED: | DRAWING NO. 4A



UTILITY TRENCH PAVEMENT REPAIR DETAIL



UTILITY TRENCH PAVEMENT REPAIR DETAIL
CHEMICALLY TREATED SUBGRADE

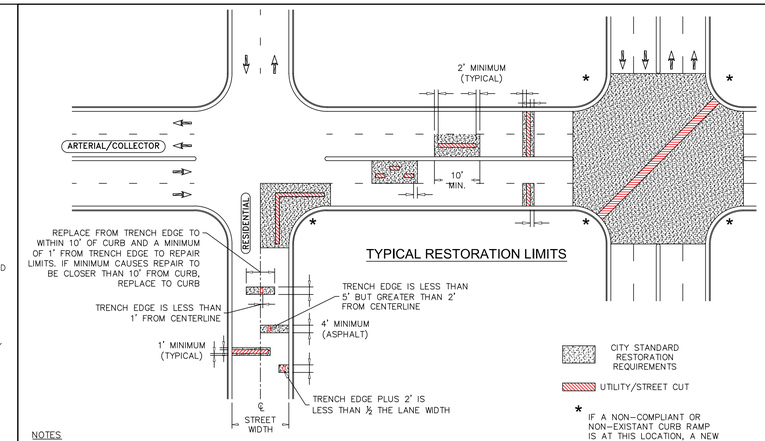


TYPICAL UTILITY TRENCH REPAIR DETAIL
(GEO-GRID SECTION)

UTILITY TRENCH REPAIR TYPICAL SECTIONS

APPROVED: CITY ENGINEER

ISSUED: 11/2/20 | REVISED: | DRAWING NO. 4B



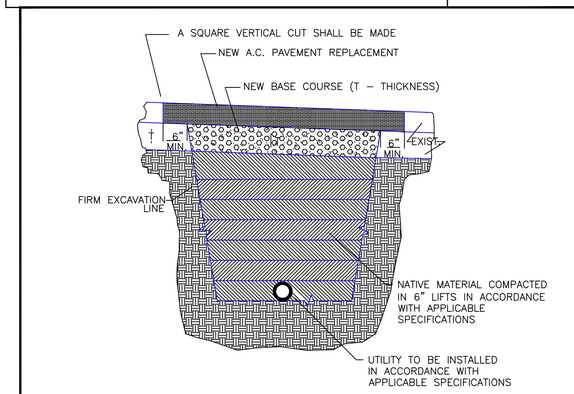
NOTES

1. REMOVE AND REPLACE A MINIMUM OF 4-FEET LONGITUDINAL OR 2-FEET FROM THE EDGE OF THE TRENCH, WHICHEVER IS GREATER.
2. IF WITHIN 5-FEET OF AN EXISTING JOINT THEN REMOVE TO THE EXISTING JOINT.
3. MULTIPLE LOCATIONS ARE TO BE A MINIMUM OF 10-FEET APART FROM EDGE OF REPAIR TO EDGE OF REPAIR; IF REPAIRS ARE LESS THAN 10-FEET APART, A CONTINUOUS SECTION MUST BE REPLACED.
4. CURB & GUTTER MAY REMAIN, PROVIDED THE CURB AND GUTTER ARE NOT DAMAGED BY THE CONSTRUCTION ACTIVITY.
5. EXACT RESTORATION LIMITS/LOCATIONS SHALL BE APPROVED BY THE CITY REPRESENTATIVE PRIOR TO REPAIRS.
6. LONGITUDINAL REPAIRS GREATER THAN 40-FEET IN LENGTH SHALL BE MILLED AND PAVED.

UTILITY TRENCH REPAIR RESTORATION LIMITS

APPROVED: CITY ENGINEER

ISSUED: 11/2/20 | REVISED: | DRAWING NO. 4C



NOTES:

1. THIS DETAIL MAY BE USED FOR PAVEMENT CUTS LESS THAN 200 SQ. FT.
2. EXISTING PAVEMENT MAY BE ROUGH CUT INITIALLY IN CONJUNCTION WITH TRENCHING.
3. A SQUARE VERTICAL CUT SHALL BE MADE IN THE EXISTING A.C. PAVEMENT AFTER PLACEMENT OF BACKFILL PRIOR TO PAVEMENT REPLACEMENT.
4. THICKNESS OF NEW A.C. PAVEMENT REPLACEMENT SHALL MATCH EXISTING (4" MIN.)
5. THICKNESS OF NEW BASE COURSE SHALL BE MINIMUM OF 6" OR EQUAL TO EXISTING, WHICHEVER IS GREATER.

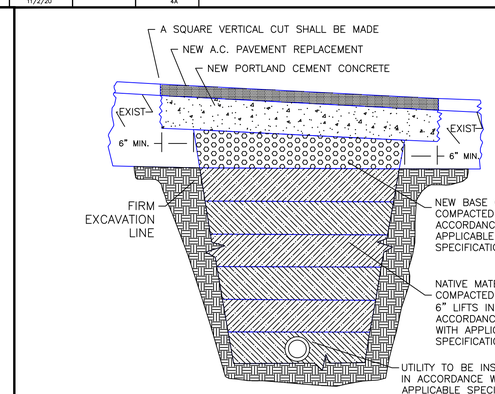
SCALE: NOT TO SCALE

8/11/11 — DATE APPROVED:

André P. Brackin — DEPARTMENT OF TRANSPORTATION

Utility Trench Repair Detail
Asphalt Pavement
Standard Drawing

REVISION DATE: 11/10/04 | FILE NAME: SD_4-20



NOTES

1. THIS DETAIL MAY BE USED FOR PAVEMENT CUT LESS THAN 200 SQ. FT.
2. EXISTING PAVEMENT MAY BE ROUGH CUT INITIALLY IN CONJUNCTION WITH TRENCHING.
3. A SQUARE. VERTICAL CUT SHALL BE MADE IN THE EXISTING A.C. PAVEMENT AFTER PLACEMENT OF BACKFILL AND PRIOR TO PAVEMENT REPLACEMENT.
4. THICKNESS OF NEW A.C. PAVEMENT REPLACEMENT SHALL MATCH EXISTING.
5. THICKNESS OF PORTLAND CEMENT CONCRETE SHALL BE A MINIMUM OF 6" WITH A 4000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
6. THICKNESS OF NEW BASE COURSE SHALL BE A MINIMUM OF 6" WHEN THE EXISTING BASE COURSE EXCEEDS 12" IN DEPTH. STREETS WITH LESS THAN 12" OF EXISTING BASE COURSE REQUIRE NO NEW BASE COURSE.

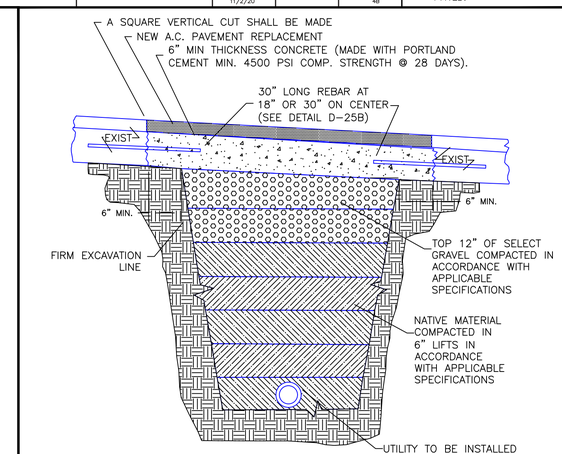
SCALE: NOT TO SCALE

8/11/11 — DATE APPROVED:

André P. Brackin — DEPARTMENT OF TRANSPORTATION

Utility Trench Repair Detail
Newly Overlayed Pavement
Standard Drawing

REVISION DATE: 11/10/04 | FILE NAME: SD_4-21



NOTES

1. EXISTING PAVEMENT MAY BE ROUGH CUT INITIALLY IN CONJUNCTION WITH TRENCHING.
2. A SQUARE, VERTICAL CUT SHALL BE MADE IN THE EXISTING A.C. PAVEMENT AFTER PLACEMENT OF BACKFILL AND PRIOR TO PAVEMENT REPLACEMENT.
3. THICKNESS OF CONCRETE AND A.C. SHALL BE EQUAL TO EXISTING CONCRETE AND A.C. THICKNESS WITH MINIMUM AS SHOWN.
4. DRILL AND EPOXY 30" LONG REBARS 15" DEEP INTO EXISTING CONCRETE PAVEMENT IN ACCORDANCE WITH DETAIL D-25B FOR TRANSVERSE AND LONGITUDINAL JOINTS.

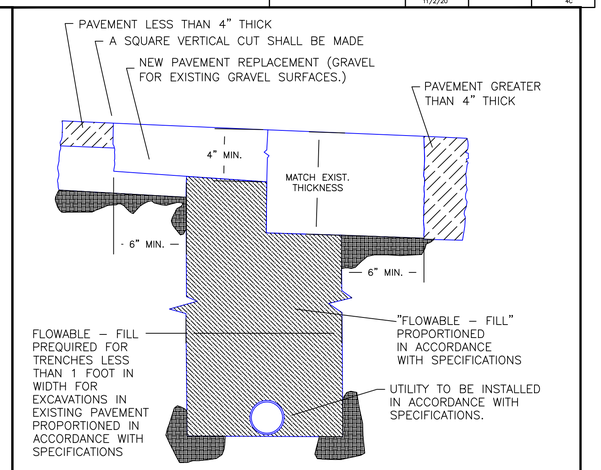
SCALE: NOT TO SCALE

8/11/11 — DATE APPROVED:

André P. Brackin — DEPARTMENT OF TRANSPORTATION

Utility Trench Repair Detail
Concrete Pavement
Standard Drawing

REVISION DATE: 11/10/04 | FILE NAME: SD_4-22



NOTES

1. EXISTING PAVEMENT MAY BE ROUGH CUT INITIALLY IN CONJUNCTION WITH TRENCHING.
2. A SQUARE. VERTICAL CUT SHALL BE MADE IN THE EXISTING A.C. PAVEMENT AFTER PLACEMENT OF BACKFILL AND PRIOR TO PAVEMENT REPLACEMENT.
3. THICKNESS OF NEW A.C. PAVEMENT REPLACEMENT SHALL MATCH EXISTING OR 4" MINIMUM, WHICHEVER IS GREATER.

SCALE: NOT TO SCALE

8/11/11 — DATE APPROVED:

André P. Brackin — DEPARTMENT OF TRANSPORTATION

Utility Trench Repair Detail
Flowable FIll
Standard Drawing

REVISION DATE: 11/10/04 | FILE NAME: SD_4-23

COLORADO 811 — KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

Colorado Springs Utilities
It's how we're all connected

COLORADO LICENSED — JEREMIAH SMITH — PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 31, 32, 33	R-18, R-19, Q-19, P-18, P-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

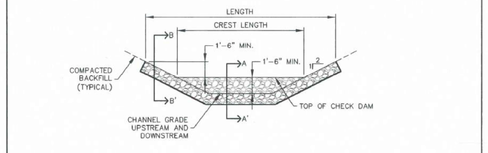
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 11 OF 60	SCALE: NTS		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

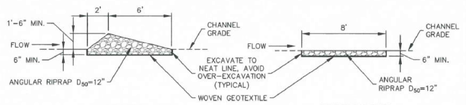
LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
UTILITY TRENCHING REPAIR DETAILS

DWG. NO: D-102

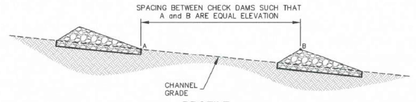
FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-C3D-CSU.dwg LAYOUT NAME: D-102 PLOTTED: Wednesday, March 22, 2023 - 4:27pm USER: nwest



CHECK DAM ELEVATION VIEW



SECTION A-A' SECTION B-B'



PROFILE

INSTALLATION NOTES

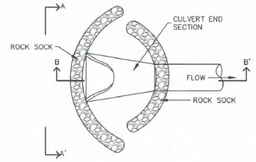
1. CHECK DAMS SHOULD BE INSTALLED BEFORE UPSTREAM LAND DISTURBING ACTIVITIES.
2. RIPRAP PAD SHOULD BE TRENCHED INTO GROUND BY A MINIMUM OF 6".

MAINTENANCE NOTES

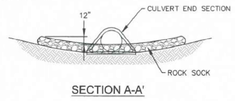
1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES ½ THE HEIGHT OF THE CHECK DAM CREST.
3. CHECK DAMS MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA AFTER CHECK DAMS ARE REMOVED IF REMOVAL IS REQUIRED.

CD

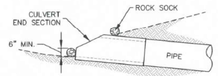
STORMWATER ENTERPRISE — CHECK DAM
APPROVED: CMENT MANAGER
ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-CD



CULVERT INLET PROTECTION PLAN



SECTION A-A'



SECTION B-B'

INSTALLATION NOTES

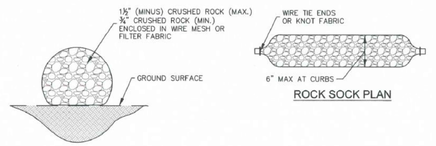
1. SEE ROCK SOCK DETAIL.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT UPSTREAM OF THE CULVERT SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS ½ HEIGHT OF THE ROCK SOCK.
3. CULVERT INLET PROTECTION SHALL REMAIN UNTIL THE UPSTREAM AREA IS PERMANENTLY STABILIZED.

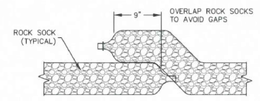
CIP

STORMWATER ENTERPRISE — CULVERT INLET PROTECTION
APPROVED: CMENT MANAGER
ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-CIP



ROCK SOCK SECTION

ROCK SOCK PLAN



ROCK SOCK OVERLAP

GRADATION TABLE

	MASS PERCENT PASSING SQUARE MESH SIEVES
	No. 4
2"	100
1½"	90–100
1"	20–55
¾"	0–15
⅜"	0–5

MATCHES SPECIFICATIONS FOR No. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M-43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES

INSTALLATION NOTES

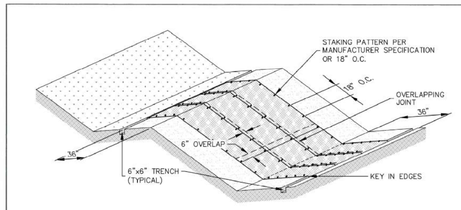
1. CRUSHED ROCK SHALL BE BETWEEN MAX. 1½" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET AND MIN. ¾" CRUSHED ROCK.
2. WIRE MESH SHALL HAVE OPENINGS SMALLER THAN THE SMALLEST SIZE ROCK.
3. WIRE MESH SHALL BE SECURED USING 'HOG RINGS' OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2' CENTERS ON ENDS OF SOCKS.

MAINTENANCE NOTES

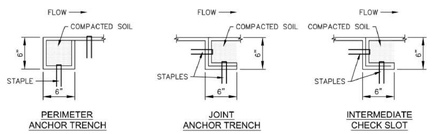
1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ROCK SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED OR DAMAGED BEYOND REPAIR.
3. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN THE DEPTH REACHES ½ OF THE HEIGHT OF THE ROCK SOCK.
4. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL DISTURBED AREA IS STABILIZED.
5. PERMANENTLY STABILIZE AREA AFTER ROCK SOCKS HAVE BEEN REMOVED.

RS

STORMWATER ENTERPRISE — ROCK SOCK
APPROVED: CMENT MANAGER
ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-RS



EROSION CONTROL BLANKET



INSTALLATION NOTES

1. 100% NATURAL AND BIODEGRADABLE MATERIALS ARE REQUIRED FOR EROSION CONTROL BLANKETS. TRM PRODUCTS MAY ME USED WHERE APPROPRIATE AS DESIGNATED BY THE ENGINEER.
2. IN AREAS WHERE EROSION CONTROL BLANKETS ARE SHOWN ON THE PLANS, THE PERMITTEE SHALL PLACE TOPSOIL AND PERFORM FINAL GRADING, SURFACE PREPARATION, AND SEEDING AND MULCHING. SUBGRADE SHALL BE SMOOTH AND MOIST PRIOR TO EROSION CONTROL BLANKET INSTALLATION, AND THE EROSION CONTROL BLANKET SHALL BE IN FULL CONTACT WITH THE SUBGRADE. NO GAPS OR VOIDS SHALL EXIST UNDER THE BLANKET.
3. PERIMETER ANCHOR TRENCH SHALL BE USED ALONG THE OUTSIDE PERIMETER OF ALL BLANKET AREAS.
4. JOINT ANCHOR TRENCH SHALL BE USED TO JOIN ROLLS OF EROSION CONTROL BLANKETS TOGETHER (LONGITUDINALLY AND TRANSVERSELY) FOR ALL EROSION CONTROL BLANKETS.
5. INTERMEDIATE CHECK SLOT OR STAPLE CHECK SHALL BE INSTALLED EVERY 15' DOWN SLOPES. IN DRAINAGEWAYS, INSTALL CHECK SLOTS EVERY 25' PERPENDICULAR TO FLOW DIRECTION.
6. OVERLAPPING JOINT DETAIL SHALL BE USED TO JOIN ROLLS OF EROSION CONTROL BLANKETS TOGETHER FOR EROSION CONTROL BLANKETS ON SLOPES.
7. MATERIAL SPECIFICATIONS OF EROSION CONTROL BLANKETS SHALL CONFORM TO TABLE ECB-1.
8. ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING EROSION CONTROL BLANKETS SHALL BE RESEEDED AND MULCHED.
9. STRAW EROSION CONTROL BLANKETS SHALL NOT BE USED WITHIN STREAMS AND DRAINAGE CHANNELS.
10. COMPACT ALL TRENCHES.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. EROSION CONTROL BLANKETS SHALL BE LEFT IN PLACE TO EVENTUALLY BIODEGRADE. TRM MUST BE REMOVED AT THE DISCRETION OF THE GEC INSPECTOR.
3. ANY EROSION CONTROL BLANKET PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE REPAIRED OR REINSTALLED. ANY SUBGRADE AREAS BELOW GEOTEXTILE THAT HAVE ERODED TO CREATE A VOID UNDER THE BLANKET, OR THAT REMAIN DEVOID OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED AND THE EROSION CONTROL BLANKET REINSTALLED.

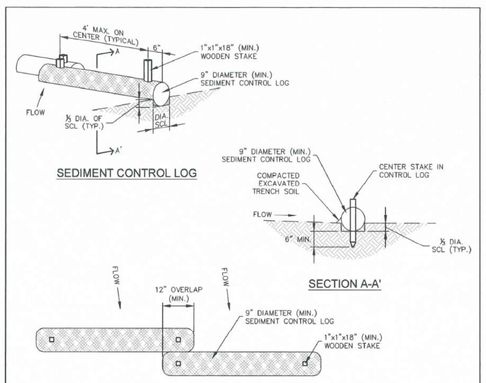
TABLE ECB-1, EROSION CONTROL BLANKET MATERIAL SPECIFICATIONS

TYPE	COCONUT CONTENT	STRAW CONTENT	EXCELSIOR CONTENT	RECOMMENDED NETTING
STRAW	–	100%	–	DOUBLE/ NATURAL
STRAW-COCONUT	30% MIN.	70% MAX.	–	DOUBLE/ NATURAL
COCONUT	100%	–	–	DOUBLE/ NATURAL
EXCELSIOR	–	–	100%	DOUBLE/ NATURAL

ECB

STORMWATER ENTERPRISE — EROSION CONTROL BLANKET
APPROVED: CMENT MANAGER
ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-ECB-1

STORMWATER ENTERPRISE — EROSION CONTROL BLANKET
APPROVED: CMENT MANAGER
ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-ECB-2



SEDIMENT CONTROL LOG

SECTION A-A'

SEDIMENT CONTROL LOG JOINTS

INSTALLATION NOTES

1. ALL SEDIMENT CONTROL LOGS MUST BE EMBEDDED TO ½ OF THE HEIGHT OF THE LOG.
2. LARGER DIAMETER SEDIMENT CONTROL LOGS NEED TO BE EMBEDDED DEEPER.
3. PLACE SEDIMENT CONTROL LOG AGAINST SIDEWALK OR BACK OF CURB WHEN ADJACENT TO THESE FEATURES.
4. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BR FREE FROM ANY NOXIOUS WEED SEEDS OF DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.
5. IF USING AS SLOPE PROTECTION, INSTALL SEDIMENT CONTROL LOGS ALONG THE CONTOUR.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.
3. PERMANENTLY STABILIZE AREA AFTER SEDIMENT CONTROL LOGS HAVE BEEN REMOVED.

SCL

STORMWATER ENTERPRISE — SEDIMENT CONTROL LOGS
APPROVED: CMENT MANAGER
ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-SCL

COLORADO 811 — KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

Colorado Springs Utilities — It's how we're all connected

COLORADO LICENSED — JEREMIAH SMITH — PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS		BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23		JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22		JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22		JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 31, 32, 33	R-18, R-19, Q-19, P-18, P-19

SYSTEM NAME: 150P

SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN | PHONE: (719) 668-8196
PROJECT MANAGER: MELISSA LINGO | PHONE: (719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD | PHONE: (719) 668-3675
SHEET NO. 12 OF 60 | SCALE: NTS
PATRICK ENGINEERING TEAM
DWN BY: NORM WEST | CHKD. BY: SETH BROWN | APPD. BY: JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
BEST MANAGEMENT PRACTICES DETAILS - 1

DWG. NO: D-103

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-CSD-CSSU.dwg LAYOUT NAME: D-103 PLOTTED: Wednesday, March 22, 2023 - 4:28pm USER: nwest

SEEDING & MULCHING

ALL SOIL TESTING, SOILS AMENDMENT AND FERTILIZER DOCUMENTATION, AND SEED LOAD AND BAG TICKETS MUST BE ADDED TO THE CSWMP.

SOIL PREPARATION

1. IN AREAS TO BE SEEDED, THE UPPER 6 INCHES OF THE SOIL MUST NOT BE HEAVILY COMPACTED, AND SHOULD BE IN FRIABLE CONDITION. LESS THAN 85% STANDARD PROCTOR DENSITY IS ACCEPTABLE. AREAS OF COMPACTION OR GENERAL CONSTRUCTION ACTIVITY MUST BE SCARIFIED TO A DEPTH OF 6 TO 12 INCHES PRIOR TO SPREADING TOPSOIL TO BREAK UP COMPACTED LAYERS AND PROVIDE A BLENDING ZONE BETWEEN DIFFERENT SOIL LAYERS.
2. AREAS TO BE PLANTED SHALL HAVE AT LEAST 4 INCHES OF TOPSOIL SUITABLE TO SUPPORT PLANT GROWTH.
3. THE CITY RECOMMENDS THAT EXISTING AND/OR IMPORTED TOPSOIL BE TESTED TO IDENTIFY SOIL DEFICIENCIES AND ANY SOIL AMENDMENTS NECESSARY TO ADDRESS THESE DEFICIENCIES. SOIL AMENDMENTS AND/OR FERTILIZERS SHOULD BE ADDED TO CORRECT TOPSOIL DEFICIENCIES BASED ON SOIL TESTING RESULTS.
4. TOPSOIL SHALL BE PROTECTED DURING THE CONSTRUCTION PERIOD TO RETAIN ITS STRUCTURE, AVOID COMPACTION, AND TO PREVENT EROSION AND CONTAMINATION. STRIPPED TOPSOIL MUST BE STORED IN AN AREA AWAY FROM MACHINERY AND CONSTRUCTION OPERATIONS, AND CARE MUST BE TAKEN TO PROTECT THE TOPSOIL AS A VALUABLE COMMODITY. TOPSOIL MUST NOT BE STRIPPED DURING UNDESIRABLE WORKING CONDITIONS (E.G. DURING WET WEATHER OR WHEN SOILS ARE SATURATED). TOPSOIL SHALL NOT BE STORED IN SWALES OR IN AREAS WITH POOR DRAINAGE.

SEEDING

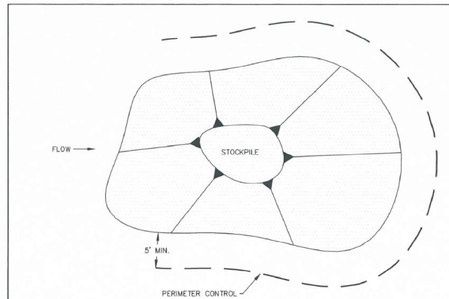
1. ALLOWABLE SEED MIXES ARE INCLUDED IN THE CITY OF COLORADO SPRINGS STORMWATER CONSTRUCTION MANUAL. ALTERNATIVE SEED MIXES ARE ACCEPTABLE IF INCLUDED IN AN APPROVED LANDSCAPING PLAN.
2. SEED SHOULD BE DRILL-SEEDED WHENEVER POSSIBLE
   - SEED DEPTH MUST BE ¼ TO ½ INCHES WHEN DRILL-SEEDING IS USED.
3. BROADCAST SEEDING OR HYDRO-SEEDING WITH TACKIFIER MAY BE SUBSTITUTED ON SLOPES STEEPER THAN 3:1 OR ON OTHER AREAS NOT PRACTICAL TO DRILL SEED.
   - SEEDING RATES MUST BE DOUBLED FOR BROADCAST SEEDING OR INCREASED BY 50% IF USING A BRILLION DRILL OR HYDRO-SEEDING.
   - BROADCAST SEEDING MUST BE LIGHTLY HAND-RAKED INTO THE SOIL

MULCHING

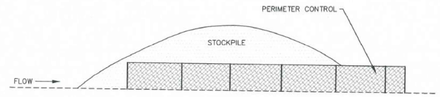
1. MULCHING SHOULD BE COMPLETED AS SOON AS PRACTICABLE AFTER SEEDING, HOWEVER PLANTED AREAS MUST BE MULCHED NO LATER THAN 14 DAYS AFTER PLANTING.
2. MULCHING REQUIREMENTS INCLUDE:
   - HAY OR STRAW MULCH
     - ONLY CERTIFIED WEED-FREE AND CERTIFIED SEED-FREE MULCH MAY BE USED. MULCH MUST BE APPLIED AT 2 TONS/ACRE AND ADEQUATELY SECURED BY CRIMPING AND/OR TACKIFIER.
     - CRIMPING MUST NOT BE USED ON SLOPES GREATER THAN 3:1 AND MULCH FIBERS MUST BE TUCKED INTO THE SOIL TO A DEPTH OF 3 TO 4 INCHES.
     - TACKIFIER MUST BE USED IN PLACE OF CRIMPING ON SLOPES STEEPER THAN 3:1.
   - HYDRAULIC MULCHING
     - HYDRAULIC MULCHING IS AN OPTION ON STEEP SLOPES OR WHERE ACCESS IS LIMITED.
     - IF HYDRO-SEEDING IS USED, MULCHING MUST BE APPLIED AS A SEPARATE, SECOND OPERATION.
     - WOOD CELLULOSE FIBERS MIXED WITH WATER MUST BE APPLIED AT A RATE OF 2,000 TO 2,500 POUNDS/ACRE, AND TACKIFIER MUST BE APPLIED AT A RATE OF 100 POUNDS/ACRE.
   - EROSION CONTROL BLANKET
     - EROSION CONTROL BLANKET MAY BE USED IN PLACE OF TRADITIONAL MULCHING METHODS.

SM

STORMWATER ENTERPRISE	SEEDING & MULCHING		
APPROVED: CMENT MANAGER			
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-SM	



STOCKPILE PROTECTION PLAN



STOCKPILE PROTECTION ELEVATION

INSTALLATION NOTES

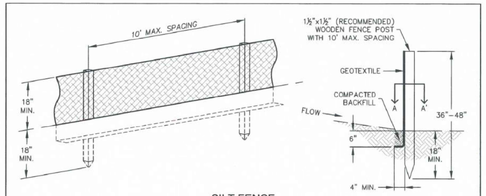
1. INSTALL PERIMETER CONTROL AROUND STOCKPILE ON DOWNGRADIENT SIDE. PERIMETER CONTROL MUST BE SUITABLE TO SITE CONDITIONS AND INSTALLED ACCORDING TO THE RELEVANT DETAIL.
2. FOR STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE, WHERE OTHER DOWNGRADIENT CONTROLS INCLUDING PERIMETER CONTROL ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

MAINTENANCE NOTES

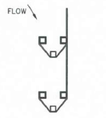
1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. IF PERIMETER CONTROLS MUST BE MOVED TO ACCESS STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORK DAY.
3. ACCUMULATED SEDIMENT MUST BE REMOVED ACCORDING TO PERIMETER CONTROL DETAIL.

SP

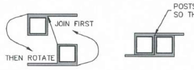
STORMWATER ENTERPRISE	STOCKPILE PROTECTION		
APPROVED: CMENT MANAGER			
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-SP	



SILT FENCE



J-HOOK INSTALLATION



SECTION A-A'

INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED ON A FLAT SURFACE 2'-5' AWAY FROM TOE OF THE SLOPE TO ALLOW FOR PONDING AND DEPOSITION.
2. COMPACT THE TRENCH USING A JUMPING JACK OR WHEEL ROLLING TO THE POINT THAT THE FENCE RESISTS BEING PULLED OUT OF THE GROUND BY HAND.
3. SILT FENCE SHALL BE TAUT WITH NO SAGS AFTER IT HAS BEEN ANCHORED.
4. FABRIC SHALL BE ATTACHED TO POSTS WITH 1" HEAVY DUTY STAPLES OR 1" NAILS. THESE SHOULD BE PLACED VERTICALLY DOWN THE POST, 3" APART.
5. THE PREFERRED INSTALLATION METHOD USES A TRENCHER OR SILT FENCE INSTALLATION DEVICE.
6. INSTALL SILT FENCE ALONG THE CONTOUR OF THE SLOPES OR IN A MANNER TO AVOID CREATING CONCENTRATED FLOW (SUCH AS A "J-HOOK" INSTALLATION).

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES ½ OF THE DESIGN HEIGHT OF THE SILT FENCE.
3. SILT FENCE MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA AFTER SILT FENCE IS REMOVED.

SF

STORMWATER ENTERPRISE	SILT FENCE		
APPROVED: CMENT MANAGER			
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-SF	

INTERIM RELEASE: CLSM (to the City Standard Specifications Manual)

206 Backfill of Utility Trenches using Controlled Low Strength Materials (CLSM)

UTILITY CUT, BACKFILL AND PATCHING

1 DESCRIPTION OF WORK

This work shall consist of the excavation and rapid backfill of trenches for the installation or repair of utility and underground features. The work also includes utilizing temporary pavement patching materials, and final permanent pavement surfaces. The work requires the use of removable, controlled low-strength materials (CLSM) for the backfill material, as an alternative to traditional compacted soil, for trenches and cuts too small for traditional soil compaction and safe human entry for testing. Various temporary pavement materials may also be utilized, prior to permanent pavement repairs. The use of traditional compacted backfill (for installation and repair of utilities) remains an acceptable method of backfill. The use of CLSM provides the advantage of being a self-compacting material.

1A Description of removable, flowable, controlled low strength materials CLSM

The term CLSM used in this Section shall mean the same as Removable CLSM or flowable backfill. This material is covered in detail due to the many time saving and engineering benefits of this type of backfill material. CLSM does not need compacting, or moisture density compaction testing. Only a few physical tests of the CLSM properties are needed to assure durability and future removability with light excavating equipment. A low strength is desired so that surrounding utilities or structures will be accessible without causing damage if the CLSM must be removed in the future. Air entrainment is required to prevent damage and heave displacement of trench patches due to freeze-thaw damage.

In addition, CLSM may be used for other applications apart from trench or street cut backfill. These include filling voids due to pipe abandonment or undercutting of excavation in caving or normal soils. CLSM offers quick restoration of the trench and improving other subgrade conditions for roadway or structure support in a rapid time frame without the need for traditional soil backfill testing requirements or when a quick strength is needed to support upper layers. These benefits may outweigh the extra costs vs. using traditional methods that require compaction and testing.

Other applications include: backfilling behind retaining walls and abutments, filling void areas including pipe abandonment, annular spaces, undercut areas and other approved void filling

applications. Other suitable applications include structural support for utilities and replacement of unstable subgrade during pavement repairs.

Utility types that can utilize CLSM include: conduits or pipes for electrical, wired or fiber optic communications, traffic signal or other utilities such as gas and water lines, sanitary and storm sewer lines, and other types of utilities under existing pavements or ground surfaces to be built upon or improved later.

1B Objectives for Required Use of CLSM

The objectives of requiring the use of the CLSM specified below, instead of reusing excavated soils, is to provide a self-leveling, frost heave-resistant, non-settling, controlled low-strength material (defined by American Concrete Institute in ACI 229 as a CLSM), that does not normally require compactive effort and compaction testing. Traditional use of compacted soil or aggregate materials for backfill shall require **CITY** approval and testing for acceptance.

1C Requirements for CLSM – Flow-Fill or Flashfill

This ITEM further specifies two distinct CLSM material products: The Flashfill products will allow trench backfill, temporary or permanent pavement restoration and traffic access to occur more quickly than Flow-Fill. The term 'CLSM' in this Section shall mean either or both.

A **high slump** is required to aid in the self-leveling and void filling objective. The visual consistency may appear to range in appearance from thin batter or mud, to thick water. It must be foremost removable with light machinery in the future, and also quickly stable to support paving operations and traffic.

Minimum air contents are required in the top 4 feet of CLSM fill to limit permanent frost heave. This air content requirement should be used for the entire depth, to aid in the ability to remove or excavate CLSM in the future. The air content requirement may be forbidden by some utility applications, such as for thrust blocks or for pipe bedding normally used for lateral support of pressurized pipes.

A **Removability Modulus** (RE) is specified at a maximum 1.5, and is based on compressive strength and unit weight of the CLSM Backfill. Refer to section 2C

2 CLSM MATERIALS

2A Flow-Fill

Flow-Fill shall consist of a controlled low-strength, self-leveling concrete material composed of various combinations of cement, fly ash, aggregates, water, chemical admixtures and/or cellular foam for air-entrainment. Generally, the **CONTRACTOR** may place Flow-Fill in approximate 3 feet thick layers, allow bleed water to rise and divert away from placement before another layer may be added. Refer to Section 3 for more information.

The Flow-Fill shall be limited to a maximum Removability Modulus (RE, as described in section 2C) of 1.5 to ensure ability to excavate in the future. Slumps of less than 7 inches will not be permitted for placement, since the flowability to fill voids and avoid future settlement is impaired, and strengths may increase beyond specified removability limits.

The **CONTRACTOR** shall submit a mix design for approval by the **CITY**, prior to placement. The mix design shall be supported by laboratory test data verifying compliance with air content, slump, strength and removability (RE) requirements.

TABLE 2A

Flow-Fill Property	Flow-Fill Specification
Air Content, ASTM C231	15% -- 25%
Compressive Strength, ASTM D4832	50psi – 150psi at 28 days
Slump, ASTM C143	7" – 10"
Removability Modulus, RE	1.5 Maximum

*All other requirements for Flow-Fill shall meet CDOT Section 206 for CLSM.

2B Flashfill

Flashfill shall consist of a controlled low-strength, self-leveling cementitious material composed of various combinations of fly ash, water, chemical admixtures and/or cellular foam for air-entrainment. No aggregate or sand is usually needed. It shall have a minimum specified air content to provide suitable resistance to frost-heave. Flashfill may generally be placed without lift thickness limits.

Higher strengths may be permitted over Flow-Fill; however, the Flashfill shall still be limited to a maximum Removability Modulus (RE) of 1.5. Slumps of less than 8 inches or spreads of less than 8 inches will not be permitted for placement, since the flowability to fill voids and avoid future settlement is impaired, and strengths may increase beyond removability limits.

The **CONTRACTOR** shall submit a mix design for approval by the **CITY**, prior to placement. The mix design shall be supported by laboratory test data verifying compliance with air content, slump, strength and removability (RE) requirements.

TABLE 2B

Flashfill Property	Flashfill Specification
Air Content, ASTM C231, or by Section 2D volumetric calculations (recommended)	15% Minimum
Compressive Strength, ASTM D4832	100psi – 300psi at 28 days
Slump, ASTM C143 (one lift, no rodding)	8" – 11"
Spread, ASTM D6103 (recommended)	8" – 12", or greater
Removability Modulus, RE	1.5 Maximum

*All other requirements for Flashfill shall meet CDOT Section 206 for CLSM.

2C Removability Modulus

The Removability Modulus* ,RE , is a value calculated by

$$RE = \frac{W^{1.5} \times 104 \times C^{0.5}}{10^6}$$

where: W = in-situ unit weight (pcf) and C = 28-day compressive strength

*RE was developed & is used by Hamilton County, Ohio; per the NCHRP #597 CLSM Report. A lower RE means CLSM is easier to excavate or remove.

Some examples of RE based on strength and unit weights are shown below:

TABLE 2C

Removability Modulus (RE)

Compressive strength, psi [C]	Unit Weight, pcf [W]										
	50	60	70	80	90	100	110	120	130	140	150
25	0.18	0.24	0.30	0.37	0.44	0.52	0.60	0.68	0.77	0.86	0.96
50	0.26	0.34	0.43	0.53	0.63	0.74	0.85	0.97	1.09	1.22	1.35
75	0.32	0.42	0.53	0.64	0.77	0.90	1.04	1.18	1.33	1.49	1.65
100	0.37	0.48	0.61	0.74	0.89	1.04	1.20	1.37	1.54	1.72	1.91
125	0.41	0.54	0.68	0.83	0.99	1.16	1.34	1.53	1.72	1.93	2.14
150	0.45	0.59	0.75	0.91	1.09	1.27	1.47	1.67	1.89	2.11	2.34
175	0.49	0.64	0.81	0.98	1.17	1.38	1.59	1.81	2.04	2.28	2.53
200	0.52	0.68	0.86	1.05	1.26	1.47	1.70	1.93	2.18	2.44	2.70

RE less than or equal to 1.50 indicates Removable

1.70 Shading indicates Not Readily Removable

2D Air Content Volumetric Calculation

Air content can be calculated as follows (using wet unit weights before and after foaming or entraining air):

Air Content = (Unit Weight not Air-Entrained – Unit Weight Air-Entrained) x 100%
Unit Weight not Air-Entrained

2E Flow Consistency of CLSM

Flow shall be measured by ASTM D6103, which utilizes a moistened 3" diameter, 6" high open-ended cylinder, filled with the flashfill. When the cylinder is lifted, the resulting "pancake" is measured at its longest and shortest dimensions and averaged.

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 – Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_#FC-C3D-CSU.dwg LAYOUT NAME: D-104 PLOTTED: Wednesday, March 22, 2023 – 4:28pm USER: rwest

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

Colorado Springs Utilities
It's how we're all connected

COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 31, 32, 33	R-18, R-19, Q-19, P-18, P-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig	
SYSTEM MOP:	145 psig	
N/A		
SYSTEM MAOP:		
SYSTEM MOP:		

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN		PHONE:	(719) 668-8196
PROJECT MANAGER: MELISSA LINGO		PHONE:	(719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD		PHONE:	(719) 668-3675
SHEET NO. 13 OF 60	SCALE: NTS		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
BEST MANAGEMENT PRACTICES DETAILS - 2 AND CLSM SPECIFICATIONS

DWG. NO: D-104

MATERIAL CONSTITUENTS

2F Cement

Cement shall meet the standard chemical requirements of Type II or Type IP, ASTM C150 or ASTM C595, respectively.

2G Fly Ash

Fly ash shall meet the requirements of ASTM C618 Type C or Type F. Fly ash not meeting the requirements of ASTM C618 may be used if prior testing indicates acceptable, consistent results for strength and air content.

2H Water

Potable water or reasonably clean and free of chemicals injurious to the final product are to be used.

2I Chemical Admixtures

Air-entraining admixtures shall conform to ASTM C260 requirements; other chemical admixtures shall conform to ASTM C494 requirements.

2J Foaming Agents

Foaming agents shall conform to ASTM C869 and C796, or as approved by the **CITY**.

2K Suitability of CLSM Constituents

The supplier shall have the required Beneficial Use Determination (BUD) from the CDPHE for the product they are supplying. Material Safety Data Sheets (MSDS) must be available for any cement, flyash or admixture component of the mixture upon request. Flowable Backfill shall be compatible with bedding materials, electrochemically and otherwise if used as a metal pipe backfill application. Thermal compatibility with plastic pipes should be considered for direct contact of the CLSM with the pipe; heat generation of the mix must not exceed the softening point of the pipe material.

2L CLSM Use Restrictions

CLSM products containing coal combustion residuals (CCR) (i.e. fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers) may not be placed below groundwater, or into permanent standing water, without the CONTRACTOR obtaining a

written waiver from the Colorado Department of Public Health & Environment's (CDPHE's) Hazardous Materials and Waste Management Division (HMWMD), and providing such waiver to the CITY for review / concurrence prior to placement.

The above noted use restriction with respect to groundwater and permanent standing water is not applicable if the CLSM product is being used in association with an emergency. An emergency is an occurrence involving a clear and imminent danger to human health or the environment, or similar occurrence demanding immediate attention, such as the restoration of a damaged utility, roadway, or storm water conveyance. If the emergency has subsided and sufficient time is available for planning (e.g., three weeks or more) the project is not considered an emergency with sole respect to CLSM placement.

Additionally, if a project involves the placement of CLSM on the land in non-roadway applications and the CLSM will contain 12,400 tons of CCR or more, the CONTRACTOR shall obtain written project specific approval from the CDPHE's HMWMD and provide such approval to the CITY for review / concurrence prior to placement. To obtain such approval, the CONTRACTOR shall adequately demonstrate that environmental releases to groundwater, surface water, soil and air are comparable to or lower than those from analogous products made without CCR, or that environmental releases to groundwater, surface water, soil and air will be at or below relevant regulatory and health-based benchmarks for human and ecological receptors during use.

2M Aggregates

The final blend of aggregates for CLSM, including rock, gravel or sand, shall conform to the following gradations:

TABLE 2L

Sieve Size	% Passing
1 inch (25 mm)	100
No. 200	0 to 10

When coarse aggregate is used, 100 percent shall pass the 1 inch sieve, and it shall comprise not more than 40 percent of the total aggregate content. Other aggregate products such as aggregate base, crushed rock, pea gravel, or reject sand which has no more than 20 percent passing the No. 200 sieve and is free of organic material and other deleterious substances, may

be accepted by the **CITY** if a flowable, workable mix can be produced without segregation of the aggregate.

3 TRENCH BACKFILL WITH CLSM

Except as otherwise provided or approved by the **CITY**, after the pipe or conduit is laid, trenches shall be backfilled with CLSM in the pipe zone as defined in the following table:

TABLE 3

Pipe or Conduit	Pipe Zone [1,2]
2-inch or less diameter	6 inches above the top of the pipe up to subgrade
Greater than 2-inch diameter, except vitrified clay pipe	12 inches above the top of the pipe up to subgrade
Vitrified clay pipe	24 inches above the top of the pipe up to subgrade

[1] The Utility Owner shall dictate any variance to these CLSM separation distances.
[2] Where depths of flashfill exceed 3 feet over water or wastewater mains please contact Colorado Springs Utilities for bedding depths.

CLSM should be well mixed and discharged directly from the truck into the space to be filled, or by other methods approved by the **CITY**. The mix may be placed part depth or full depth as conditions at the site and CLSM type dictate. When used as backfill in the pipe zone, care should be taken to prevent flotation or misalignment of the pipe by means of straps, soil anchors or other approved means of restraint. Material may be placed in stages with initially lesser flowability, to prevent movement or flotation of pipe. Refer to Section 2K for thermal compatibility when using CLSM directly against plastic pipe materials. CLSM shall not be placed when the trench bottom or walls are frozen or contain frozen materials.

Compaction of CLSM shall not be performed.

The maximum layer thickness for CLSM shall be determined by the Contractor. Additional layers shall not be placed until the backfill has lost sufficient moisture to be walked on without indenting more than 2 inches. Allow bleed water to rise and divert away from placement area before another layer may be added. Do not place CLSM on top of bleed water or on any water above the bearing layer. Any damage resulting from placing Flow-Fill in layers that are too thick

or from not allowing sufficient strength gain time between placement of layers shall be repaired at the **CONTRACTOR's** expense.

The maximum layer thickness for Flashfill is not restricted except to prevent flowing or running into undesired areas.

Contractor shall observe all other Construction Requirements as provided in CDOT Section 206 for placement of CLSM.

4 STREET SURFACING and PATCHING

Placement of pavement materials for vehicle traffic shall not be allowed until the removable CLSM backfill has cured 24 hours (Flow-Fill only) or achieved sufficient resistance to allow paving. CLSM (either type) should be subjected to standard proofroll criteria, or penetration resistance tests. CLSM should achieve a penetration resistance of at least 3.6 tsf (tons per square foot) (equivalent to 50 psi) using a hand-held soil penetrometer, typically pushed to ¼" depth, in accordance with the penetrometer manufacturer's instructions. Alternately, penetration resistance shall be considered achieved when a person weighing 100 pounds by use of their body weight as an axial load, cannot penetrate the CLSM backfill with the square cut end of a ½" diameter (#4) steel reinforcing bar.

4A Temporary Pavement Selection

Whenever permanent pavement patches are not constructed immediately following trench backfilling operations, temporary pavement patch construction consisting of:

- A minimum of 3 inches of hot mix asphalt (or approved warm mix if allowed) or cold plant mix asphalt on Flashfill or cured Flow-Fill CLSM , or
- A thickness of Flash-Patch equal to existing pavement thickness on CLSM, or
- Steel plates per **CITY** requirements on CLSM,

must be utilized to provide the required number of paved travel lanes. Sufficient excavation of backfill shall be done to allow the temporary surfacing to be level with surrounding pavement. Use of steel plates may be left in place for a short duration as approved by the **CITY**. Temporary pavement patches may be left in place for a maximum of 30 working days following completion of backfilling operations unless otherwise approved by the **CITY**.

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CLSM strengths, but are limited in thickness to the existing pavement thickness to allow removal.

- Flash-Patch usage on arterial roadways will require that **Small Aggregate topping** be used. Gradations shall meet ASTM C33 for size #9, and be crushed stone or natural gravels, with gradations requirements listed below:

TABLE 4B

Sieve	3/8"	#4	#8	#16	#50
% Passing	100	85 – 100	10 - 40	0 - 10	0 - 5

4C Temporary Pavement Patch Placement

Temporary asphalt should ideally be placed according to the Pikes Peak Region Asphalt Paving Specifications requirements. Any temporary asphalt pavement patch shall be placed and compacted and shall be maintained by the **CONTRACTOR** so that the patched surface and the surrounding area remain a single even (smooth) unbroken plane, suitable to handle the traffic, for the duration of Temporary Patch.

Flash-Patch usage on arterial roadways will require that the **Small Aggregate** shall be broadcast on and embedded into the surface, for increased skid-resistance. Aggregate application will occur on patches within 100 feet of approaching stop signs or signal lights on other city streets. This aggregate shall be applied at approximately 5 lb per SY of patch surface, before the Flash-Patch hardens. The **CONTRACTOR** shall be responsible to apply and embed the surface aggregate in a timely manner before set occurs.

The following **surface tolerance** for any temporary patches shall be observed. When a 10 foot straight edge is laid across the temporary patch parallel to the centerline of the street and in the direction transverse to the centerline, there shall be no more than a 3/4 inch rut, hump, or depression evident. Deteriorated temporary patches exhibiting ruts, humps, or depressions shall be repaired or replaced immediately. If the existing street exceeded the above tolerances prior to patching, then the temporary patch shall be equal to or better than the condition of the surrounding pavements.

Temporary patches with hot or cold mix asphalt may be **opened to traffic** after proper compaction and clean-up of the adjacent areas has occurred. Temporary patches of Flash-Patch may be opened to traffic usually within 1-1/2 hours after placement on arterial roadways, and usually within one hour on other streets.

4D Permanent Pavement Materials

Asphalt for replacement of Asphalt Pavement streets, shall be **HMA** (Hot Mix Asphalt), or **WMA** (Warm Mix Asphalt) if allowed by **CITY**, and shall meet the material requirements in the Pikes Peak Region Asphalt Paving Specifications for Grading S or SX with PG 64-22 binder, unless specified otherwise. Completion of the permanent patch in areas where an open graded surface course (SMA) exists shall include placement of a surface course to match the existing surface texture.

4E Permanent Pavement Construction

Prior to placing the permanent patch, the existing cuts made for trenches shall be properly prepared for final pavement patching.

Existing Asphalt Pavement shall be saw cut to a neat straight line and to a minimum 12 inches outside of the trench area. The **CITY** may require just the top lift be outside the trench edges. The resulting "T patch" edges shall not fall within existing wheel paths. Patches parallel to the direction of traffic and encompassing the wheel path shall extend to lane lines.

The **asphalt thickness** shall be the thicker of the existing depth, or the minimum depth of at least 4 inches.
A tack coat shall be applied to all edges to the existing freshly cut and/or approved well cleaned edges of asphalt pavement prior to placing new pavement.

Compaction of each lift shall be to a density of 94% (± 2%) of the maximum theoretical density of the approved Job Mix Formula, and conforming to the Pikes Peak Region Asphalt Paving Specifications.

The top of CLSM placed for temporary paving or for steel plates in section 4A shall be excavated to the top of subgrade/bottom of the final asphalt or concrete pavement level. The depth of excavation shall allow for the permanent pavement section to be equal to, or greater than, the existing section, or as otherwise required by the **CITY**.

Any improvements in the right-of-way or on private property disturbed or damaged during construction shall be replaced prior to placement of the permanent pavement patch. Damaged sections of concrete sidewalk shall be removed and replaced to the nearest expansion joint or score line. Damaged concrete curb and gutter shall be removed and replaced to the nearest contraction joint. Replacement of less than a standard length of curb and gutter will not be permitted. Integral curb, gutters, and/or sidewalk shall be replaced in their entirety.

The following **surface tolerance** for permanent pavement patch for asphalt, including any surface treatment before striping, shall be observed. The surface shall be thoroughly compacted, smooth, and free from ruts, humps, depressions, or irregularities. When a 10 foot straight-edge is laid across the permanent patch parallel to the centerline of the street and in a direction transverse to the centerline, the surface shall not vary more than 1/4 inch from the lower edge of the straight edge. Patches exhibiting deviations greater than 1/4 inch shall be replaced prior to acceptance of the patch. If the existing street exceeds the above tolerances, then the patch shall be equal or better than the condition of the surrounding pavement.

Patches shall also have a cross slope or cross section consistent with the design of the existing roadway.

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 31, 32, 33	R–18, R–19, Q–19, P–18, P–19

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

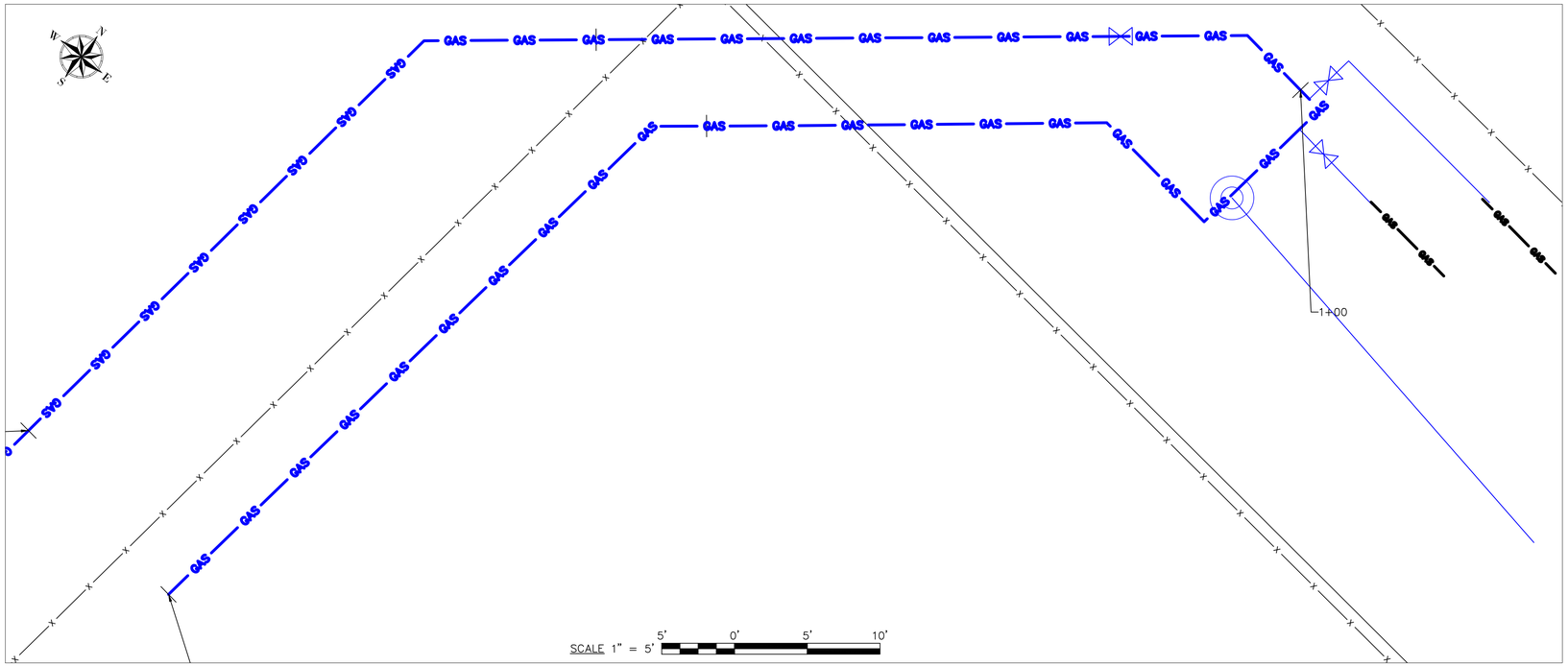
W/O #: 3747144
RELATED W/O #s: 3789816

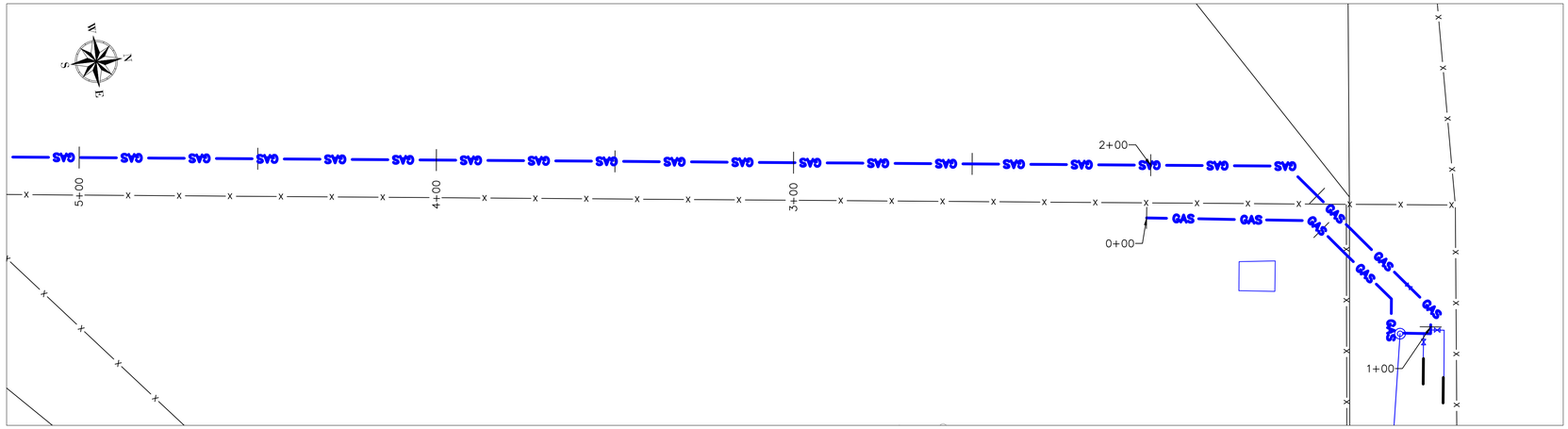
ENGINEER: SCOTT JENSEN PHONE: (719) 668–8196
PROJECT MANAGER: MELISSA LINGO PHONE: (719) 668–8794
CONSTRUCTION LEAD: JOSH RICHARD PHONE: (719) 668–3675
SHEET NO. 14 OF 60 SCALE: NTS
PATRICK ENGINEERING TEAM
DWN BY: NORM WEST CHKD. BY: SETH BROWN APPD. BY: JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
CLSM SPECIFICATIONS

DWG. NO: D-105

WELD & X-RAY (NDT) DOCUMENTATION





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Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
PROJ. NO. 22282.003

8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com

NO.	REVISIONS	BY:	DATE:	APPVD:
5	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
4	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
3	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
	N/A			

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTION 33	R-18, R-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	
DISTRIBUTION:	X
FEEDER:	
TRANS. BY DEF.	
TRANS v 20%	

W/O #: 3747144

RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
	PATRICK ENGINEERING TEAM		
SHEET NO. 15 OF 60	SCALE: AS NOTED		
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
WELD, X-RAY, NDT DOCUMENTATION
0+00 - 5+00

DWG. NO: **W-100**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-C3D-CSU.dwg LAYOUT NAME: W-100 PLOTTED: Wednesday, March 22, 2023 - 4:28pm USER: nwest

WELD & X-RAY DOCUMENTATION

SCALE 1" = 20' 20' 0' 20' 40'

COLORADO 811

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COLORADO LICENSED PROFESSIONAL ENGINEER — JEREMIAH SMITH — Jeremiah Matthew Smith 2023.03.24 16:47:06 -04'00'

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PROJ. NO. 22282.003

REVISIONS				
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 32, 33	R-19 & Q-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%:	☐

W/O #
3747144
RELATED W/O #s
3789816

ENGINEER: SCOTT JENSEN	PHONE: (719) 668-8196
PROJECT MANAGER: MELISSA LINGO	PHONE: (719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD	PHONE: (719) 668-3675
SHEET NO. 16 OF 60	SCALE: 1" = 20'-0"

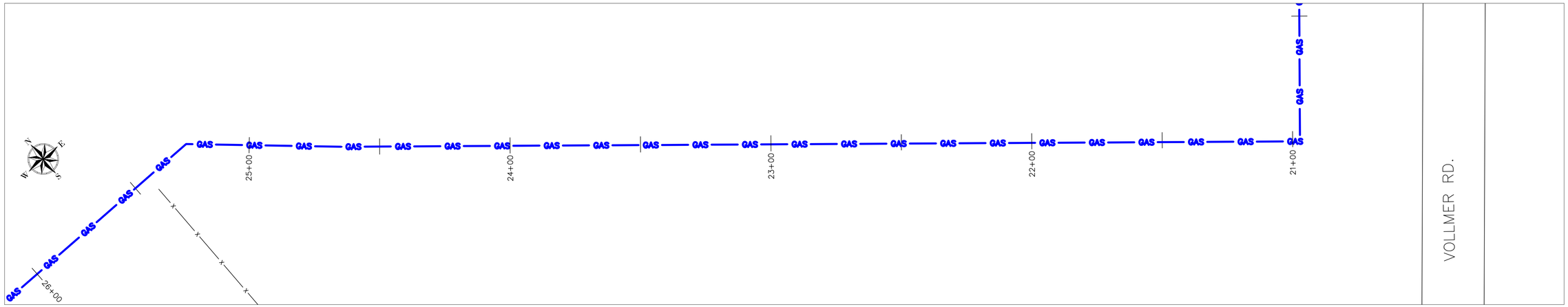
PATRICK ENGINEERING TEAM

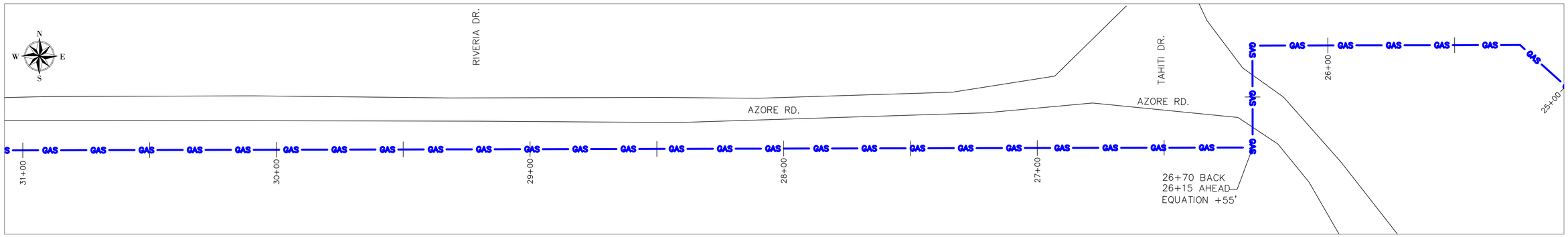
DWN BY: NORM WEST | CHKD. BY: SETH BROWN | APPD. BY: JEREMIAH SMITH

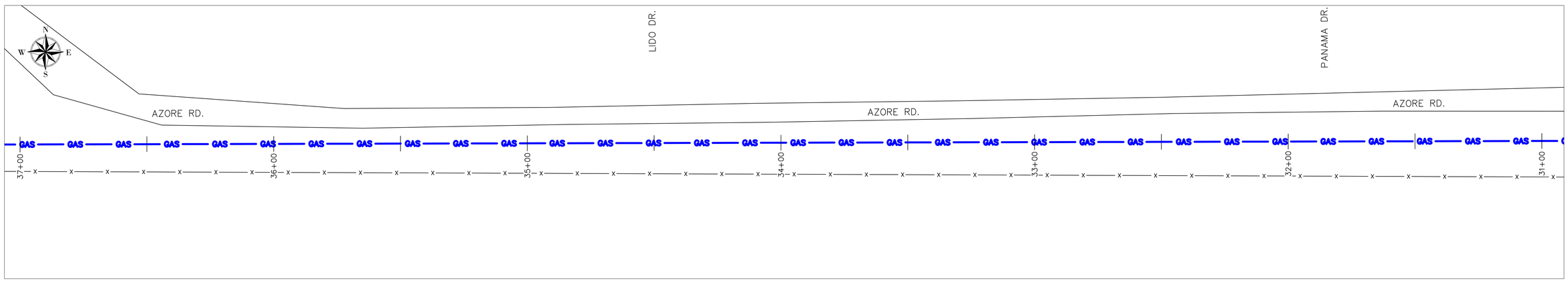
LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
WELD, X-RAY, NDT DOCUMENTATION
5+00 - 21+00

DWG. NO: **W-101**

WELD & X-RAY (NDT) DOCUMENTATION







SCALE 1" = 20' 20' 0' 20' 40'

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COLORADO LICENSED
JEREMIAH SMITH
PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

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8902 Vincennes Circle, Suite F
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TEL. (317) 217-1701
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NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTION 32	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig

N/A

SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	
DISTRIBUTION:	X
FEEDER:	
TRANS. BY DEF.	
TRANS v 20%	

W/O #: 3747144

RELATED W/O #s: 3789816

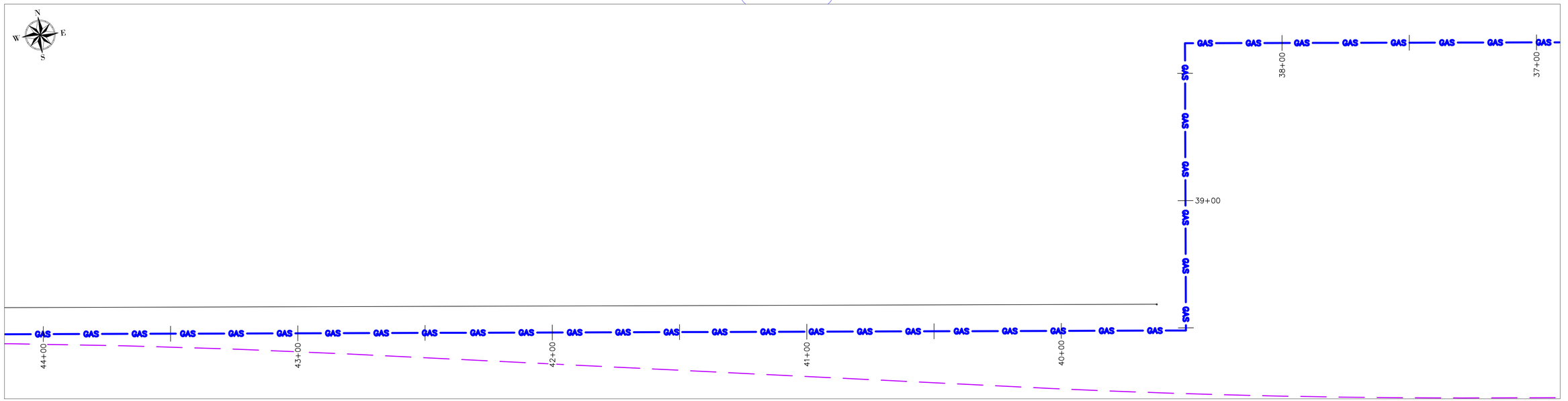
ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 17 OF 60	SCALE: 1" = 20'-0"		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

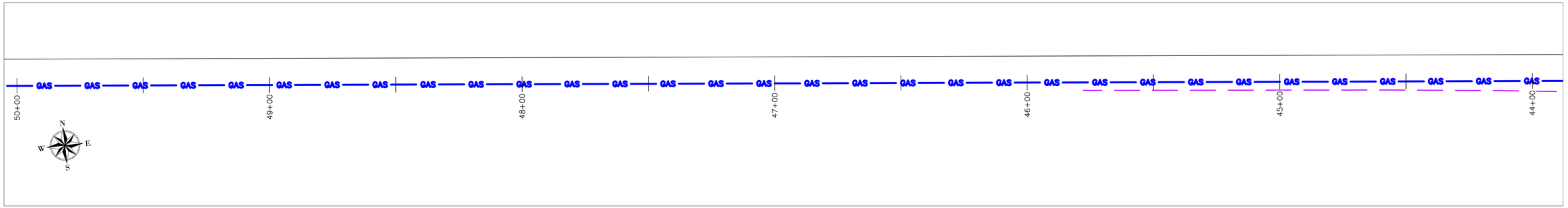
LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
WELD, X-RAY, NDT DOCUMENTATION
21+00 - 37+00

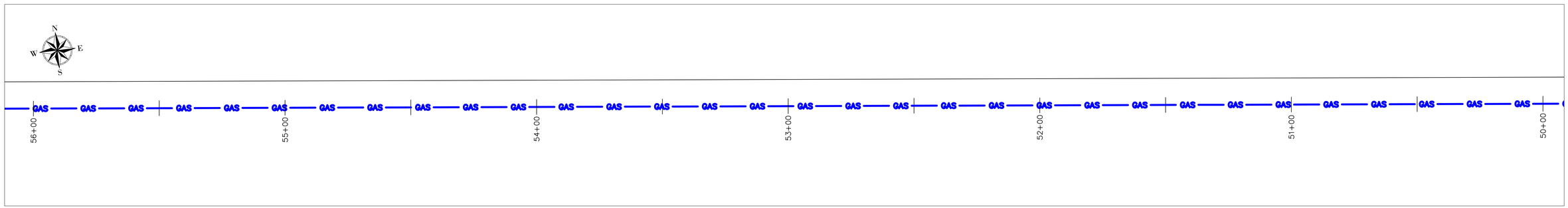
DWG. NO: **W-102**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-C3D-CSU.dwg LAYOUT NAME: W-102 PLOTTED: Wednesday, March 22, 2023 - 4:28pm USER: nwest

WELD & X-RAY (NDT) DOCUMENTATION







SCALE 1" = 20' 20' 0' 20' 40'

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
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PROJ. NO. 22282.003

REVISIONS				
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	REISSUED FOR CONSTRUCTION	NEW	3/06/23	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 32	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O # 3747144

RELATED W/O #s 3789816

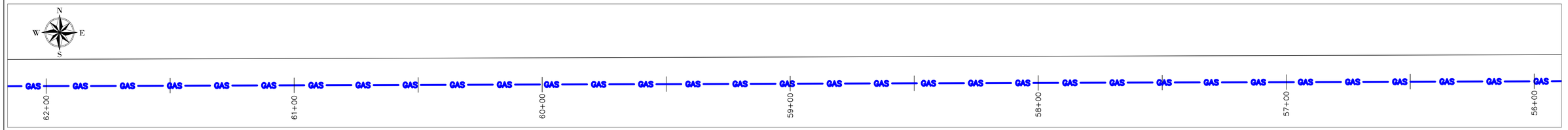
ENGINEER: SCOTT JENSEN		PHONE: (719) 668-8196
PROJECT MANAGER: MELISSA LINGO		PHONE: (719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD		PHONE: (719) 668-3675
SHEET NO. 18 OF 60	SCALE: 1" = 20'-0"	
PATRICK ENGINEERING TEAM		
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH

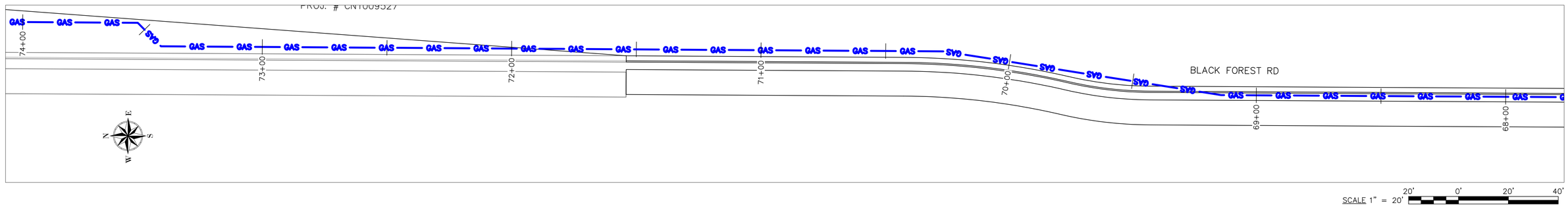
LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
WELD, X-RAY, NDT DOCUMENTATION
37+00 - 56+00

DWG. NO: **W-103**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-C3D-CSU.dwg LAYOUT NAME: W-103 PLOTTED: Wednesday, March 22, 2023 - 4:28pm USER: nwest

WELD & X-RAY (NDT) DOCUMENTATION





SCALE 1" = 20' 20' 0' 20' 40'

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-C3D-CSU.dwg LAYOUT NAME: W-104 PLOTTED: Wednesday, March 22, 2023 - 4:29pm USER: nwest

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COLORADO LICENSED JEREMIAH SMITH 10682 PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

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8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

REVISIONS				
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTION 32	P-19, Q-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20%: ☐

W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 19 OF 60	SCALE: 1" = 20'-0"		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
WELD, X-RAY, NDT DOCUMENTATION
56+00 - 74+00

DWG. NO: **W-104**

WELD & X-RAY (NDT) DOCUMENTATION

SCALE 1" = 20'

20' 0' 20' 40'

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JEREMIAH SMITH
PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06-04'00'

P.E. CERTIFICATION

PATRICK ENGINEERING

8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com

PROJ. NO. 22282.003

REVISIONS				
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 31, 32	P-19

SYSTEM NAME: 150P	
SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:	
HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%:	☐

W/O #
3747144
RELATED W/O #s
3789816

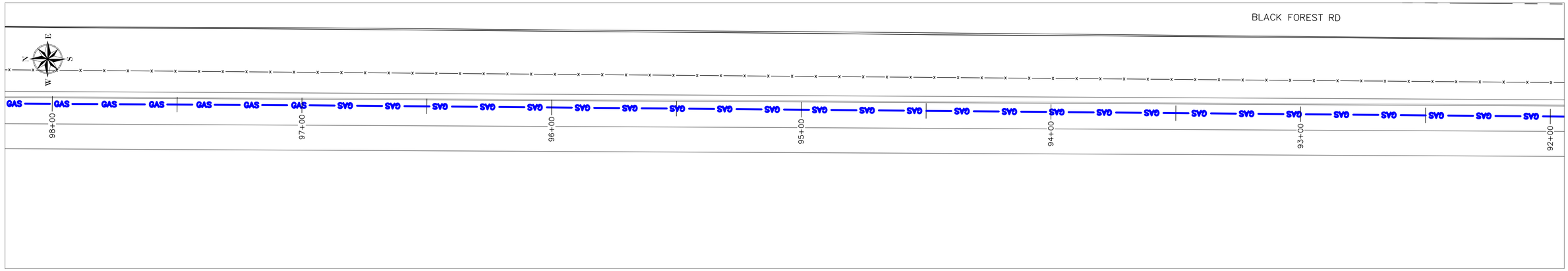
ENGINEER: SCOTT JENSEN		PHONE: (719) 668-8196
PROJECT MANAGER: MELISSA LINGO		PHONE: (719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD		PHONE: (719) 668-3675
SHEET NO. 20 OF 60	SCALE: 1" = 20'-0"	
PATRICK ENGINEERING TEAM		
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH

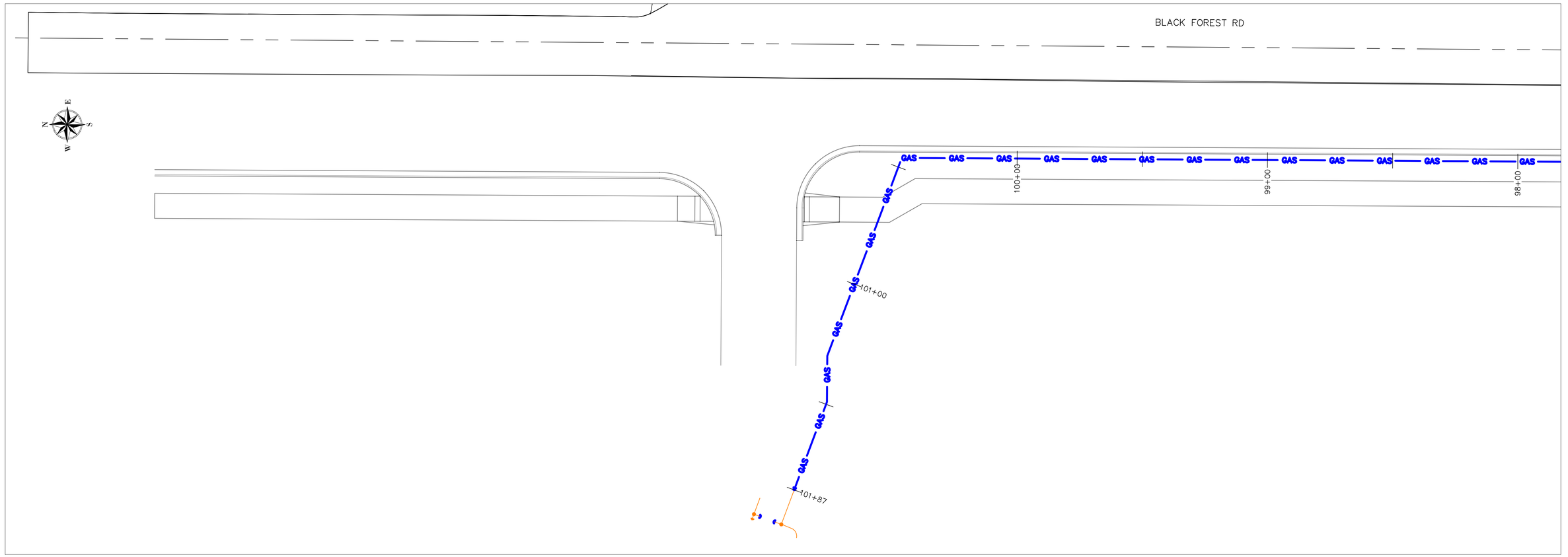
LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
WELD, X-RAY, NDT DOCUMENTATION
74+00 - 92+00

DWG. NO: **W-105**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-C3D-CSU.dwg LAYOUT NAME: W-105 PLOTTED: Wednesday, March 22, 2023 - 4:29pm USER: nwest

WELD & X-RAY (NDT) DOCUMENTATION





SCALE 1" = 20' 20' 0' 20' 40'

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
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NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTION 31	P-18, P-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	
DISTRIBUTION:	X
FEEDER:	
TRANS. BY DEF.	
TRANS v 20%	

W/O #: 3747144

RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 21 OF 60	SCALE: 1" = 20'-0"		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
WELD, X-RAY, NDT DOCUMENTATION
92+00 - 101+67

DWG. NO: **W-106**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-C3D-CSU.dwg LAYOUT NAME: W-106 PLOTTED: Wednesday, March 22, 2023 - 4:29pm USER: nwest

FITTINGS & VALVES LOG

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING
1	8,733		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE
2	1,530[2]		241-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE/ARO	ERW	FBE/ARO
3	52		220-647-920	20" ELBOW, 0.375 WT, STL, 45 DEG, 3R, WPHY 52, B16.9	FORGED	FBE
4	11		220-692-920	20" ELBOW, 0.375 WT, STL, 90 DEG, 3R, WPHY 52, B16.9	FORGED	FBE
5	1		215-796-920	REDUCER, WELD, WPHY52, CARBON STEEL, STD WALL, 20IN X 16IN NPS, B16.9	FORGED	FBE
6	40		240-365-910	10" PIPE, STL, 0.365" WT, API 5L-X52, FBE	ERW	FBE
7	40		240-154-238	2" PIPE, STL, 0.154" WT, X52, FBE, A105 SMLS	SMLS	FBE
8	1		229-692-910	10" ELBOW, 0.365 WT, STL, 90 DEG, 3R, WPHY 52, B16.6	FORGED	FBE
9	1		215-792-920	REDUCER, WELD, WPHY52, CARBON STEEL, STD WALL, 20IN X 12IN NPS, B16.9	FORGED	FBE
10	1		215-790-100	REDUCER, WELD, WPHY52, CARBON STEEL, STD WALL, 12IN X 10IN NPS, B16.9	FORGED	FBE
11	1		280-700-920	20" TEE, WELD,WPHY52, CARBON STEEL, STD WALL, B16.9	FORGED	FBE
12	1		254-960-055	BRANCH CONNECTION, WELDOLET, CS, CL3000, 20"x2", MSS-SP-97	FORGED	N/A
13	1		290-100-920	20" BALL VALVE, API 6D, CL150, VERTICAL GEAR OPERATED, FULL PORT, STD 0.375" WALL	FORGED	FBE
14	1		290-100-911	10" BALL VALVE, API 6D, CL150, VERTICAL GEAR OPERATED, FULL PORT, STD 0.365" WALL	FORGED	FBE
15	1		290-100-200	2" BALL VALVE, API 6D, , CL150, VERTICAL GEAR OPERATED, FULL PORT, STD 0.154" WALL	FORGED	FBE

NOTE:
1) 9,405' HAS BEEN ORDERED
2) 3,795' HAS BEEN ORDERED

TARE ITEMS

TARE #	QTY.	UNITS	`	DESCRIPTION
1	7	EA	209-700-920	20" CAP, WELD, WPHY-52,CARBON STEEL, 0.375" WT, B16.9
2	1	EA	209-700-200	2" CAP, WELD, WPHY-52,CARBON STEEL, 0.154" WT, B16.9
3	1	EA	209-700-910	10" CAP, WELD, WPHY-52,CARBON STEEL, 0.365" WT, B16.9
4	1	EA	209-700-916	16" CAP, WELD, WPHY-52,CARBON STEEL, 0.375" WT, B16.9

MISCELLANEOUS ITEMS

CODE	QTY.	UNITS	STOCK ID	DESCRIPTION	P.O. #
1	5	EA	284-100-127	TEST STATION, PIPELINE MARKER, GAS, YELLOW, 70-80IN	
	10	EA	211-000-110	COATING, CAP, 4"X4" EXOTHERMIC WELD, WITH INTEGRATED PRIMER, PATCH	
	10	EA		SLEEVE, COPPER	
	50	FT		2" TAPE	
	1	ROLL	292-000-014	TEST STATION WIRE, SOFT DRAWN CU 500 FT ROLL, 600 VAC, HMWPE, #12 AWG	
2	51	EA	233-000-020	POST, MARKER, YELLOW, 66" WITH ATTACHED GAS PIPELINE WARNING LABEL	
	200	FT		ROCK SOCK	
	1,000	FT		STRAW WATTLES	
	10,000	FT		SILT FENCE	
	400	SF		STEEL ROAD COVER PLATES	
	130	ROLLS	239-111-600	TAPE, PRIMERLESS, GRAY, TAPE COAT, 6-INCH X -FT	
	2,800	CY		CONE SAND	
	50	CY		CONTROLLED LOW STRENGTH MATERIAL (CLM) (SEE SHEETS D-104 AND D-105)	
	1,260	CY		PADDING SOIL	
	15	ROLLS	286-100-420	TAPE, FIBERGLASS WRAP, 4-IN X 60-FT	
	4,000	SY		EROSION CONTROL BLANKET	

HEAT CHART FABRICATION

TAG #	COMP #	HEAT/SERIAL #	PO #	TAG #	COMP #	HEAT/SERIAL #	PO #
3				4			
				5			
				8			
				9			
				10			
				11			
				12			
				13			
				14			
				15			

GPS WELDS NOTE:

GPS ALL NEW WELDS AND EXISTING WELDS THAT ARE UNCOVERED IN THE TRENCH DURING CONSTRUCTION. ENSURE ALL WALL THICKNESS, AND OTHER PIPE INFORMATION AND WELD INFORMATION IS RECORDED.

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COLORADO LICENSED — JEREMIAH SMITH — PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

REVISIONS				
5	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
4	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
3	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 31, 32, 33	R-18, R-19, Q-19, P-17, P-18, P-19

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 22 OF 60	SCALE: NTS		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
FITTINGS & VALVES LOGS

DWG. NO: **W-107**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-CSD-CSU.dwg LAYOUT NAME: W-107 PLOTTED: Wednesday, March 22, 2023 - 4:29pm USER: nwest

PIPE LOG

HEAT CHART - PIPE

TAG	COMP #	HEAT/SERIAL #	PO #
1			
2			
6			
7			

GPS WELDS NOTE:

GPS ALL NEW WELDS AND EXISTING WELDS THAT ARE UNCOVERED IN THE TRENCH DURING CONSTRUCTION. ENSURE ALL WALL THICKNESS, AND OTHER PIPE INFORMATION AND WELD INFORMATION IS RECORDED.

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COLORADO LICENSED — JEREMIAH SMITH — PROFESSIONAL ENGINEER
Jeremiah Mathew Smith
P.E. 0039947
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING

8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
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PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
5	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
4	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
3	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 31, 32, 33	R-18, R-19, Q-19, P-17, P-18, P-19

SYSTEM NAME: 150P

SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

W/O #: 3747144

RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN		PHONE:	(719) 668-8196
PROJECT MANAGER: MELISSA LINGO		PHONE:	(719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD		PHONE:	(719) 668-3675
SHEET NO. 23 OF 60	SCALE: NTS		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH	

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PIPE LOG

DWG. NO: **W-108**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_#C-C3D-CS3J.dwg LAYOUT NAME: W-108 PLOTTED: Wednesday, March 22, 2023 - 4:29pm USER: nwest

WELD CHART - FABRICATION

TAG #	WELD #	COMP. #	WELD #	X-RAY DATE	X-RAY TYPE	RESULT	REPAIR	X-RAY DATE	X-RAY TYPE	RESULT	TAG #	WELD #	COMP. #	WELD #	X-RAY DATE	X-RAY TYPE	RESULT	REPAIR	X-RAY DATE	X-RAY TYPE	RESULT	TAG #	WELD #	COMP. #	WELD #	X-RAY DATE	X-RAY TYPE	RESULT	REPAIR	X-RAY DATE	X-RAY TYPE	RESULT

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Jeremiah Matthew Smith
2023.03.24 16:47:06-04'00'
PE.0059747

P.E. CERTIFICATION

PATRICK ENGINEERING

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Indianapolis, IN 46268
TEL. (317) 217-1701
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PROJ. NO. 22282.003

REVISIONS				
5	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
4	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
3	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	TWN. 12S, RNG. 65W, SECTIONS 31, 32, 33	R–18, R–19, Q–19, P–17, P–18, P–19

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20%: ☐

W/O #
3747144
RELATED W/O #s
3789816

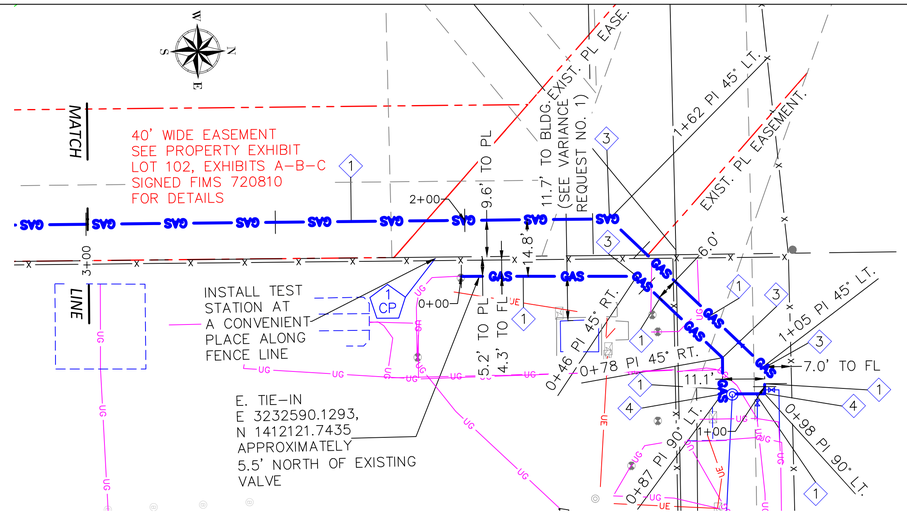
ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668–8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668–8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668–3675
SHEET NO. 24 OF 60	SCALE: NTS		

PATRICK ENGINEERING TEAM
DWN BY: NORM WEST
CHKD. BY: SETH BROWN
APPD. BY: JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
WELD CHART

DWG. NO:
W-109

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 – Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC–C3D–CSU.dwg LAYOUT NAME: W–109 PLOTTED: Wednesday, March 22, 2023 – 4:29pm USER: nwest



PLAN

SCALE 1" = 20' (20' 0' 20' 40')

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

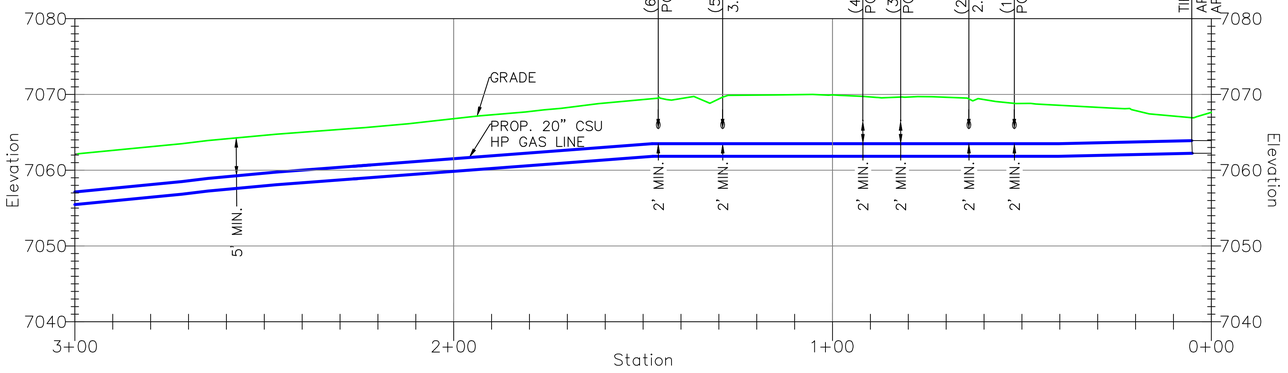
CATHODIC PROTECTION NOTES	
1 CP	INSTALL TEST STATIONS AT LOCATIONS SHOWN IN THE DESIGN PACKAGE.
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
3	4		220-647-920	20" ELBOW, 0.375" WT, STL, 45 DEG., 3R, WPHY 52	FORGED	FBE	
4	2		220-692-920	20" ELBOW, 0.375" WT, STL, 90 DEG., 3R, WPHY 52	FORGED	FBE	
6	13'		240-365-910	10" PIPE, STL, 0.365" WT, API 5L-X52, FBE	ERW	FBE	
7	4'		240-154-238	2" PIPE, STL, 0.154" WT, X-52, FBE	SMLS	FBE	
8	1		220-692-910	10" ELBOW, 0.365" WT, STL, 90 DEG., 3R, WPHY 52	FORGED	FBE	
9	1		215-792-920	REDUCER, WELD, WPHY52, CARBON STEEL, STD., 20IN X 12 NPS	FORGED	FBE	
10	1		215-790-100	REDUCER, WELD, WPHY52, CARBON STEEL, STD., 12IN X 10 NPS	FORGED	FBE	
11	1		220-700-920	20" TEE, WELD, WPHY 52, CARBON STEEL, STD. WALL	FORGED	FBE	
12	1		254-960-055	BRANCH CONNECTION, WELDOLET, CS, CL3000, 20"X2"	FORGED	N/A	
13	1		290-100-920	20" BALL VALVE, API 6D, CL150, VERTICAL GEAR OPERATED, FULL PORT, STD 0.375" WALL	FORGED	FBE	
14	1		290-100-911	10" BALL VALVE, API 6D, CL150, VERTICAL GEAR OPERATED, FULL PORT, STD 0.365" WALL	FORGED	FBE	
15	1		290-100-200	2" BALL VALVE, API 6D, CL150, VERTICAL GEAR OPERATED, FULL PORT, STD. 0.154" WALL	FORGED	FBE	

CROSSING TABLE				
ITEM	CROSSING	SIZE	DEPTH (TOP PIPE)	MIN. VERT. SEPERATION
1	CSU HP GAS LINE	12'	FIELD VERIFY[1]	2'
2	CSU HP GAS LINE	12"	2.9'	2'
3	CSU HP GAS LINE	2"	FIELD VERIFY[1]	2'
4	CSU HP GAS LINE	2"	FIELD VERIFY[1]	2'
5	CSU HP GAS LINE	12"	3.1'	2'
6	CSU HP GAS LINE	12"	FIELD VERIFY[1]	2'

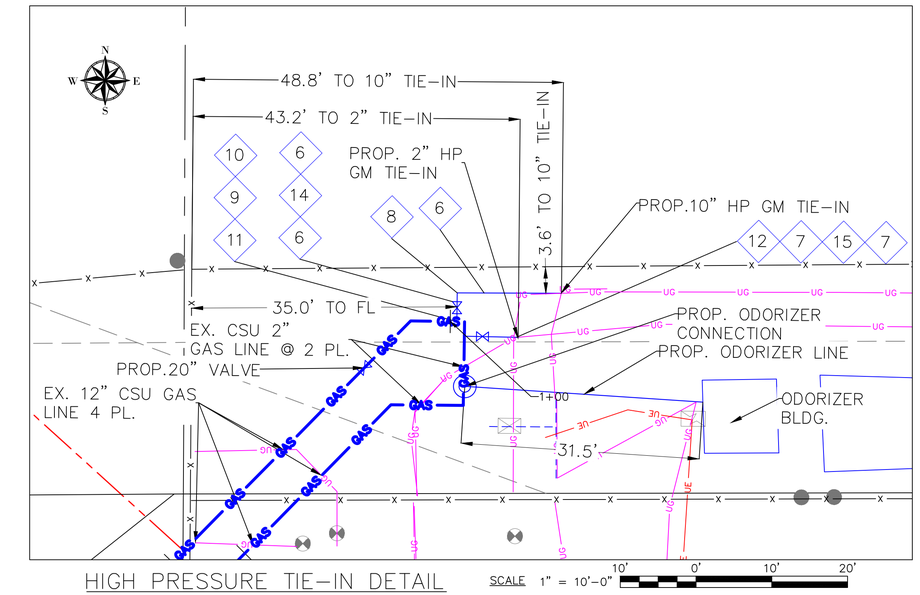
1 POTHOLE COULD NOT FIND



PROFILE

HORIZONTAL SCALE 1" = 20' (20' 0' 20' 40')

VERTICAL SCALE 1" = 10' (10' 0')



HIGH PRESSURE TIE–IN DETAIL

SCALE 1" = 10'–0" (10' 0' 10' 20')

CSU SPECIFICATION VARIANCE APPROVAL REQUEST	
1	THE PROPOSED 20" CSU GAS LINE IN THE MCCLINTOCH STATION IS ROUTED ADJACENT TO AND LESS THAN 15 FEET FROM A STATION BUILDING THAT IS NOT MEANT FOR HUMAN OCCUPANCY, AND A VARIANCE REQUEST IS BEING APPLIED FOR APPROVAL.
APPROVED BY	

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

REVISIONS					
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS	
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS	
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS	
NO.	N/A	BY:	DATE:	APPVD:	

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 33 TWN. 12S, RNG. 65W	R–18

SYSTEM NAME: 150P

SYSTEM MAOP: 275 psig

SYSTEM MOP: 145 psig

N/A

SYSTEM MAOP:

SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

W/O # 3747144

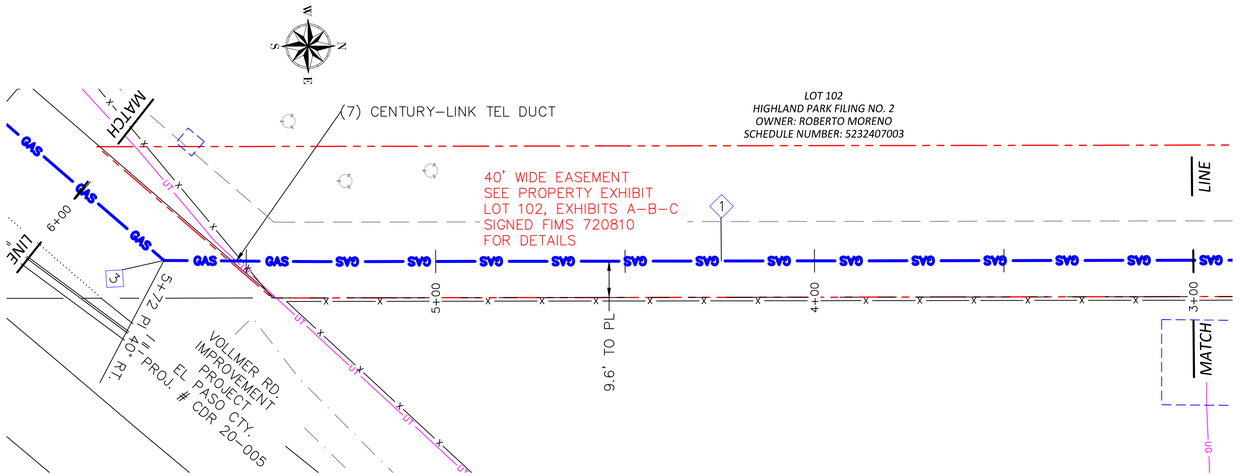
RELATED W/O #s 3789816

ENGINEER: SCOTT JENSEN	PHONE: (719) 668–8196		
PROJECT MANAGER: MELISSA LINGO	PHONE: (719) 668–8794		
CONSTRUCTION LEAD: JOSH RICHARD	PHONE: (719) 668–3675		
SHEET NO. 25 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH	

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE 0+00 - 3+00

DWG. NO: C-200

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 – Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC–C3D–CSU.dwg LAYOUT NAME: C–200 PLOTTED: Wednesday, March 22, 2023 – 4:29pm USER: rwest



PLAN

SCALE 1" = 20' (20' 0' 20' 40')

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

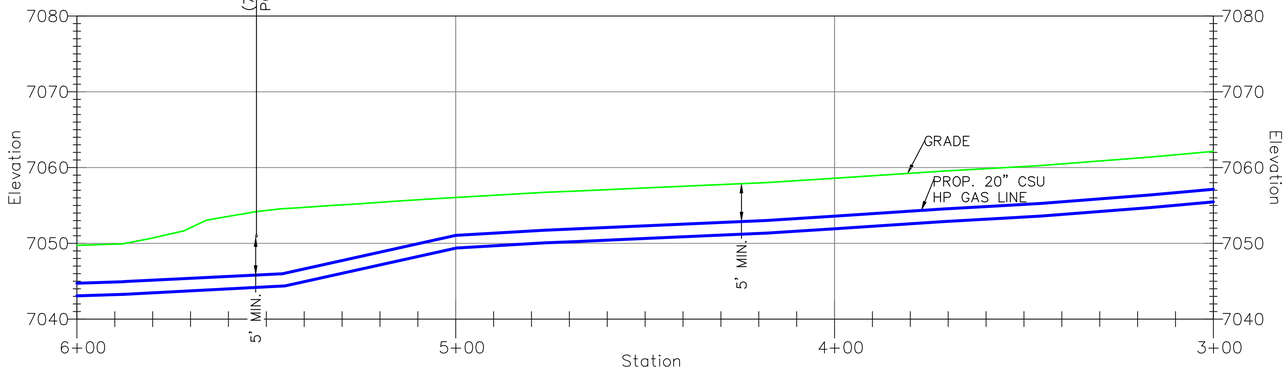
CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
3	1		220-647-920	20" ELBOW, 0.375" WT, STL, 45 DEG., 3R, WPHY 52	FORGED	FBE	

CROSSING TABLE					
ITEM	CROSSING	SIZE	DEPTH (TOP OF PIPE)		MIN. VERT. SEPERATION
7	CENTURY-LINK TEL DUCT	4"[1]	FIELD VERIFY[1]		5'

1 POTHOLE COULD NOT FIND

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003



PROFILE

VERTICAL SCALE 1" = 10' (10' 0')

HORIZONTAL SCALE 1" = 20' (20' 0' 20' 40')

REFERENCE NOTE:
ANY WORK RELATED TO VOLLMER RD., (COUNTY REFERENCE FILE NO. CDR 20–005) OR OTHER UTILITIES TO BE INSTALLED IN THE AREA OTHER THAT THE 20" GAS LINE IS TO BE COMPLETED BY OTHER PROJECTS.

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Jeremiah Matthew Smith, P.E. 0059747, 2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

REVISIONS				
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 33 TWN. 12S, RNG. 65W	R–18, R–19

SYSTEM NAME: 150P

SYSTEM MAOP: 275 psig

SYSTEM MOP: 145 psig

N/A

SYSTEM MAOP:

SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

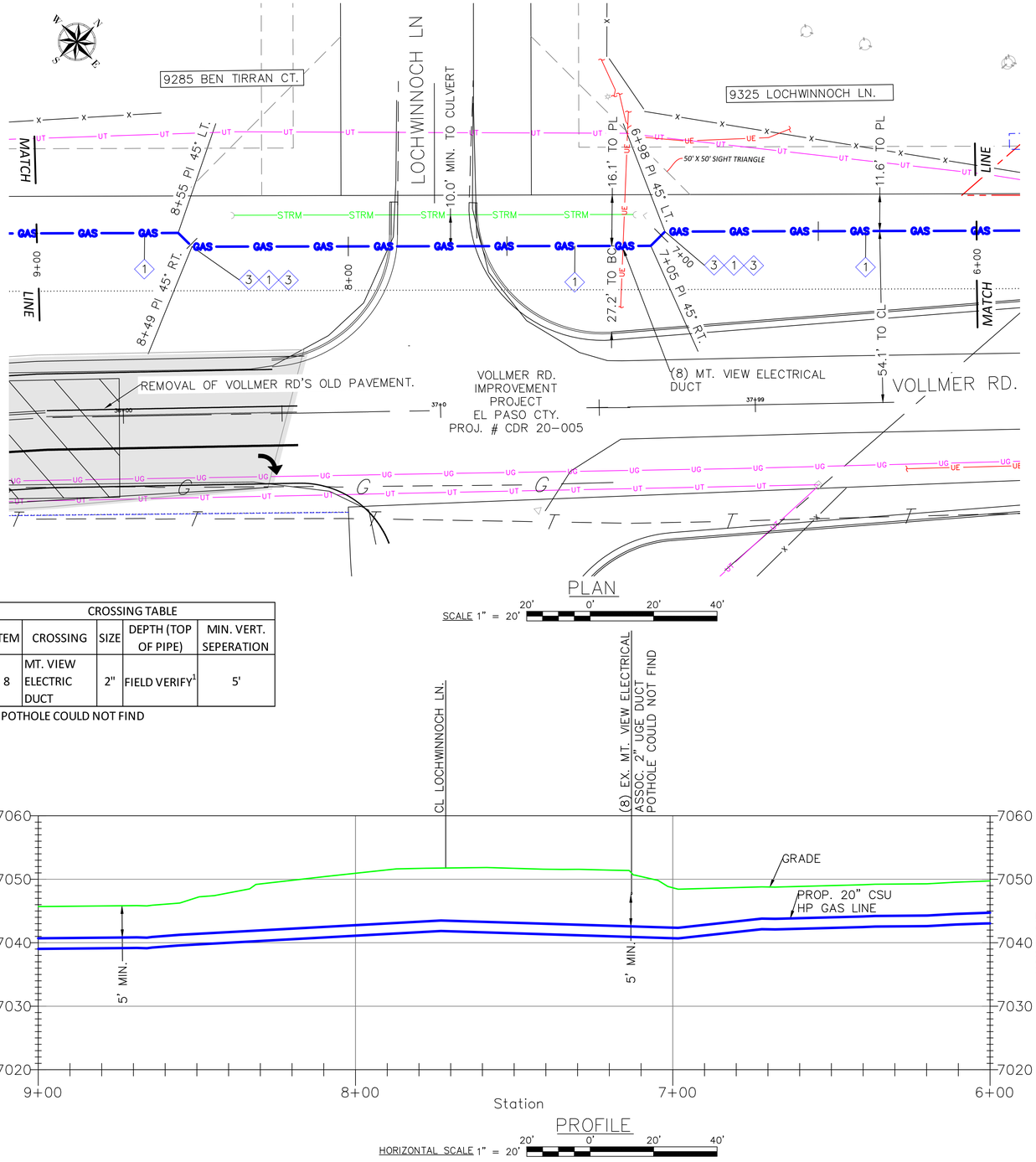
W/O #: 3747144

RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN		PHONE:	(719) 668-8196
PROJECT MANAGER: MELISSA LINGO		PHONE:	(719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD		PHONE:	(719) 668-3675
SHEET NO. 26 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
3+00 - 6+00

DWG. NO: **C-201**



CROSSING TABLE				
ITEM	CROSSING	SIZE	DEPTH (TOP OF PIPE)	MIN. VERT. SEPERATION
8	MT. VIEW ELECTRIC DUCT	2"	FIELD VERIFY[1]	5'

1 POTHOLE COULD NOT FIND

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
3	4		220-647-920	20" ELBOW, 0.375" WT, STL, 45 DEG., 3R, WPHY 52	FORGED	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO VOLLMER RD., (COUNTY REFERENCE FILE NO. CDR 20-005) OR OTHER UTILITIES TO BE INSTALLED IN THE AREA OTHER THAT THE 20" GAS LINE IS TO BE COMPLETED BY OTHER PROJECTS.

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

REVISIONS				
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 33 TWN. 12S, RNG. 65W	R-19

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

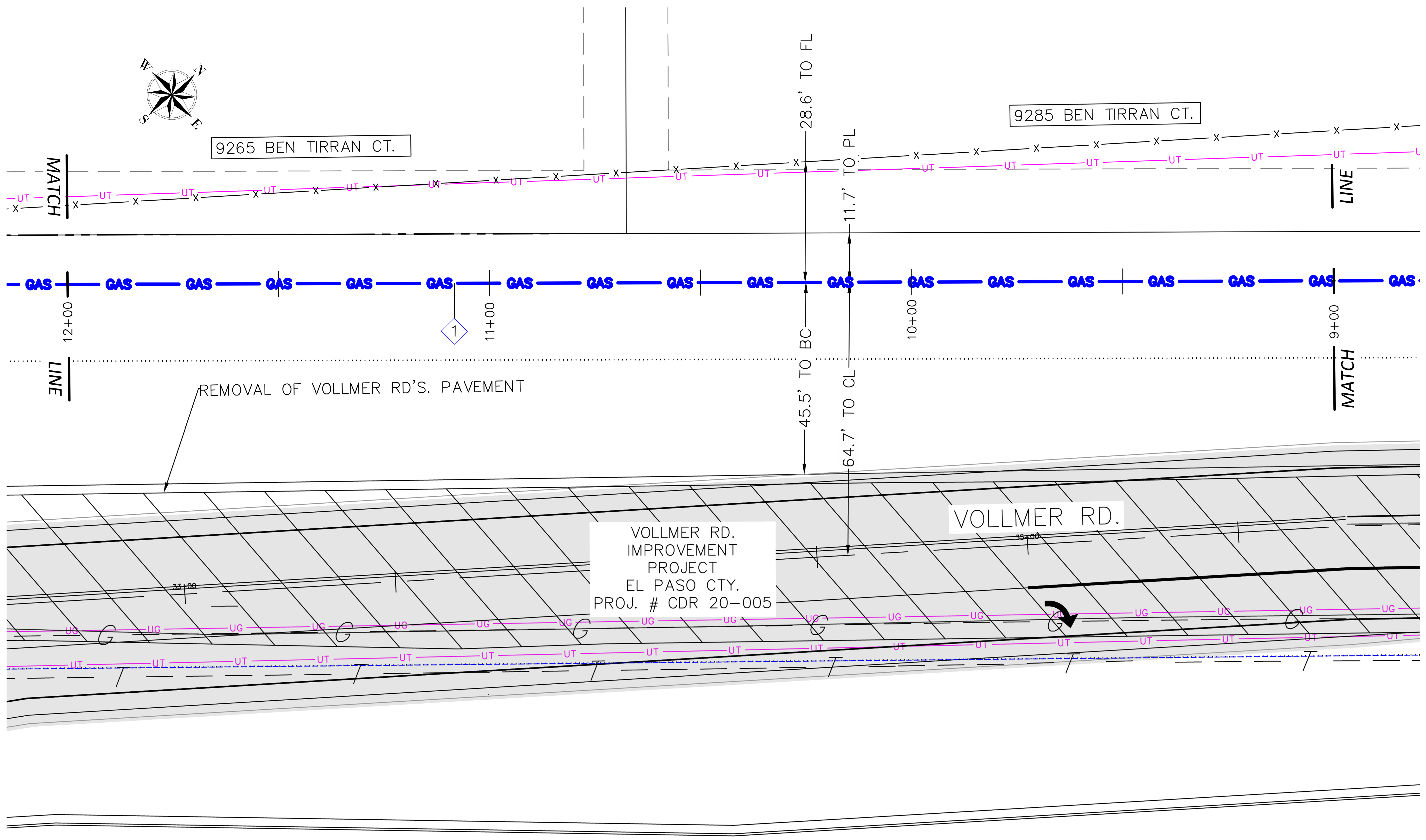
JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN	PHONE: (719) 668-8196		
PROJECT MANAGER: MELISSA LINGO	PHONE: (719) 668-8794		
CONSTRUCTION LEAD: JOSH RICHARD	PHONE: (719) 668-3675		
SHEET NO. 27 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH	

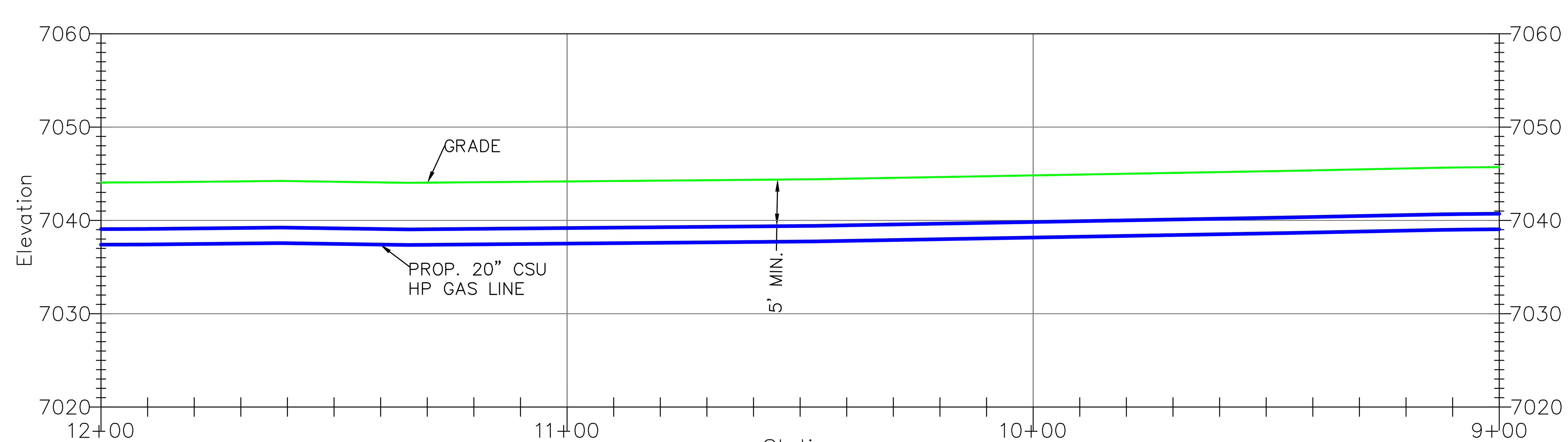
LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
6+00 - 9+00
DWG. NO: **C-202**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-C3D-CSU.dwg LAYOUT NAME: C-202 PLOTTED: Wednesday, March 22, 2023 - 4:29pm USER: nwest



PLAN

SCALE 1" = 20'



VERTICAL SCALE 1" = 10'

PROFILE

HORIZONTAL SCALE 1" = 20'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO VOLLMER RD., (COUNTY REFERENCE FILE NO. CDR 20-005) OR OTHER UTILITIES TO BE INSTALLED IN THE AREA OTHER THAT THE 20" GAS LINE IS TO BE COMPLETED BY OTHER PROJECTS.

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COLORADO LICENSED PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

REVISIONS				
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE	N/A
N/A	N/A	SEC. 33 TWN. 12S, RNG. 65W	R-19	

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20%: ☐

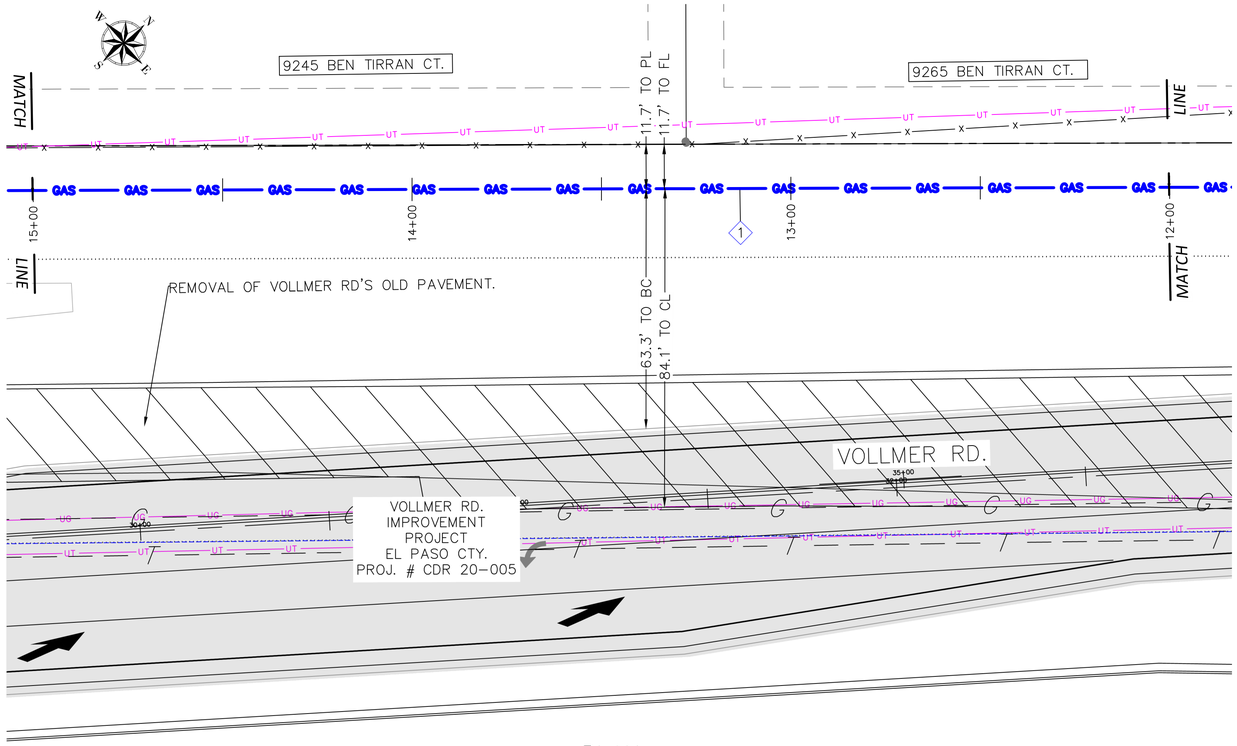
W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN		PHONE: (719) 668-8196
PROJECT MANAGER: MELISSA LINGO		PHONE: (719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD		PHONE: (719) 668-3675
SHEET NO. 28 OF 60	SCALE: AS NOTED	
PATRICK ENGINEERING TEAM		
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
9+00 - 12+00

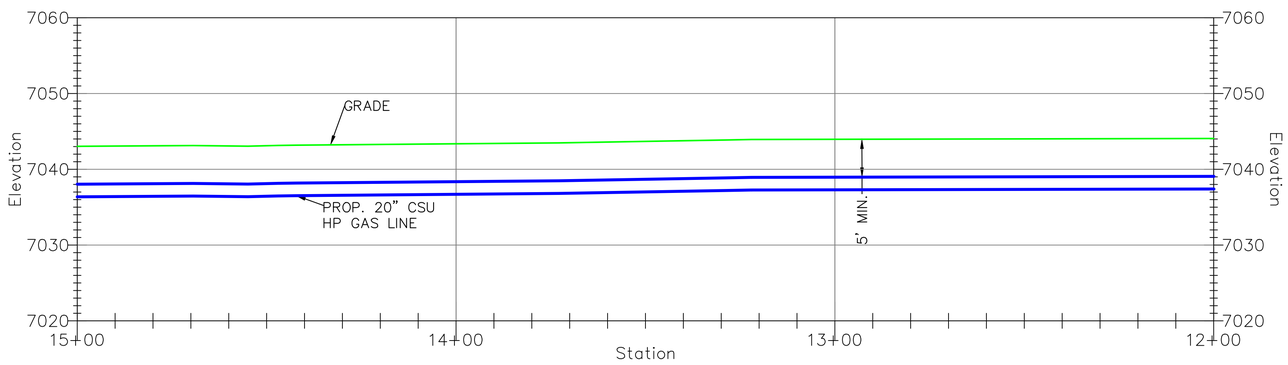
DWG. NO: C-203

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-C30-CSU.dwg LAYOUT NAME: C-203 PLOTTED: Wednesday, March 22, 2023 - 4:29pm USER: nwest



PLAN

SCALE 1" = 20'



VERTICAL SCALE 1" = 10'

PROFILE

HORIZONTAL SCALE 1" = 20'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	

CONSTRUCTION NOTES

4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
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11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES

2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO VOLLMER RD., (COUNTY REFERENCE FILE NO. CDR 20-005) OR OTHER UTILITIES TO BE INSTALLED IN THE AREA OTHER THAT THE 20" GAS LINE IS TO BE COMPLETED BY OTHER PROJECTS.

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 33 TWN. 12S, RNG. 65W SEC. 32 TWN. 12S, RNG. 65W	R-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

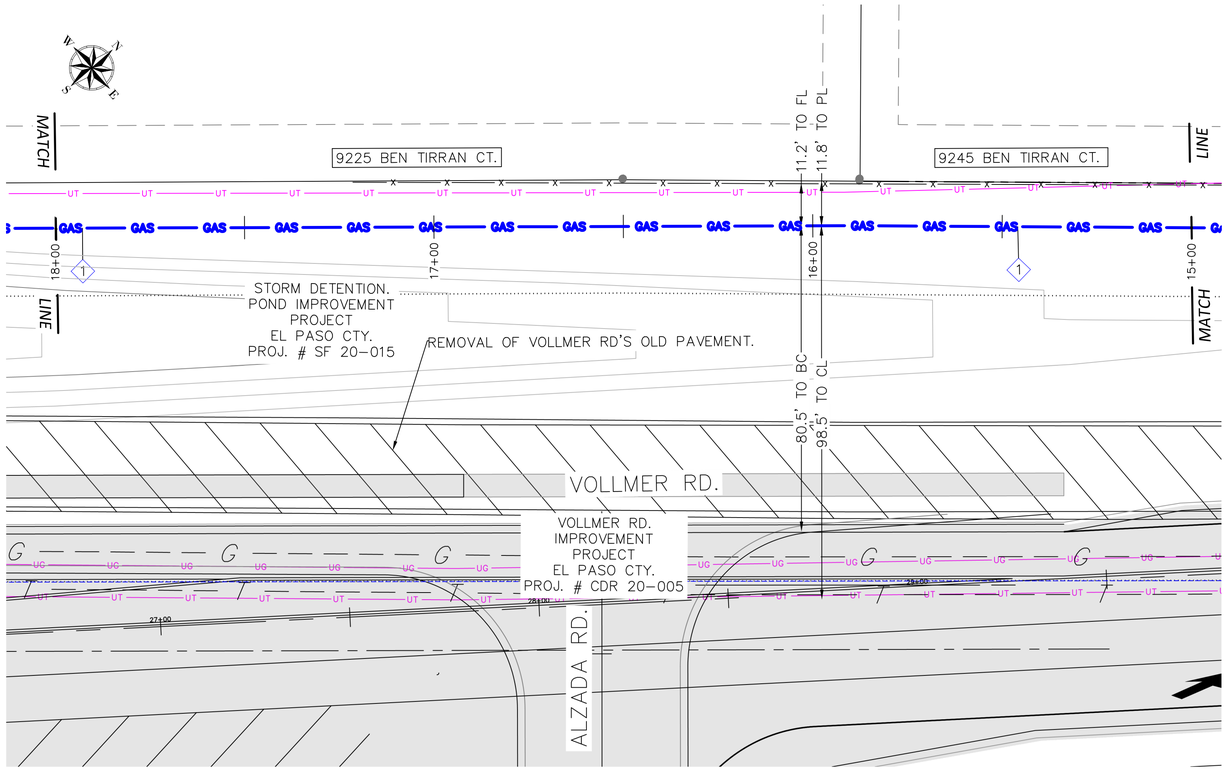
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 29 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
12+00 - 15+00

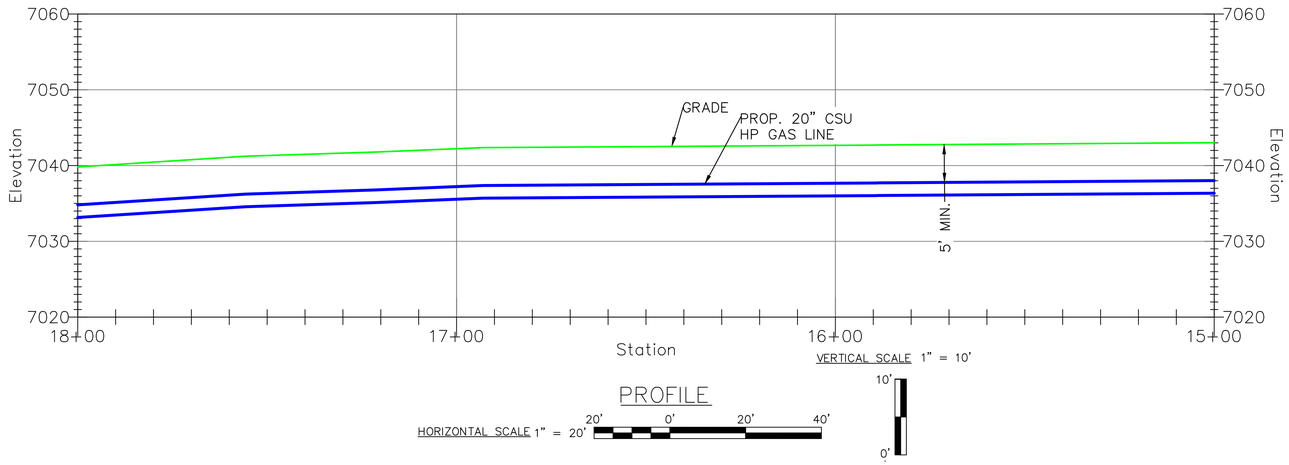
DWG. NO: C-204

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-C3D-CSU.dwg LAYOUT NAME: C-204 PLOTTED: Wednesday, March 22, 2023 - 4:30pm USER: nwest



PLAN

SCALE 1" = 20'



VERTICAL SCALE 1" = 10'

PROFILE

HORIZONTAL SCALE 1" = 20'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO VOLLMER RD., (COUNTY REFERENCE FILE NO. CDR 20-005) AND THE STORM DETENTION POND (COUNTY REFERENCE FILE NO. SF-20-015) OR OTHER UTILITIES TO BE INSTALLED IN THE AREA OTHER THAT THE 20" GAS LINE IS TO BE COMPLETED BY OTHER PROJECTS.

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COLORADO LICENSED PROFESSIONAL ENGINEER JEREMIAH SMITH
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	R-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
	N/A
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

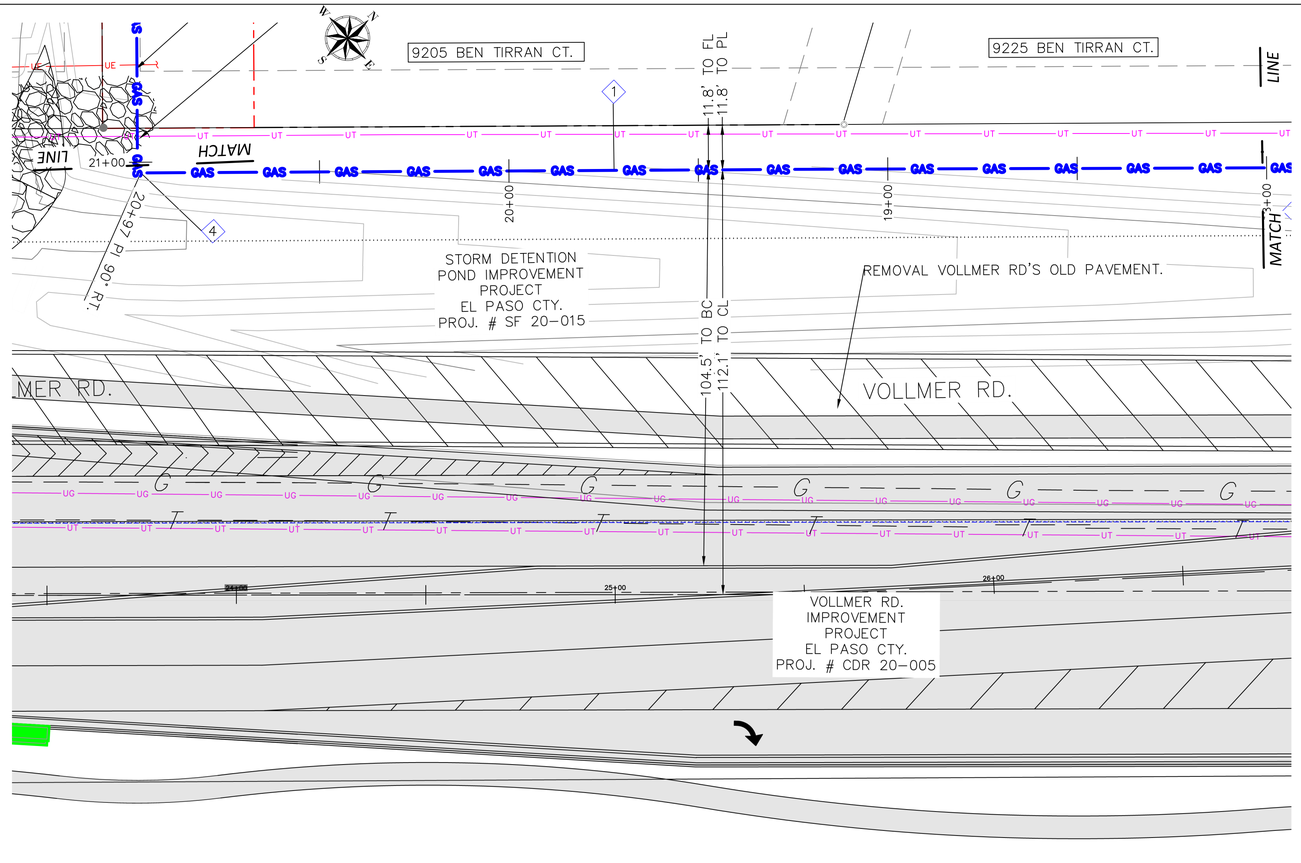
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 30 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
15+00 - 18+00

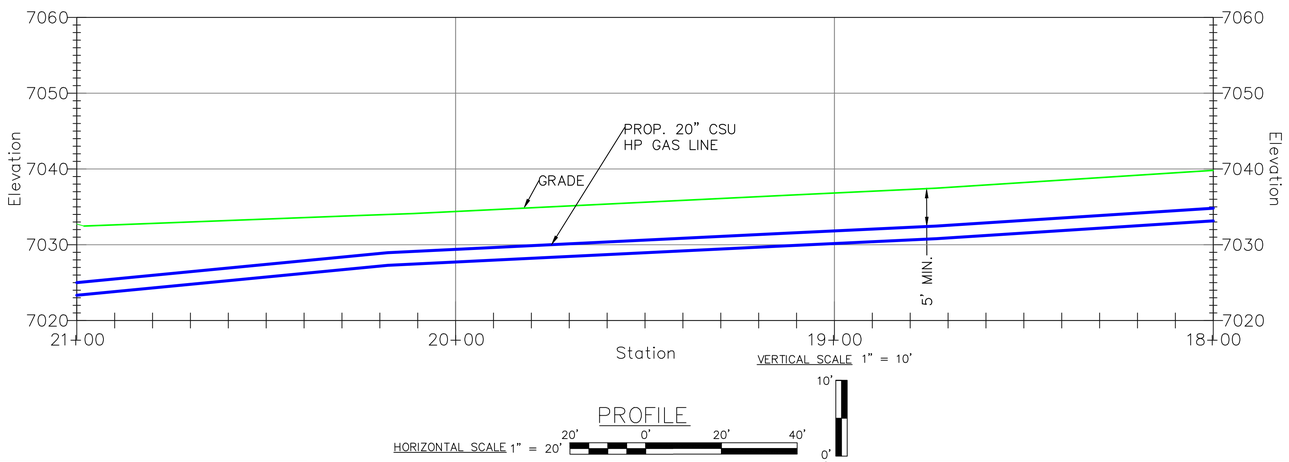
DWG. NO: **C-205**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-C3D-CSU.dwg LAYOUT NAME: C-205 PLOTTED: Wednesday, March 22, 2023 - 4:30pm USER: nwest



PLAN

SCALE 1" = 20'



VERTICAL SCALE 1" = 10'

PROFILE

HORIZONTAL SCALE 1" = 20'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
4	1		220-692-920	20" ELBOW, 0.375" WT, STL, 90 DEG., 3R, WPHY 52	FORGED	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
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14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO VOLLMER RD., (COUNTY REFERENCE FILE NO. CDR 20-005) AND THE STORM DETENTION POND (COUNTY REFERENCE FILE NO. SF-20-015) OR OTHER UTILITIES TO BE INSTALLED IN THE AREA OTHER THAT THE 20" GAS LINE IS TO BE COMPLETED BY OTHER PROJECTS.

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

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Indianapolis, IN 46268
TEL. (317) 217-1701
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PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	R-19 & Q-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
	N/A
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

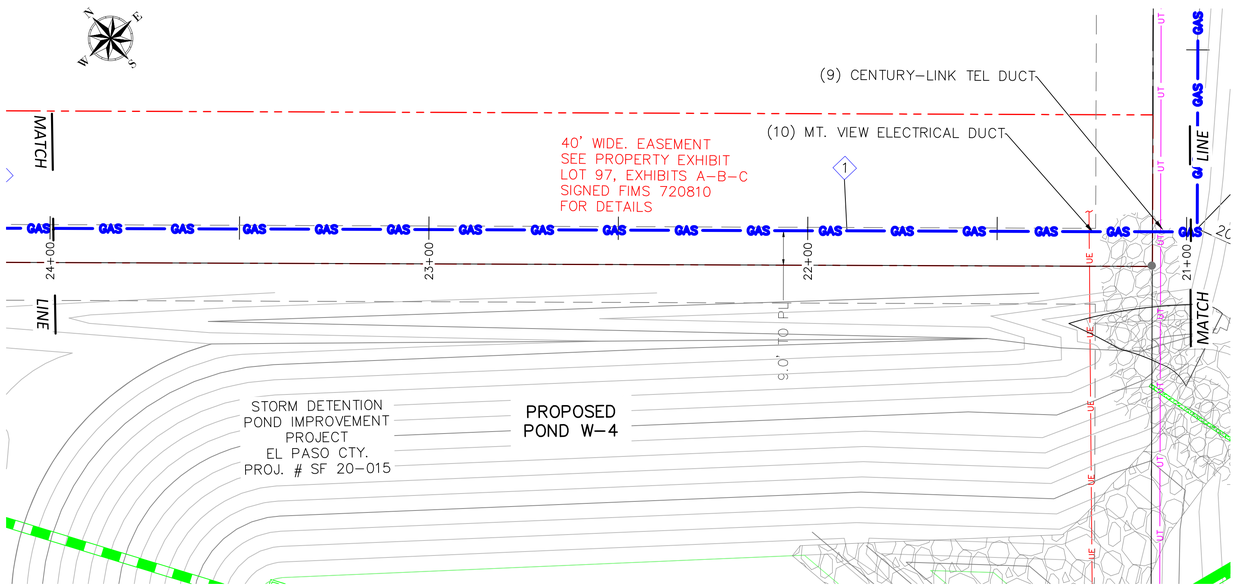
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD AS NOTED	PHONE:	(719) 668-3675
SHEET NO. 31 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE 18+00 - 21+00

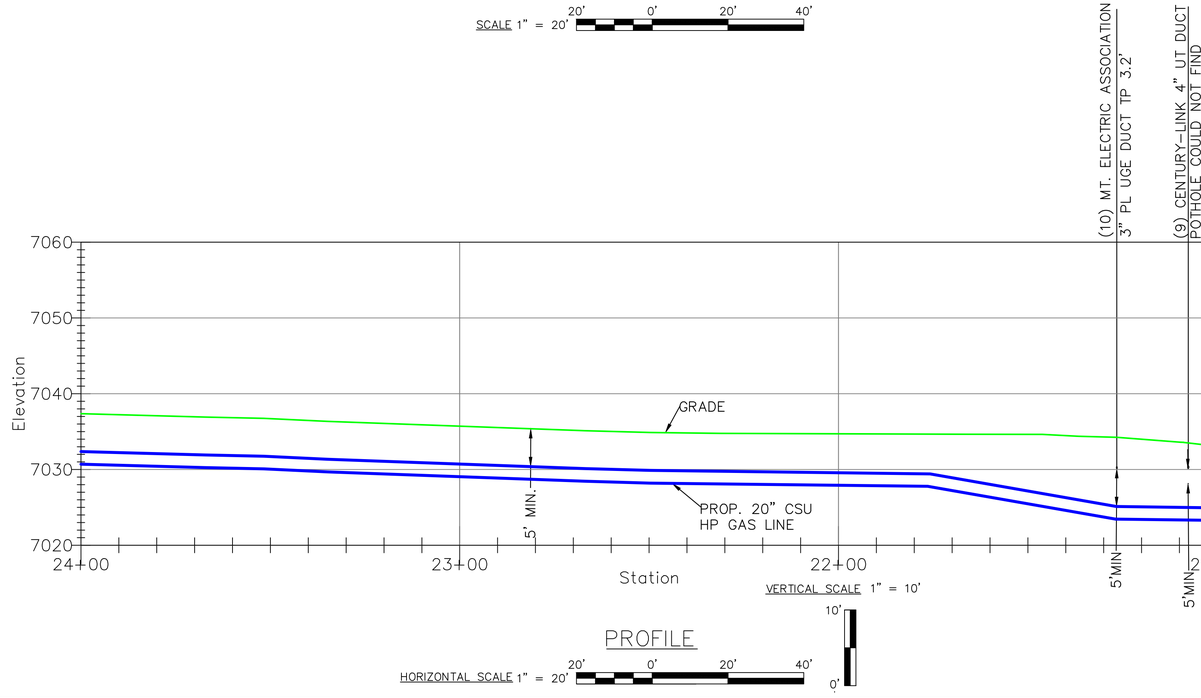
DWG. NO: C-206

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_#FC-C3D-CSU.dwg LAYOUT NAME: C-206 PLOTTED: Wednesday, March 22, 2023 - 4:30pm USER: nwest



PLAN

SCALE 1" = 20'



PROFILE

HORIZONTAL SCALE 1" = 20'

VERTICAL SCALE 1" = 10'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
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14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

CROSSING TABLE				
ITEM	CROSSING	SIZE	DEPTH	MIN. VERT. SEPERATION
9	CENTURY-LINK TEL DUCT	4"[1]	FIELD VERIFY	5'
10	MT. VIEW ELECTRIC DUCT	3"	3.2'	5'

1 POTHOLE COULD NOT FIND

REFERENCE NOTE:
ANY WORK RELATED TO THE STORM DETENTION POND (COUNTY REFERENCE FILE NO. F–20–015) OR OTHER UTILITIES TO BE INSTALLED IN THE AREA OTHER THAT THE 20" GAS LINE IS TO BE COMPLETED BY OTHER PROJECTS.

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q–19

SYSTEM NAME: 150P

SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

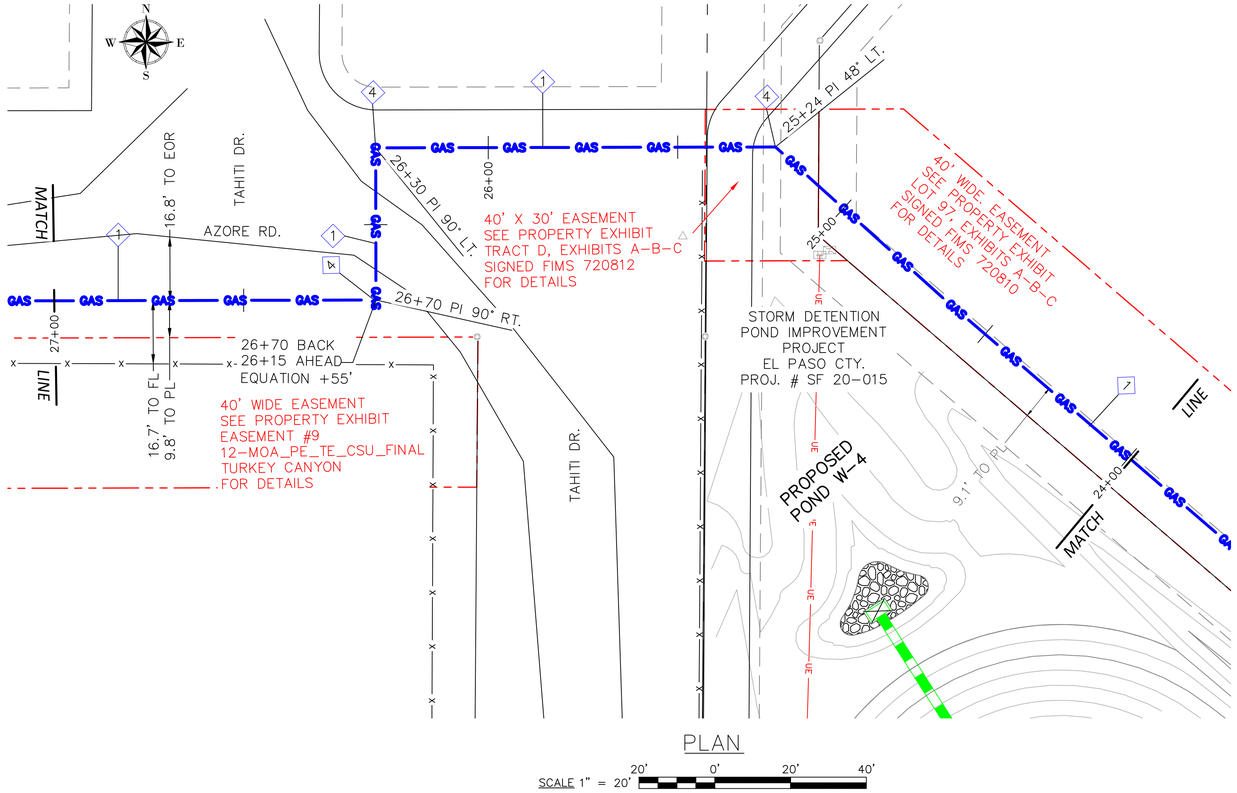
W/O #: 3747144
RELATED W/O #s: 3789816

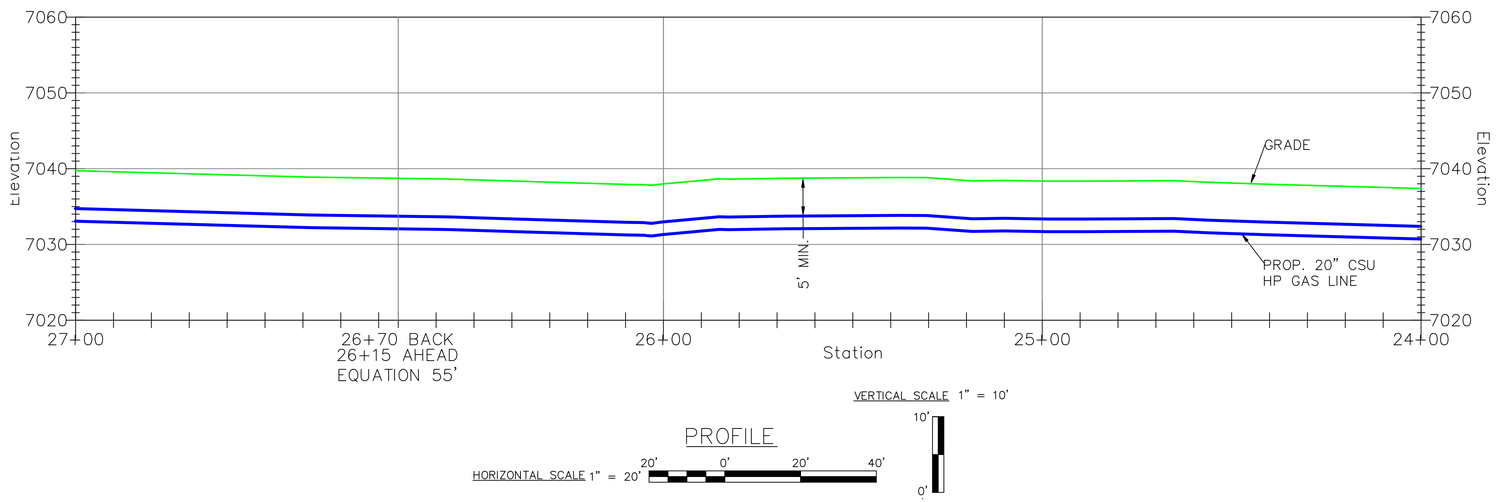
ENGINEER: SCOTT JENSEN	PHONE: (719) 668-8196		
PROJECT MANAGER: MELISSA LINGO	PHONE: (719) 668-8794		
CONSTRUCTION LEAD: JOSH RICHARD	PHONE: (719) 668-3675		
SHEET NO. 32 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH	

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
21+00 - 24+00

DWG. NO: C-207

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-C3D-CSU.dwg LAYOUT NAME: C-207 PLOTTED: Wednesday, March 22, 2023 - 4:30pm USER: nwest





HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	355'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
4	3		220-692-920	20" ELBOW, 0.375" WT, STL, 90 DEG., 3R, WPHY 52	FORGED	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO THE STORM DETENTION POND (COUNTY REFERENCE FILE NO. F-20-015) OR OTHER UTILITIES TO BE INSTALLED IN THE AREA OTHER THAT THE 20" GAS LINE IS TO BE COMPLETED BY OTHER PROJECTS.

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
	N/A
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

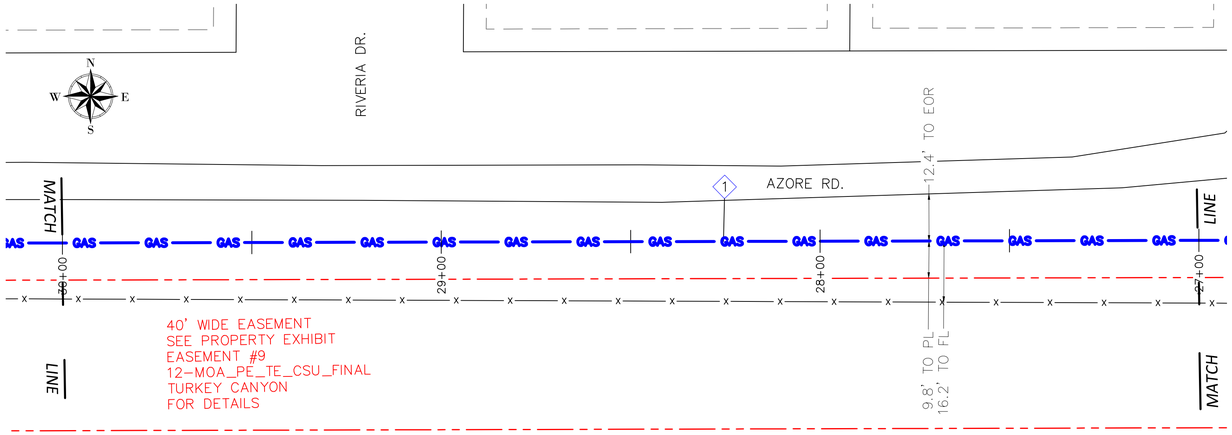
W/O #: 3747144
RELATED W/O #s: 3789816

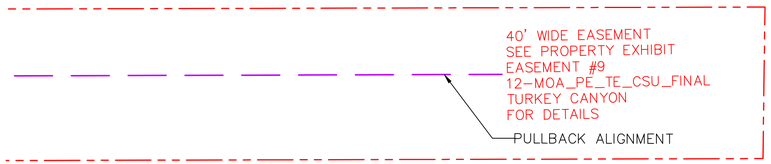
ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 33 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

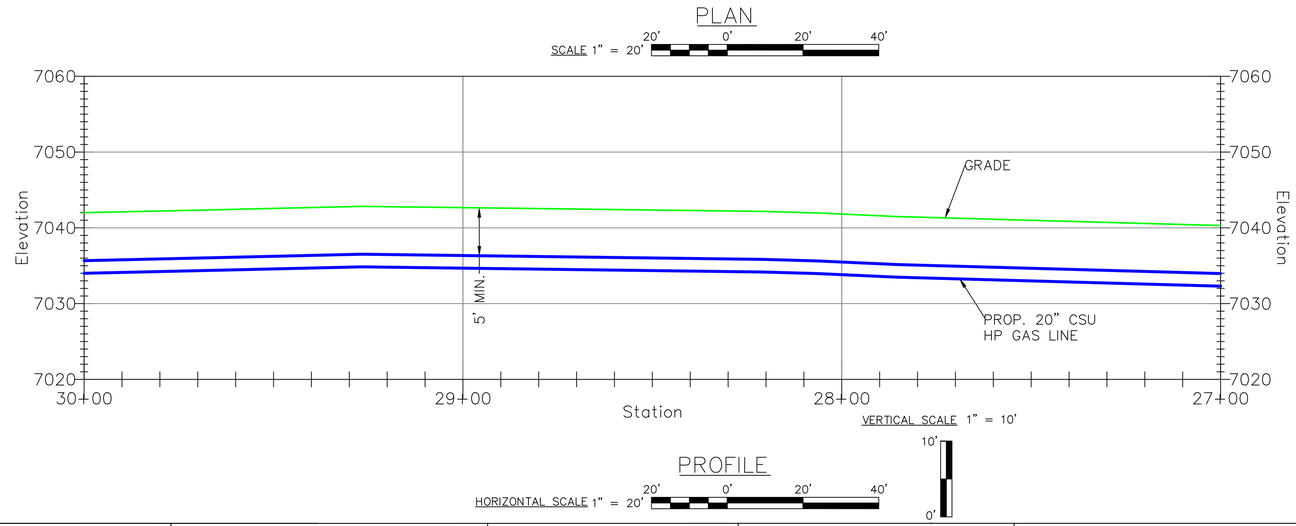
LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
24+00 - 27+00

DWG. NO: C-208

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-C3D-CSU.dwg LAYOUT NAME: C-208 PLOTTED: Wednesday, March 22, 2023 - 4:30pm USER: nwest







HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

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COLORADO LICENSED — JEREMIAH SMITH — PROFESSIONAL ENGINEER
Jeremiah Mathew Smith, PE 0058477
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

REVISIONS				
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:	
HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

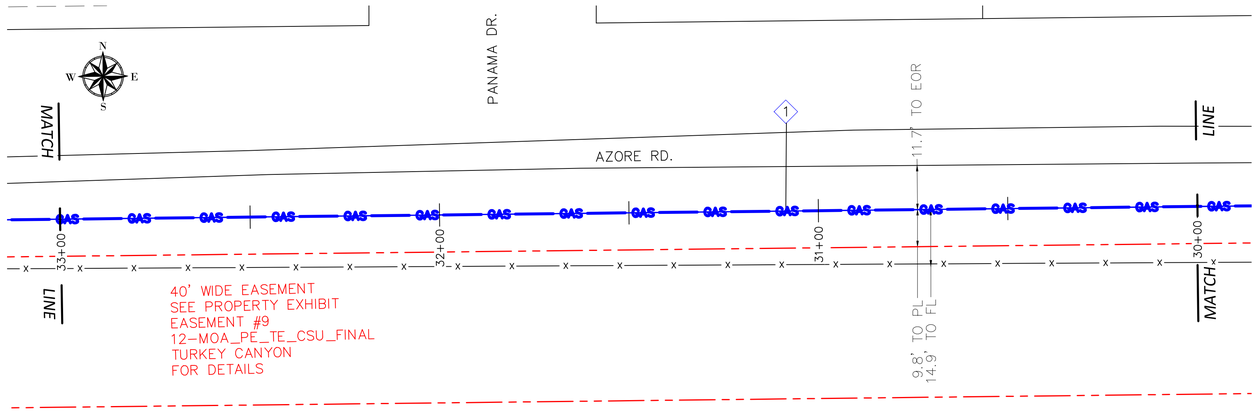
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 34 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
27+00 - 30+00

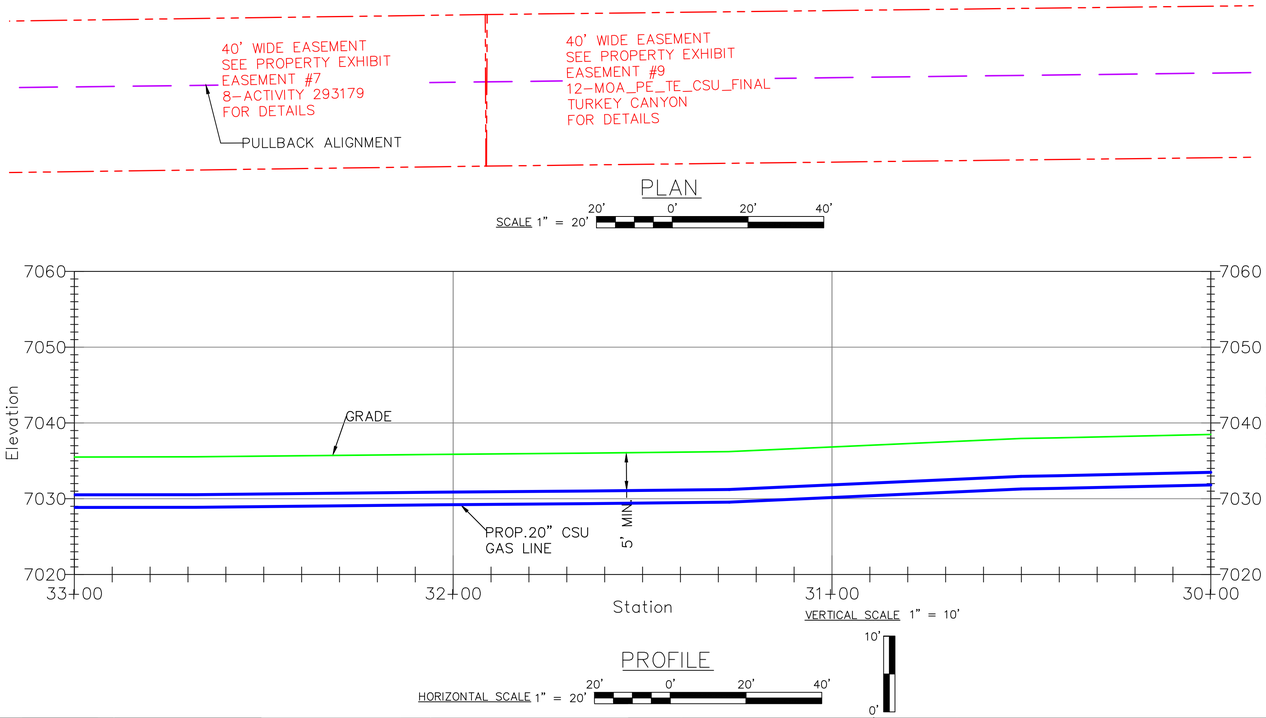
DWG. NO: C-209

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-CSD-CSU.dwg LAYOUT NAME: C-209 PLOTTED: Wednesday, March 22, 2023 - 4:30pm USER: nwest



HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	



CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

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COLORADO LICENSED
JEREMIAH SMITH
PE 0064240
PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

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NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O # 3747144

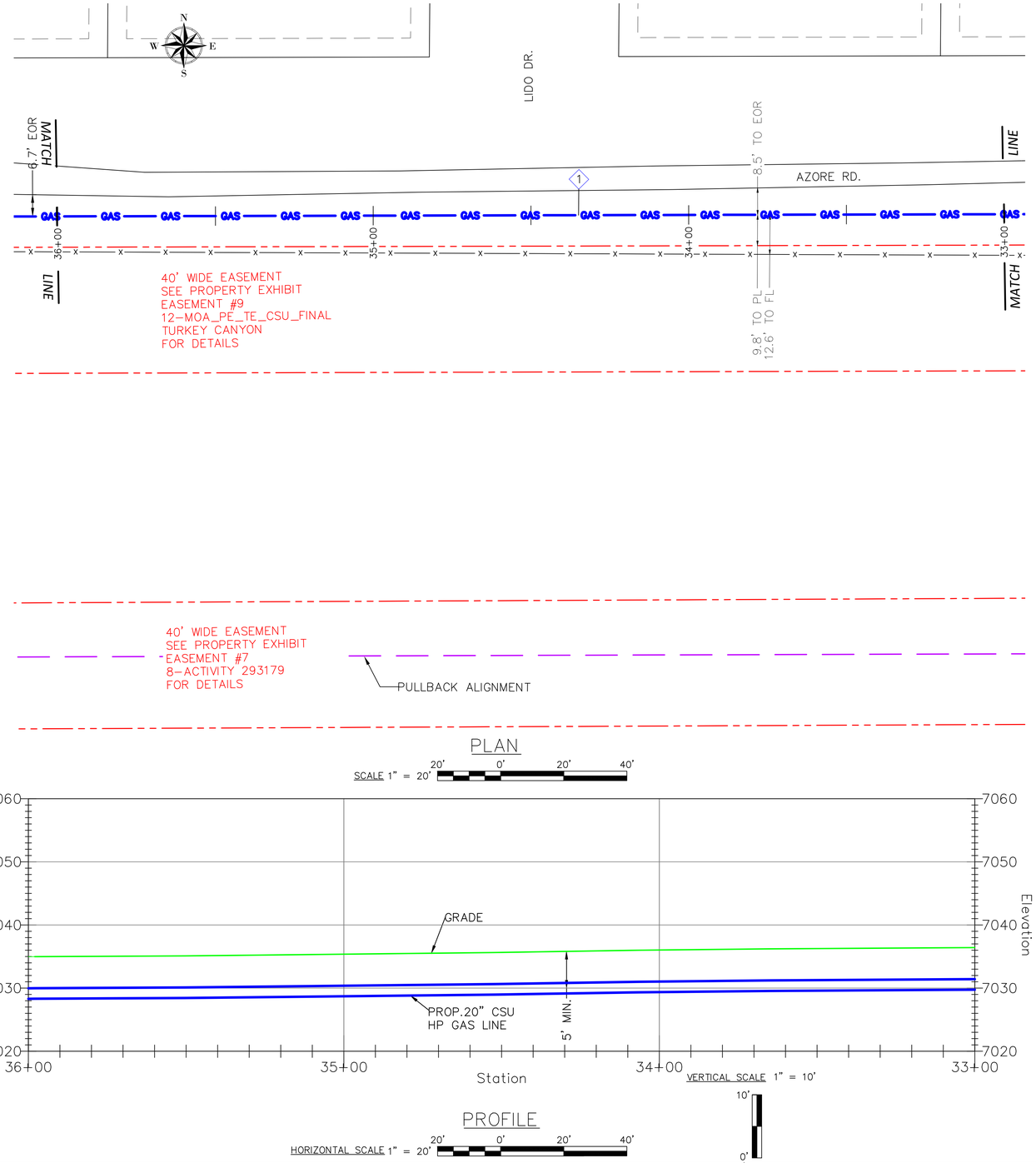
RELATED W/O #s 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 35 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE 30+00 - 33+00

DWG. NO: C-210

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-C3D-CSU.dwg LAYOUT NAME: C-210 PLOTTED: Wednesday, March 22, 2023 - 4:30pm USER: nwest



HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
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CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

PLAN

SCALE 1" = 20'

PROFILE

HORIZONTAL SCALE 1" = 20'

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

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8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
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PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

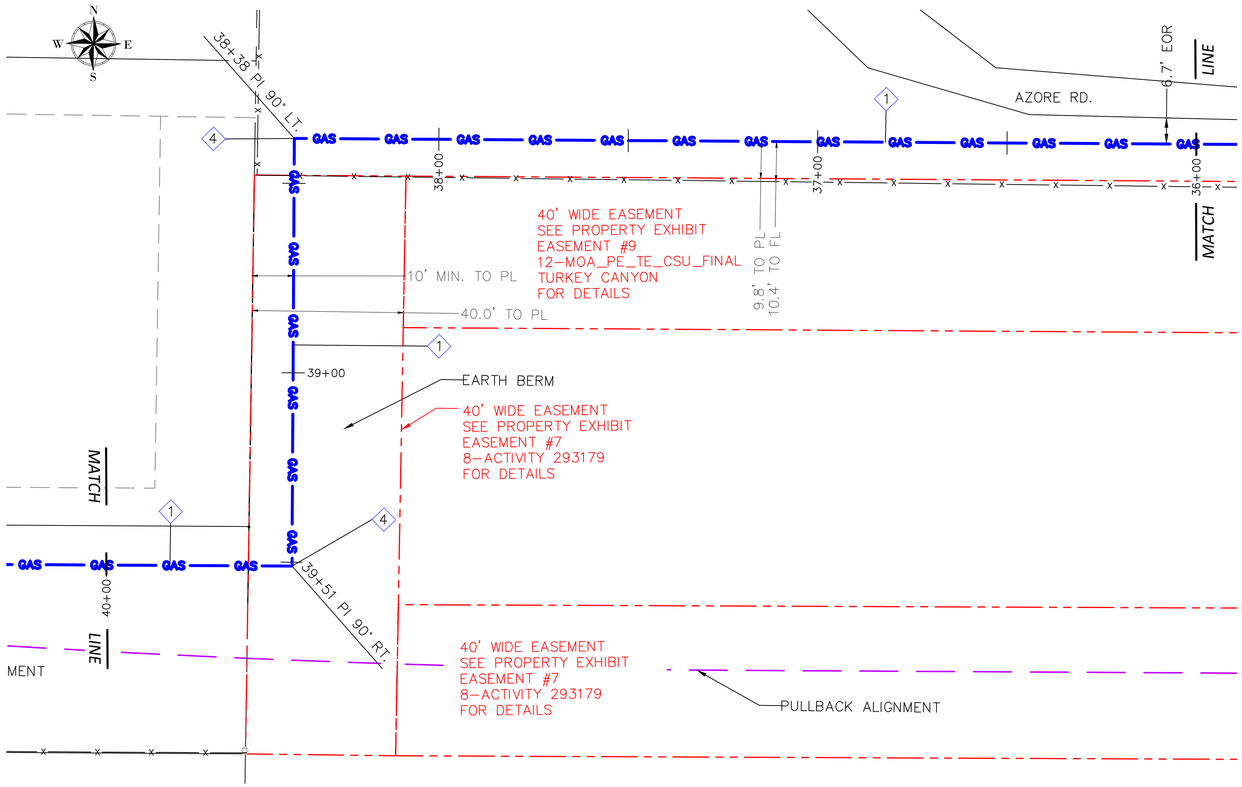
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 36 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE 33+00 - 36+00

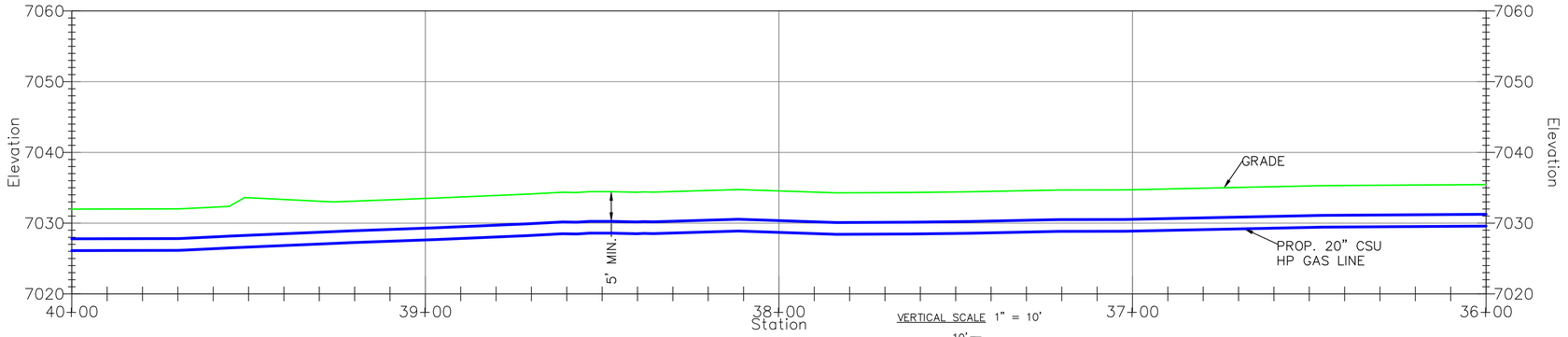
DWG. NO: C-211

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_#C-C3D-CSU.dwg LAYOUT NAME: C-211 PLOTTED: Wednesday, March 22, 2023 - 4:30pm USER: nwest



PLAN

SCALE 1" = 20'



VERTICAL SCALE 1" = 10'

PROFILE

HORIZONTAL SCALE 1" = 20'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	400'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
4	2		220-692-920	20" ELBOW, 0.375" WT, STL, 90 DEG., 3R, WPHY 52	FORGED	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

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COLORADO LICENSED
JEREMIAH SMITH
PE 0044210
PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
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TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

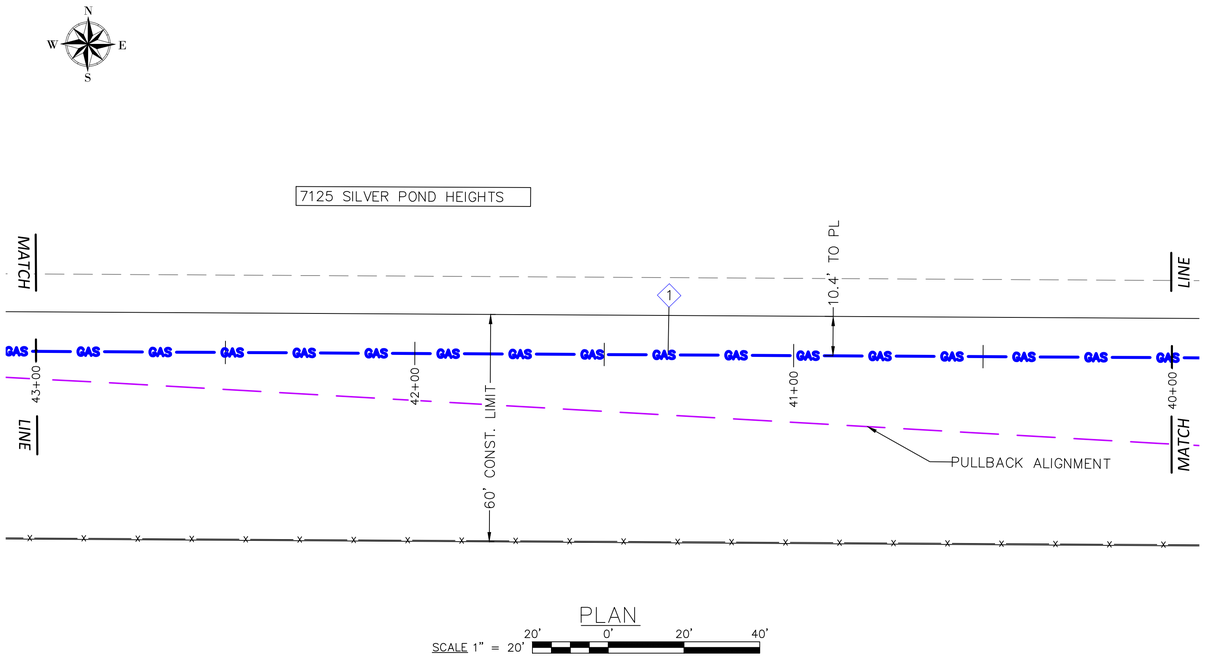
W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN	PHONE: (719) 668-8196		
PROJECT MANAGER: MELISSA LINGO	PHONE: (719) 668-8794		
CONSTRUCTION LEAD: JOSH RICHARD	PHONE: (719) 668-3675		
SHEET NO. 37 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH	

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE 36+00 - 40+00

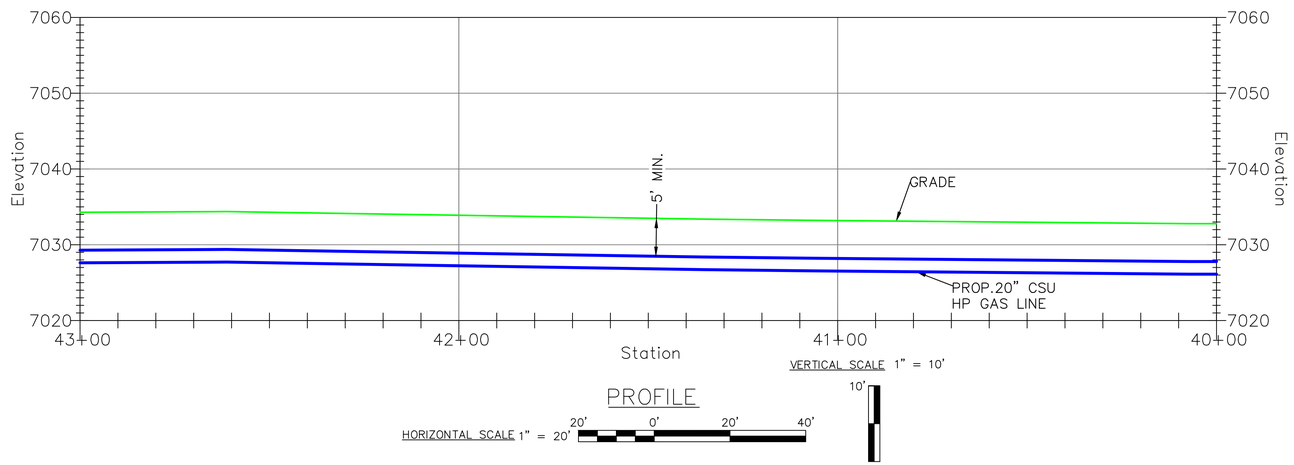
DWG. NO: C-212

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-C3D-CSU.dwg LAYOUT NAME: C-212 PLOTTED: Wednesday, March 22, 2023 - 4:31pm USER: nwest



PLAN

SCALE 1" = 20'



VERTICAL SCALE 1" = 10'

PROFILE

HORIZONTAL SCALE 1" = 20'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
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14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

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COLORADO LICENSED — JEREMIAH SMITH — PROFESSIONAL ENGINEER
Jeremiah Mathew Smith, PE 0058774
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

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TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

REVISIONS				
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

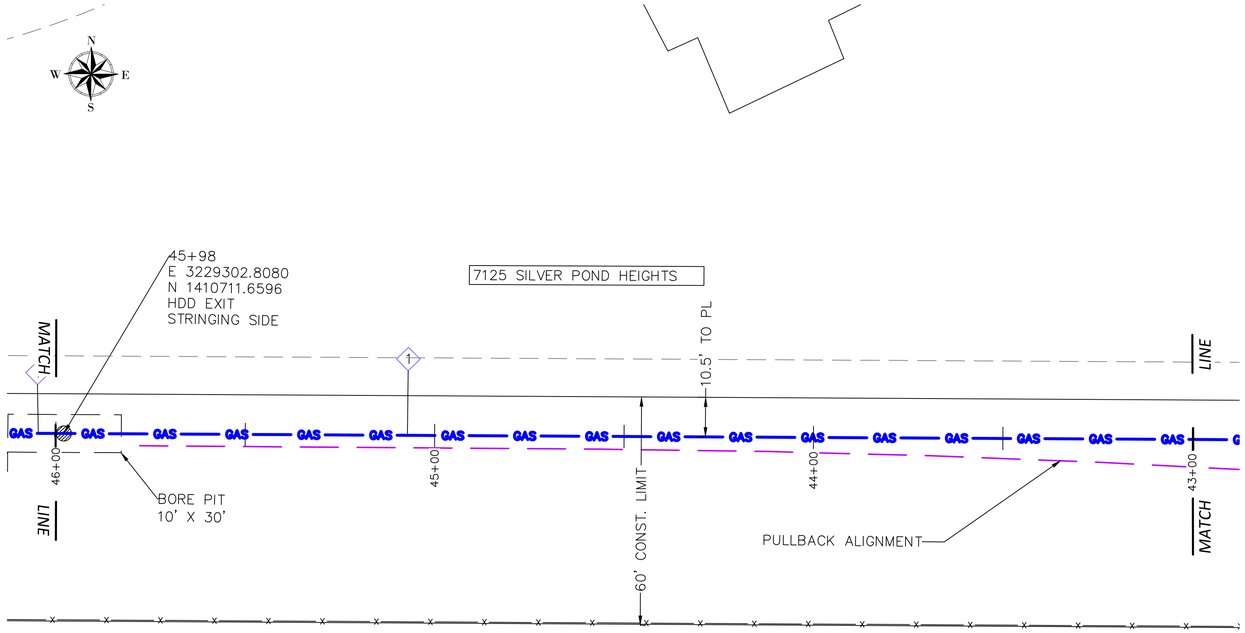
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 38 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE 40+00 - 43+00

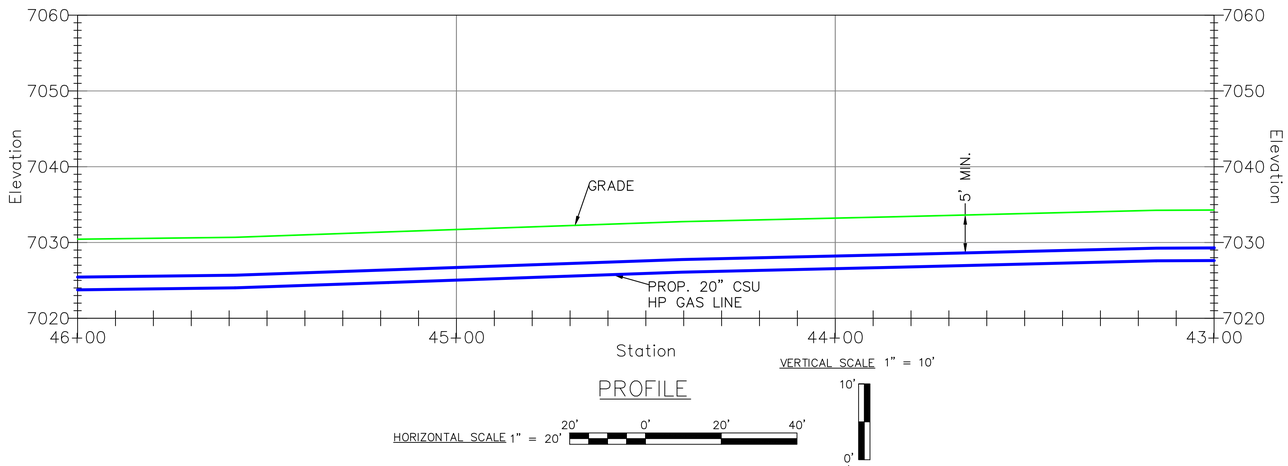
DWG. NO: C-213

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-CSD-CSU.dwg LAYOUT NAME: C-213 PLOTTED: Wednesday, March 22, 2023 - 4:31pm USER: nwest



PLAN

SCALE 1" = 20' 20' 0' 20' 40'



VERTICAL SCALE 1" = 10'

10' 0'

PROFILE

HORIZONTAL SCALE 1" = 20' 20' 0' 20' 40'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	

CONSTRUCTION NOTES

4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES

2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
	N/A			

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

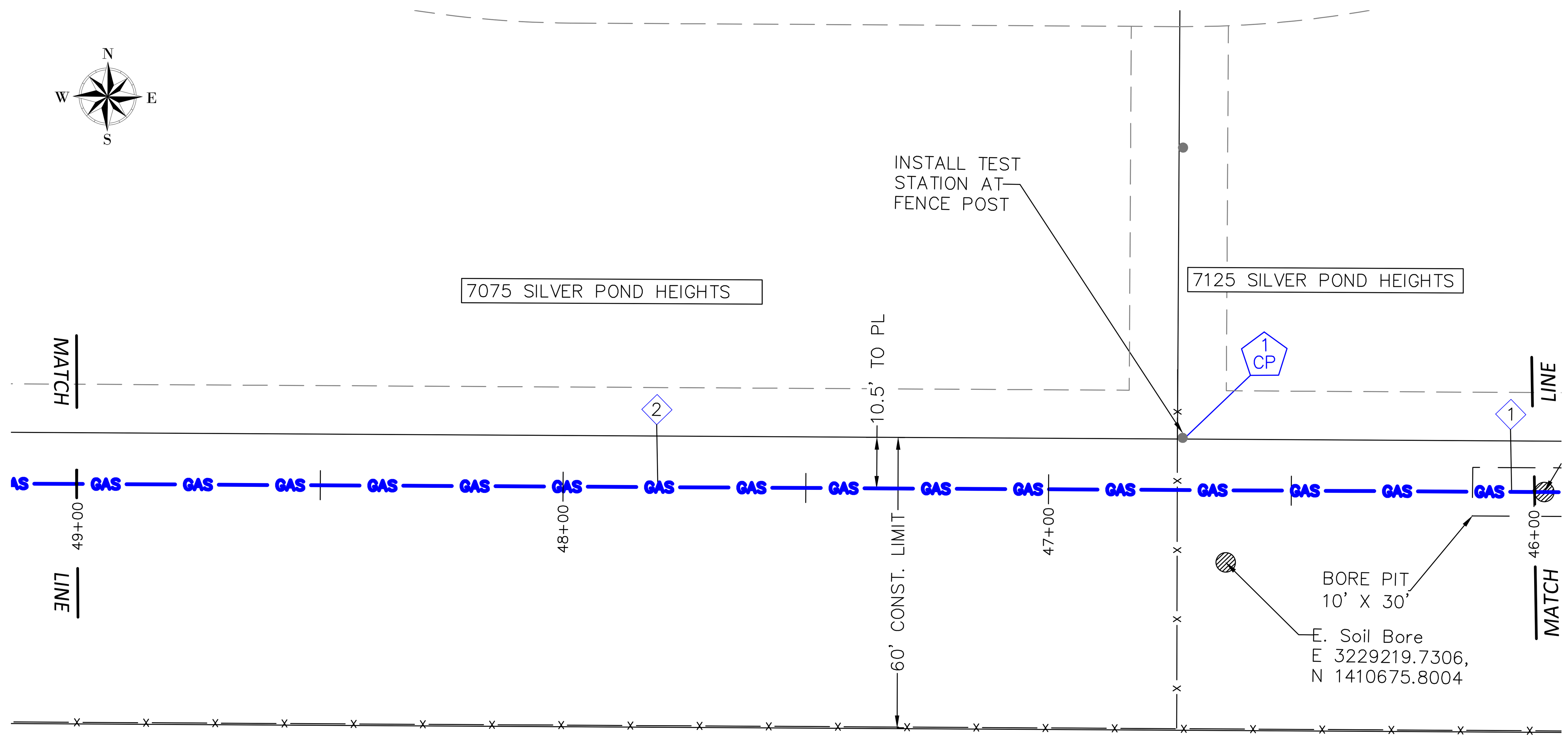
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 39 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
43+00 - 46+00

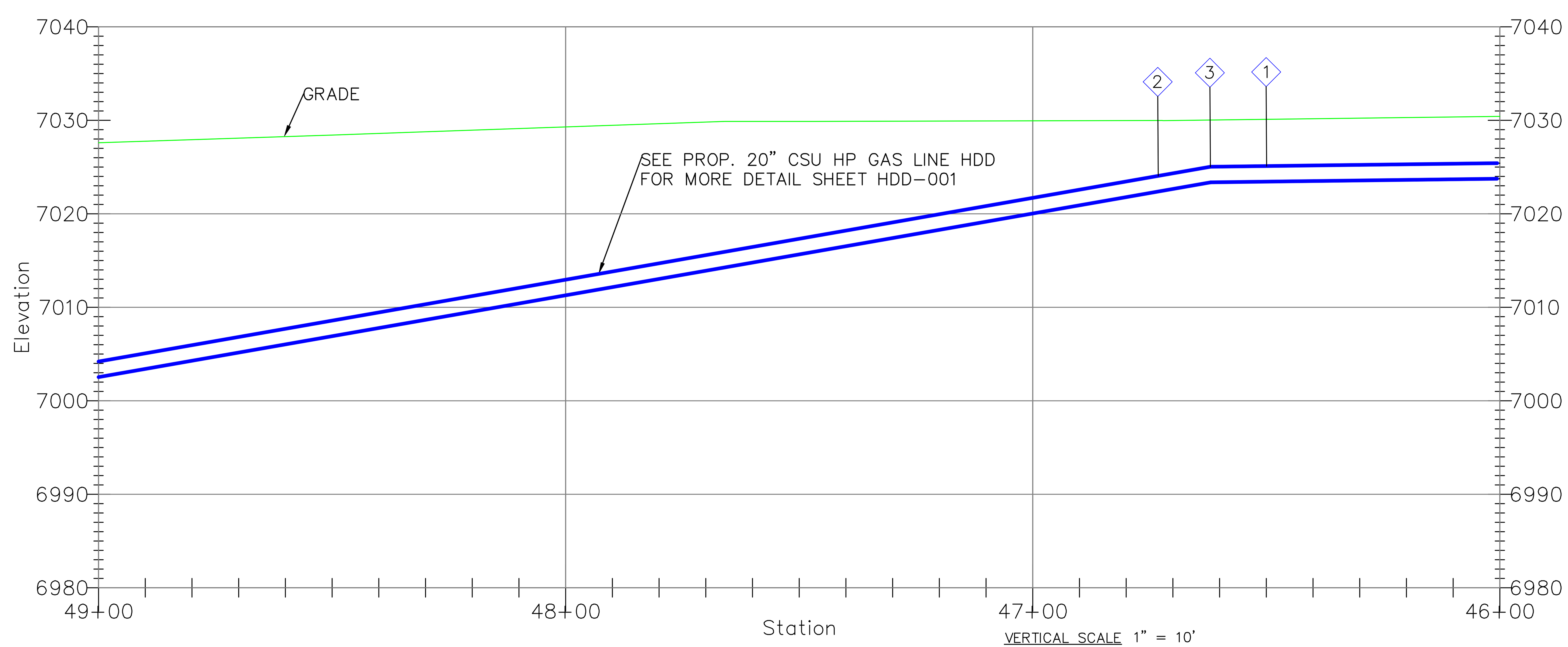
DWG. NO: C-214

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-C3D-CSU.dwg LAYOUT NAME: C-214 PLOTTED: Wednesday, March 22, 2023 - 4:31pm USER: nwest



PLAN

SCALE 1" = 20'   20' 0' 20' 40'



VERTICAL SCALE 1" = 10'   10' 0'

PROFILE

HORIZONTAL SCALE 1" = 20'   20' 0' 20' 40'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	60'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
2	240'		241-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE/ARO	ERW	FBE/ARO	
3	1		220-647-920	20" ELBOW, 0.375" WT, STL, 45 DEG., 3R, WPHY 52	FORGED	FBE	

CONSTRUCTION NOTES

4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES

1 CP	INSTALL TEST STATIONS AT LOCATIONS SHOWN IN THE DESIGN PACKAGE.
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

COLORADO 811

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COLORADO LICENSED PROFESSIONAL ENGINEER — JEREMIAH SMITH
Jeremiah Matthew Smith
2023.03.24 16:47:06-04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

REVISIONS				
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q-19

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

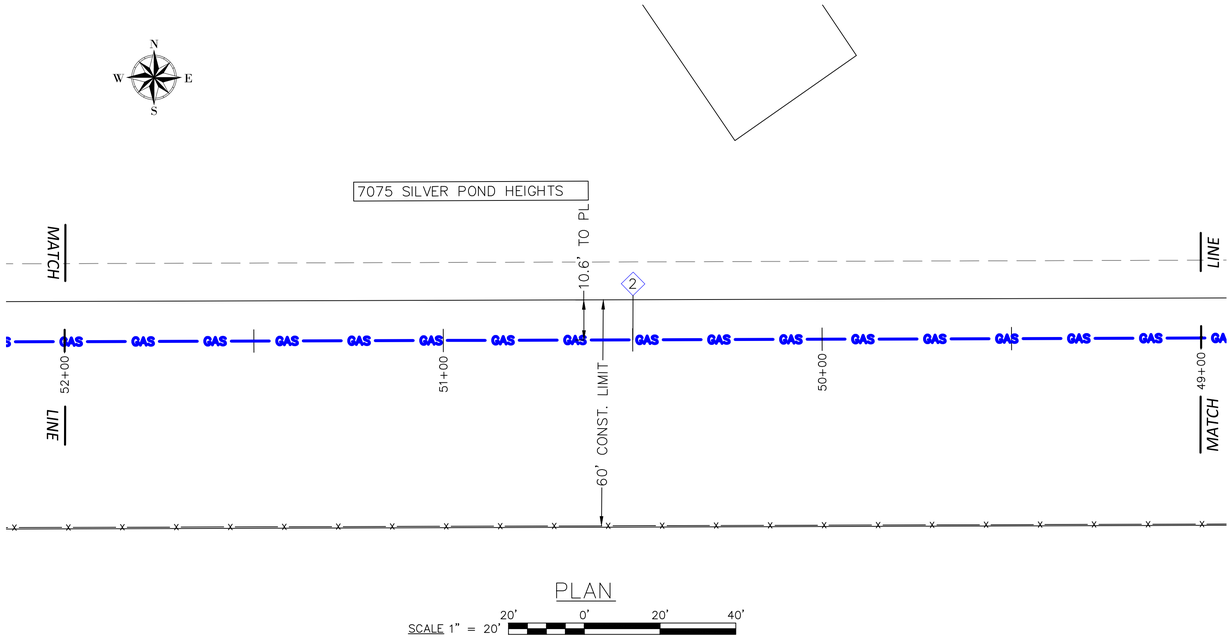
JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20%: ☐

W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN		PHONE: (719) 668-8196
PROJECT MANAGER: MELISSA LINGO		PHONE: (719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD		PHONE: (719) 668-3675
SHEET NO. 40 OF 60	SCALE: AS NOTED	
PATRICK ENGINEERING TEAM		
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH

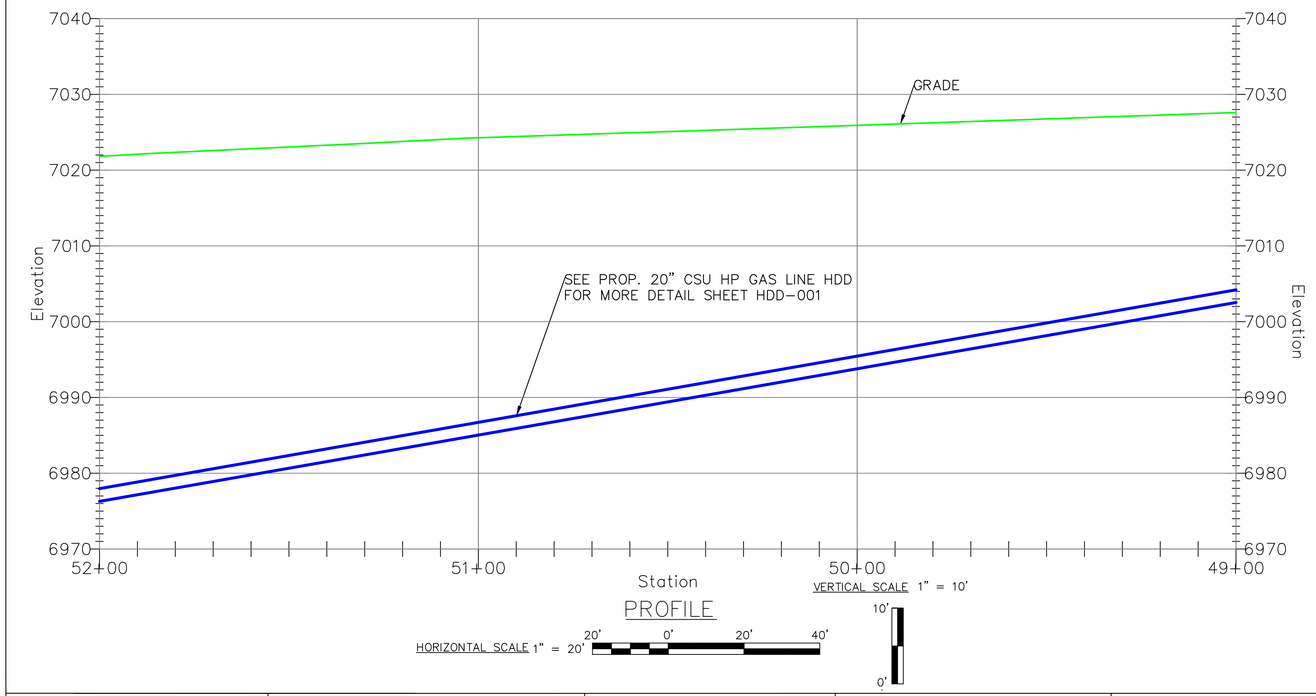
LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
46+00 - 49+00

DWG. NO: **C-215**



PLAN

SCALE 1" = 20'



PROFILE

HORIZONTAL SCALE 1" = 20'

VERTICAL SCALE 1" = 10'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
2	300'		241-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE/ARO	ERW	FBE/ARO	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

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Jeremiah Matthew Smith
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NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
	N/A			

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP: 275 psig

SYSTEM MOP: 145 psig

N/A

SYSTEM MAOP:

SYSTEM MOP:

JOB TYPE:

HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

W/O #: 3747144

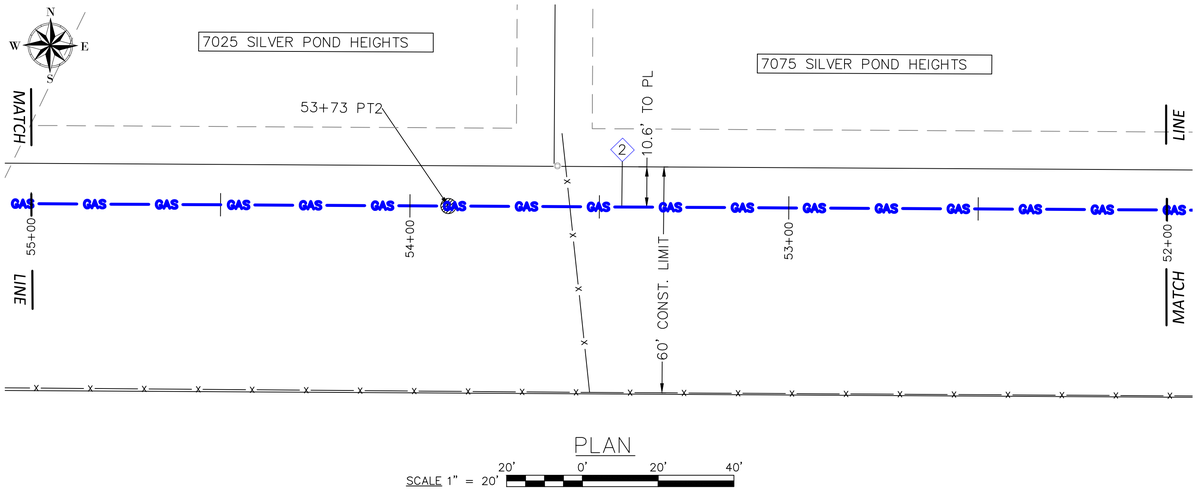
RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN		PHONE:	(719) 668-8196
PROJECT MANAGER: MELISSA LINGO		PHONE:	(719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD		PHONE:	(719) 668-3675
SHEET NO. 41 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH	

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
49+00 - 52+00

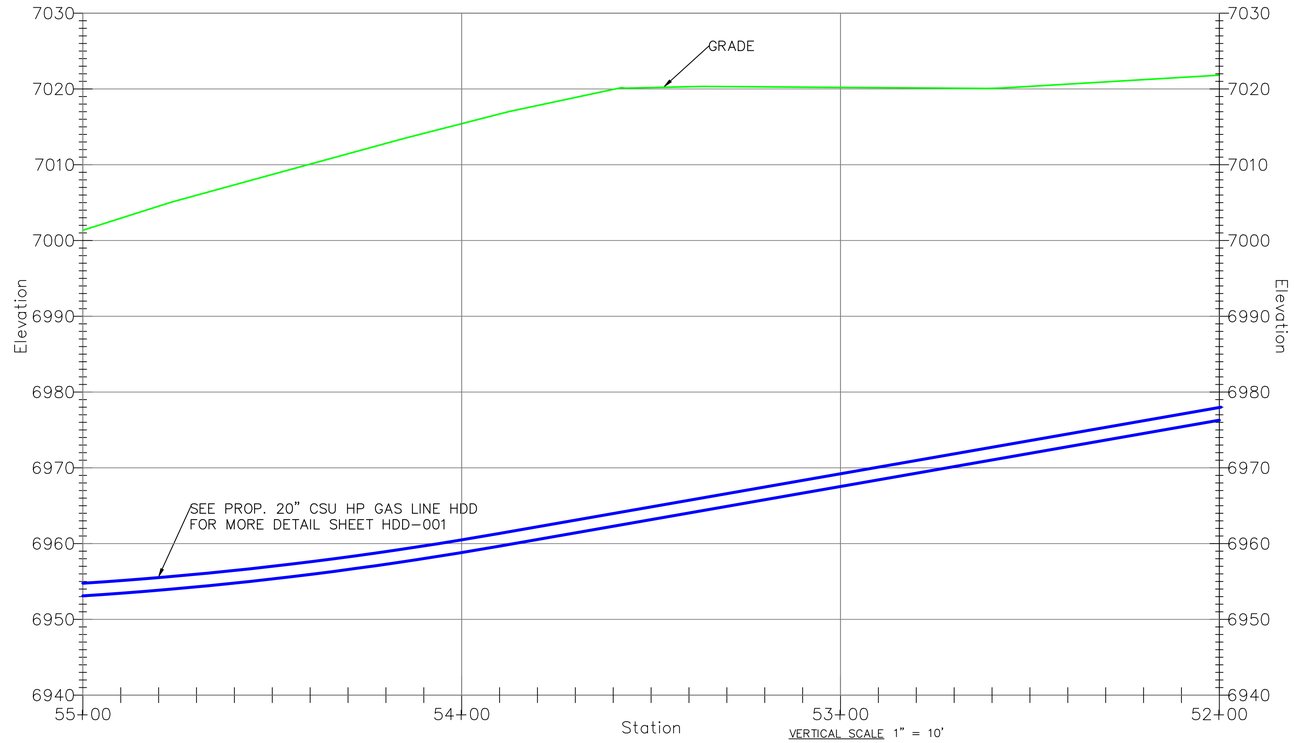
DWG. NO: C-216

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-C3D-CSU.dwg LAYOUT NAME: C-216 PLOTTED: Thursday, March 23, 2023 - 8:44am USER: nwest



PLAN

SCALE 1" = 20' 20' 0' 20' 40'



PROFILE

HORIZONTAL SCALE 1" = 20' 20' 0' 20' 40'

VERTICAL SCALE 1" = 10' 10' 0'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
2	300'		241-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE/ARO	ERW	FBE/ARO	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
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Indianapolis, IN 46268
TEL. (317) 217-1701
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PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
	N/A
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O # 3747144

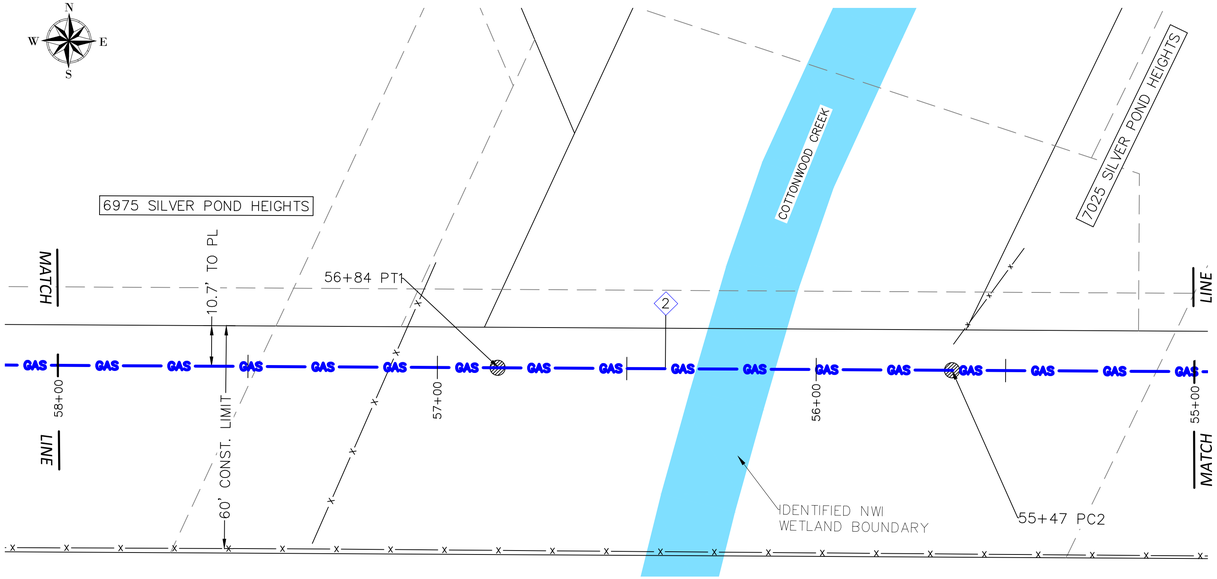
RELATED W/O #s 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 42 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
52+00 - 55+00

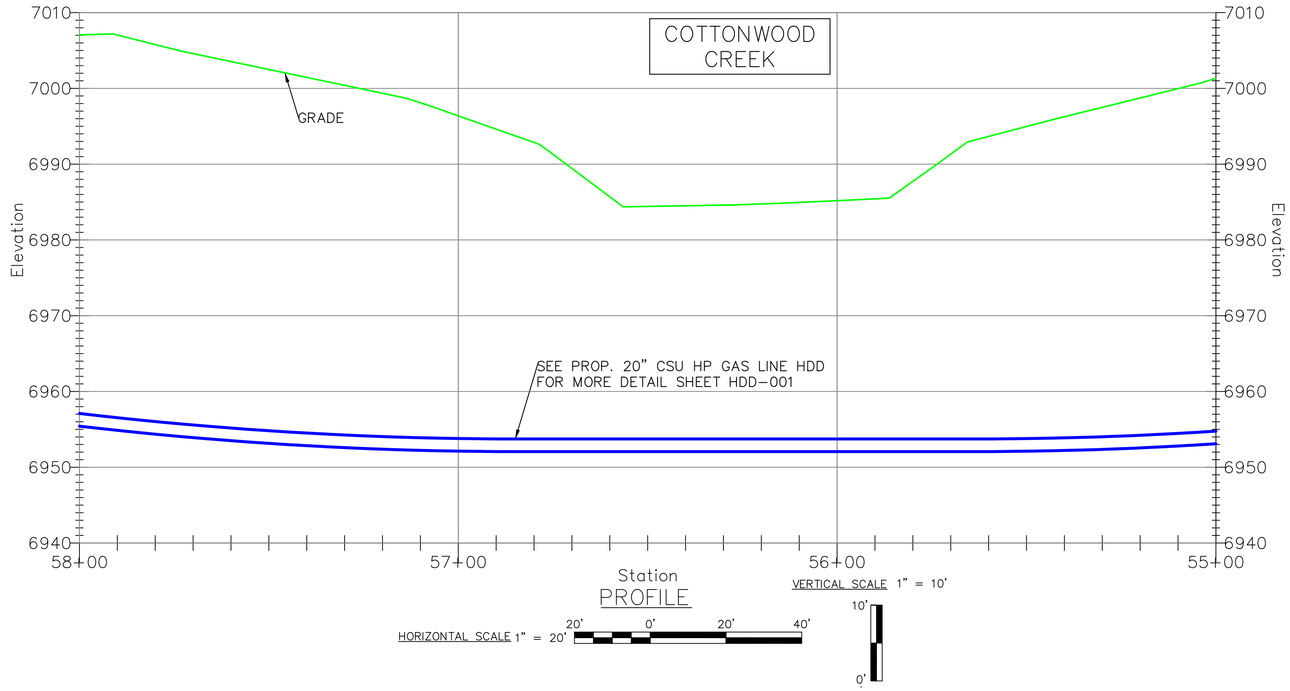
DWG. NO: C-217

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-CSD-CSU.dwg LAYOUT NAME: C-217 PLOTTED: Thursday, March 23, 2023 - 8:42am USER: nwest



PLAN

SCALE 1" = 20'



PROFILE

HORIZONTAL SCALE 1" = 20'

VERTICAL SCALE 1" = 10'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
2	300'		241-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE/ARO	ERW	FBE/ARO	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
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11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

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PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

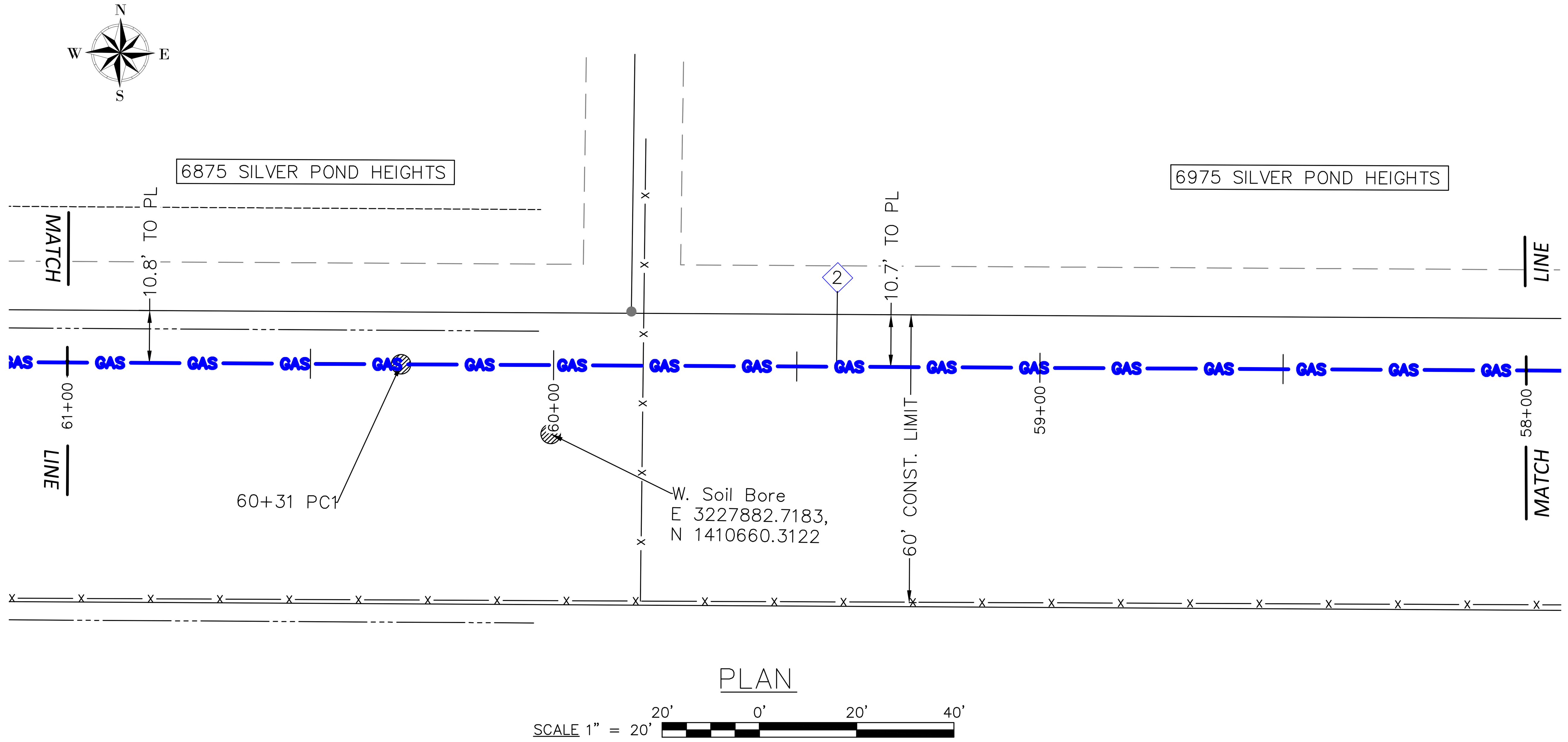
W/O # 3747144
RELATED W/O #s 3789816

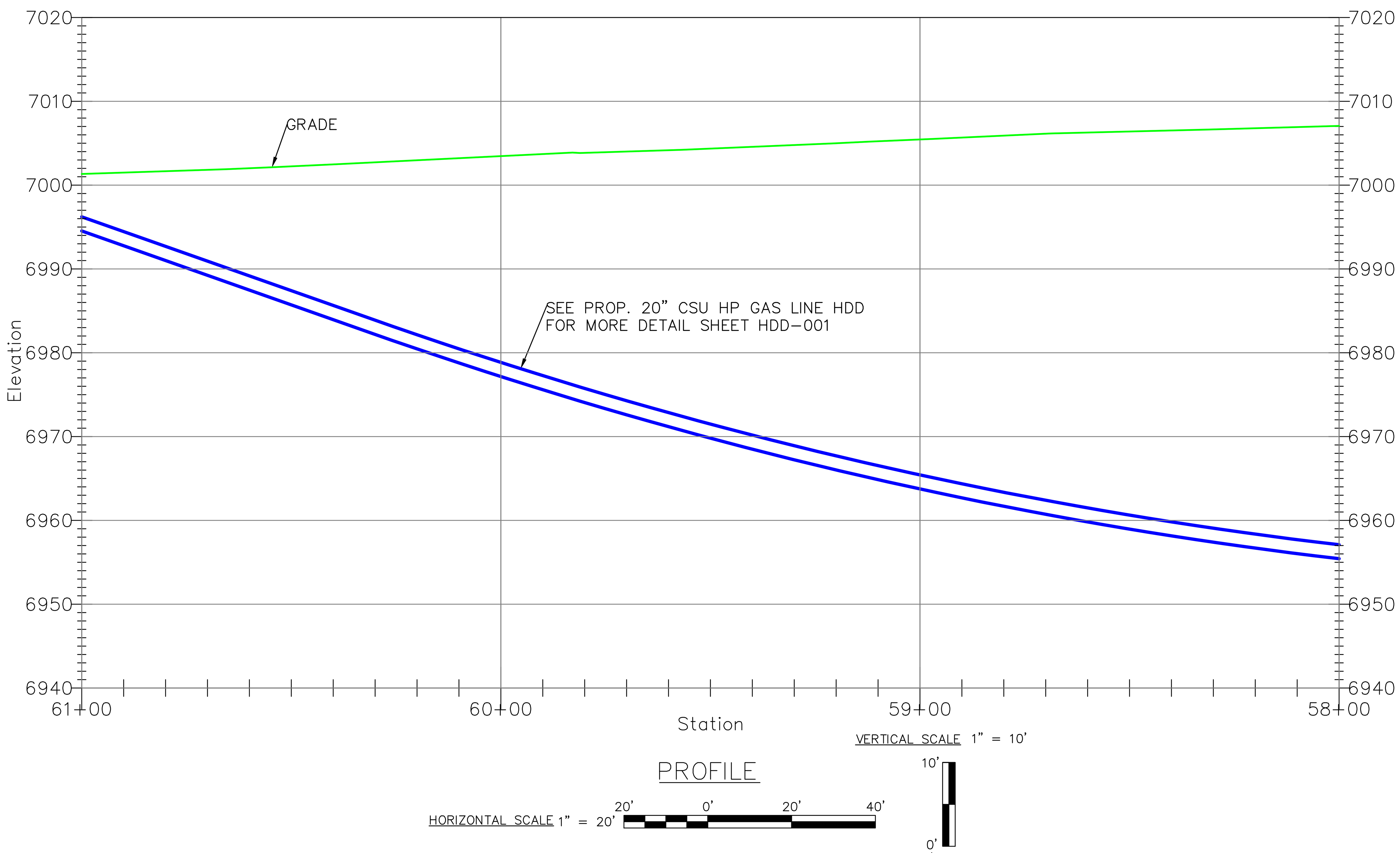
ENGINEER: SCOTT JENSEN	PHONE: (719) 668-8196		
PROJECT MANAGER: MELISSA LINGO	PHONE: (719) 668-8794		
CONSTRUCTION LEAD: JOSH RICHARD	PHONE: (719) 668-3675		
SHEET NO. 43 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH	

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
55+00 - 58+00

DWG. NO: C-218

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-C3D-CSU.dwg LAYOUT NAME: C-218 PLOTTED: Thursday, March 23, 2023 - 8:40am USER: nwest





HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
2	300'		241-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE/ARO	ERW	FBE/ARO	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
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14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

COLORADO 811

Colorado Springs Utilities
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COLORADO LICENSED
JEREMIAH SMITH
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
PROFESSIONAL ENGINEER
P.E. CERTIFICATION

PATRICK ENGINEERING

8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com

PROJ. NO. 22282.003

REVISIONS				
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q-19

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20%: ☐

W/O #: 3747144
RELATED W/O #s: 3789816

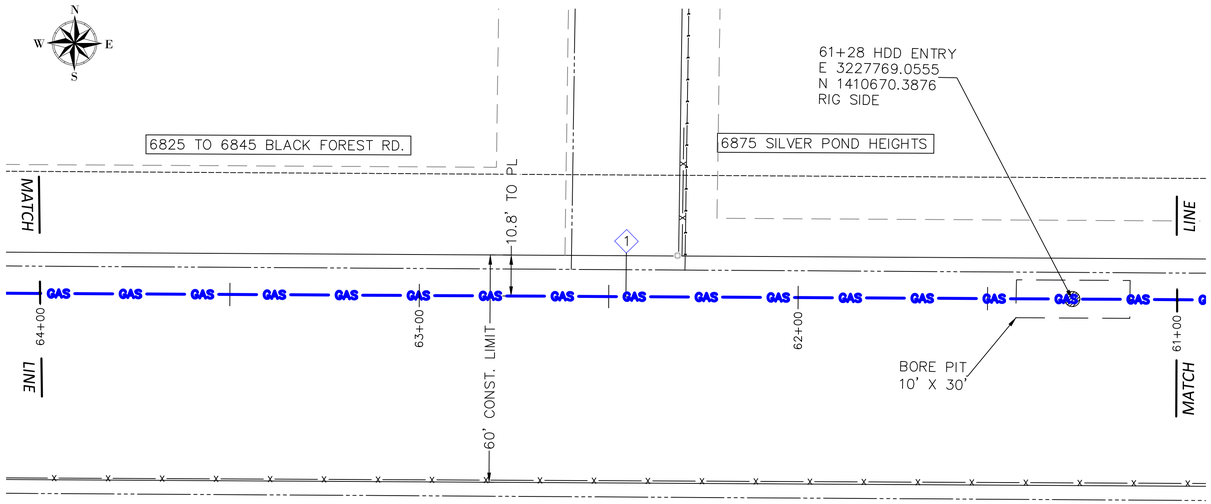
ENGINEER: SCOTT JENSEN	PHONE: (719) 668-8196
PROJECT MANAGER: MELISSA LINGO	PHONE: (719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD	PHONE: (719) 668-3675
SHEET NO. 44 OF 60	SCALE: AS NOTED

PATRICK ENGINEERING TEAM
DWN BY: NORM WEST | CHKD. BY: SETH BROWN | APPD. BY: JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
58+00 - 61+00

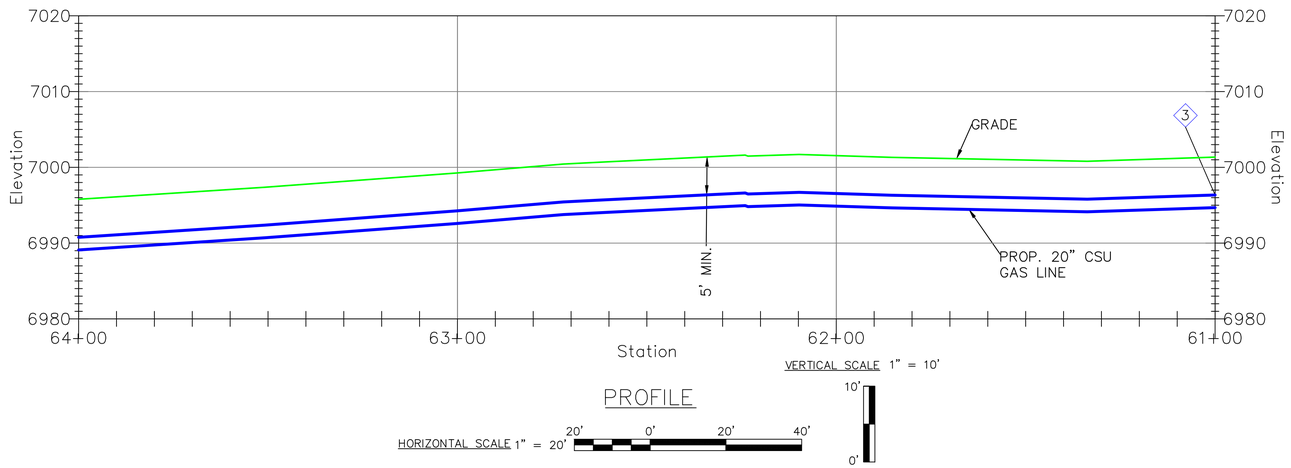
DWG. NO: C-219

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-C3D-CSU.dwg LAYOUT NAME: C-219 PLOTTED: Thursday, March 23, 2023 - 8:36am USER: rwest



PLAN

SCALE 1" = 20'



PROFILE

HORIZONTAL SCALE 1" = 20'

VERTICAL SCALE 1" = 10'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
3	1		220-647-920	20" ELBOW, 0.375" WT, STL, 45 DEG., 3R, WPHY 52	FORGED	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
1 CP	NOT ON THIS SHEET.
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

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COLORADO LICENSED — JEREMIAH SMITH — PROFESSIONAL ENGINEER

Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'

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5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

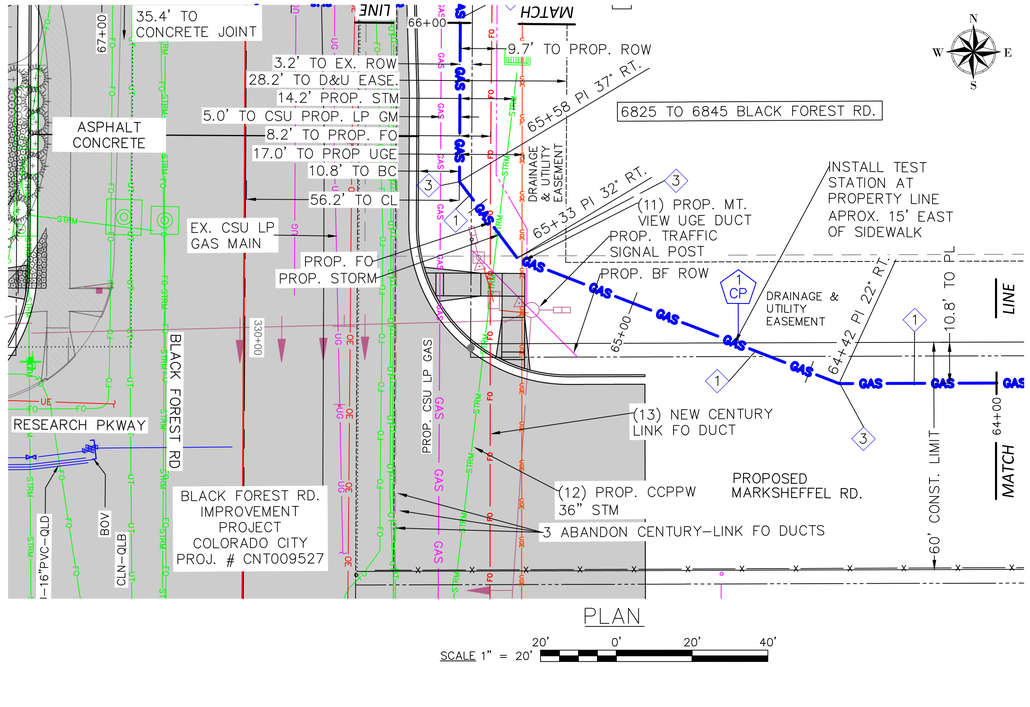
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 45 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

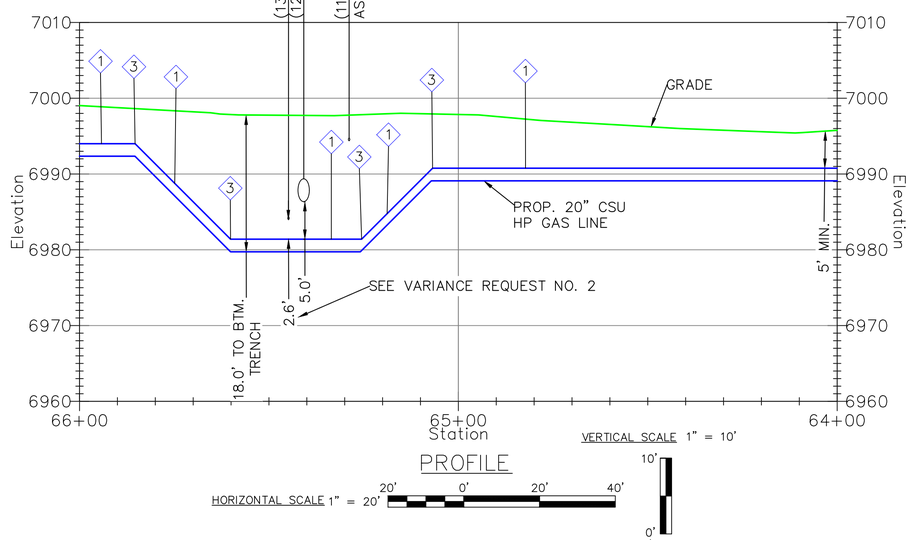
LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE 61+00 - 64+00

DWG. NO: C-220

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-C3D-CSU.dwg LAYOUT NAME: C-220 PLOTTED: Thursday, March 23, 2023 - 8:34am USER: nwest



PLAN



PROFILE

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	200'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
3	7		220-647-920	20" ELBOW, 0.375" WT, STL, 45 DEG., 3R, WPHY 52	FORGED	FBE	

CROSSING TABLE					
ITEM	CROSSING	SIZE	DEPTH (TOP OF PIPE)	MIN. VERT. SEPERATION	MIN. HORZ. SEPERATION
11	MT. VIEW ELECTRIC DUCT	4"	3'[1]	5'	6'
12	CCPPW[2] STORM	36"	8.4'[1]	5'	10'
13	CENTURY-LINK FO DUCT	4"	13.4'[1]	5'	6'

1. PROPOSED UTILITIES, VERIFY DEPTH AND LOCATION BEFORE CONSTRUCTION.
2. CCPPW- COLORADO CITY OF PARKS AND PUBLIC WORKS.

CSU SPECIFICATION VARIANCE APPROVAL REQUEST	
2	REQUESTING APPROVAL TO REDUCE THE SEPARATION CLEARANCE BETWEEN THE PROPOSED 20" GAS LINE AND THE PROPOSED FIBER OPTIC DUCT TO REDUCE THE EXCAVATION DEPTH TO LESS THAN 20-FEET FOR THE NEW GAS LINE. THIS WILL PREVENT HAVING TO HAVE AN ENGINEERED EXCAVATION.
APPROVED BY	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
1 CP	INSTALL TEST STATIONS AT LOCATIONS SHOWN IN THE DESIGN PACKAGE.
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO THE BLACK FOREST RD. PROJECT, (CITY REFERENCE FILE NO. CN: T009527) AND OTHER UTILITIES OTHER THAN THE 20" GAS LINE ARE TO BE COMPLETED BY OTHERS.

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
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NO.	REVISIONS	BY:	DATE:	APPVD:
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5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q-19

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

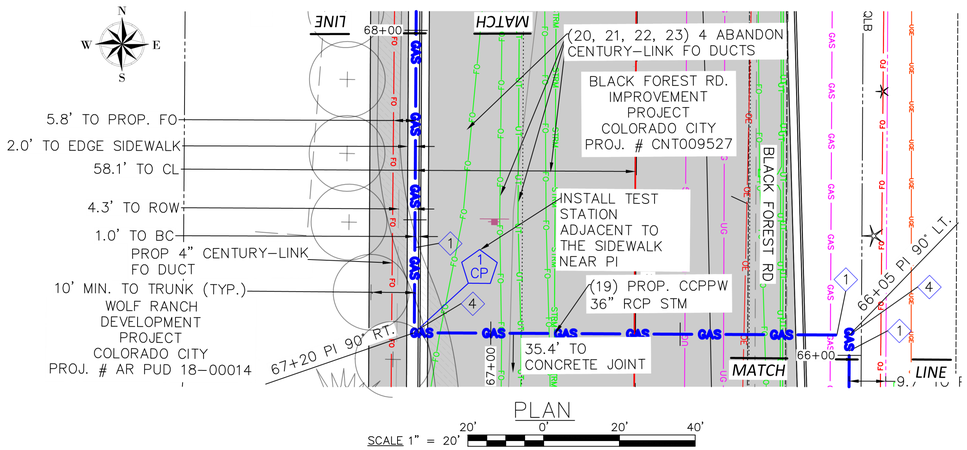
W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN	PHONE: (719) 668-8196		
PROJECT MANAGER: MELISSA LINGO	PHONE: (719) 668-8794		
CONSTRUCTION LEAD: JOSH RICHARD	PHONE: (719) 668-3675		
SHEET NO. 46 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH	

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
64+00 - 66+00

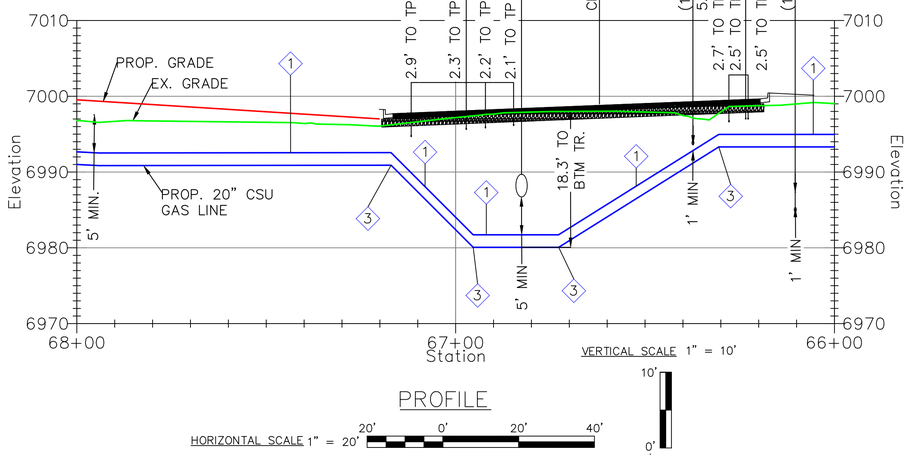
DWG. NO: C-221

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\1! Design\01 Drawings\06 Alignment\Colorado Springs_#FC-C3D-CSU.dwg LAYOUT NAME: C-221 PLOTTED: Wednesday, March 22, 2023 - 4:32pm USER: nwest



PLAN

SCALE 1" = 20'



PROFILE

HORIZONTAL SCALE 1" = 20'

VERTICAL SCALE 1" = 10'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	200'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
3	4		220-647-920	20" ELBOW, 0.375" WT, STL, 45 DEG., 3R, WPHY 52	FORGED	FBE	
4	2		220-692-920	20" ELBOW, 0.375" WT, STL, 90 DEG., 3R, WPHY 52	FORGED	FBE	

CROSSING TABLE				
ITEM	CROSSING	SIZE	DEPTH (TOP OF PIPE)	MIN. VERT. SEPERATION
14	CSU PROP LP GAS LINE	4"	14.9'[1]	1'
15	CENTURY-LINK ABANDON FO DUCT	2"	2.5'[2]	NONE
16	CENTURY-LINK ABANDON FO DUCT	2"	2.5'[2]	NONE
17	CENTURY-LINK ABANDON FO DUCT	2"	2.5'[2]	NONE
18	CSU ABANDON LP GAS LINE	4"	5.2'[3]	NONE
19	CCPPW[5] PROP.RCP STORM	36"	8.7'[4]	5'
20	CENTURY-LINK ABANDON FO DUCT	2"	2.1'[2]	NONE
21	CENTURY-LINK ABANDON FO DUCT	2"	2.2'[2]	NONE
22	CENTURY-LINK ABANDON FO DUCT	2"	2.3'[2]	NONE
23	CENTURY-LINK ABANDON FO DUCT	2"	2.9'[2]	NONE

1. (1) PROPOSED CSU PROPOSED LP LINE LINE, VERIFY DEPTH AND LOCATION BEFORE CONSTRUCTION. THE DEPTH IS BASED ON THE NEED TO CROSS A PROPOSED STORM SEWER.

2. (2, 3 4, 7, 8, 9, 10) FIBER OPTIC DUCTS ARE EXPECTED TO BE ABANDON IN PLACE, BUT THEY MAY HAVE BEEN REMOVED DURING ROAD CONSTRUCTION.

3. (5) EXISTING CSU 4" LP GAS LINE THAT WILL BE ABANDON. DEPTH IS MEASURED FROM TOP OF THE PROPOSED BLACK FOREST RD.

4. (6) PROPOSED STORM SEWER, VERIFY LOCATION AND DEPTH BEFORE CONSTRUCTION.

5. CCPPW - COLORADO CITY PARKS AND PUBLIC WORKS

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
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10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
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CATHODIC PROTECTION NOTES	
1 CP	INSTALL TEST STATIONS AT LOCATIONS SHOWN IN THE DESIGN PACKAGE.
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO THE BLACK FOREST RD. PROJECT, (CITY REFERENCE FILE NO. CN: T009527) AND THE WOLF RANCH DEVELOPMENT INCLUDING LANDSCAPING PROJECT (CITY REFERENCE FILE NO. AR–PUD 18–00014) AND OTHER UTILITIES OTHER THAN THE 20" GAS LINE ARE TO BE COMPLETED BY OTHERS.

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
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REVISIONS			
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5	ISSUED FOR CONSTRUCTION	NEW 11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW 10/14/22	JMS
NO.	N/A	BY: DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q–19

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

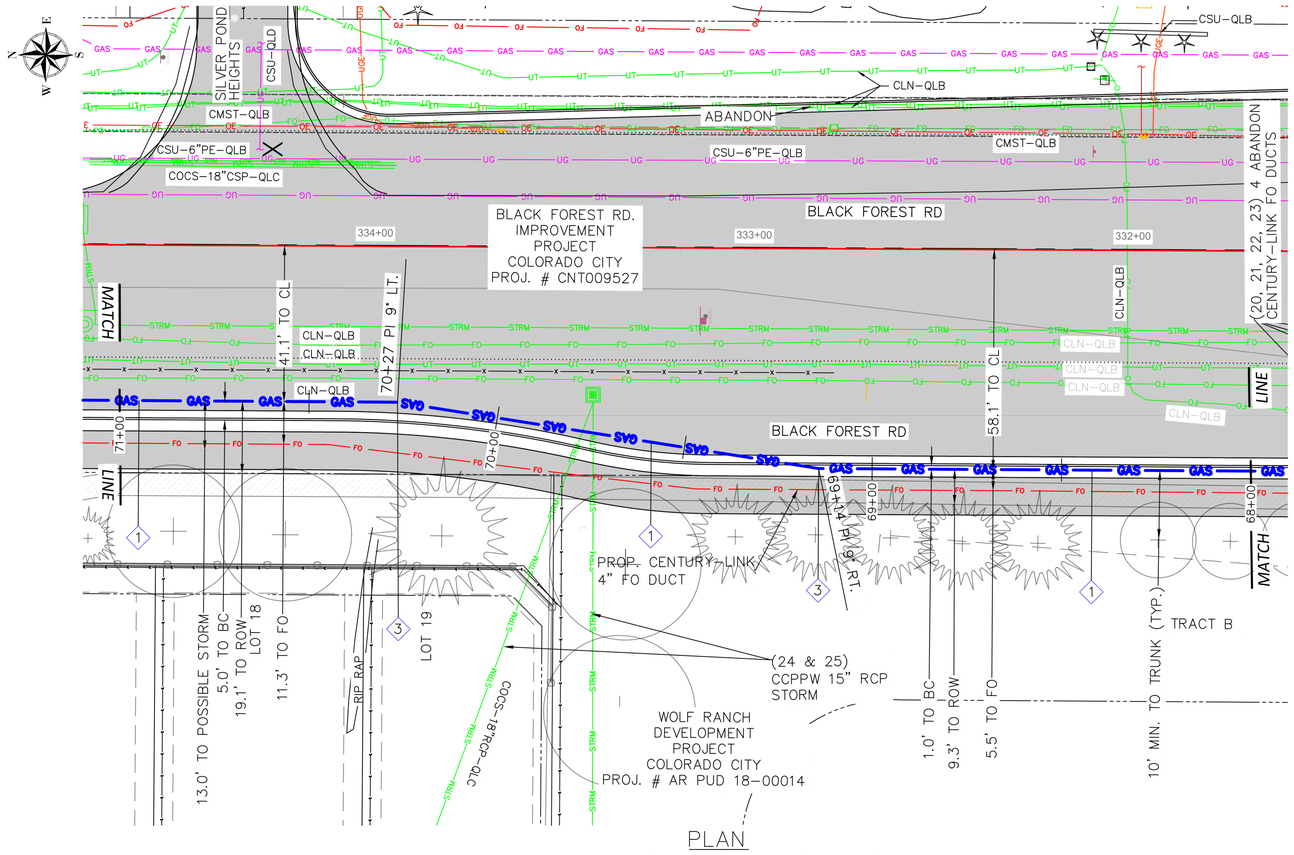
W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN		PHONE:	(719) 668-8196
PROJECT MANAGER: MELISSA LINGO		PHONE:	(719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD		PHONE:	(719) 668-3675
SHEET NO. 47 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH	

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
66+00 - 68+00

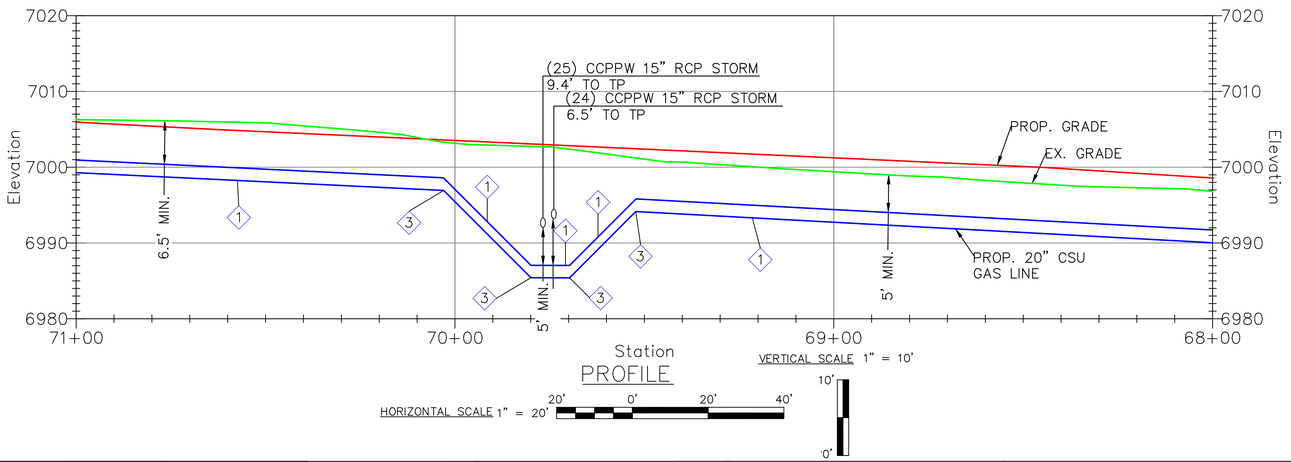
DWG. NO: C-222

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_#FC-C3D-CSU.dwg LAYOUT NAME: C-222 PLOTTED: Wednesday, March 22, 2023 - 4:32pm USER: nwest



PLAN

SCALE 1" = 20'



PROFILE

HORIZONTAL SCALE 1" = 20'

VERTICAL SCALE 1" = 10'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
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CONSTRUCTION NOTES	
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CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

CROSSING TABLE					
SIZE	CROSSING	SIZE	DEPTH (TOP OF PIPE)	MIN. VERT. SEPERATION	MIN. HORZ. SEPERATION
24	CCPPW RCP STORM	15"	6.4'	5'	-
25	CCPPW RCP STORM	15"	9.4'	5'	-

CCPPW - COLORADO CITY PARKS AND PUBLIC WORKS

REFERENCE NOTE:
ANY WORK RELATED TO THE BLACK FOREST RD. PROJECT, (CITY REFERENCE FILE NO. CN: T009527) AND THE WOLF RANCH DEVELOPMENT INCLUDING LANDSCAPING PROJECT (CITY REFERENCE FILE NO. AR-PUD 18-00014) AND OTHER UTILITIES OTHER THAN THE 20" GAS LINE ARE TO BE COMPLETED BY OTHERS.

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Jeremiah Matthew Smith
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PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q-19

SYSTEM NAME: 150P

SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

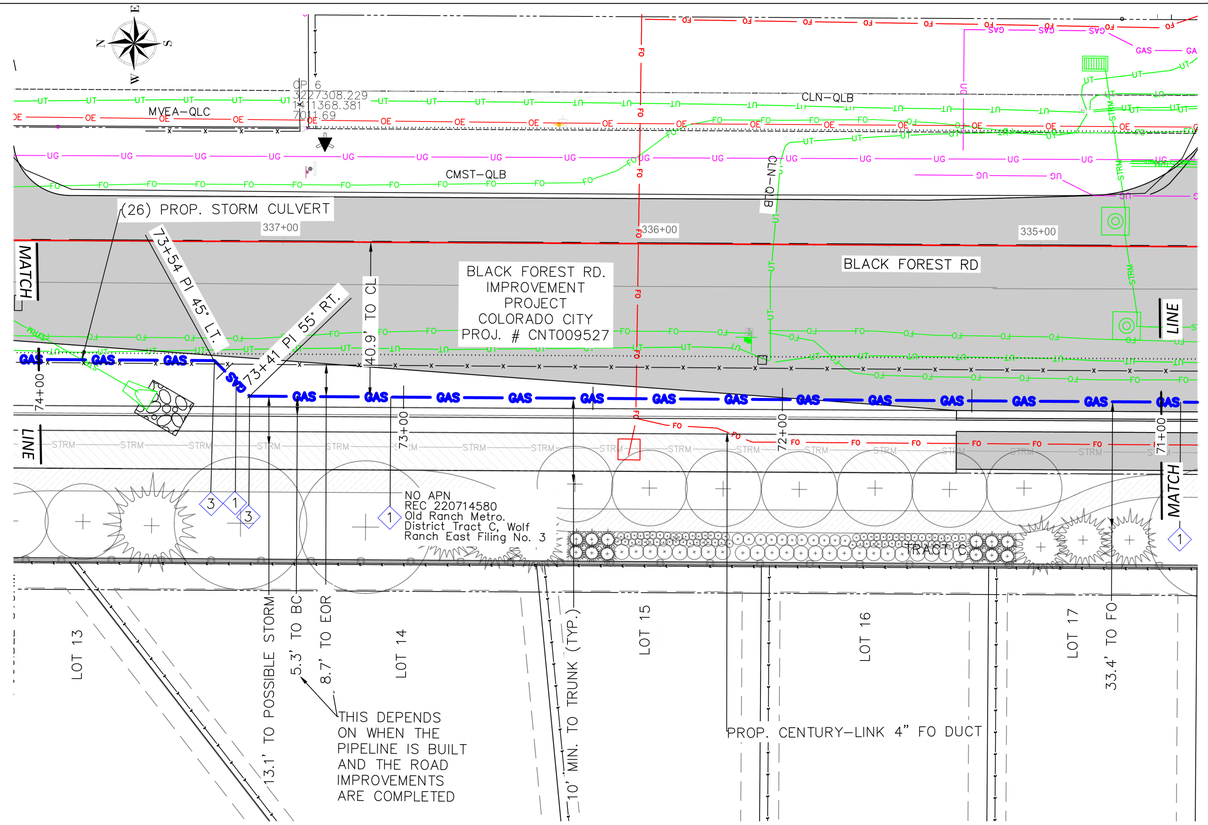
JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 48 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

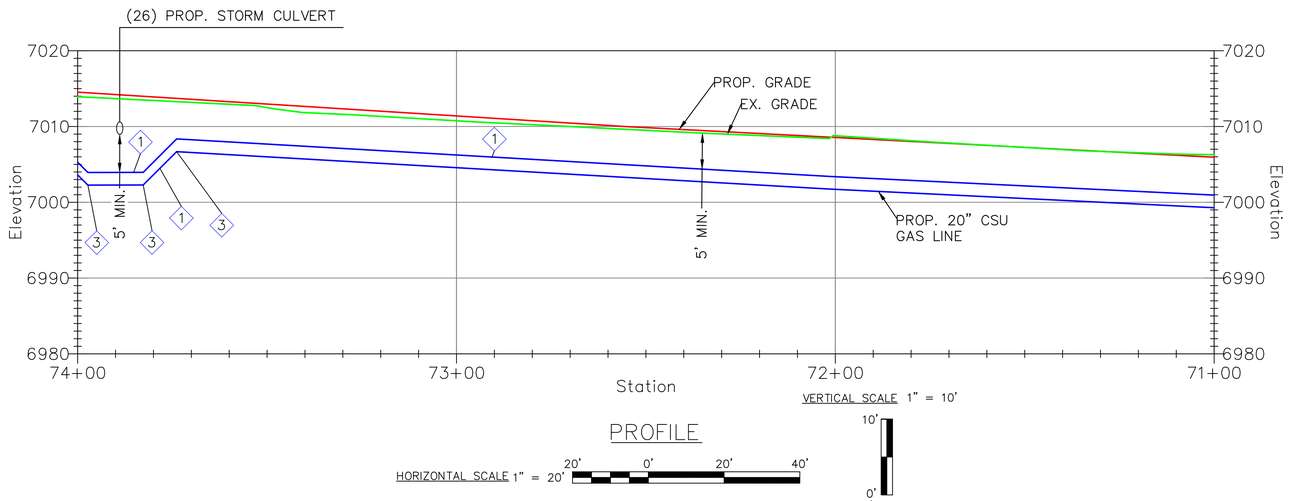
LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
68+00 - 71+00
DWG. NO: **C-223**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-CSD-CSU.dwg LAYOUT NAME: C-223 PLOTTED: Wednesday, March 22, 2023 - 4:32pm USER: nwest



PLAN

SCALE 1" = 20'



PROFILE

HORIZONTAL SCALE 1" = 20'

VERTICAL SCALE 1" = 10'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
3	5		220-647-920	20" ELBOW, 0.375" WT, STL, 45 DEG., 3R, WPHY 52	FORGED	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

CROSSING TABLE					
SIZE	CROSSING	SIZE	DEPTH (TOP OF PIPE)	MIN. VERT. SEPERATION	MIN. HORZ. SEPERATION
26	CCPPW STORM CULVERT	TBD	TBD	5'	-

CCPPW - COLORADO CITY PARKS AND PUBLIC WORKS

REFERENCE NOTE:
ANY WORK RELATED TO THE BLACK FOREST RD. PROJECT, (CITY REFERENCE FILE NO. CN: T009527) AND THE WOLF RANCH DEVELOPMENT INCLUDING LANDSCAPING PROJECT (CITY REFERENCE FILE NO. AR–PUD 18–00014) AND OTHER UTILITIES OTHER THAN THE 20" GAS LINE ARE TO BE COMPLETED BY OTHERS.

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Colorado Springs Utilities
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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING

8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com

PROJ. NO. 22282.003

REVISIONS				
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	Q–19 & P–19

SYSTEM NAME: 150P

SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

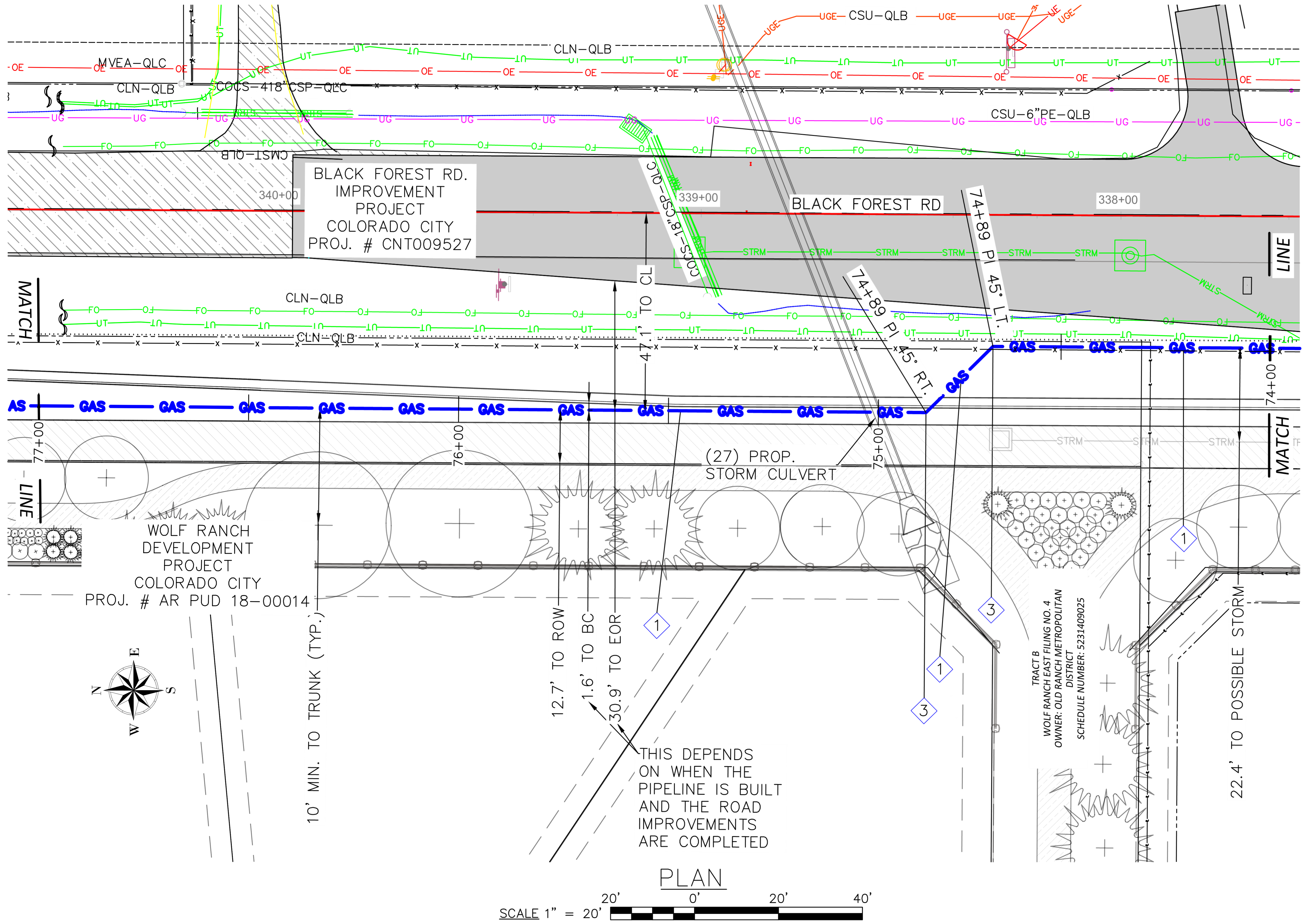
W/O #: 3747144
RELATED W/O #s: 3789816

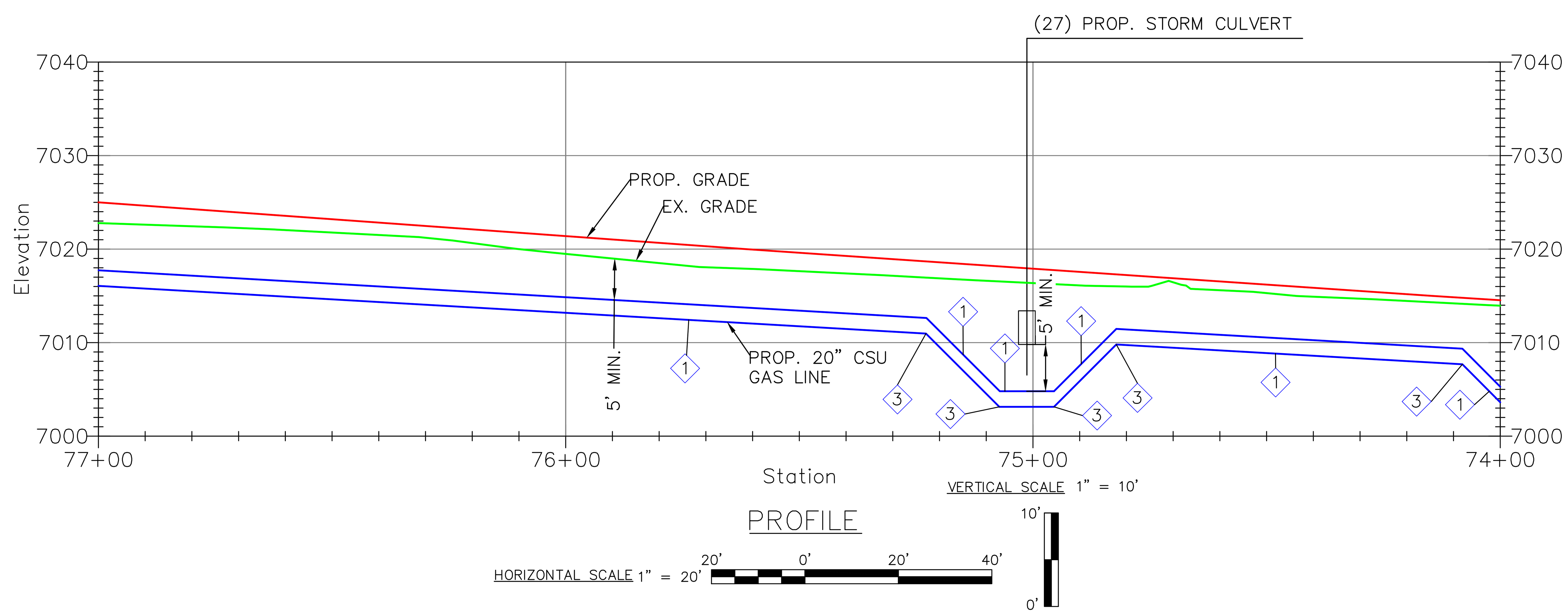
ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 49 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE 71+00 - 74+00

DWG. NO: C-224

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 – Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC–C3D–CSU.dwg LAYOUT NAME: C–224 PLOTTED: Wednesday, March 22, 2023 – 4:33pm USER: nwest





HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
3	7		220-647-920	20" ELBOW, 0.375" WT, STL, 45 DEG., 3R, WPHY 52	FORGED	FBE	

CONSTRUCTION NOTES

4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES

2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

CROSSING TABLE

SIZE	CROSSING	SIZE	DEPTH (TOP OF PIPE)	MIN. VERT. SEPERATION	MIN. HORZ. SEPERATION
27	CCPPW STORM CULVERT	TBD	TBD	5'	-

CCPPW - COLORADO CITY PARKS AND PUBLIC WORKS

REFERENCE NOTE:
ANY WORK RELATED TO THE BLACK FOREST RD. PROJECT, (CITY REFERENCE FILE NO. CN: T009527) AND THE WOLF RANCH DEVELOPMENT INCLUDING LANDSCAPING PROJECT (CITY REFERENCE FILE NO. AR-PUD 18-00014) AND OTHER UTILITIES OTHER THAN THE 20" GAS LINE ARE TO BE COMPLETED BY OTHERS.

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COLORADO LICENSED PROFESSIONAL ENGINEER JEREMIAH SMITH
Jeremiah Matthew Smith 2023.03.24 16:47:06-04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

REVISIONS				
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 32 TWN. 12S, RNG. 65W	P-19

SYSTEM NAME: 150P
SYSTEM MAOP: 275 psig
SYSTEM MOP: 145 psig
N/A
SYSTEM MAOP:
SYSTEM MOP:

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20%: ☐

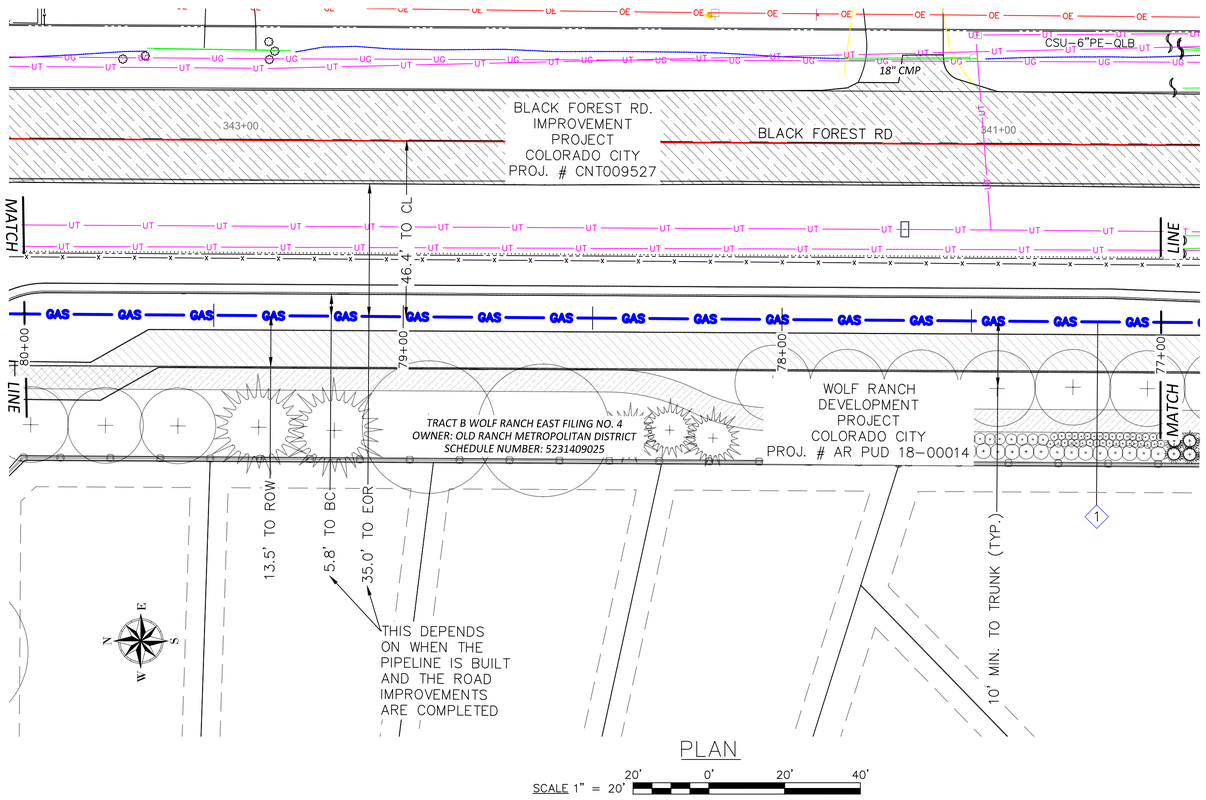
W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER: SCOTT JENSEN		PHONE:	(719) 668-8196
PROJECT MANAGER: MELISSA LINGO		PHONE:	(719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD		PHONE:	(719) 668-3675
SHEET NO. 50 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH	

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
74+00 - 77+00

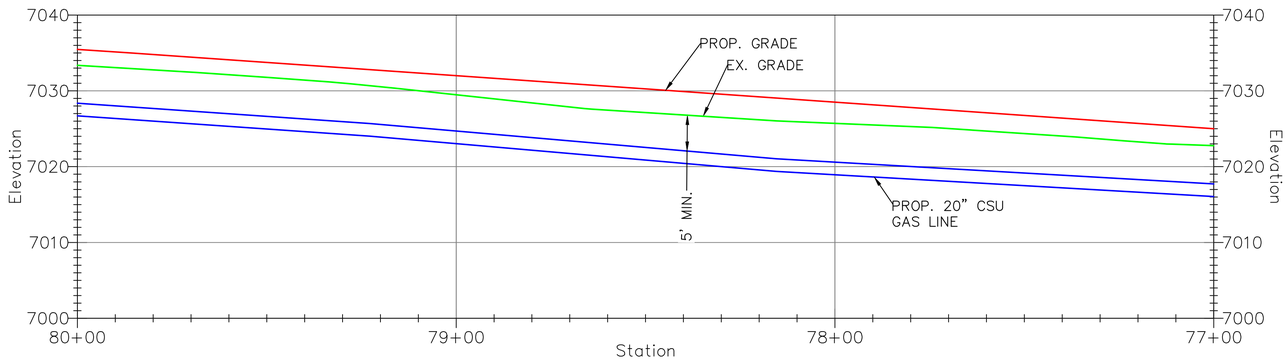
DWG. NO: C-225

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_IFC-C30-CSU.dwg LAYOUT NAME: C-225 PLOTTED: Wednesday, March 22, 2023 - 4:33pm USER: nwest



PLAN

SCALE 1" = 20' (20' 0' 20' 40')



PROFILE

HORIZONTAL SCALE 1" = 20' (20' 0' 20' 40')

VERTICAL SCALE 1" = 10' (10' 0')

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO THE BLACK FOREST RD. PROJECT, (CITY REFERENCE FILE NO. CN: T009527) AND THE WOLF RANCH DEVELOPMENT INCLUDING LANDSCAPING PROJECT (CITY REFERENCE FILE NO. AR-PUD 18-00014) AND OTHER UTILITIES OTHER THAN THE 20" GAS LINE ARE TO BE COMPLETED BY OTHERS.

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 31 TWN. 12S, RNG. 65W	P-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
	N/A
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:
HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

W/O # 3747144

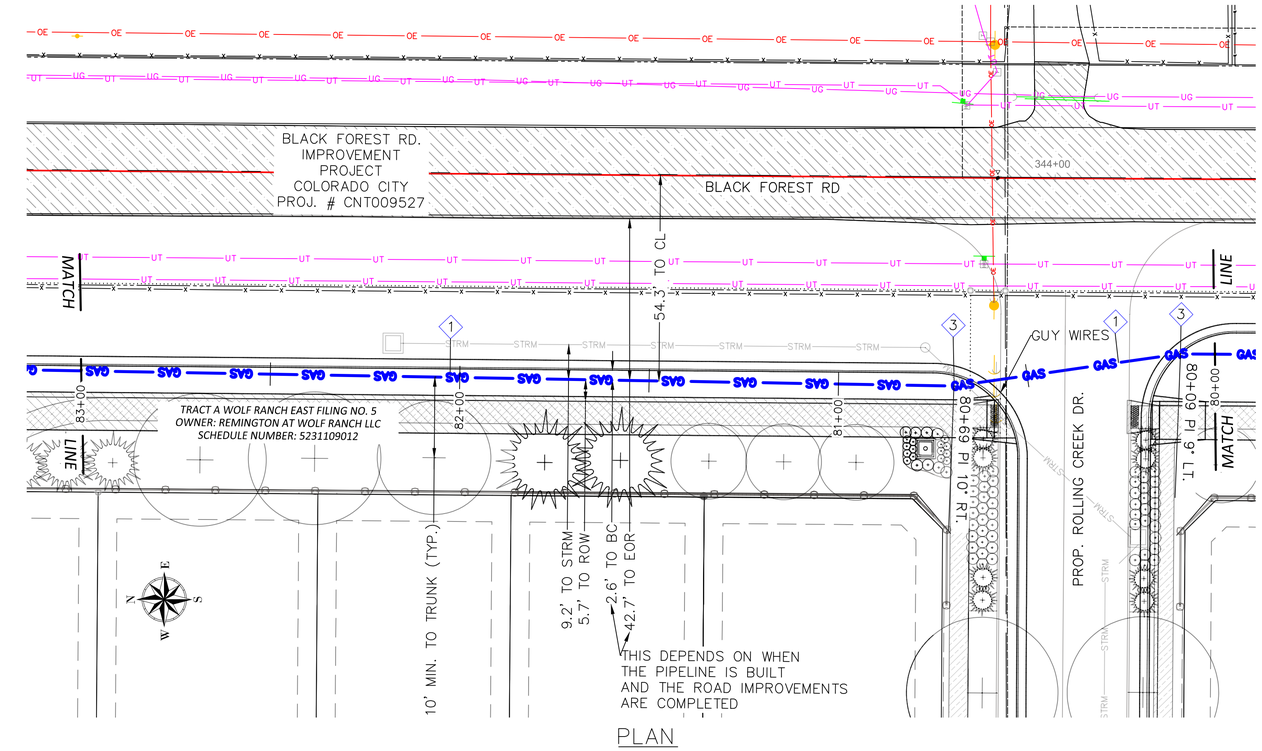
RELATED W/O #s 3789816

ENGINEER: SCOTT JENSEN PHONE: (719) 668-8196
PROJECT MANAGER: MELISSA LINGO PHONE: (719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD PHONE: (719) 668-3675
SHEET NO. 51 OF 60 SCALE: AS NOTED
PATRICK ENGINEERING TEAM
DWN BY: NORM WEST CHKD. BY: SETH BROWN APPD. BY: JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE 77+00 - 80+00

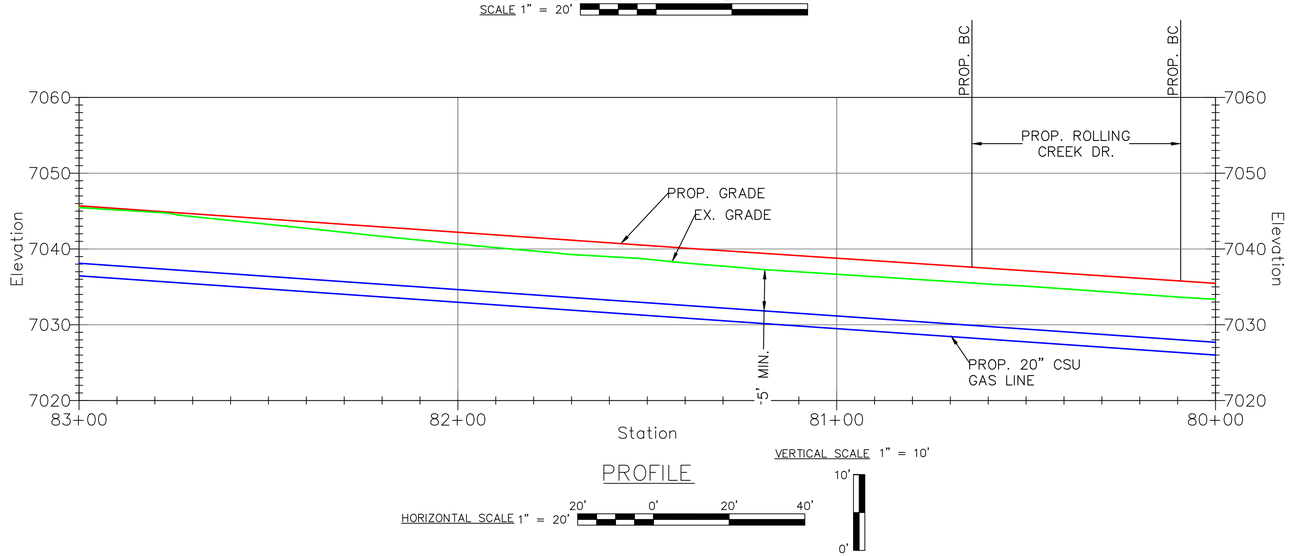
DWG. NO: C-226

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-C3D-CSU.dwg LAYOUT NAME: C-226 PLOTTED: Wednesday, March 22, 2023 - 4:34pm USER: nwest



PLAN

SCALE 1" = 20'



PROFILE

HORIZONTAL SCALE 1" = 20'

VERTICAL SCALE 1" = 10'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
3	2		220-647-920	20" ELBOW, 0.375" WT, STL, 45 DEG., 3R, WPHY 52	FORGED	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO THE BLACK FOREST RD. PROJECT, (CITY REFERENCE FILE NO. CN: T009527) AND THE WOLF RANCH DEVELOPMENT INCLUDING LANDSCAPING PROJECT (CITY REFERENCE FILE NO. AR-PUD 18-00014) AND OTHER UTILITIES OTHER THAN THE 20" GAS LINE ARE TO BE COMPLETED BY OTHERS.

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COLORADO LICENSED — JEREMIAH SMITH — PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
No. 0048747
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
	N/A			

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 31 TWN. 12S, RNG. 65W	P-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
	N/A
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	
DISTRIBUTION:	X
FEEDER:	
TRANS. BY DEF.	
TRANS v 20%	

W/O #: 3747144

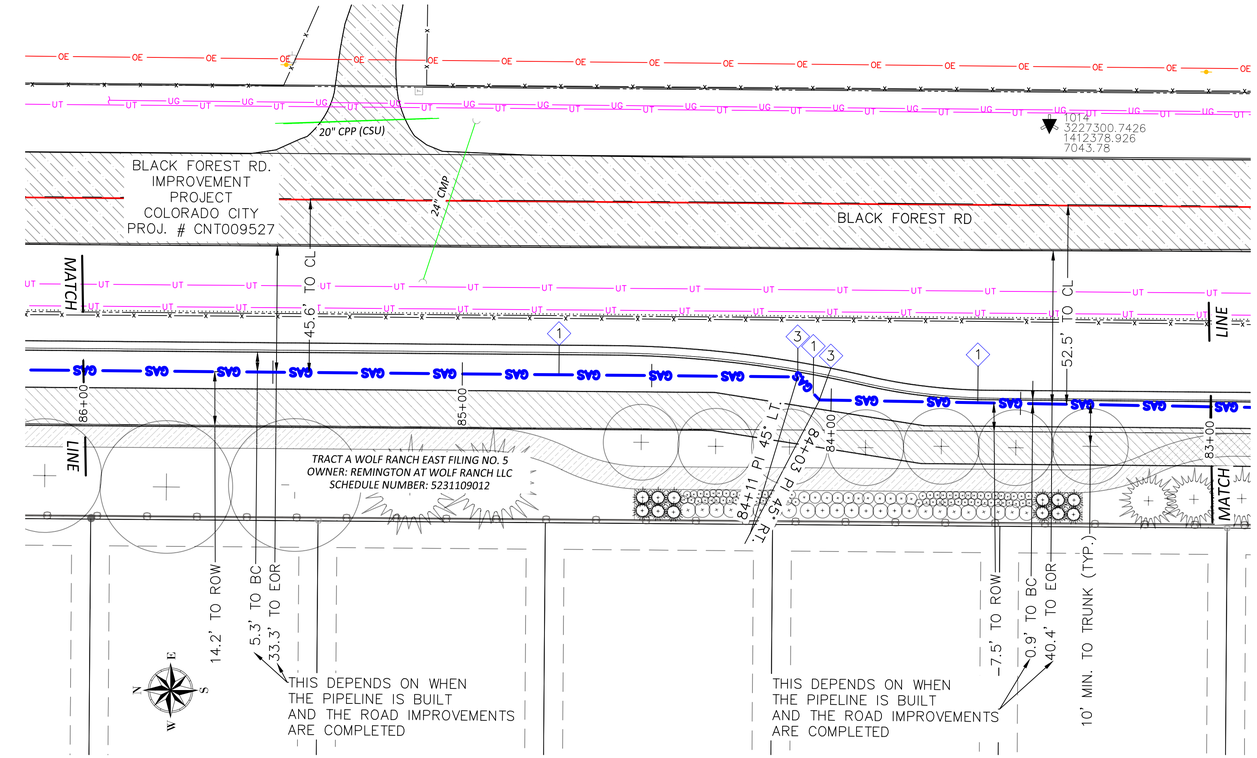
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 52 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE 80+00 - 83+00

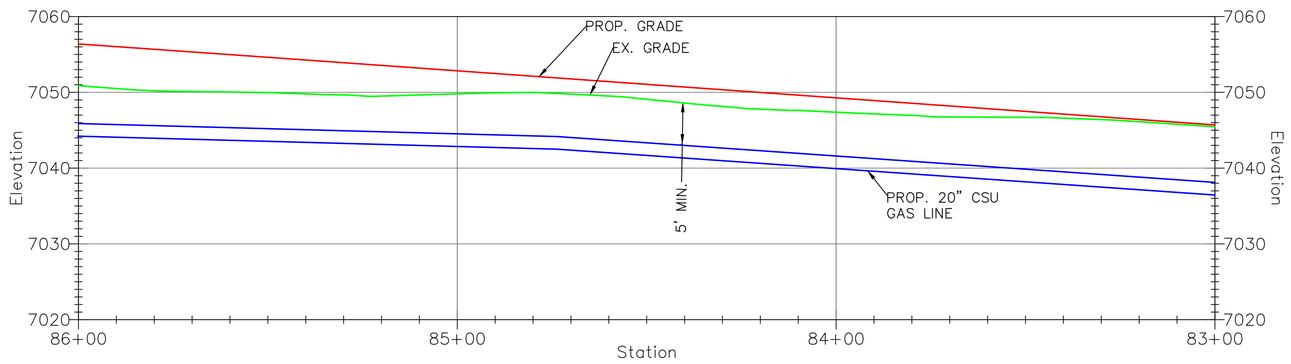
DWG. NO: C-227

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JPC-C3D-CSU.dwg LAYOUT NAME: C-227 PLOTTED: Thursday, March 23, 2023 - 1:19pm USER: nwest



PLAN

SCALE 1" = 20'



VERTICAL SCALE 1" = 10'

PROFILE

HORIZONTAL SCALE 1" = 20'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
3	2		220-647-920	20" ELBOW, 0.375" WT, STL, 45 DEG., 3R, WPHY 52	FORGED	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO THE BLACK FOREST RD. PROJECT, (CITY REFERENCE FILE NO. CN: T009527) AND THE WOLF RANCH DEVELOPMENT INCLUDING LANDSCAPING PROJECT (CITY REFERENCE FILE NO. AR-PUD 18-00014) AND OTHER UTILITIES OTHER THAN THE 20" GAS LINE ARE TO BE COMPLETED BY OTHERS.

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Colorado Springs Utilities
It's how we're all connected

COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	DATE:	BY:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW 3/16/23	JMS	
5	ISSUED FOR CONSTRUCTION	NEW 11/14/22	JMS	
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW 10/14/22	JMS	

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 31 TWN. 12S, RNG. 65W	P-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

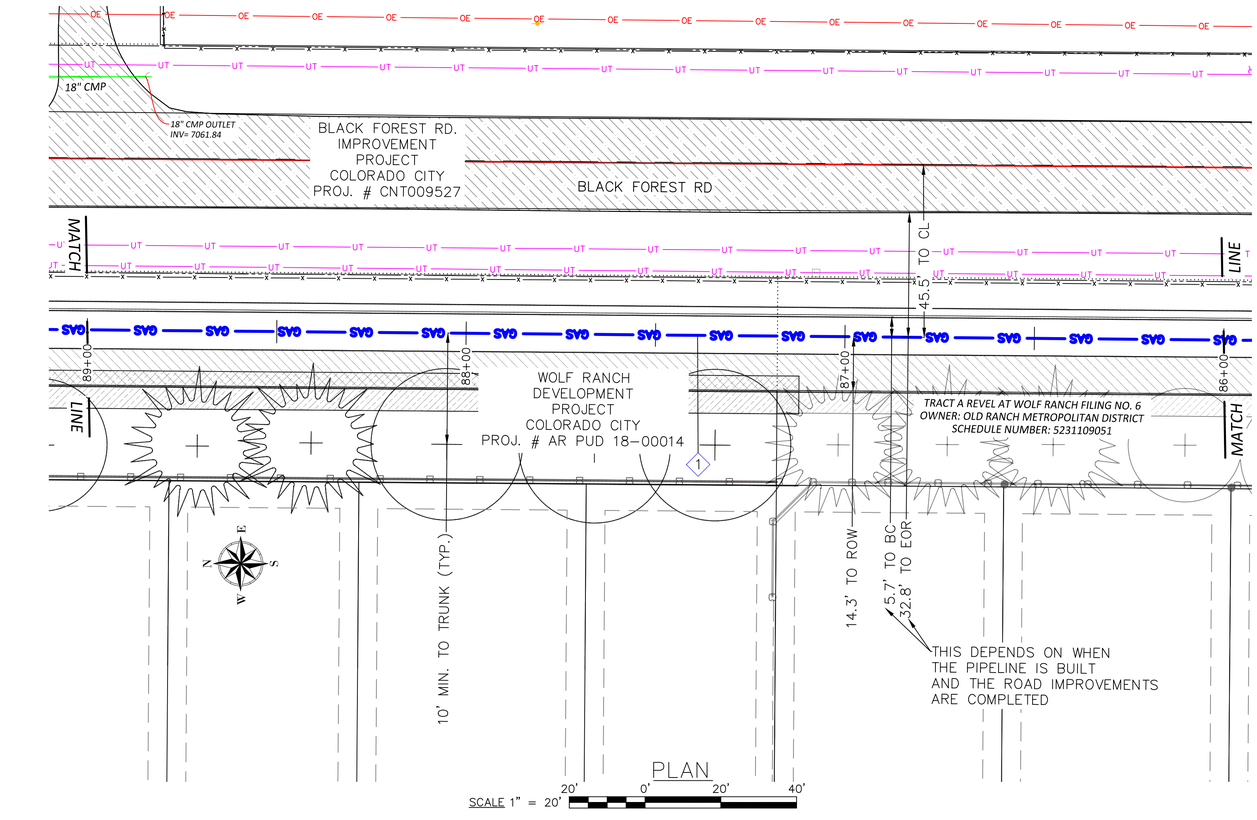
RELATED W/O #s: 3789816

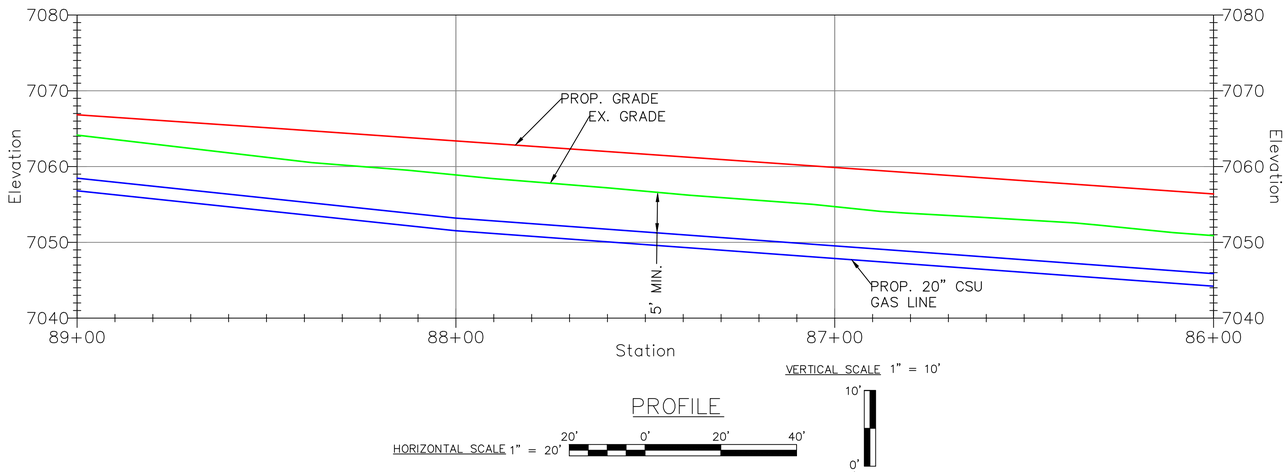
ENGINEER: SCOTT JENSEN		PHONE: (719) 668-8196
PROJECT MANAGER: MELISSA LINGO		PHONE: (719) 668-8794
CONSTRUCTION LEAD: JOSH RICHARD		PHONE: (719) 668-3675
SHEET NO. 53 OF 60	SCALE: AS NOTED	
PATRICK ENGINEERING TEAM		
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY: JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
83+00 - 86+00

DWG. NO: **C-228**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_#C-C3D-CSU.dwg LAYOUT NAME: C-228 PLOTTED: Thursday, March 23, 2023 - 1:21pm USER: nwest





HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
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CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO THE BLACK FOREST RD. PROJECT, (CITY REFERENCE FILE NO. CN: T009527) AND THE WOLF RANCH DEVELOPMENT INCLUDING LANDSCAPING PROJECT (CITY REFERENCE FILE NO. AR-PUD 18-00014) AND OTHER UTILITIES OTHER THAN THE 20" GAS LINE ARE TO BE COMPLETED BY OTHERS.

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

Colorado Springs Utilities
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COLORADO LICENSED
JEREMIAH SMITH
Jeremiah Matthew Smith
PE.0062470
2023.03.24 16:47:06 -04'00'
PROFESSIONAL ENGINEER
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
	N/A			

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 31 TWN. 12S, RNG. 65W	P-19

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

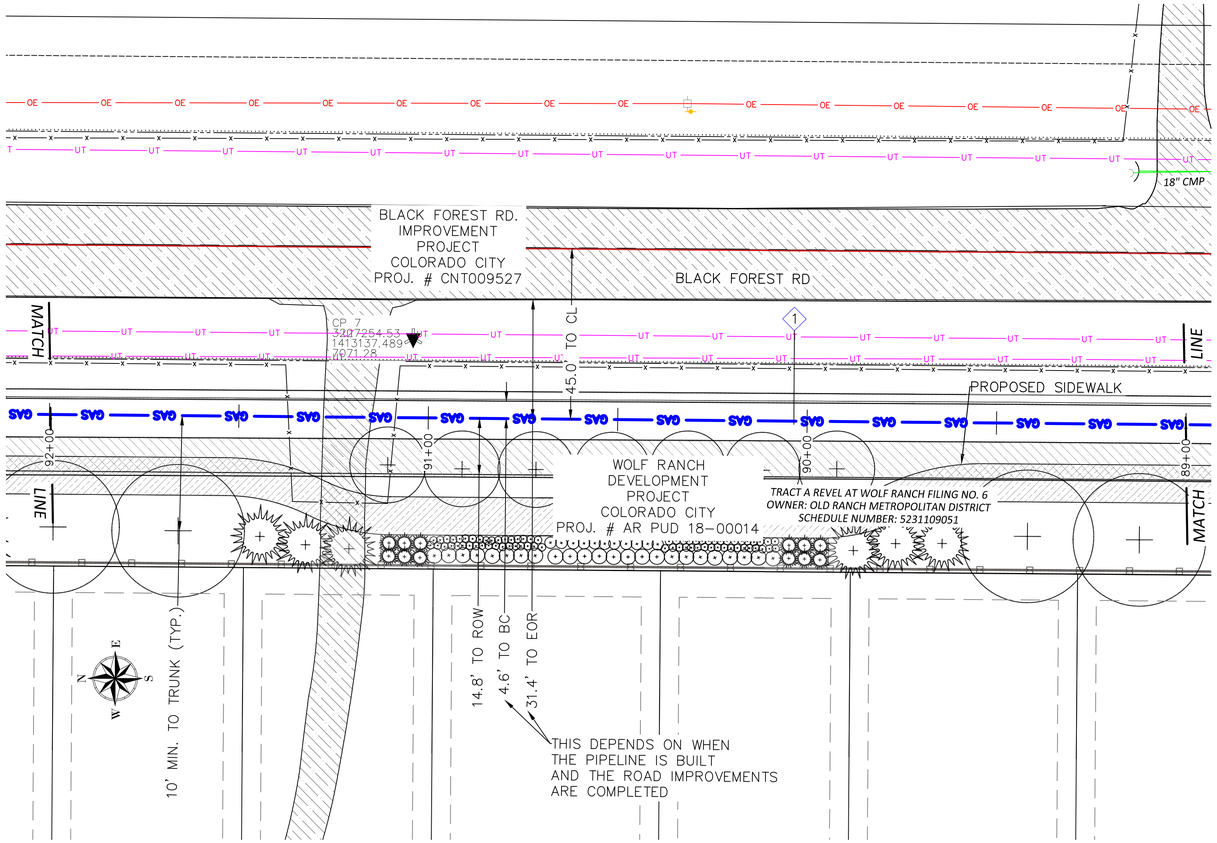
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 54 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
86+00 - 89+00

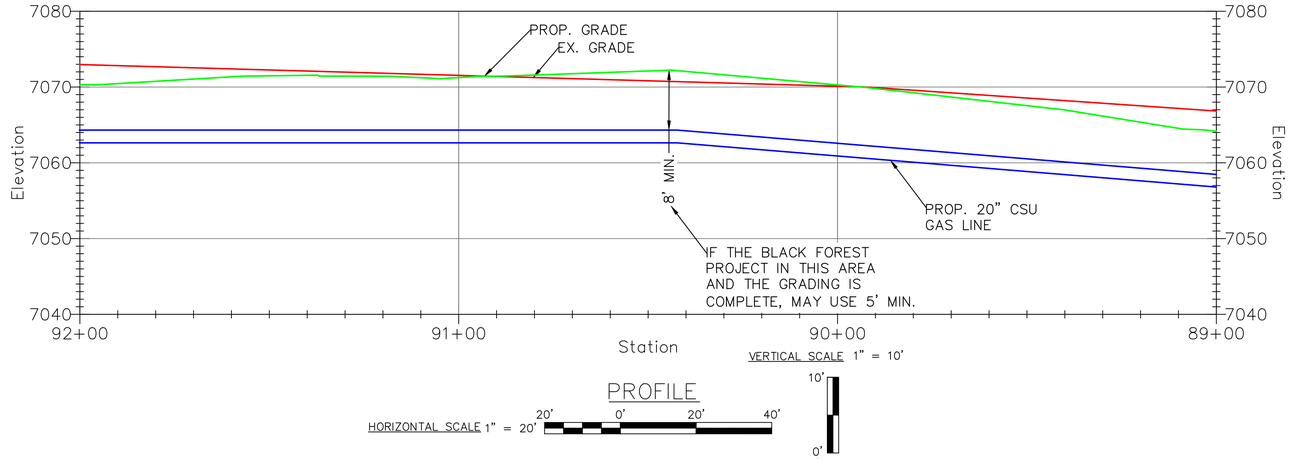
DWG. NO: C-229

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-C3D-CSU.dwg LAYOUT NAME: C-229 PLOTTED: Wednesday, March 22, 2023 - 4:34pm USER: nwest



PLAN

SCALE 1" = 20'



VERTICAL SCALE 1" = 10'

PROFILE

HORIZONTAL SCALE 1" = 20'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO THE BLACK FOREST RD. PROJECT, (CITY REFERENCE FILE NO. CN: T009527) AND THE WOLF RANCH DEVELOPMENT INCLUDING LANDSCAPING PROJECT (CITY REFERENCE FILE NO. AR-PUD 18-00014) AND OTHER UTILITIES OTHER THAN THE 20" GAS LINE ARE TO BE COMPLETED BY OTHERS.

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It's how we're all connected

COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

REVISIONS				
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 31 TWN. 12S, RNG. 65W	P-19 & P-18

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	
DISTRIBUTION:	X
FEEDER:	
TRANS. BY DEF.	
TRANS v 20%	

W/O #: 3747144

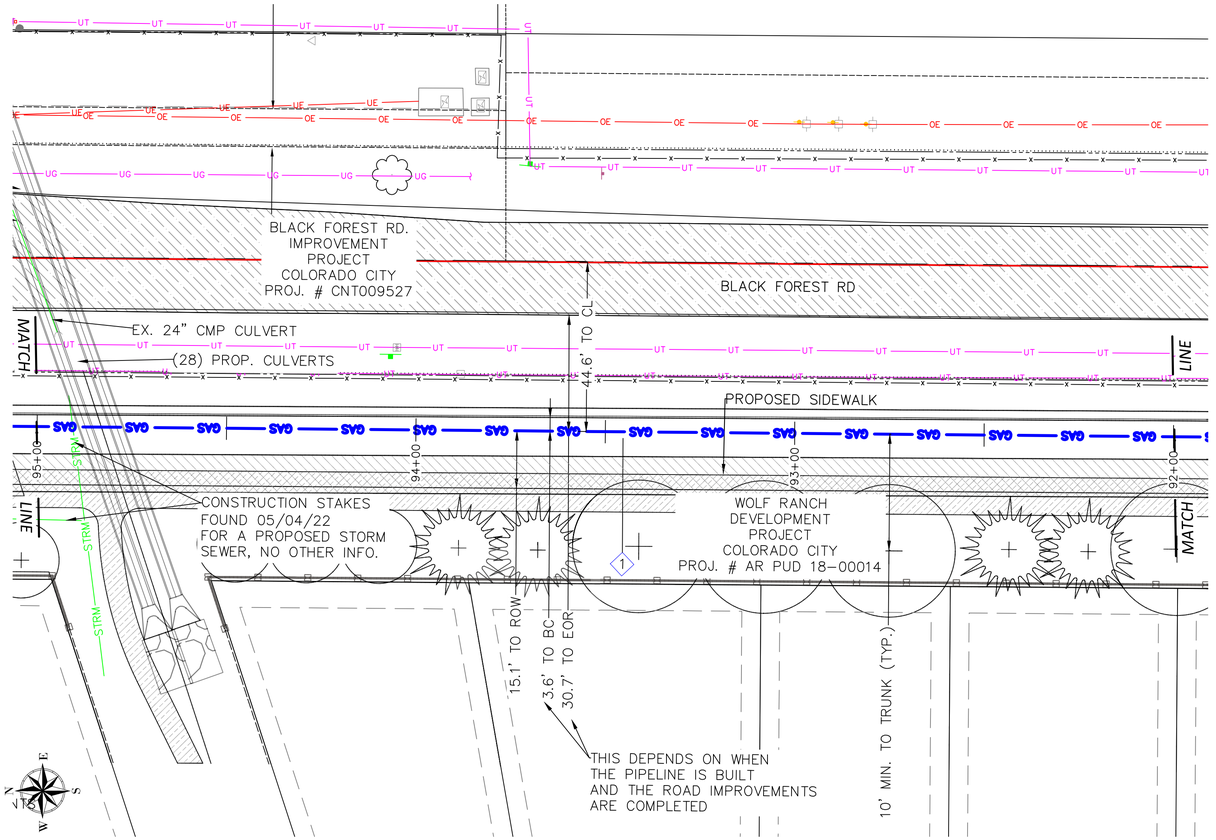
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 55 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
89+00 - 92+00

DWG. NO: C-230

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-C3D-CSU.dwg LAYOUT NAME: C-230 PLOTTED: Thursday, March 23, 2023 - 1:24pm USER: nwest



HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
3	3		220-647-920	20" ELBOW, 0.375" WT, STL, 45 DEG., 3R, WPHY 52	FORGED	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

CROSSING TABLE					
SIZE	CROSSING	SIZE	DEPTH (TOP OF PIPE)	MIN. VERT. SEPERATION	MIN. HORZ. SEPERATION
28	CCPPW STORM CULVERTS	TBD	TBD	5'	-

CCPPW - COLORADO CITY PARKS AND PUBLIC WORKS

REFERENCE NOTE:
ANY WORK RELATED TO THE BLACK FOREST RD. PROJECT, (CITY REFERENCE FILE NO. CN: T009527) AND THE WOLF RANCH DEVELOPMENT INCLUDING LANDSCAPING PROJECT (CITY REFERENCE FILE NO. AR-PUD 18-00014) AND OTHER UTILITIES OTHER THAN THE 20" GAS LINE ARE TO BE COMPLETED BY OTHERS.

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

REVISIONS				
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS
NO.	N/A	BY:	DATE:	APPVD:

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 31 TWN. 12S, RNG. 65W	P-18

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

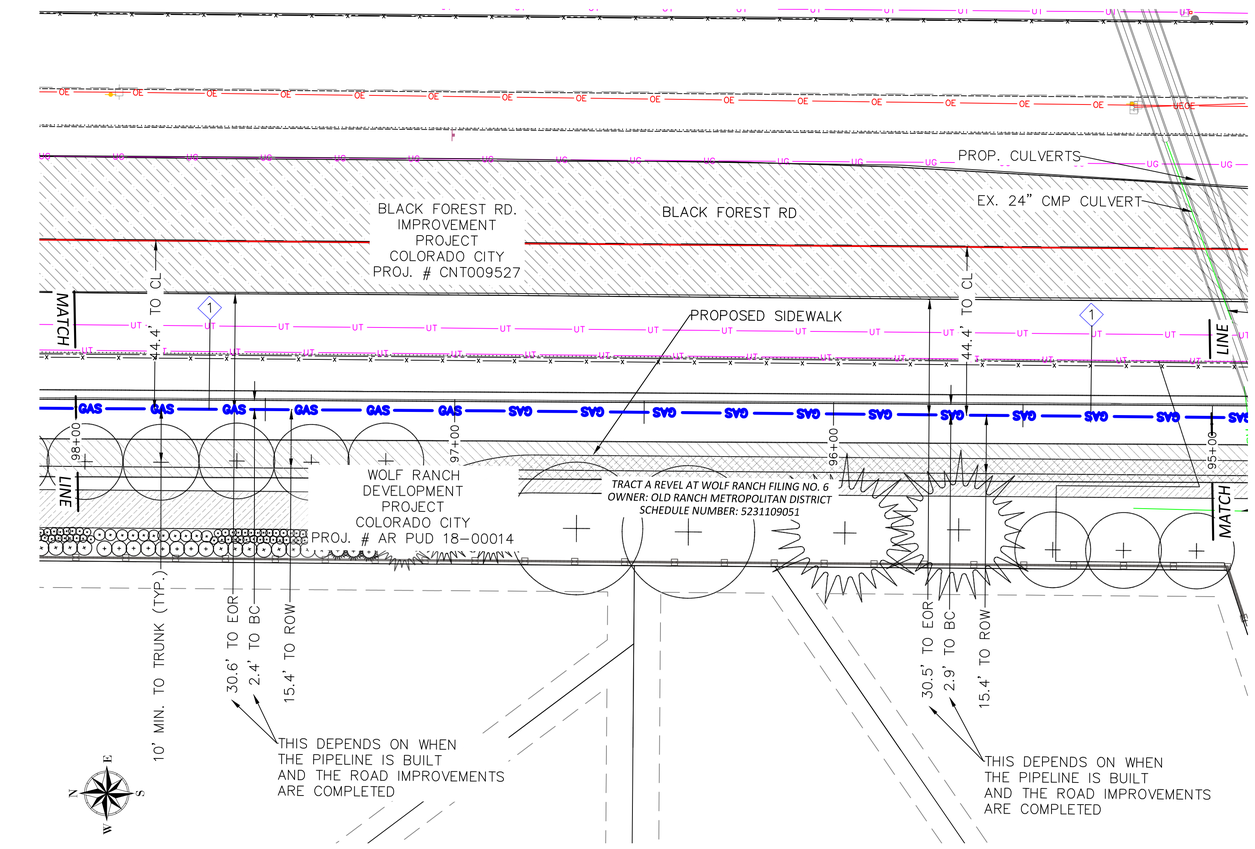
W/O #: 3747144
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 56 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE 92+00 - 95+00

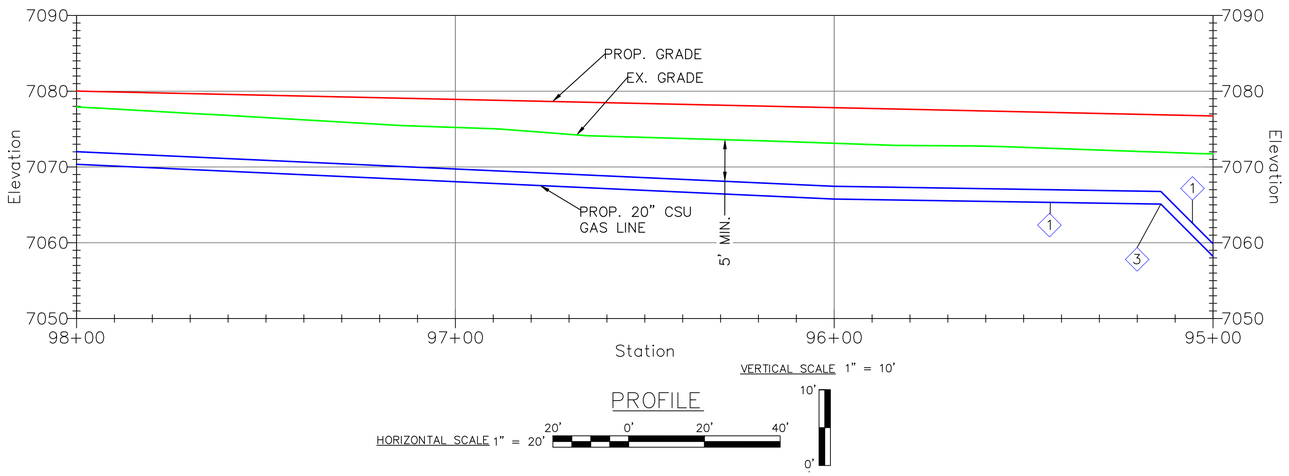
DWG. NO: C-231

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_#FC-C3D-CSU.dwg LAYOUT NAME: C-231 PLOTTED: Thursday, March 23, 2023 - 2:11pm USER: nwest



PLAN

SCALE 1" = 20'



VERTICAL SCALE 1" = 10'

PROFILE

HORIZONTAL SCALE 1" = 20'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
3	1		220-647-920	20" ELBOW, 0.375" WT, STL, 45 DEG., 3R, WPHY 52	FORGED	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO THE BLACK FOREST RD. PROJECT, (CITY REFERENCE FILE NO. CN: T009527) AND THE WOLF RANCH DEVELOPMENT INCLUDING LANDSCAPING PROJECT (CITY REFERENCE FILE NO. AR-PUD 18-00014) AND OTHER UTILITIES OTHER THAN THE 20" GAS LINE ARE TO BE COMPLETED BY OTHERS.

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COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW 3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW 11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW 10/14/22	JMS
NO.	N/A	BY:	

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 31 TWN. 12S, RNG. 65W	P-18

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
	N/A
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

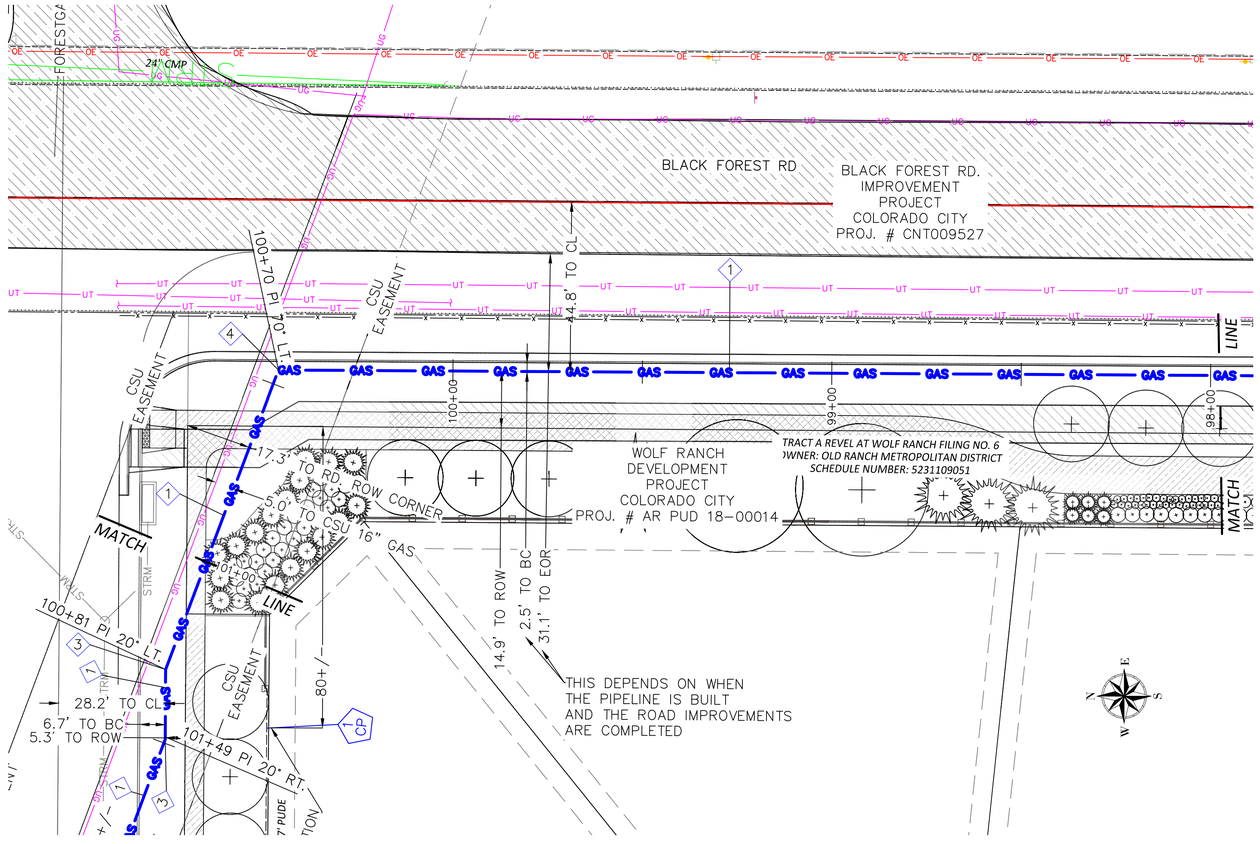
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 57 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE
95+00 - 98+00

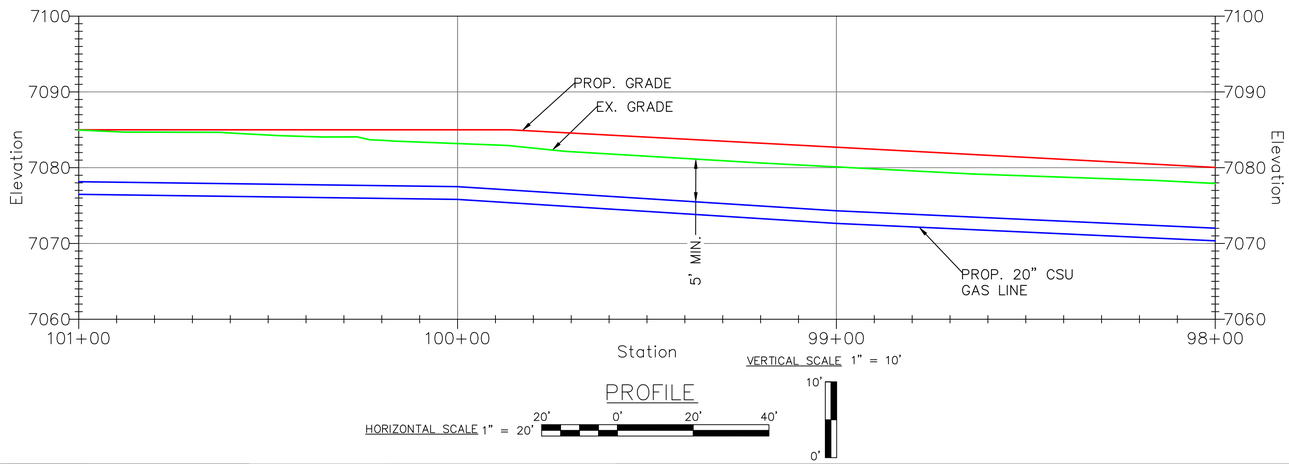
DWG. NO: **C-232**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_#FC-C3D-CSU.dwg LAYOUT NAME: C-232 PLOTTED: Thursday, March 23, 2023 - 2:13pm USER: nwest



PLAN

SCALE 1" = 20'



VERTICAL SCALE 1" = 10'

PROFILE

HORIZONTAL SCALE 1" = 20'

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	300'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
4	1		220-692-920	20" ELBOW, 0.375" WT, STL, 90 DEG., 3R, WPHY 52	FORGED	FBE	

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO THE BLACK FOREST RD. PROJECT, (CITY REFERENCE FILE NO. CN: T009527) AND THE WOLF RANCH DEVELOPMENT INCLUDING LANDSCAPING PROJECT (CITY REFERENCE FILE NO. AR-PUD 18-00014) AND OTHER UTILITIES OTHER THAN THE 20" GAS LINE ARE TO BE COMPLETED BY OTHERS.

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Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

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Indianapolis, IN 46268
TEL. (317) 217-1701
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PROJ. NO. 22282.003

NO.	REVISIONS	BY:	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW	3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW	11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW	10/14/22	JMS

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 31 TWN. 12S, RNG. 65W	P-18

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

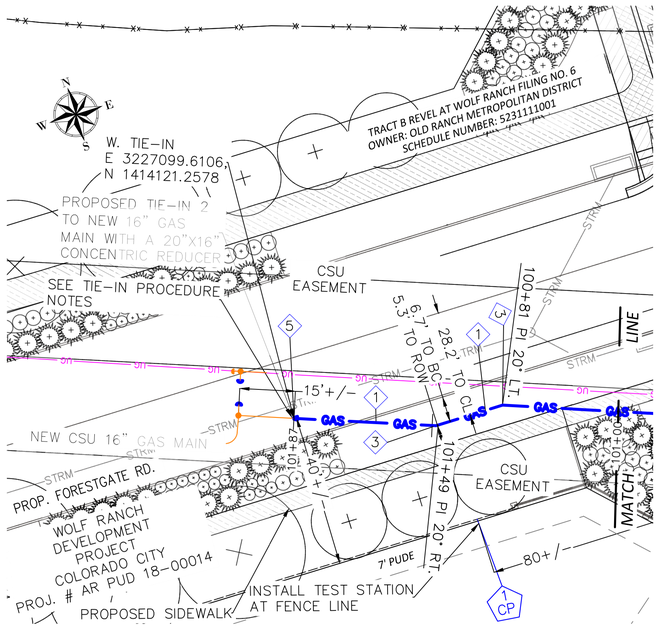
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 58 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE 98+00 - 101+00

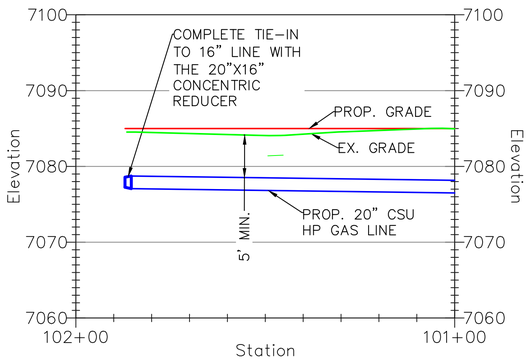
DWG. NO: C-233

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_#FC-C3D-CSU.dwg LAYOUT NAME: C-233 PLOTTED: Thursday, March 23, 2023 - 2:15pm USER: nwest



PLAN

SCALE 1" = 20' (20' 0' 20' 40')



PROFILE

VERTICAL SCALE 1" = 10' (10' 0')

HORIZONTAL SCALE 1" = 20' (20' 0' 20' 40')

HIGH PRESSURE MATERIALS LIST (WO# 3747144)

CODE	DESIGN QTY.	AS-BUILT QTY.	STOCK ID	DESCRIPTION	SEAM	COATING	COMPONENT NO.
1	87'		240-375-920	20" PIPE, STL, 0.375" WT, API 5L-X52, FBE	ERW	FBE	
3	1		220-647-920	20" ELBOW, 0.375" WT, STL, 45 DEG., 3R, WPHY 52	FORGED	FBE	
5	1		215-796-920	REDUCER, WELD, WPHY52, CARBON STEEL, STD., 20IN X 16 NPS	FORGED	FBE	

WEST TIE-IN PROCEDURE NOTES	
1	AFTER THE TIE-IN OF THE NEW 20" GAS LINE TO THE NEWLY INSTALLED 16" LINE IS COMPLETED, COMPLETE THE PURGE OUT OF AIR FROM THE NEW 20" LINE AND PACK WITH GAS (SEE PURGE PROCEDURE ON SHEET C-106 FOR ADDITIONAL INFORMATION).
2	REMOVE THE BLIND FLANGE FROM THE EXISTING 16" SPHERICAL TEE , AND INSTALL A TEMPORARY 16" TAPPING FULL PORT BALL VALVE, THEN INSTALL TAPPING MACHINE.
3	OPEN THE TAPPING VALVE AND USE THE TAPPING MACHINE TO REMOVE THE INNER PLUG IN THE SPHERICAL TEE. THEN RECLOSE THE VALVE, AND REMOVE THE TAPPING MACHINE WITH THE INNER PLUG.
4	REINSTALL THE TAPPING MACHINE WITH A CUTTER HEAD ON THE TAPPING VALVE. CUT OUT THE COUPON FROM THE EXISTING 16" PIPE AND WITHDRAW THE COUPON. CLOSE THE TAPPING VALVE AND REMOVE THE TAPPING MACHINE AND COUPON.
5	REINSTALL THE TAPPING MACHINE WITH A STOPPLE PLUG REOPEN THE TAPPING VALVE AND SET THE STOPPLE PLUG IN PLACE.
5	WITH THE STOPPLE IN PLACE, COMPLETE THE PURGE OF THE EXISTING 16" SECTION TO BE RETIRED USING A CSU APPROVED PURGE PROCEDURE. ONCE THE LINE HAS BEEN PURGE, COLD-CUT OUT A SECTION OF THE 16" PIPE BETWEEN THE NEW AND EXISTING 16" LINE AND INSTALL 16" WED CAPS ON EACH END.
7	REMOVE AND WITHDRAW THE STOPPLE PLUG AND RECLOSE THE TAPPING VALVE. THEN REMOVE THE TAPPING MACHINE WITH THE STOPPLE.
8	REINSTALL THE TAPPING MACHINE WITH THE INNER PLUG TO THE TAPPING VALVE. THEN REOPEN THE TAPPING VALVE AND REINSTALL INNER PLUG IN THE SPHERICAL TEE. REMOVE TAPPING MACHINE AND TAPPING VALVE AND REPLACE BLIND FLANGE TO SPHERICAL TEE.

CONSTRUCTION NOTES	
4	MINIMUM DEPTH OF COVER FOR THE ENTIRE PIPELINE IS 5'. THE PIPELINE SHALL MEET THE MINIMUM VERTICAL SEPARATION FROM UTILITIES BEING CROSSED AS INDICATED IN THE CROSSING TABLES.
6	BACKFILL OF THE TRENCH SHALL NOT BE COMPLETED UNTIL ALL WELDS HAVE BEEN GPS'ED
10	WELDING SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST CURRENT VERSIONS OF API 1104, AND CSU APPROVED WELDING PROCEDURES. WELDERS SHALL BE REQUIRED TO QUALIFY ON THE CSU APPROVED WELDING PROCEDURES.
11	THE PIPE SEGMENTS SHALL BE AIR TESTED IN ACCORDANCE WITH CSU STANDARD PROCEDURES.
14	CONTRACTOR SHALL RESTORE ALL CONSTRUCTION AREAS, AND REMOVE ALL TRASH, DEBRIS, AND MATERIALS AFTER COMPLETION OF CONSTRUCTION.

CATHODIC PROTECTION NOTES	
1 CP	INSTALL TEST STATIONS AT LOCATIONS SHOWN IN THE DESIGN PACKAGE.
2 CP	STEEL PIPE WILL BE PROTECTED WITH THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTIONS SYSTEM UTILIZING RECTIFIER 1003

REFERENCE NOTE:
ANY WORK RELATED TO THE BLACK FOREST RD. PROJECT, (CITY REFERENCE FILE NO. CN: TOO9527) AND THE WOLF RANCH DEVELOPMENT INCLUDING LANDSCAPING PROJECT (CITY REFERENCE FILE NO. AR-PUD 18-00014) AND OTHER UTILITIES OTHER THAN THE 20" GAS LINE ARE TO BE COMPLETED BY OTHERS.

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

Colorado Springs Utilities
It's how we're all connected

COLORADO LICENSED JEREMIAH SMITH PROFESSIONAL ENGINEER
Jeremiah Matthew Smith
2023.03.24 16:47:06 -04'00'
P.E. CERTIFICATION

PATRICK ENGINEERING
8902 Vincennes Circle, Suite F
Indianapolis, IN 46268
TEL. (317) 217-1701
www.patrickco.com
PROJ. NO. 22282.003

NO.	REVISIONS	DATE:	APPVD:
6	REISSUED FOR CONSTRUCTION	NEW 3/16/23	JMS
5	ISSUED FOR CONSTRUCTION	NEW 11/14/22	JMS
4	100% DESIGN PACKAGE ISSUED FOR REVIEW	NEW 10/14/22	JMS
NO.	N/A	BY:	

PERMIT INFORMATION	ISOLATION AREA	LOCATION	ATLAS OR TITLE
N/A	N/A	SEC. 31 TWN. 12S, RNG. 65W	P-18

SYSTEM NAME: 150P

SYSTEM MAOP:	275 psig
SYSTEM MOP:	145 psig
N/A	
SYSTEM MAOP:	
SYSTEM MOP:	

JOB TYPE:

HP SERVICE:	☐
DISTRIBUTION:	☒
FEEDER:	☐
TRANS. BY DEF.	☐
TRANS v 20%	☐

W/O #: 3747144

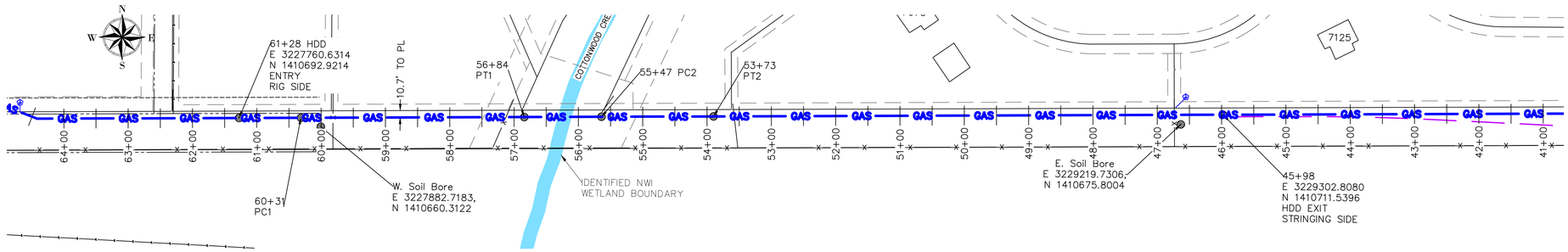
RELATED W/O #s: 3789816

ENGINEER:	SCOTT JENSEN	PHONE:	(719) 668-8196
PROJECT MANAGER:	MELISSA LINGO	PHONE:	(719) 668-8794
CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 59 OF 60	SCALE: AS NOTED		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

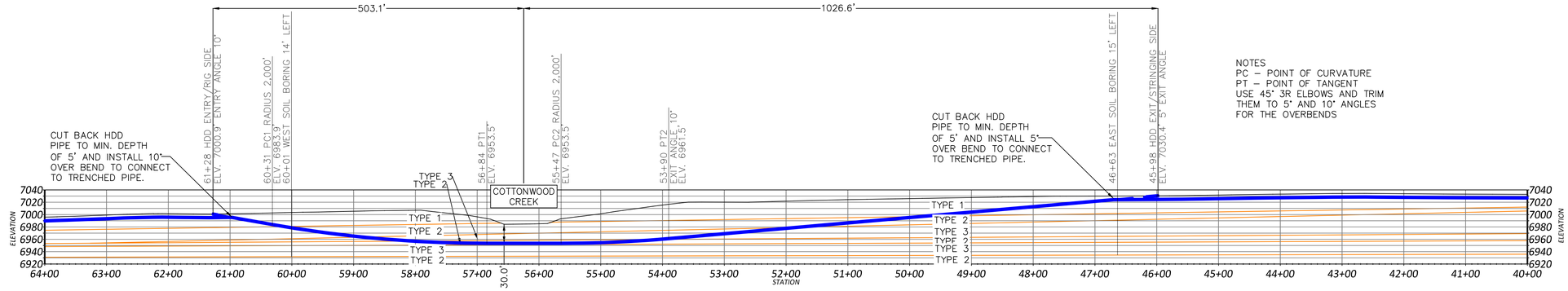
LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
PLAN & PROFILE 101+00 - 101+87

DWG. NO: C-234

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-C3D-CSU.dwg LAYOUT NAME: C-234 PLOTTED: Wednesday, March 22, 2023 - 4:35pm USER: nwest



PLAN



NOTES
PC – POINT OF CURVATURE
PT – POINT OF TANGENT
USE 45° 3R ELBOWS AND TRIM
THEM TO 5° AND 10° ANGLES
FOR THE OVERBENDS

PROFILE

HDD TOLERANCES (UNLESS OTHERWISE APPROVED BY ENGINEER)
LENGTH - NOT TO BE MORE THAN 10' SHORT OR 20' LONG
LEFT-RIGHT OF CENTERLINE +/-5'
DEPTH NOT TO BE 0' SHALLOWER, OR 10' DEEPER
RADIUS OF CURVATURE NOT TO BE LESS THAN 1,800' PER 3-JOINT RULE

COTTONWOOD CREEK HDD

SOIL TYPE	SOIL DESCRIPTION
1	SM-SW SAND, SILTY, FINE TO COURSE GRAINED, TAN, MEDIUM DENSE, DRY TO MOIST
2	SANDSTONE, SM-SC, SLIGHTLY SILTY-CLAYEY, FINE TO COURSE GRAINED, GRAY-BROWN, DENSE TO VERY DENSE, MOIST
3	CLAYSTONE, SC, SANDY TO VERY SANDY, GRAY-BROWN, VERY DENSE, MOIST

SCALE 1" = 100' (100' 0' 100' 200')

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N/A
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HP SERVICE: ☐
DISTRIBUTION: ☒
FEEDER: ☐
TRANS. BY DEF. ☐
TRANS v 20% ☐

W/O #: 3747144
RELATED W/O #s: 3789816

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CONSTRUCTION LEAD:	JOSH RICHARD	PHONE:	(719) 668-3675
SHEET NO. 60 OF 60	SCALE: 1" = 100'		
PATRICK ENGINEERING TEAM			
DWN BY: NORM WEST	CHKD. BY: SETH BROWN	APPD. BY:	JEREMIAH SMITH

LOCH FYNE 20" GAS PIPELINE
COLORADO SPRINGS, COLORADO
HDD PLAN & PROFILE
DWG. NO: **HDD-001**

FILE NAME: P:\Indianapolis\Colorado Springs Utilities\22282.003 - Loch Fyne 20in Gas Line\11 Design\01 Drawings\06 Alignment\Colorado Springs_JFC-C3D-CSU.dwg LAYOUT NAME: HDD-001 PLOTTED: Wednesday, March 22, 2023 - 4:35pm USER: nwest