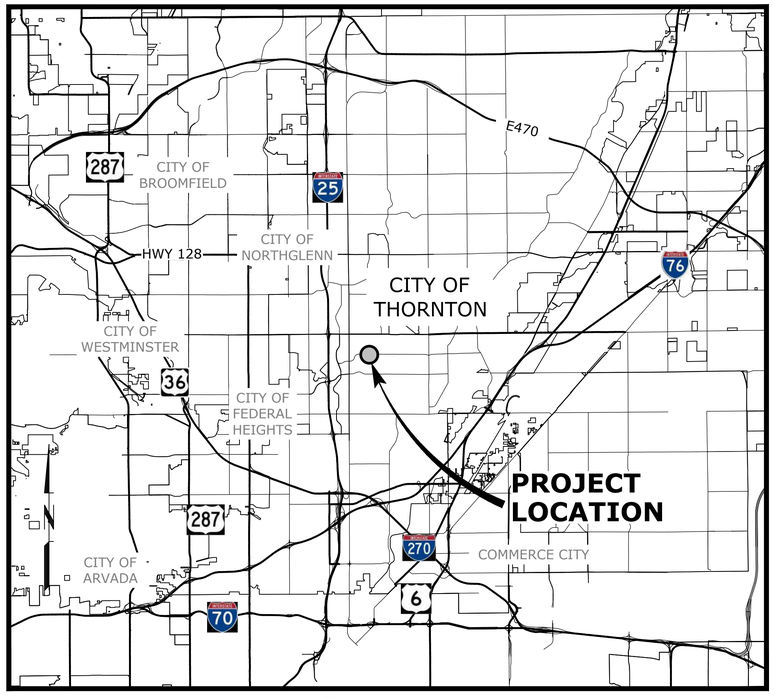
CITY OF THORNTON
100TH AVENUE WATERLINE REPLACEMENT

(CITY PROJECT NO. 20-33)

JULY 2022

BID SET



VICINITY MAP

SCALE: 1"=2000'

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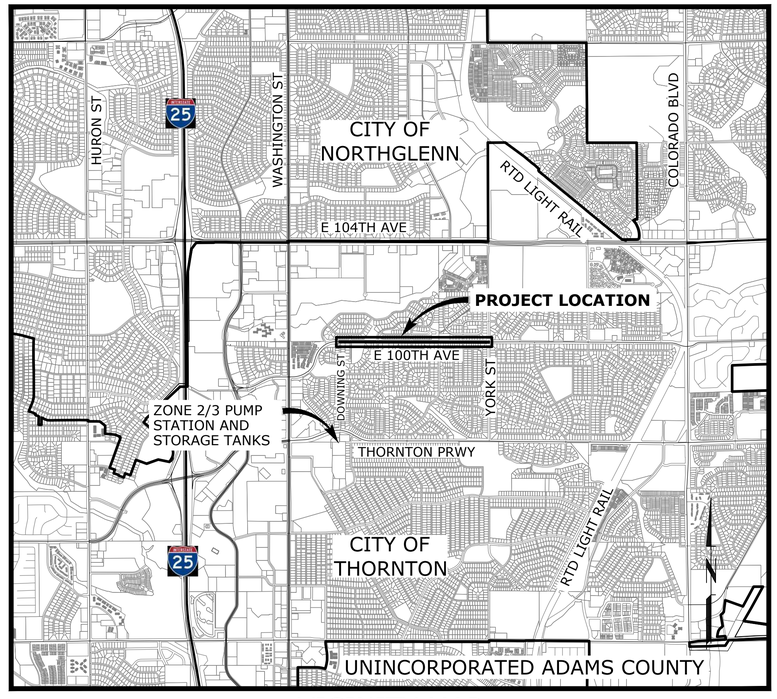

VICINITY MAP

SCALE: 1"=2000'

APPROVALS

CITY OF THORNTON

WORK SHALL BE CONSTRUCTED TO CITY OF THORNTON STANDARDS AND SPECIFICATIONS. THIS APPROVAL IS FOR CONFORMANCE TO THESE STANDARDS AND SPECIFICATIONS AND OTHER CITY REQUIREMENTS. THE DESIGN AND CONCEPT REMAINS RESPONSIBILITY OF THE PROFESSIONAL ENGINEER OR LANDSCAPE PROFESSIONAL.

KRISTIN SCHWARTZ P.E., CIVIL ENGINEER, CITY OF THORNTON — DATE

JASON PIERCE P.E., INFRASTRUCTURE ENGINEERING DIRECTOR, CITY OF THORNTON — DATE

JOSH REDMAN, UTILITIES OPERATION MANAGER, CITY OF THORNTON — DATE

murraysmith

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21-3048

I:\BOI_Projects\21\3048 - Thornton - 100th Ave Waterline Replacement\CAD\Sheets\21-3048-CO-G1-5.dwg G-1 6/27/2022 2:10 PM NICK.CAMPBELL 23.0s (LMS Tech)

CITY OF THORNTON GENERAL NOTES

1. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS AT AND ADJACENT TO THE JOB SITE; INCLUDING, SAFETY OF PERSONS AND PROPERTY DURING THE PERFORMANCE OF WORK. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE CITY CONSTRUCTION REVIEW OF THE CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES IN, ON, OR NEAR THE CONSTRUCTION SITE.

2. THE TYPE, SIZE, LOCATION, AND NUMBER OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES ALONG THE ROUTE OF THE WORK. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY CONTRACTOR PRIOR TO DATE OF CONSTRUCTION. FOR INFORMATION CONTACT: UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) - 1- 800-922-1987. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY SIZE AND HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES PRIOR TO CONSTRUCTION AND NOTIFY THE CITY AND ENGINEER OF ANY DISCREPANCIES.

3. MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CITY OF THORNTON STANDARDS AND SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF PUBLIC AND PRIVATE IMPROVEMENTS AND WORK SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY AUTHORIZED CITY OF THORNTON PERSONNEL.

4. ALL TRENCHES SHALL BE ADEQUATELY SUPPORTED AND THE SAFETY OF WORKERS PROVIDED FOR AS REQUIRED BY THE MOST RECENT OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) "SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION." THESE REGULATIONS ARE DESCRIBED IN SUBPART P, PART 1926 OF THE CODE OF FEDERAL REGULATIONS. SHEETING AND SHORING SHALL BE UTILIZED WHERE NECESSARY TO PREVENT ANY EXCESSIVE WIDENING OR SLOUGHING OF THE TRENCH WHICH MAY BE DETRIMENTAL TO HUMAN SAFETY, TO THE PIPE BEING PLACED, TO TREES, OR TO ANY EXISTING STRUCTURE WHERE EXCAVATIONS ARE MADE UNDER SEVERE WATER CONDITIONS. THE CONTRACTOR MAY BE REQUIRED TO USE AN APPROVED PILING INSTEAD OF SHEETING AND SHORING.

5. THE CONTRACTOR SHALL FURNISH THE ENGINEER THE "AS CONSTRUCTED" LOCATIONS OF FACILITIES INSTALLED AND, THIS IN TURN, SHALL BE SUBMITTED TO THE CITY OF THORNTON ON AS-BUILT MYLAR DRAWINGS AND ELECTRONIC FILES PREPARED BY THE ENGINEER.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING NEARBY PUBLIC STREETS OF MUD OR DEBRIS DUE TO CONSTRUCTION ACTIVITY INITIATED BY SAID CONTRACTOR ON A DAILY BASIS OR AS OTHERWISE DIRECTED BY AUTHORIZED CITY PERSONNEL.

7. PRIOR TO THE BEGINNING OF WORK, A PRECONSTRUCTION CONFERENCE SHALL BE HELD BETWEEN THE CITY, THE RESPONSIBLE PARTY WHO IS SCHEDULED TO PERFORM THE WORK, THE DESIGNATED ON-SITE FIELD REPRESENTATIVE, THE CONSULTING ENGINEER OR LANDSCAPE PROFESSIONAL, AND ANY OTHER ENTITIES INVOLVED IN THE CONSTRUCTION.

8. NO WORK SHALL BEGIN UNTIL THE INSTALLING RESPONSIBLE PARTY IS IN POSSESSION OF AN APPROVED SET OF PLANS AND THE CITY OF THORNTON STANDARDS AND SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF PUBLIC AND PRIVATE IMPROVEMENTS, AND ALL NECESSARY PERMITS FOR THE IMPROVEMENTS HAS BEEN ISSUED BY THE CITY. DEVELOPMENT ENGINEERING'S APPROVAL SHALL BE FOR GENERAL CONFORMITY TO THE UTILITY SPECIFICATIONS AND SHALL NOT CONSTITUTE BLANKET APPROVAL OF ALL DIMENSIONS, QUANTITIES AND DETAILS OF THE MATERIAL OR EQUIPMENT SHOWN. NOR SHALL SUCH APPROVAL RELIEVE THE RESPONSIBLE PARTY, CONSULTING ENGINEER, OR LANDSCAPE ARCHITECT OF THEIR RESPONSIBILITY FOR ERRORS CONTAINED IN THE DRAWINGS. A COPY OF THE APPROVED PLANS AND ALL PERMITS SHALL BE ONSITE AT ALL TIMES.

9. THE MATERIALS USED IN PROJECTS SHALL BE NEW AND SUBJECT TO THE INSPECTION AND APPROVAL OF THE INSPECTOR AT ALL TIMES. THE INSPECTOR HAS THE RIGHT TO PERFORM ANY TESTING DEEMED NECESSARY TO ENSURE COMPLIANCE OF THE MATERIAL WITH THESE STANDARDS. NO MATERIAL SHALL BE USED BEFORE BEING INSPECTED AND APPROVED BY THE INSPECTOR. FAILURE OR NEGLECT ON THE PART OF THE INSPECTOR TO CONDEMN OR REJECT INFERIOR MATERIALS OR WORK SHALL NOT BE CONSTRUED TO IMPLY THEIR ACCEPTANCE SHOULD THEIR INFERIORITY BECOME EVIDENT AT ANY TIME PRIOR TO FINAL ACCEPTANCE OF THE WORK. INSPECTORS HAVE THE AUTHORITY TO REJECT DEFECTIVE OR INFERIOR MATERIALS AND/OR DEFECTIVE WORKMANSHIP AND TO SUSPEND WORK UNTIL SUCH TIME AS THE RESPONSIBLE PARTY SHALL CORRECT THE DISCREPANCIES IN QUESTION.

10. WHENEVER DEFECTIVE MATERIALS AND WORK ARE REJECTED, THE RESPONSIBLE PARTY SHALL PROMPTLY REMOVE SUCH DEFECTIVE MATERIALS AND CONSTRUCTION FROM THE JOB SITE AND REPLACE ALL DEFECTIVE PORTIONS TO THE SATISFACTION OF DEVELOPMENT ENGINEERING. IN THE EVENT THE RESPONSIBLE PARTY FAILS TO REMOVE REJECTED ITEMS FROM THE JOB SITE WITHIN A REASONABLE LENGTH OF TIME, DEVELOPMENT ENGINEERING MAY ARRANGE FOR SUCH REMOVAL AT THE EXPENSE OF THE RESPONSIBLE PARTY.

11. INSPECTION SHALL NOT RELIEVE THE RESPONSIBLE PARTY FROM ANY OBLIGATION TO PERFORM THE WORK STRICTLY IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS OR ANY MODIFICATIONS THEREOF. WORK NOT SO CONSTRUCTED SHALL BE REMOVED AND CORRECTED BY THE RESPONSIBLE PARTY AT HIS SOLE EXPENSE, WHENEVER SO ORDERED BY DEVELOPMENT ENGINEERING, WITHOUT REFERENCE TO ANY PREVIOUS ERROR OR OVERSIGHT IN INSPECTION.

12. EXCEPT IN CASES OF EMERGENCY, MAINTENANCE, OR PROTECTION OF WORK ALREADY COMPLETED, NO WORK SHALL BE ALLOWED BETWEEN THE HOURS OF 7 P.M. AND 7 A.M.; NOR ON SATURDAY, SUNDAY, OR LEGAL HOLIDAYS UNLESS APPROVED BY DEVELOPMENT ENGINEERING IN EACH CASE. WHEN ANY INSPECTOR IS REQUIRED TO WORK OUTSIDE THE HOURS OF 7 A.M. TO 4 P.M. ON REGULAR CITY BUSINESS DAYS, OVERTIME SHALL BE CHARGED TO THE RESPONSIBLE PARTY. HOWEVER, SUCH INSPECTORS SHALL REMAIN EMPLOYEES OF THE CITY FOR ALL PURPOSES. REQUESTS FOR OVERTIME SHALL BE MADE TO DEVELOPMENT ENGINEERING AT LEAST 48 HOURS IN ADVANCE. PAYMENT FOR SUCH OVERTIME WORK SHALL BE MADE TO THE CITY PRIOR TO FINAL ACCEPTANCE.

13. THE WORK SHALL BE SURVEYED AND STAKED UNDER THE SUPERVISION OF A LICENSED LAND SURVEYOR IN ACCORDANCE WITH THE APPROVED PLANS.

14. IF IRRIGATION DITCHES ARE INVOLVED, AN APPROVAL BLOCK FOR THE DITCH COMPANY SHALL BE PROVIDED.

15. COMPACTION OF ALL TRENCHES MUST BE ATTAINED AND COMPACTION TEST RESULTS SUBMITTED TO THE ENGINEER AND THE CITY OF THORNTON PRIOR TO FINAL ACCEPTANCE.

16. ALL WORK, INCLUDING CORRECTION WORK, SHALL BE INSPECTED BY A CITY REPRESENTATIVE WHO SHALL HAVE THE AUTHORITY TO HALT CONSTRUCTION WHEN STANDARD CONSTRUCTION PRACTICES ARE NOT BEING ADHERED TO.

17. CONTRACTOR SHALL REGULARLY PATROL THE PUBLIC LANDS ADJACENT TO THE DEVELOPMENT TO REMOVE CONSTRUCTION DEBRIS AND KEEP THE SITE CLEAN AND SAFE.

18. ALL SITE GRADING (EXCAVATION, EMBANKMENT, AND COMPACTION) SHALL CONFORM TO THE RECOMMENDATIONS OF THE LATEST SOILS INVESTIGATION FOR THIS PROPERTY AND SHALL FURTHER BE IN CONFORMANCE WITH THE CITY OF THORNTON STANDARDS AND SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF PUBLIC AND PRIVATE IMPROVEMENTS", LATEST EDITION. A CDPS GENERAL PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES SHALL BE OBTAINED PRIOR TO ANY GRADING BEING PERFORMED ON SITES ONE (1) ACRE OR LARGER IN SIZE. THESE PERMITS CAN BE OBTAINED FROM THE STATE WATER QUALITY CONTROL DIVISION.

19. NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHEREVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DISTURBANCE OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATION AND FOR THE SHORTEST PRACTICAL PERIOD OF TIME.

20. TOPSOIL SHALL BE STOCKPILED TO THE EXTENT PRACTICABLE ON THE SITE FOR USE ON AREAS TO BE REVEGETATED. ANY AND ALL STOCKPILES SHALL BE LOCATED AND AND PROPER MEASURES TAKEN TO CONTROL EROSION AND SEDIMENT MOVEMENT.

21. AT ALL TIMES, THE PROPERTY SHALL BE MAINTAINED AND/OR WATERED TO PREVENT WIND-CAUSED EROSION. EARTHWORK OPERATIONS SHALL BE DISCONTINUED WHEN DUST SIGNIFICANTLY IMPACTS ADJACENT PROPERTY. IF EARTHWORK IS COMPLETE OR DISCONTINUED AND DUST FROM THE SITE CONTINUES TO CREATE PROBLEMS, THE OWNER/DEVELOPER SHALL IMMEDIATELY INSTITUTE MITIGATIVE MEASURES AND SHALL CORRECT DAMAGE TO ADJACENT PROPERTY.

22. THIS EROSION AND SEDIMENT CONTROL PLAN HAS BEEN SUBMITTED TO THE CITY OF THORNTON AND IS IN GENERAL CONFORMANCE WITH THE CITY'S EROSION CONTROL STANDARDS. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURE MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEM OR IF THE PROPOSED EROSION CONTROL MEASURES DO NOT FUNCTION AS INTENDED. THE REQUIREMENTS OF THIS EROSION CONTROL PLAN AND THE OBLIGATION OF THE LANDOWNER SHALL RUN WITH THE LAND UNTIL SUCH TIME AS THE EROSION CONTROL PLAN IS PROPERLY COMPLETED, OFFICIALLY MODIFIED, OR VOIDED.

23. NEW WATER MAINS 12 INCHES OR LESS SHALL BE AWWA STANDARD C-900-07 PVC DR -25 PRESSURE PIPE. WATER MAINS LARGER THAN 12 INCHES SHALL MEET AWWA C-905 PVC DR-21 OR DR-18 AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER. HYDRANT LEADS SHALL ONLY BE DIP.

24. WATER MAINS SHALL BE LAID IN CONFORMANCE WITH THE LATEST EDITION OF THE CITY OF THORNTON STANDARDS AND SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF PUBLIC AND PRIVATE IMPROVEMENTS AND SHALL BE SUBJECT TO CITY INSPECTION AND APPROVAL.

25. FIRE HYDRANTS SHALL BE LIMITED TO THE FOLLOWING MANUFACTURERS ONLY AND SHALL BE PAINTED ACCORDING TO THE LATEST EDITION OF THE CITY OF THORNTON STANDARDS AND SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF PUBLIC AND PRIVATE IMPROVEMENTS PRIOR TO ACCEPTANCE.

    MUELLER COMPANY - 5-1/4" SUPER CENTURION
    WATEROUS COMPANY - MODEL WB-250-PACER
    AMERICAN AVK

26. THERE SHALL BE A MINIMUM OF FOUR AND ONE HALF (4.5) FEET OF COVER FROM FINISHED GRADE TO THE TOP OF WATERLINES.

27. BEDDING AND BACKFILL MATERIALS FOR BOTH WATER AND SEWER SHALL CONFORM TO THE LATEST EDITION OF THE CITY OF THORNTON STANDARDS AND SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF PUBLIC AND PRIVATE IMPROVEMENTS.

28. THRUSTBLOCKS SHALL BE PLACED AT FITTINGS, TEES, BENDS, CROSSES, PLUGS, ETC., IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF THORNTON STANDARDS AND SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF PUBLIC AND PRIVATE IMPROVEMENTS.

29. FOR ALL WORK INVOLVING EXIST ASBESTOS-CEMENT PIPE, CONTRACTOR SHALL POTHOLE TO VERIFY LOCATION AND MEASURE OUTSIDE DIAMETER OF THE PIPE PRIOR TO ORDERING ANY RELATED PARTS OR MATERIALS.CONTRACTOR SHALL PROVIDE ANY TRANSITION COUPLINGS AS NECESSARY FOR CONNECTIONS.

30. IN ALL CASES, 10 FEET OF HORIZONTAL DISTANCE, AS MEASURED FROM EDGE OF PIPE TO EDGE OF PIPE, SHALL BE MAINTAINED BETWEEN WATER AND ANY SANITARY OR STORM SEWER.

31. CONTRACTOR SHALL NOTIFY ALL RESIDENTS AND/OR BUSINESSES IN WRITING 48 HOURS PRIOR TO ANY SHUT-OFF IN SERVICE. THE NOTICES MUST HAVE CONTRACTOR'S PHONE NUMBER AND NAME OF CONTACT PERSON, AND EMERGENCY PHONE NUMBER FOR AFTER HOURS CALLS. ALL SHUT-OFF'S MUST BE APPROVED BY THE CITY'S INFRASTRUCTURE DEPARTMENT, AND CITY VALVES AND APPURTENANCES SHALL BE OPERATED BY CITY PERSONNEL, UNLESS WRITTEN PERMISSION IS GIVEN OTHERWISE.

32. WATER SHALL NOT BE SHUT OFF FOR LONGER THAN 8 HOURS UNDER ANY CONDITION, UNLESS TEMPORARY WATER SERVICE IS PROVIDED. IT IS ANTICIPATED THAT TEMPORARY WATER SERVICE WILL BE NEEDED FOR WATER SERVICE TO THE SIX HOUSES ON MARION STREET SOUTH OF 100TH AVENUE (9903, 9913, 9933, 9953, 9973, AND 9993 MARION STREET), FOR WATER SERVICE TO 1570 100TH AVENUE, AND FOR THE IRRIGATION WATER SERVICE NORTH OF 100TH AVENUE AT RACE STREET (STA 35+69).

33. RIM ELEVATIONS OF MANHOLE SHOWN ON THE PLAN AND PROFILE SHEETS ARE APPROXIMATE ONLY AND ARE NOT TO BE TAKEN AS FINAL ELEVATIONS. THE PIPELINE CONTRACTOR SHOULD ALLOW APPROXIMATELY THE TOP ONE (1) FOOT OF RIM ELEVATION TO BE ADJUSTED EITHER UP OR DOWN IN ORDER TO MATCH FINAL PAVEMENT ELEVATION. THE MAXIMUM ADJUSTMENT TO FINAL GRADE IS 12 INCHES WITH CONCRETE RINGS.

34. DURING CONSTRUCTION, CARE MUST BE TAKEN TO AVOID ANY GROUND WATER, STORM WATER, CONSTRUCTION DEBRIS, SOIL, OR ANY OTHER FOREIGN MATERIALS FROM ENTERING ANY ACTIVE CITY OF THORNTON SEWER. THE USE OF THE SANITARY SEWER SYSTEM FOR THE PURPOSES OF DEWATERING IS STRICTLY PROHIBITED.

35. ALL CONSTRUCTION ACTIVITIES DEWATERING MUST COMPLY WITH THE STATE OF COLORADO PERMITTING PROCESS FOR "STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY." FOR INFORMATION, PLEASE CONTACT COLORADO DEPARTMENT OF HEALTH, WATER QUALITY CONTROL DIVISION.

36. AFTER ANY OVERLAY OF AN EXISTING ROADWAY, WHERE CITY UTILITIES ARE PRESENT, THE CONTRACTOR SHALL OPEN ALL MANHOLES AND VALVE BOXES FOLLOWING THE PAVING OPERATION TO ENSURE THAT MANHOLE AND VALVES WERE NOT PAVED OVER NOR FILLED WITH ASPHALT. AS SEVERAL MANHOLES AND VALVES WITHIN THE PROJECT EXTENTS ARE KNOWN TO BE CURRENTLY INACCESSIBLE, IT IS ADVISED THAT THE CONTRACTOR ASSESS AND NOTIFY THE CITY OF THE CONDITION OF ALL MANHOLES AND VALVES PRIOR TO CONSTRUCTION.

37. WHEN AN EXISTING ASPHALT STREET IS CUT, THE STREET MUST BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN ITS ORIGINAL CONDITION. THE EXISTING STREET CONDITION SHALL BE DOCUMENTED BY THE CITY OF THORNTON'S CONSTRUCTION INSPECTOR BEFORE ANY CUTS ARE MADE. PATCHING SHALL BE DONE IN CONFORMANCE WITH THE CITY OF THORNTON STANDARDS AND SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF PUBLIC AND PRIVATE IMPROVEMENTS. THE FINISHED PATCH SHALL BLEND SMOOTHLY INTO THE EXISTING SURFACE. ALL LARGE PATCHES SHALL BE PAVED WITH AN ASPHALT LAY-DOWN MACHINE. IN STREETS WHERE MORE THAN ONE CUT IS MADE, AN OVERLAY OF THE ENTIRE STREET WIDTH, INCLUDING THE PATCHED AREAS, MAY BE REQUIRED. THE DETERMINATION OF NEED FOR A COMPLETE OVERLAY SHALL BE MADE BY THE PROJECT MANAGER.

38. PAVING SHALL NOT START UNTIL A GEOTECHNICAL REPORT AND PAVEMENT DESIGN HAVE BEEN APPROVED BY THE CITY OF THORNTON'S DEVELOPMENT ENGINEERING DIVISION AND SUBGRADE COMPACTION TEST AND PROOF ROLL HAVE BEEN PERFORMED AND THE RESULTS HAVE MET WITH THE APPROVAL OF THE CITY OF THORNTON. THE PAVEMENT DESIGN REPORT MUST BE SUBMITTED THREE (3) WEEKS PRIOR TO THE ANTICIPATED DATE OF PAVING.

39. ALL DAMAGED EXISTING CURB, GUTTER, AND SIDEWALK SHALL BE REPAIRED PRIOR TO ACCEPTANCE OF COMPLETED IMPROVEMENTS.

40. ALL CURB RETURNS WITHIN PUBLIC RIGHT-OF-WAY SHALL BE CONSTRUCTED WITH SIDEWALK RAMPS IN ACCORDANCE WITH THE CITY OF THORNTON STANDARDS AND SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF PUBLIC AND PRIVATE IMPROVEMENTS. ALL SIDEWALK RAMPS SHALL INCLUDE A TRUNCATED DOME DETECTABLE WARNING PATTERN AS SHOWN ON THE DETAIL SHEETS.

41. THE CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN PROPER TRAFFIC CONTROL DEVICES UNTIL THE SITE IS OPEN TO TRAFFIC. THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO THE CITY OF THORNTON FOR APPROVAL PRIOR TO CONSTRUCTION.

42. REPAIR OF ANY DAMAGE TO EXISTING IMPROVEMENTS OR LANDSCAPING IS THE RESPONSIBILITY OF THE CONTRACTOR.

PROJECT CONTACTS

OWNER:
CITY OF THORNTON
9500 CIVIC CENTER DRIVE
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CONTACT: KRISTIN SCHWARTZ, P.E.
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P: 303-591-3434

BID SET

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

NLO DESIGNED
NJC DRAWN
CMJ CHECKED

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DO NOT USE FOR CONSTRUCTION
JULY 2022
Murraysmith
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City of Thornton Colorado

100TH AVE WATERLINE REPLACEMENT

GENERAL NOTES AND PROJECT CONTACTS

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
G-2
2 of 29

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TOPOGRAPHIC LEGEND

	EXISTING	PROPOSED
WATERLINE	10"W	12"PVC W
RAW WATERLINE	12"RW	12"RW
ELECTRICITY	E	E
GAS	4"G	4"G
TELEPHONE/TELEMETRY	T	T
CABLE TELEVISION	CATV	CATV
SANITARY SEWER LINE	8"SS	8"SS
SANITARY SEWER FORCE MAIN	6"FM	6"FM
STORM DRAIN	8"SD	8"SD
CULVERT	12"CMP	18"D
ABANDON PIPE		
DRAINAGE DITCH		
WOODEN FENCE		
CHAIN LINK FENCE		
TEMPORARY SILT FENCE		
GUARDRAIL		
TREE/BUSH LINE		
CENTERLINE		
CITY OPEN SPACE SHADING		
EASEMENT		
PROPERTY LINE		
RIGHT-OF-WAY		
EDGE OF PAVEMENT/AC		
EDGE OF GRAVEL		
CURB		
RESTRAINED JOINT PIPE		R
SURFACE ELEVATION	+ 176.63	+ 176.63

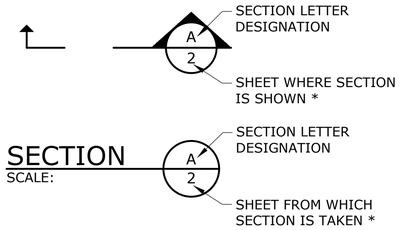
	EXISTING	PROPOSED
SIDEWALK/CONCRETE	S/W	
STRUCTURE OR FACILITY		
CONTOUR MINOR		
CONTOUR MAJOR	200	200
MANHOLE		
CLEAN-OUT		
CATCH BASIN/FIELD INLET		
THRUST BLOCK		
VALVE		
AIR INJECTION ASSEMBLY		
BLOW-OFF ASSEMBLY		
AIR RELEASE ASSEMBLY		
FIRE HYDRANT ASSEMBLY		
WATER METER		
VENT		
UTILITY MARKER/POST		
PULL BOX/JUNCTION BOX		
COMMUNICATIONS RISER		
UTILITY POLE		
GUY WIRE		
LIGHT POST		
MAILBOX		
SIGN		
BENCHMARK		
POTHOLE		
CONTROL POINT/MONUMENT		
TREE DECIDUOUS		
TREE CONIFEROUS		
TREE TO BE REMOVED		

APPROXIMATE SCHEDULE OF VALUES

MATERIAL	QUANTITY	UNITS
6" C900 PVC WATERLINE, RESTRAINED	35	LF
8" C900 PVC WATERLINE, RESTRAINED	100	LF
16" C900 PVC WATERLINE, RESTRAINED	20	LF
20" C900 PVC WATERLINE, RESTRAINED	850	LF
20" C900 PVC WATERLINE, UNRESTRAINED	3,100	LF
CONNECTION TO EXISTING WATERLINE, LESS THAN 12" DIAMETER	7	EA
CONNECTION TO EXISTING WATERLINE, 16" DIAMETER	2	EA
CONNECTION TO EXISTING WATERLINE, 20" DIAMETER	1	EA
WATER SERVICE CONNECTIONS	2	EA
CAP AND ABANDON EXISTING WATERLINE	15	EA
8" - 11.25° BEND	1	EA
8" - 45° BEND	2	EA
20" - 22.5° BEND	6	EA
20" - 45° BEND	6	EA
20"x8" CROSS	1	EA
20"X6" TEE (TO FIRE HYDRANT)	1	EA
20"x8" TEE	5	EA
20"x16" TEE	1	EA
6" GATE VALVE	1	EA
8" GATE VALVE	4	EA
16" BUTTERFLY VALVE AND VALVE BOX (DIRECT BURY)	1	EA
20" BUTTERFLY VALVE AND VALVE VAULT	4	EA
NEW FIRE HYDRANT ASSEMBLY FOR BLOWOFF	1	EA
AIR-VAC ASSEMBLY AND VAULT	2	EA
APPROXIMATE UTILITY CROSSINGS	45	EA
CURB AND GUTTER REMOVE AND REPLACE	80	LF
CONCRETE PAN REMOVE AND REPLACE	45	SY
AGGREGATE BASE COURSE	700	CY
FULL DEPTH HOT MIX ASPHALT PATCH REMOVE AND REPLACE	4,200	SY
HOT MIX ASPHALT MILL AND OVERLAY	10,050	SY
PAVEMENT MARKING REMOVE AND REPLACE	2,645	SY
AREA OF DISTURBANCE	2.15	ACRE

SECTION AND DETAIL DESIGNATIONS

SECTION DESIGNATIONS



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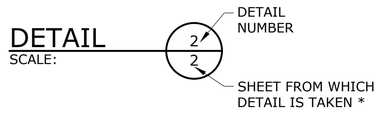

* NOTE: IF PLAN AND SECTION FOR DETAIL CALL-OUT AND DETAIL ARE SHOWN ON THE SAME DRAWING, DRAWING NUMBER IS REPLACED WITH A DASH.

BID SET

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

NLO DESIGNED
NJC DRAWN
CMJ CHECKED

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City of Thornton Colorado

100TH AVE WATERLINE REPLACEMENT

SYMBOLS, LEGEND, AND SCHEDULE OF VALUES

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
G-3
3 of 29

I:\BOI_Projects\21\3048 - Thornton - 100th Ave Waterline Replacement\CAD\Sheets\21-3048-CO-G1-5.dwg G-3 6/27/2022 4:21 PM NICK.CAMPBELL 23.0s (LMS Tech)

@	AT
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS
AB	ANCHOR BOLT
ABAN(D)	ABANDON(ED)
ABS	ACRYLONITRILE BUTADIENE STYRENE
ABV	ABOVE / ALCOHOL BY VOLUME
AC	ASBESTOS CEMENT PIPE
ACP	ASPHALTIC CONCRETE PAVING
ADJ	ADJUSTABLE
ADJC	ADJACENT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHR	ANCHOR
AL	ALUMINUM
ALT	ALTERNATE
AMP	AMPERE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPROX	APPROXIMATE
APPVD	APPROVED
APWA	AMERICAN PUBLIC WORKS ASSOCIATION
ARCH	ARCHITECTURAL
ARV	AIR RELEASE VALVE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASSN	ASSOCIATION
ASSY	ASSEMBLY
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS
ATM	ATMOSPHERE
AUTO	AUTOMATIC
AUX	AUXILIARY
AVE	AVENUE
AVG	AVERAGE
AWWA	AMERICAN WATER WORKS ASSOCIATION
B&S	BELL & SPIGOT
BC	BOLT CIRCLE
BD	BOARD
BETW	BETWEEN
BF	BOTH FACE
BFD	BACKFLOW PREVENTION DEVICE
BFILL	BACKFILL
BFV	BUTTERFLY VALVE
BHP	BRAKE HORSEPOWER
BH	GEOTECHNICAL BORE HOLE
BKGD	BACKGROUND
BLDG	BUILDING
BLK	BLOCK
BLVD	BOULEVARD
BM	BENCHMARK / BEAM
BMP	BEST MANAGEMENT PRACTICES
BO	BLOW-OFF
BOC	BACK OF CURB
BS	BOTH SIDES
BSMT	BASEMENT
BTF	BOTTOM FACE
BTU	BRITISH THERMAL UNIT
BV	BALL VALVE
BW	BOTH WAYS
C	CELSIUS
C TO C	CENTER TO CENTER
CARV	COMBINATION AIR RELEASE VALVE
CATV	CABLE TELEVISION
CB	CATCH BASIN
CCP	CONCRETE CYLINDER PIPE
CCW	COUNTER CLOCKWISE
CDOT	COLORADO DEPARTMENT OF TRANSPORTATION
CF	CUBIC FEET
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CHAN	CHANNEL
CHEM	CHEMICAL
CHFR	CHAMFER
CHKV	CHECK VALVE
CI	CAST IRON
CIP	CAST IRON PIPE
CIPC	CAST IN PLACE CONCRETE
CIR	CIRCLE
CISP	CAST IRON SOIL PIPE
CJ	CONSTRUCTION JOINT
CL OR C/L	CENTER LINE
CL2	CHLORINE
CLG	CEILING
CLJ	CONTROL JOINT
CLR	CLEARANCE
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CND	CONDUIT
CO	CLEANOUT
COL	COLUMN
COMB	COMBINATION
COMM	COMMUNICATION
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS / CONTINUATION
CONTR	CONTRACT(OR)
COORD	COORDINATE
COP	COPPER
CORP	CORPORATION
CORR	CORRUGATED
COT	CITY OF THORNTON
CP	CONTROL POINT
CPLG	COUPLING
CPVC	CHLORINATED POLYVINYL CHLORIDE
CR	CRUSHED ROCK
CS	COMBINED SEWER
CSP	CONCRETE SEWER PIPE
CT	COURT
CTR	CENTER
CU	CUBIC
CULV	CULVERT
CV	CONTROL VALVE
CW	CLOCKWISE / COLD WATER
CY	CUBIC YARDS
CYL	CYLINDER LOCK
D	DRAIN
DC	DIRECT CURRENT
DEFL	DEFLECTION
DEMO	DEMOLISH
DEQ	DEPARTMENT OF ENVIRONMENTAL QUALITY
DET	DETAIL
DI	DUCTILE IRON
DIA	DIAMETER
DIM	DIMENSION
DIR	DIRECTION
DIST	DISTANCE
DN	DOWN
DR	DRIVE
DS	DOWNSPOUT
DWG	DRAWING
DWL	DOWEL
DWV	DRAIN WASTE AND VENT
DWY	DRIVEWAY
E	EAST/ EASTING
ELEC	ELECTRICAL
EA	EACH
ECC	ECCENTRIC
EF	EACH FACE
EL	ELEVATION
ELB	ELBOW
ENCL	ENCLOSURE
EOP	EDGE OF PAVEMENT
EQ	EQUAL
EQL SP	EQUALLY SPACED
EQUIP	EQUIPMENT
ESC	EROSION & SEDIMENT CONTROL
ESMT	EASEMENT
EW	EACH WAY
EXC	EXCAVATE
EXIST	EXISTING
EXP	EXPANSION
EXP BT	EXPANSION BOLT
EXP JT	EXPANSION JOINT
EXT	EXTERIOR
F	FAHRENHEIT
F TO F	FACE TO FACE
FAB	FABRICATE
FB	FLAT BAR
FCA	FLANGED COUPLING ADAPTER
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FDN	FOUNDATION
FEXT	FIRE EXTINGUISHER
FF	FAR FACE
FGL	FIBERGLASS
FH	FIRE HYDRANT
FIN	FINISH(ED)
FIPT	FEMALE IRON PIPE THREAD
FITG	FITTING
FL	FLOOR LINE
FLEX	FLEXIBLE
FLG	FLANGE
FLL	FLOW LINE
FLR	FLOOR
FM	FORCE MAIN
FO	FIBER OPTIC
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUDS
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FEET / FOOT
FTG	FOOTING
FUT	FUTURE
FXTR	FIXTURE
G	GAS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GROOVED COUPLING
GFA	GROOVED FLANGE ADAPTER
GI	GALVANIZED IRON
GIP	GALVANIZED IRON PIPE
GJ	GRIP JOINT
GL	GLASS
GLV	GLOBE VALVE
GND	GROUND
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GPS	GALLONS PER SECOND
GR	GRADE
GR LN	GRADE LINE
GRTG	GRATING
GV	GATE VALVE
GRVL	GRAVEL
GYP	GYPSUM
HB	HOSE BIBB
HC	HOLLOW CORE
HDPE	HIGH DENSITY POLYETHYLENE
HDR	HEADER
HDWE	HARDWARE
HGR	HANGER
HGT	HEIGHT
HH	HANDHOLD
HM	HOLLOW METAL
HMAC	HOT MIX ASPHALT CONCRETE
HNDRL	HANDRAIL
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HORIZ	HORIZONTAL
HP	HIGH PRESSURE / HORSEPOWER
HPG	HIGH PRESSURE GAS
HPT	HIGH POINT
HR	HOUR
HSB	HIGH STRENGTH BOLT
HV	HOSE VALVE
HVAC	HEATING, VENTILATION, AIR CONDITIONING
HWL	HIGH WATER LINE
HWY	HIGHWAY
HYD	HYDRANT
HYDR	HYDRAULIC
I&C	INSTRUMENTATION & CONTROL
IAW	IN ACCORDANCE WITH
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IF	INSIDE FACE
IMPVT	IMPROVEMENT
IN	INCH
INCC	INCLUDE(D)(ING)
INFL	INFLUENT
INJ	INJECTION
INSTL	INSTALLATION / INSTALL
INSUL	INSULATION
INTER	INTERCEPTOR
INTR	INTERIOR
INV	INVERT
IP	IRON PIPE
IPT	IRON PIPE THREAD
IR	IRON ROD
IRRIG	IRRIGATION
ITD	IDAHO TRANSPORTATION DEPARTMENT
JT	JOINT
JUNC	JUNCTION
KPL	KICK PLATE
KVA	KILOVOLT AMPERE
KW	KILOWATT
KWY	KEYWAY
L	LENGTH
LAB	LABORATORY
LAV	LAVATORY
LB	POUND
LF	LINEAR FOOT
LIN	LINEAL
LN	LANE
LOC	LOCATION
LONG	LONGITUDINAL
LP	LOW PRESSURE
LPT	LOW POINT
LRG	LARGE
LS	LONG SLEEVE / LUMP SUM
LT	LEFT
LVL	LEVEL
LWL	LOW WATER LINE
MAN	MANUAL
MAT	MATERIAL
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MCP	MASTER CONTROL PANEL
MECH	MECHANICAL
MET	METAL
MFR	MANUFACTURER
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MIN	MINIMUM
MIPT	MALE IRON PIPE THREAD
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MON	MONUMENT / MONOLITHIC
MOT	MOTOR
MP	MILEPOST
MSL	MEAN SEAL LEVEL
MTD	MOUNTED
MUTCD	MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES
N	NORTH/ NORTHING
NA	NOT APPLICABLE
NAVD	NORTH AMERICAN VERTICAL DATUM
NC	NORMALLY CLOSED
NF	NEAR FACE
NIC	NOT IN CONTRACT
NO / NO.	NORMALLY OPEN / NUMBER
NOM	NOMINAL
NORM	NORMAL
NPT	NATIONAL PIPE THREAD
NRS	NON-RISING STEM
NTS	NOT TO SCALE
O TO O	OUT TO OUT
OC	ON CENTER
OD	OUTSIDE DIAMETER
OE	OVERHEAD ELECTRIC
OF	OVERFLOW / OUTSIDE FACE
OPNG	OPENING
OPP	OPPOSITE
ORIG	ORIGINAL
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OVHD	OVERHEAD
P&ID	PROCESS & INSTRUMENTATION DIAGRAM
PC	POINT OF CURVE
PCC	POINT OF COMPOUND CURVE
PCVC	POINT OF CURVATURE ON VERTICAL CURVE
PE	PLAIN END
PERF	PERFORATED
PERM	PERMANENT
PERP	PERPENDICULAR
PG	PRESSURE GAUGE
PH	PIPE HANGER
PI	POINT OF INTERSECTION
PIVC	POINT OF INTERSECTION ON VERTICAL CURVE
PL OR P/L	PROPERTY LINE / PLATE / PLASTIC/ PLACE
PLBG	PLUMBING
PNL	PANEL
POC	POINT OF CURVATURE
POLY	POLYETHYLENE
PP	POWER POLE
PRC	POINT OF REVERSE CURVATURE
PRCST	PRECAST
PREP	PREPARATION
PRESS	PRESSURE
PRKG	PARKING
PROP	PROPERTY/ PROPOSED
PRV	PRESSURE REDUCING VALVE
PS	PUMP STATION
PSIG	POUNDS PER SQUARE INCH GAUGE
PSL	PIPE SLEEVE
PSPT	PIPE SUPPORT
PT	POINT OF TANGENCY
PTVC	POINT OF TANGENCY ON VERTICAL CURVE
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PWR	POWER
QTY	QUANTITY
RAD	RADIUS
RC	REINFORCED CONCRETE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD / ROOF DRAIN
RDCR	REDUCER
REF	REFERENCE
REINF	REINFORCE(D)(ING)(MENT)
REQ'D	REQUIRED
RESTR	RESTRAINED
RFCA	RESTRAINED FLANGE COUPLING ADAPTER
RM	ROOM
RND	ROUND
RO	ROUGH OPENING
R/W	RIGHT-OF-WAY
RPBPD	REDUCED PRESSURE BACKFLOW PREVENTION DEVICE
RPM	REVOLUTIONS PER MINUTE
RR	RAILROAD
RST	REINFORCED STEEL
RT	RIGHT
S	SOUTH
SALV	SALVAGE
SAN	SANITARY SEWER
SC	SOLID CORE
SCHED	SCHEDULE
SD	STORM DRAIN
SDL	SADDLE
SDR	STANDARD DIMENSION RATIO
SECT	SECTION
SHLDR	SHOULDER
SHT	SHEET
SIM	SIMILAR
SLP	SLOPE
SLV	SLEEVE
SOLN	SOLUTION
SP	SOIL PIPE / SEWER PIPE
SPCL	SPECIAL
SPEC(S)	SPECIFICATION(S)
SPG	SPACING
SPL	SPOOL
SPRT	SUPPORT
SQ	SQUARE
SQ FT	SQUARE FOOT
SQ IN	SQUARE INCH
SQ YD	SQUARE YARD
SS	SANITARY SEWER
SST	STAINLESS STEEL
ST	STREET
STA	STATION
STD	STANDARD
STL	STEEL
STOR	STORAGE
STR	STRAIGHT
STRUCT	STRUCTURE / STRUCTURAL
SUBMG	SUBMERGED
SUCT	SUCTION
SV	SOLENOID VALVE
S/W	SIDEWALK
SWD	SIDEWATER DEPTH
SWGR	SWITCH GEAR
SYMM	SYMMETRICAL
SYS	SYSTEM
T OR TEL	TELEPHONE
T&B	TOP & BOTTOM
TAN	TANGENCY
TB	THRUST BLOCK
TBM	TEMPORARY BENCHMARK
TC	TOP OF CONCRETE / TOP OF CURB
TCE	TEMPORARY CONSTRUCTION EASEMENT
TDH	TOTAL DYNAMIC HEAD
TEMP	TEMPERATURE / TEMPORARY
T&G	TONGUE & GROOVE
TH	TEST HOLE
THK	THICK / THICKNESS
THRD	THREAD (ED)
THRU	THROUGH
T.O.P.	TOP OF PAVEMENT/ PIPE
TP	TEST PIT / TOP OF PAVEMENT / TURNING POINT
TRANS	TRANSITION
TSP	TRI-SODIUM PHOSPHATE
TST	TOP OF STEEL
TW	TOP OF WALL
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UN	UNION
UON	UNLESS OTHERWISE NOTED
USGS	UNITED STATES GEOLOGIC SURVEY
V	VENT / VOLT
VAC	VACUUM
VB	VACUUM BREAKER
VBOX	VALVE BOX
VC	VERTICAL CURVE
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VCP	VITRIFIED CLAY PIPE
VTR	VENT THROUGH ROOF
W	WEST/WATER
W/	WITH
W/IN	WITHIN
W/O	WITHOUT
W/W	WALL TO WALL
WD	WOOD
WF	WIDE FLANGE
WH	WATER HEATER
WI	WROUGHT IRON
WL	WATER LINE
WM	WATER METER
WP	WORKING POINT / WATERPROOFING
WS	WATER SERVICE
WT	WEIGHT
WTP	WATER TREATMENT PLANT
WTRT	WATERTIGHT
WWF	WELDED WIRE FABRIC
WWTF	WASTEWATER TREATMENT FACILITY
WWTP	WASTEWATER TREATMENT PLANT
X SECT	CROSS SECTION
XFMR	TRANSFORMER
YD	YARD DRAIN / YARD
YH	YARD HYDRANT
YR	YEAR
ZN	ZINC

BID SET

NO.	DATE	BY	REVISION

NOTICE

0 ½ 1

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100TH AVE WATERLINE REPLACEMENT

ABBREVIATIONS

SHEET G-4

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

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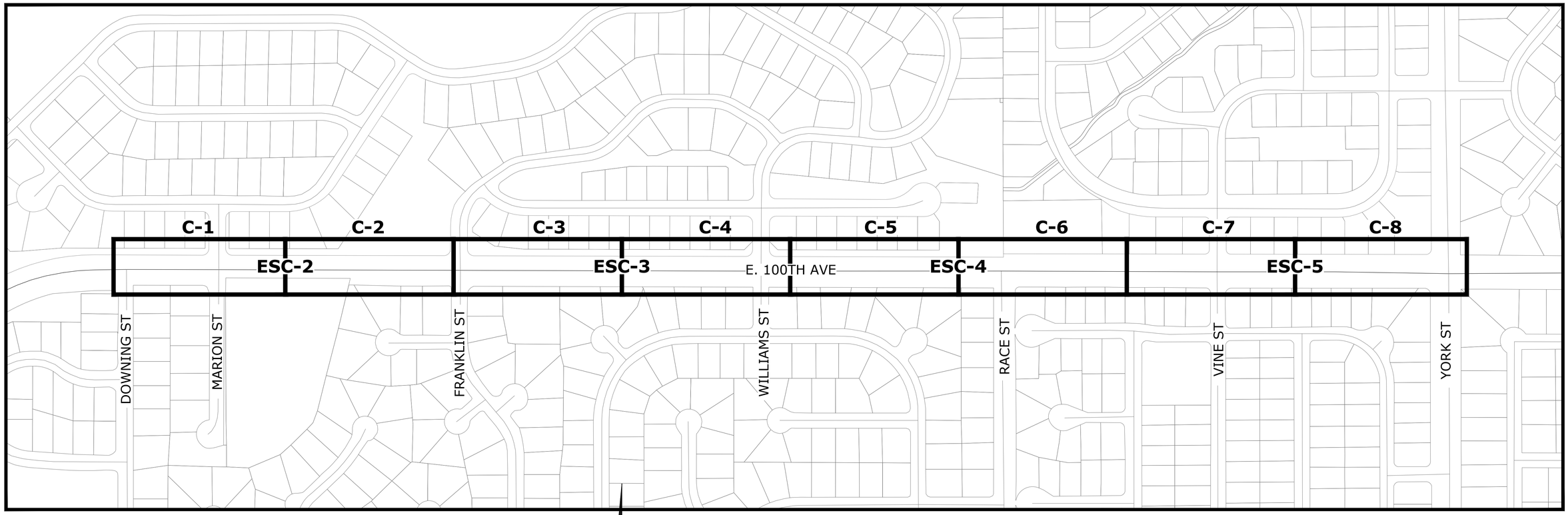

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E. 100TH AVE KEY MAP PLAN

SCALE: 1"=150'

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NOTICE

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100TH AVE WATERLINE REPLACEMENT

KEY MAP

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET

G-5

5 of 29

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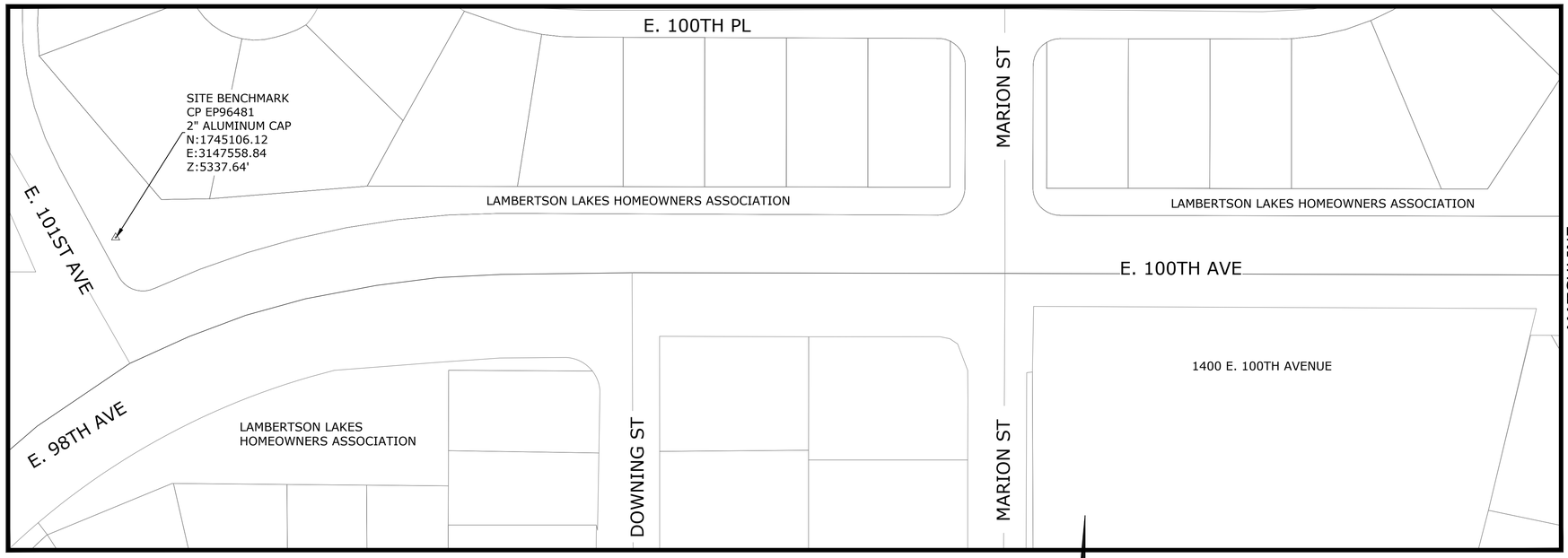
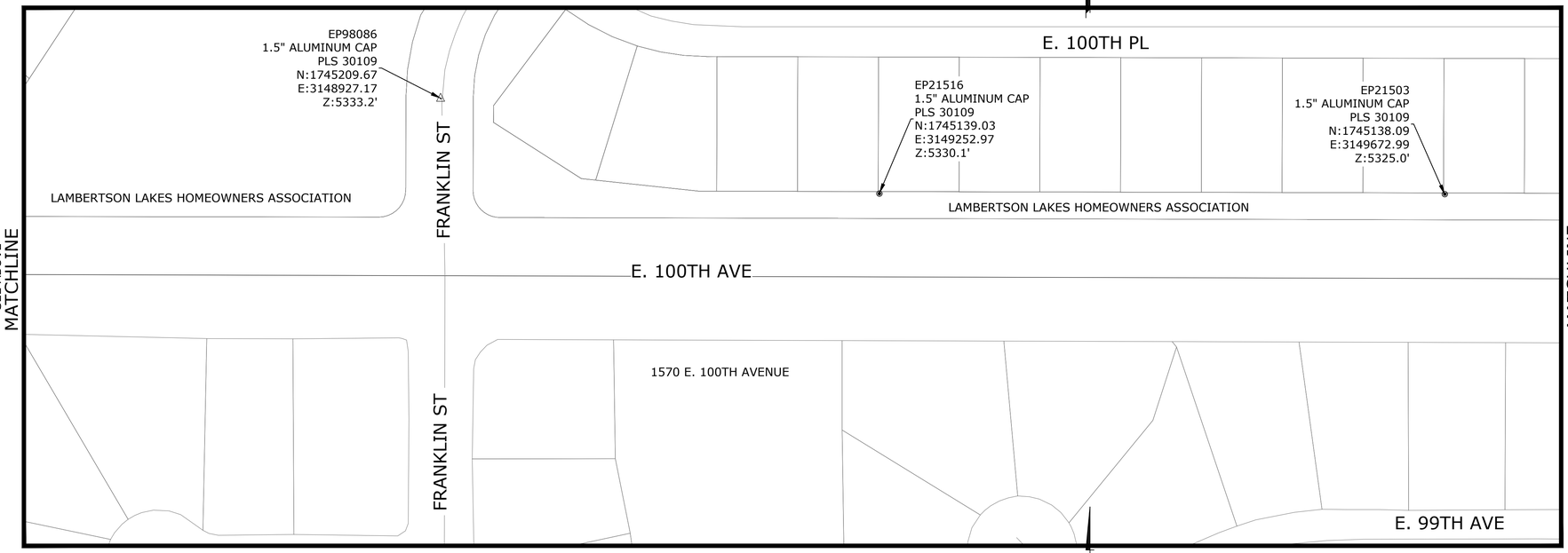


E. 100TH AVE SURVEY CONTROL PLAN

SCALE: 1"=50'



E. 100TH AVE SURVEY CONTROL PLAN

SCALE: 1"=50'

NOTES:

1. SITE BENCHMARK IS A 2" ALUMINUM CAP SET NEAR THE NORTHEAST CORNER OF E. 100TH AVENUE AND E. 101ST AVENUE, AS SHOWN HEREON, WITH A NAVD 88 ELEVATION OF 5337.64'. ALL DIRECTIONS, DISTANCES AND DIMENSIONS ARE BASED ON COORDINATES FROM THE COLORADO COORDINATE SYSTEM OF 1983 CENTRAL ZONE (C.R.S. 38-52-102).
2. THIS PLAN WAS PREPARED FOR THE PURPOSE OF A TOPOGRAPHIC SURVEY AND IS NOT A BOUNDARY SURVEY. THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY THIS SURVEYOR OF THE PROPERTY SHOWN AND DESCRIBED HEREON TO DETERMINE:
   A.) OWNERSHIP OF THE TRACT OF LAND.
   B.) COMPATIBILITY OF THIS DESCRIPTION WITH THOSE OF ADJACENT TRACTS OF LAND.
   C.) RIGHTS OF WAY, EASEMENTS AND ENCUMBRANCES OF RECORD AFFECTING THIS TRACT OF LAND.
3. UNDERGROUND UTILITIES AS SHOWN HEREON ARE BASED ON BEST PHYSICAL EVIDENCE AS FOUND IN THE FIELD, MARKINGS BY OTHERS AND MAY NOT BE ACCURATE OR COMPLETE. ALL UTILITIES ARE TO BE FIELD LOCATED AND VERIFIED BY THE PROPER ENTITY.
4. THIS SURVEY WAS CONDUCTED DURING THE MONTH OF MAY 2021.
5. ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.
6. ANY PERSON WHO KNOWINGLY REMOVES, ALTERS OR DEFACES ANY PUBLIC LAND SURVEY MONUMENT OR LAND BOUNDARY MONUMENT OR ACCESSORY COMMITS A CLASS TWO (2) MISDEMEANOR PURSUANT TO STATE STATUTE 18-4-508, C.R.S.
7. UTILITIES SHOWN HEREON TO BE QUALITY LEVEL D WERE TAKEN FROM MAPS BY OTHERS AND FIT TO APPURTENANCES FOUND IN THE FIELD. UTILITIES SHOWN HEREON TO BE QUALITY LEVEL C WERE TAKEN FROM MAPS BY OTHERS AND / OR FROM THE DIRECTION OF PIPES FOUND IN MANHOLES.
8. ALL PROPERTY AND RIGHT OF WAY LINES SHOWN ARE BASED UPON GEOSPATIAL INFORMATION SYSTEMS DATA FROM ADAMS COUNTY AND HAVE NOT BEEN SURVEY VERIFIED.

CONTROL POINT LIST

POINT NO.	NORTHING(Y)	EASTING(X)	ELEV(Z)	DESCRIPTION
EP96481	1745106.12	3147558.84	5337.64	2" ALUMINUM CAP (TRIMBLE VRS)
EP21503	1745138	3149673	5325.02	1.5" ALUMINUM CAP PLS 30109
EP21516	1745139	3149253	5330.09	1.5" ALUMINUM CAP PLS 30109
EP98086	1745210	3148927	5333.15	1.5" ALUMINUM CAP PLS 30109

BID SET

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
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NLO DESIGNED
NJC DRAWN
CMJ CHECKED

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City of Thornton Colorado

100TH AVE WATERLINE REPLACEMENT

SURVEY CONTROL - 1

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
G-6
6 of 29

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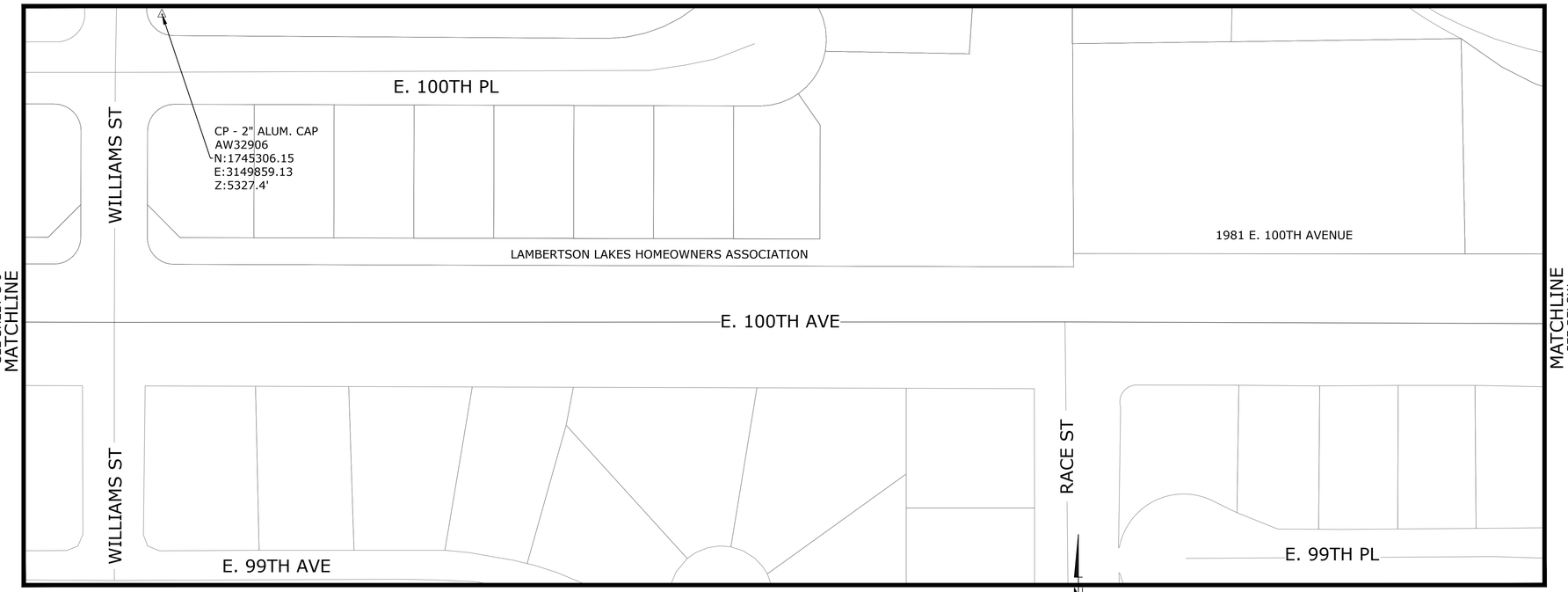
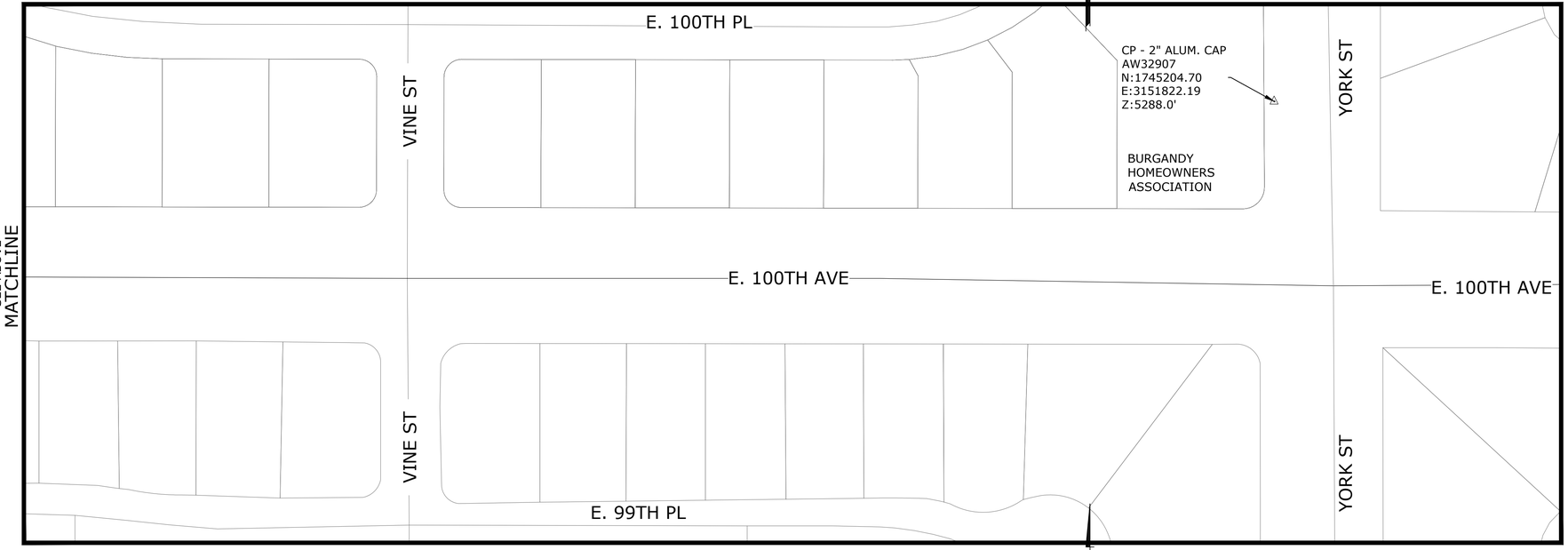


E. 100TH AVE SURVEY CONTROL PLAN

SCALE: 1"=50'



E. 100TH AVE SURVEY CONTROL PLAN

SCALE: 1"=50'

NOTES:

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   B.) COMPATIBILITY OF THIS DESCRIPTION WITH THOSE OF ADJACENT TRACTS OF LAND.
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5. ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.
6. ANY PERSON WHO KNOWINGLY REMOVES, ALTERS OR DEFACES ANY PUBLIC LAND SURVEY MONUMENT OR LAND BOUNDARY MONUMENT OR ACCESSORY COMMITS A CLASS TWO (2) MISDEMEANOR PURSUANT TO STATE STATUTE 18-4-508, C.R.S.
7. UTILITIES SHOWN HEREON TO BE QUALITY LEVEL D WERE TAKEN FROM MAPS BY OTHERS AND FIT TO APPURTENANCES FOUND IN THE FIELD. UTILITIES SHOWN HEREON TO BE QUALITY LEVEL C WERE TAKEN FROM MAPS BY OTHERS AND / OR FROM THE DIRECTION OF PIPES FOUND IN MANHOLES.
8. ALL PROPERTY AND RIGHT OF WAY LINES SHOWN ARE BASED UPON GEOSPATIAL INFORMATION SYSTEMS DATA FROM ADAMS COUNTY AND HAVE NOT BEEN SURVEY VERIFIED.

CONTROL POINT LIST

POINT NO.	NORTHING(Y)	EASTING(X)	ELEV(Z)	DESCRIPTION
AW32906	1745306.15	3149859.13	5327.4'	CP - 2" ALUM. CAP
AW32907	1745204.70	3151822.19	5288.0'	CP - 2" ALUM. CAP

BID SET

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

NLO DESIGNED
NJC DRAWN
CMJ CHECKED

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City of Thornton Colorado

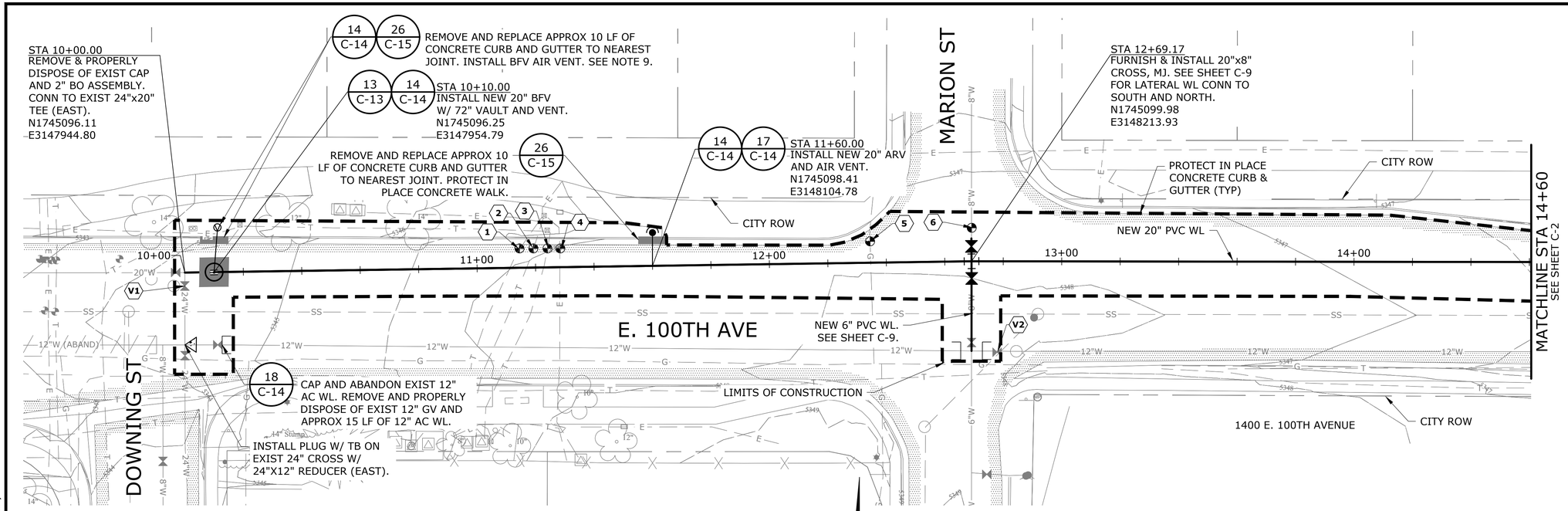
100TH AVE WATERLINE REPLACEMENT

SURVEY CONTROL - 2

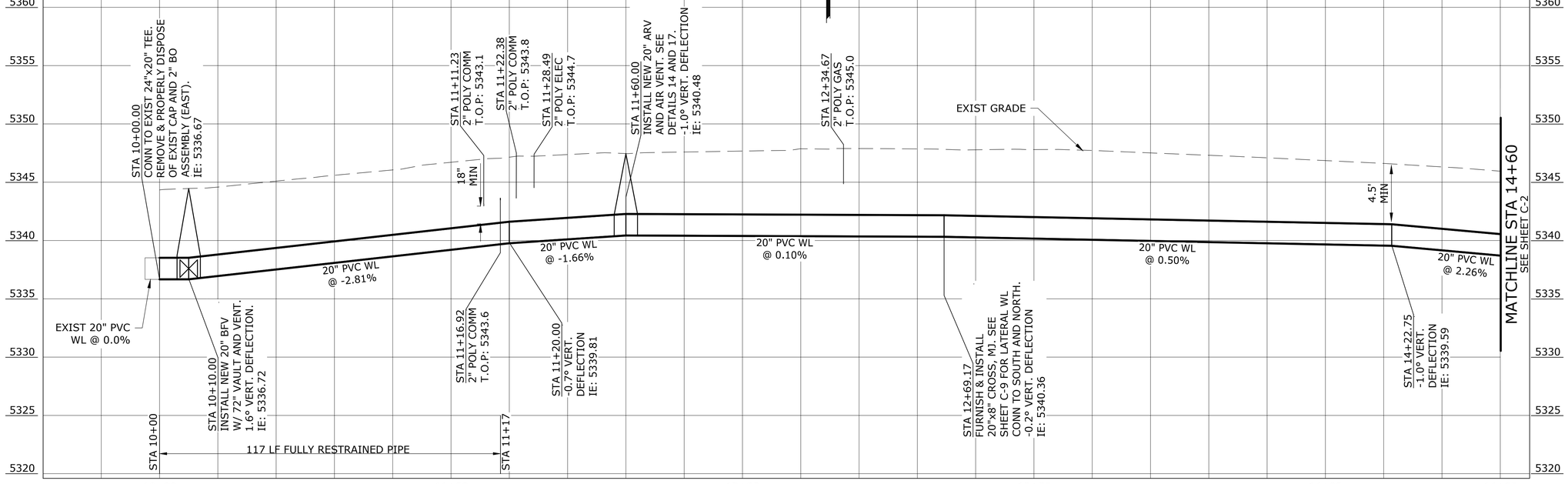
PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
G-7
7 of 29

I:\BOI_Projects\21\3048 - Thornton - 100th Ave Waterline Replacement\CAD\Sheets\21-3048-CO-G6.dwg G-7 6/27/2022 12:25 PM NICK.CAMPBELL 23.0s (LMS Tech)



PLAN
SCALE: 1"=20'



PROFILE
SCALE: 1"=20' HORIZ; 1"=5' VERT

NOTES:

1. CONTRACTOR SHALL COMPLY WITH CITY OF THORNTON AND MUTCD TRAFFIC CONTROL REQUIREMENTS FOR ALL WORK. MAINTAIN A MINIMUM OF 1 LANE OF TRAFFIC OPEN IN BOTH DIRECTIONS AT ALL TIMES (TYP).
2. CONTRACTOR SHALL BE RESPONSIBLE FOR POTHOLING EVERY UTILITY CROSSING AND VERIFYING UTILITY DEPTHS PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL PROTECT IN PLACE ANY AND ALL UTILITIES EXPOSED WITHIN PIPE TRENCH.
4. ALL FITTINGS, BENDS, AND VALVES SHALL HAVE MECHANICALLY RESTRAINED JOINTS.
5. CONTRACTOR SHALL DOCUMENT EXISTING PAVEMENT MARKING AND WILL BE RESPONSIBLE FOR REPLACING ALL IMPACTED PAVEMENT MARKINGS PER THE CITY OF THORNTON SPECIFICATIONS.
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7. CONTRACTOR SHALL VERIFY THE SIZE OF THE WATER SERVICE PRIOR TO CONSTRUCTION AND NOTIFY THE CITY OF ANY DISCREPANCIES.
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9. CONTRACTOR SHALL COORDINATE WITH CITY OF THORNTON TO FIELD FIT FINAL LOCATION FOR BUTTERFLY VALVE VAULT VENTS.
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12. CONTRACTOR IS REQUIRED TO MAINTAIN DRIVEWAY AND SIDE STREET ACCESS FOR HOMEOWNERS AT ALL TIMES.

SUBSURFACE UTILITY INFORMATION:

1. POTHOLE
2" POLY COMMUNICATION
SURFACE EL: 5346.8'
TOP OF PIPE (T.O.P.) EL: 5343.1'

2. POTHOLE
2" POLY COMMUNICATION
SURFACE EL: 5346.8'
TOP OF PIPE (T.O.P.) EL: 5343.6'

3. POTHOLE
1.25" POLY COMMUNICATION
SURFACE EL: 5346.8'
TOP OF PIPE (T.O.P.) EL: 5343.8'

4. POTHOLE
2" POLY ELECTRICAL
SURFACE EL: 5346.8'
TOP OF PIPE (T.O.P.) EL: 5344.7'

5. POTHOLE
2" LP POLY GAS
SURFACE EL: 5347.7'
TOP OF PIPE (T.O.P.) EL: 5345.0'

6. POTHOLE
8" PVC WATER
SURFACE EL: 5347.5'
TOP OF PIPE (T.O.P.) EL: 5341.8'

V1. BUTTERFLY VALVE VAULT
24" PVC WATER
SURFACE EL: 5344.3'
TOP OF PIPE (T.O.P.) EL: 5338.5'

V2. VALVE NUT
12" AC WATER
SURFACE EL: 5348.3'
TOP OF VALVE (T.O.V.) EL: 5343.9'

BID SET

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
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NLO DESIGNED
NJC DRAWN
CMJ CHECKED

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City of Thornton Colorado

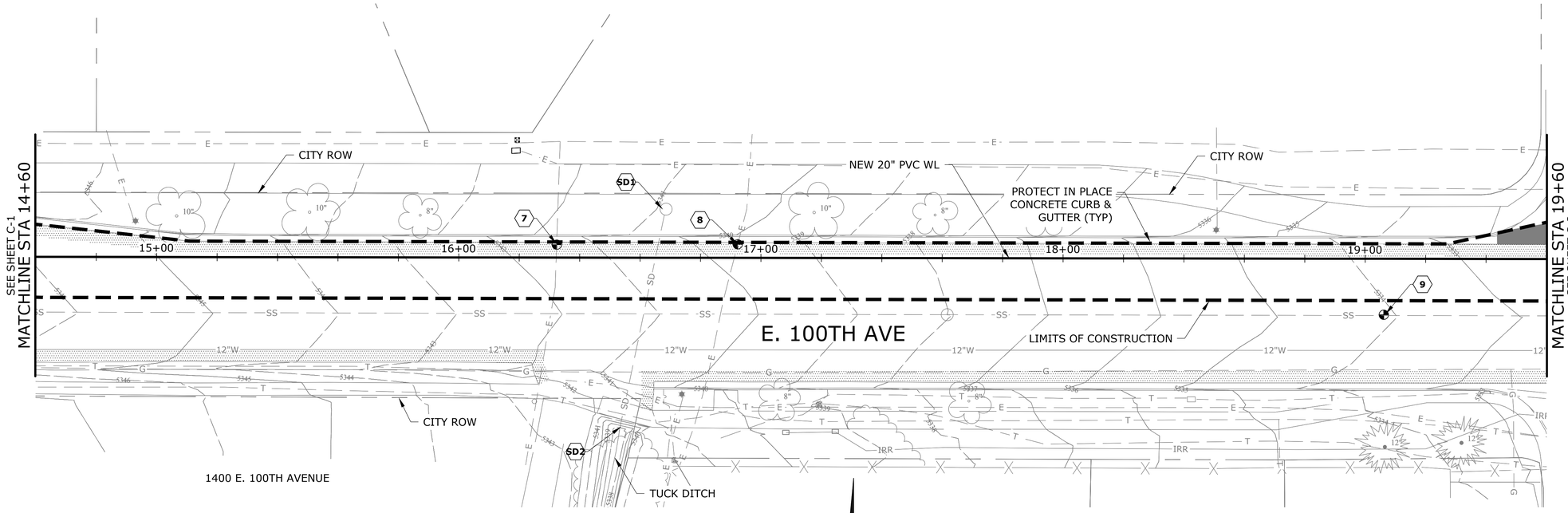
100TH AVE WATERLINE REPLACEMENT

100TH AVE WATERLINE REPLACEMENT
PLAN AND PROFILE
STA 10+00 TO STA 14+60

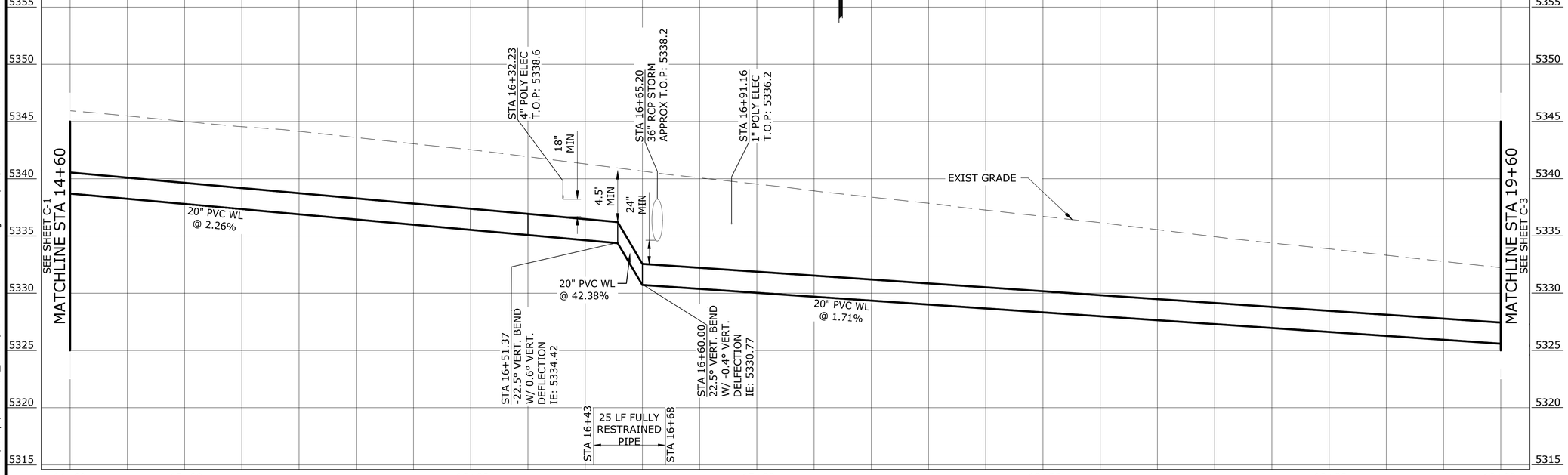
PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
C-1
8 of 29

C:\Users\nick.campbell\AppData\Local\Temp\AcPublish_5012\21-3048-CO-C1-8.dwg C-1 6/28/2022 3:37 PM NICK.CAMPBELL 23.0s (LMS Tech)



PLAN
SCALE: 1"=20'



PROFILE
SCALE: 1"=20' HORIZ; 1"=5' VERT

NOTES:

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12. CONTRACTOR IS REQUIRED TO MAINTAIN DRIVEWAY AND SIDE STREET ACCESS FOR HOMEOWNERS AT ALL TIMES.

SUBSURFACE UTILITY INFORMATION:

7 POTHOLE
4" POLY ELECTRIC
SURFACE EL: 5341.5'
TOP OF PIPE (T.O.P.) EL: 5338.6'

8 POTHOLE
1" POLY ELECTRIC
SURFACE EL: 5339.7'
TOP OF PIPE (T.O.P.) EL: 5336.2'

9 POTHOLE
18" CIP SANITARY SEWER
SURFACE EL: 5334.0'
TOP OF PIPE (T.O.P.) EL: 5321.5'

SD1 STORM DRAIN MANHOLE
36" RCP STORM
SURFACE EL: 5340.9'
APPROX TOP OF PIPE (T.O.P.) EL: 5338.5'

SD2 STORM DRAIN OUTLET
36" RCP STORM
APPROX TOP OF PIPE (T.O.P.) EL: 5337.0'

BID SET

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
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CMJ CHECKED

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City of Thornton Colorado

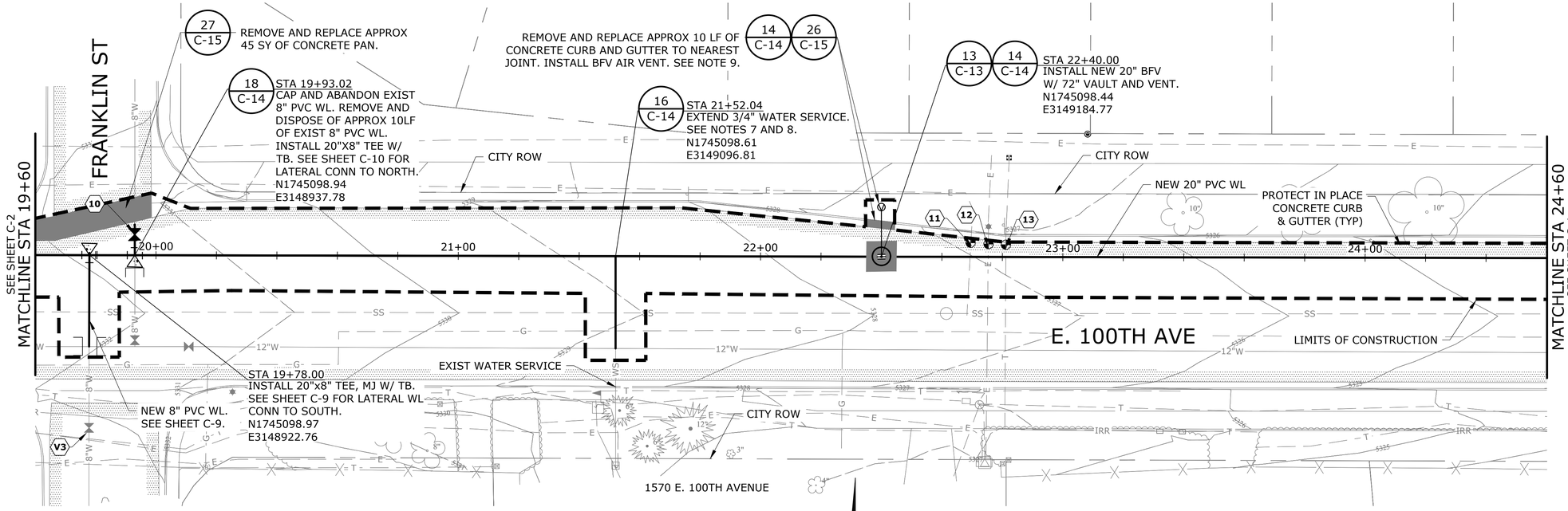
100TH AVE WATERLINE REPLACEMENT

100TH AVE WATERLINE REPLACEMENT
PLAN AND PROFILE
STA 14+60 TO STA 19+60

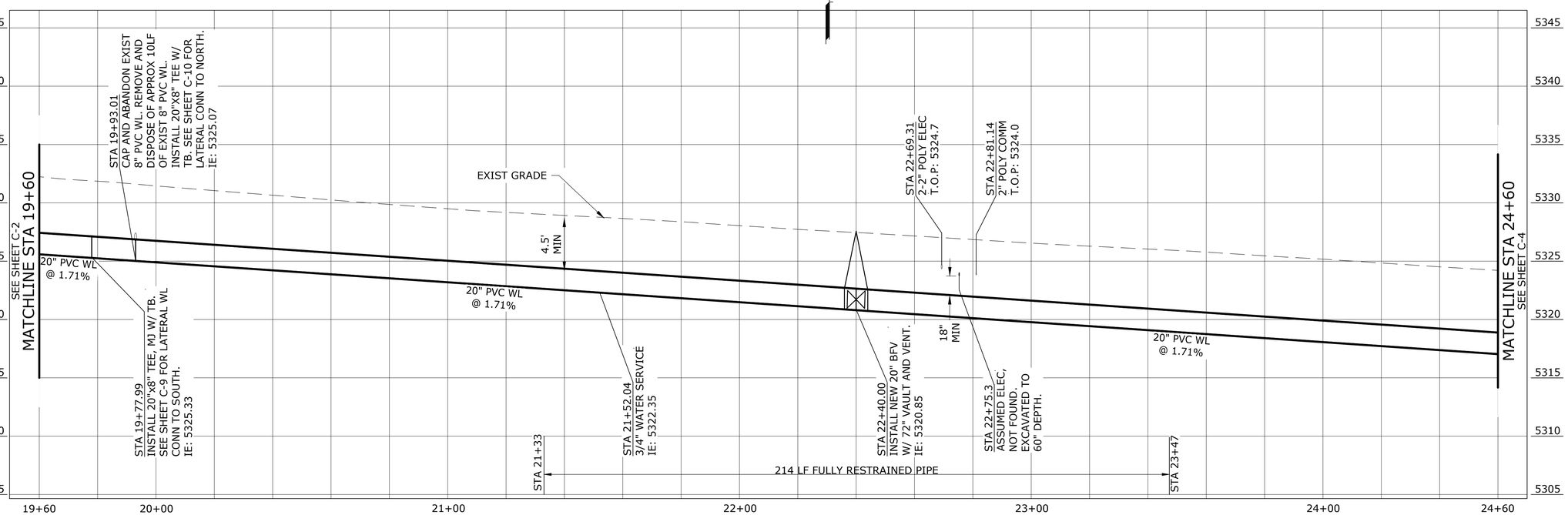
PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
C-2
9 of 29

C:\Users\nick.campbell\AppData\Local\Temp\AcPublish_5012\21-3048-CO-C1-8.dwg C-2 6/28/2022 3:37 PM NICK.CAMPBELL 23.0s (LMS Tech)



PLAN
SCALE: 1"=20'



PROFILE
SCALE: 1"=20' HORIZ; 1"=5' VERT

NOTES:

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SUBSURFACE UTILITY INFORMATION:

10 POTHOLE
8" PVC WATER
SURFACE EL: 5331.4'
TOP OF PIPE (T.O.P.) EL: 5327.4'

11 POTHOLE
2-2" POLY ELECTRIC
SURFACE EL: 5326.9'
TOP OF PIPE (T.O.P.) EL: 5324.7'

12 POTHOLE
ELECTRIC
NOT FOUND.
REACHED DEPTH OF 60".

13 POTHOLE
2" POLY COMMUNICATION
SURFACE EL: 5326.9'
TOP OF PIPE (T.O.P.) EL: 5324.0'

V3 VALVE NUT
8" AC WATER
SURFACE EL: 5332.2'
TOP OF VALVE (T.O.V.) EL: 5329.0'

BID SET

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
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City of Thornton Colorado

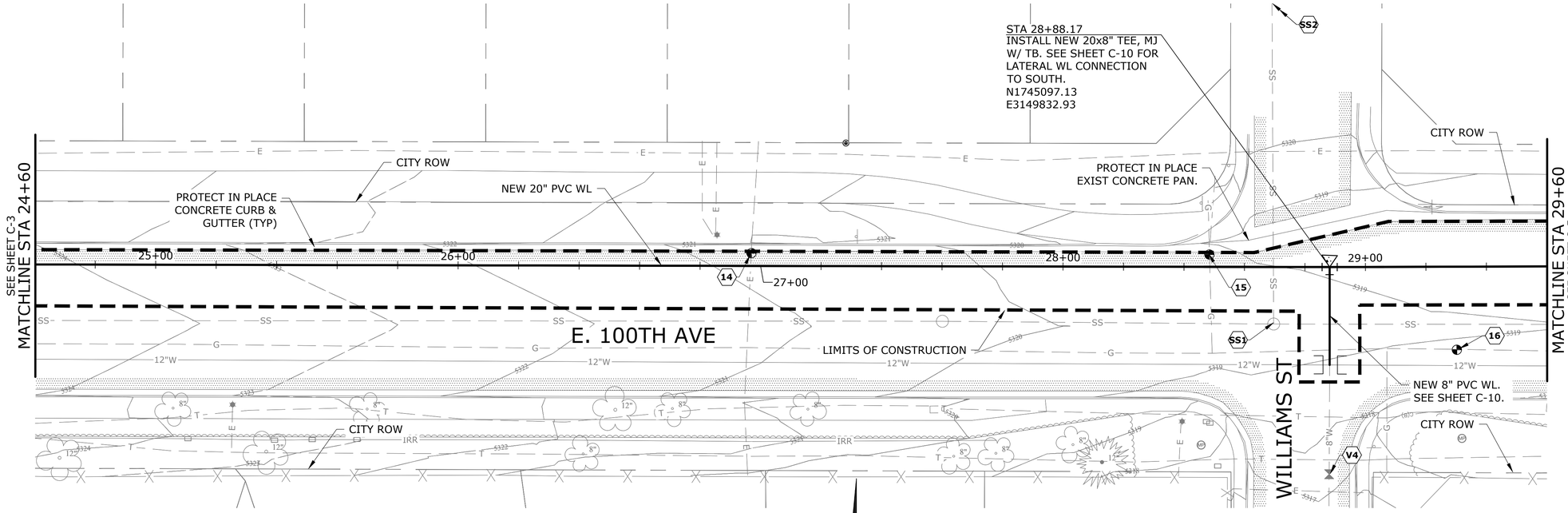
100TH AVE WATERLINE REPLACEMENT

100TH AVE WATERLINE REPLACEMENT
PLAN AND PROFILE
STA 19+60 TO STA 24+60

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

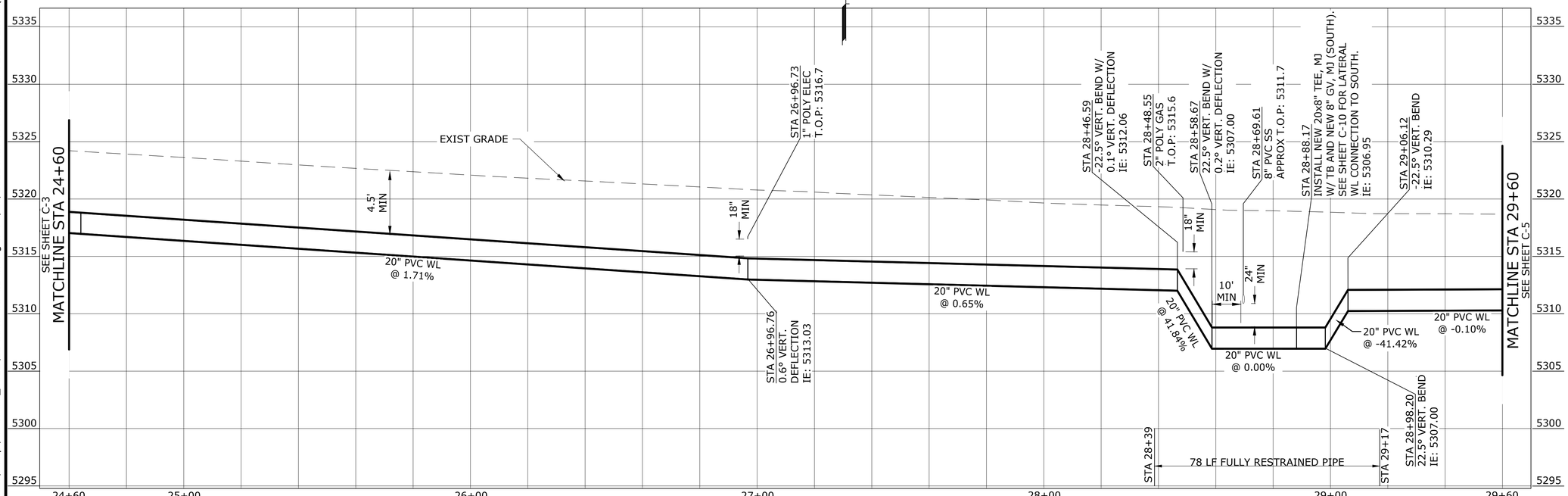
SHEET C-3
10 of 29

C:\Users\nick.campbell\AppData\Local\Temp\AcPublish_5012\21-3048-CO-C1-8.dwg C-3 6/28/2022 3:37 PM NICK.CAMPBELL 23.0s (LMS Tech)



PLAN

SCALE: 1"=20'



PROFILE

SCALE: 1"=20' HORIZ; 1"=5' VERT

NOTES:

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SUBSURFACE UTILITY INFORMATION:

POTHOLE
14 1" POLY ELECTRIC
SURFACE EL: 5320.8'
TOP OF PIPE (T.O.P.) EL: 5316.7'

POTHOLE
15 2" POLY GAS
SURFACE EL: 5319.2'
TOP OF PIPE (T.O.P.) EL: 5315.6'

POTHOLE
16 6" STEEL GAS
SURFACE EL: 5319.2'
TOP OF PIPE (T.O.P.) EL: 5317.2'

SANITARY SEWER MANHOLE
SS1 8" PVS SS
SURFACE EL: 5319.3'
TOP OF PIPE (T.O.P.) EL: 5311.5'

SANITARY SEWER MANHOLE
SS2 8" PVS SS
SURFACE EL: UNKNOWN
DEPTH OF PIPE: 12'
MH SS2 IS APPROX 175 LF DUE NORTH OF MH SS1.
NORTHING: 1745253.72
EASTING: 3149813.98

VALVE NUT
V4 8" AC WATER
SURFACE EL: 5317.2'
TOP OF VALVE (T.O.V.) EL:5312.3'

BID SET

NO.	DATE	BY	REVISION

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City of Thornton Colorado

100TH AVE WATERLINE REPLACEMENT

100TH AVE WATERLINE REPLACEMENT
PLAN AND PROFILE
STA 24+60 TO STA 29+60

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
C-4
11 of 29

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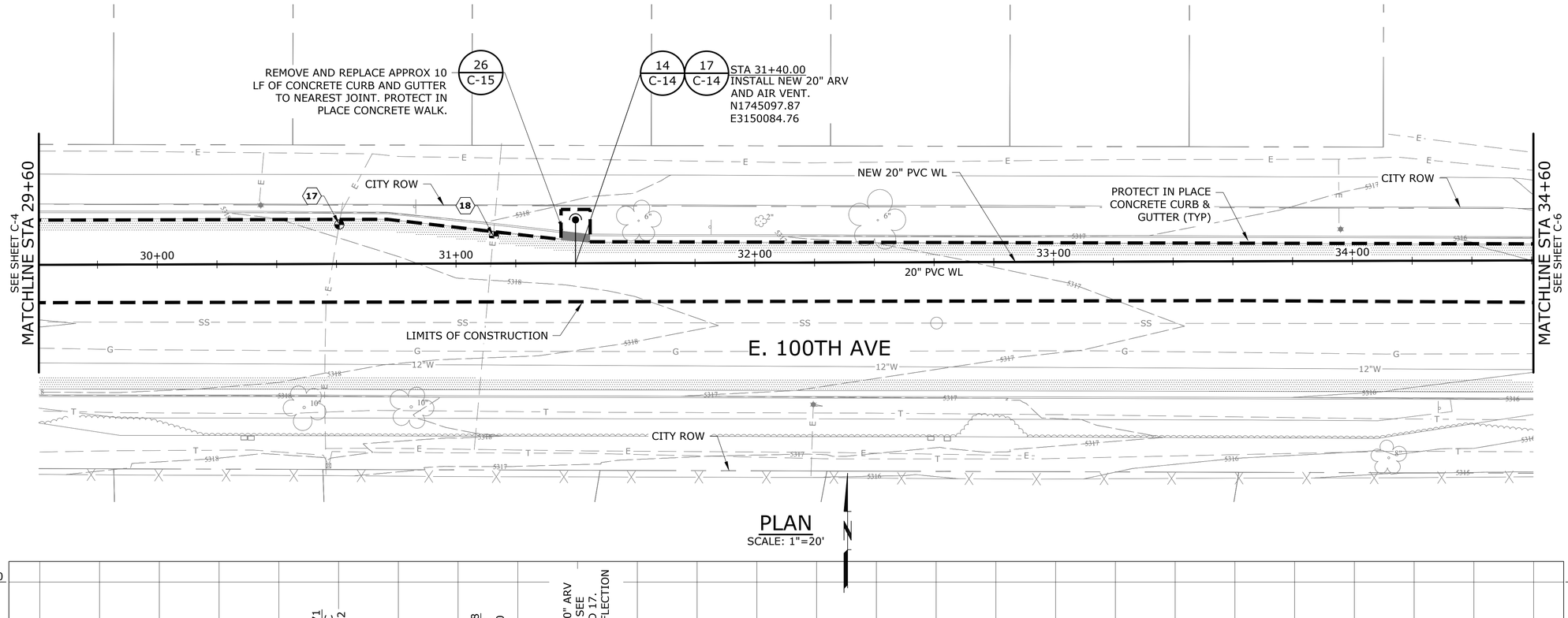
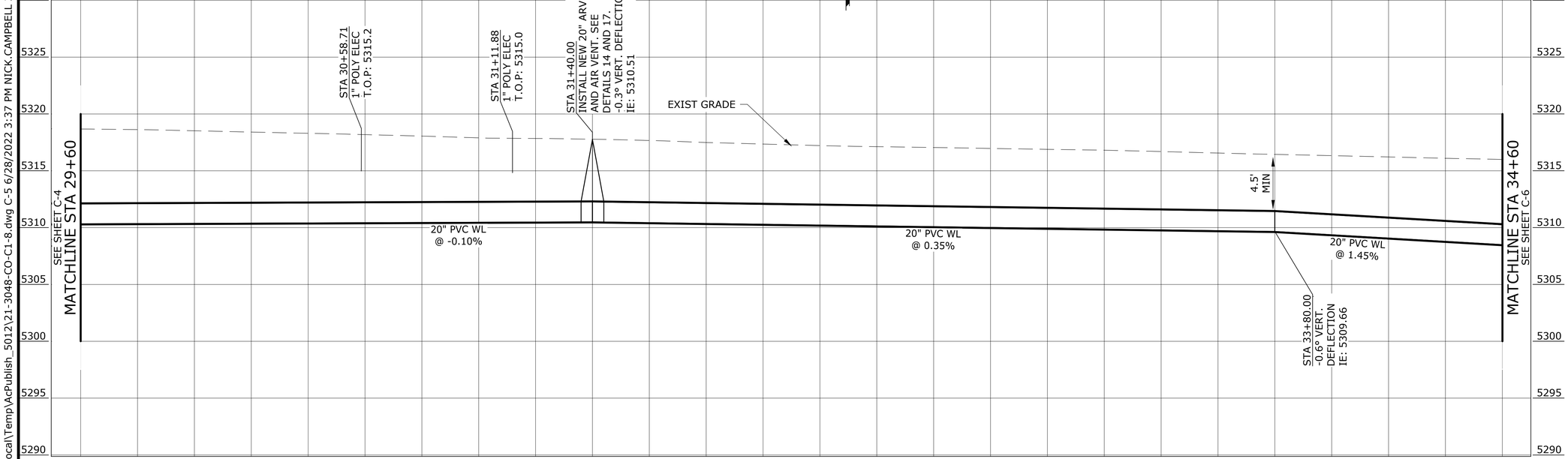


PLAN
SCALE: 1"=20'



PROFILE
SCALE: 1"=20' HORIZ; 1"=5' VERT

NOTES:

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SUBSURFACE UTILITY INFORMATION:

(17) POTHOLE
1" POLY ELECTRIC
SURFACE EL: 5317.9'
TOP OF PIPE (T.O.P.) EL: 5315.2'

(18) POTHOLE
1" POLY ELECTRIC
SURFACE EL: 5317.6'
TOP OF PIPE (T.O.P.) EL: 5315.0'

BID SET

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City of Thornton Colorado

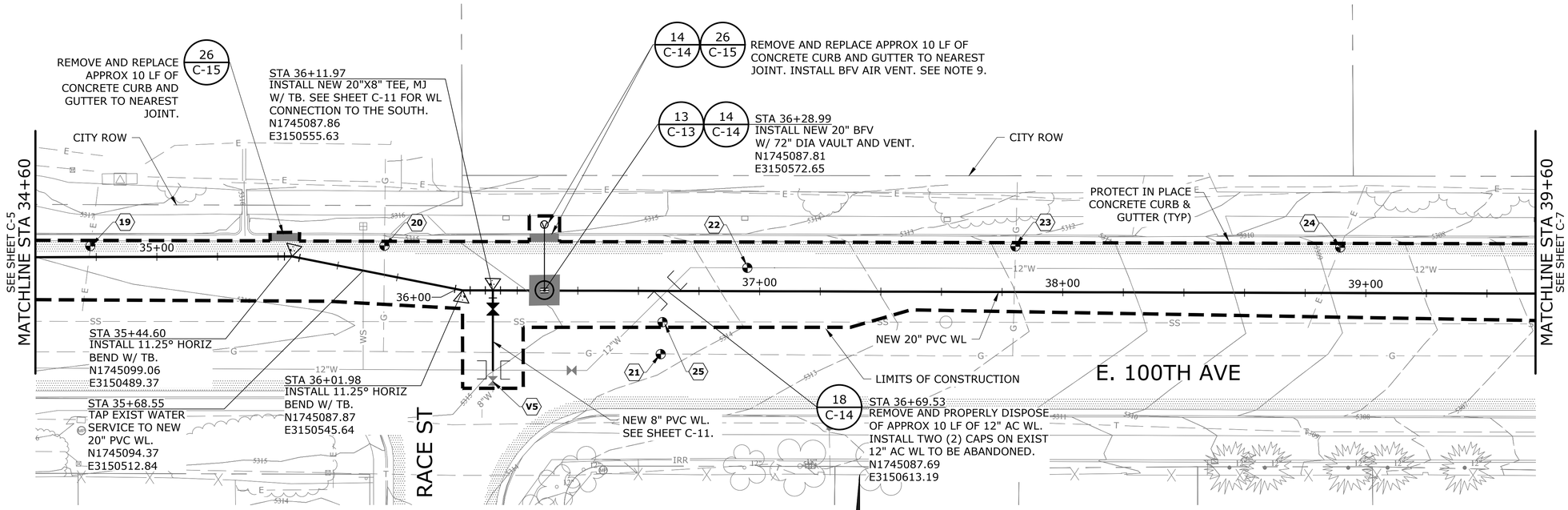
100TH AVE WATERLINE REPLACEMENT

100TH AVE WATERLINE REPLACEMENT
PLAN AND PROFILE
STA 29+60 TO STA 34+60

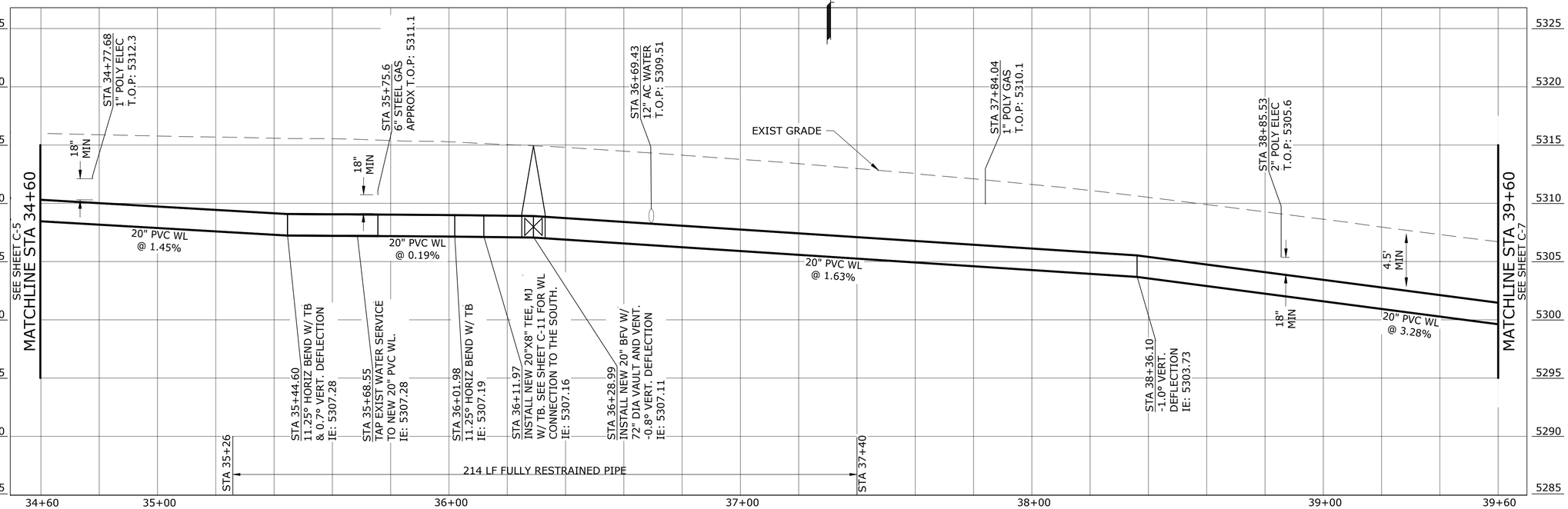
PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET C-5
12 of 29

C:\Users\nick.campbell\AppData\Local\Temp\AcPublish_5012\21-3048-CO-C1-8.dwg C-5 6/28/2022 3:37 PM NICK.CAMPBELL 23.0s (LMS Tech)



PLAN
SCALE: 1"=20'



PROFILE
SCALE: 1"=20' HORIZ; 1"=5' VERT

NOTES:

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2. CONTRACTOR SHALL BE RESPONSIBLE FOR POTHOLING EVERY UTILITY CROSSING AND VERIFYING UTILITY DEPTHS PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL PROTECT IN PLACE ANY AND ALL UTILITIES EXPOSED WITHIN PIPE TRENCH.
4. ALL FITTINGS, BENDS, AND VALVES SHALL HAVE MECHANICALLY RESTRAINED JOINTS.
5. CONTRACTOR SHALL DOCUMENT EXISTING PAVEMENT MARKING AND WILL BE RESPONSIBLE FOR REPLACING ALL IMPACTED PAVEMENT MARKINGS PER THE CITY OF THORNTON SPECIFICATIONS.
6. All WORK SHALL OCCUR WITHIN THE CITY OF THORNTON RIGHT OF WAY. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL APPLICABLE CITY OF THORNTON PERMITS PRIOR TO CONSTRUCTION.
7. CONTRACTOR SHALL VERIFY THE SIZE OF THE WATER SERVICE PRIOR TO CONSTRUCTION AND NOTIFY THE CITY OF ANY DISCREPANCIES.
8. CONTRACTOR SHALL NOTIFY HOMEOWNERS AND THE CITY OF ANY WATER SHUT-OFF 48 HOURS PRIOR TO THE SHUT-OFF. WATER SHALL NOT BE SHUT OFF FOR LONGER THAN 8 HOURS UNDER ANY CONDITION, UNLESS TEMPORARY WATER SERVICE IS PROVIDED.
9. CONTRACTOR SHALL COORDINATE WITH CITY OF THORNTON TO FIELD FIT FINAL LOCATION FOR BUTTERFLY VALVE VAULT VENTS.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSING OF ALL MATERIALS TO BE REMOVED.
11. ALL WORK WITHIN THE CITY OF THORNTON RIGHT OF WAY SHALL BE CONDUCTED BETWEEN THE HOURS OF 8:30 A.M. AND 3:30 P.M., MONDAY THROUGH FRIDAY ONLY. NO WORK SHALL BE CONDUCTED OUTSIDE OF THESE TIMES WITHOUT PRIOR WRITTEN APPROVAL BY THE CITY.
12. CONTRACTOR IS REQUIRED TO MAINTAIN DRIVEWAY AND SIDE STREET ACCESS FOR HOMEOWNERS AT ALL TIMES.

SUBSURFACE UTILITY INFORMATION:

19 POTHOLE
1" POLY ELECTRIC
SURFACE EL: 5315.8'
TOP OF PIPE (T.O.P.) EL: 5312.3'

20 POTHOLE
GAS
NOT FOUND.
REACHED DEPTH OF 80".

21 POTHOLE
6" STEEL GAS
SURFACE EL: 5314.2'
TOP OF PIPE (T.O.P.) EL: 5311.1'

22 POTHOLE
12" AC WATER
SURFACE EL: 5313.8'
TOP OF PIPE (T.O.P.) EL: 5309.5'

23 POTHOLE
1" POLY GAS
SURFACE EL: 5311.9'
TOP OF PIPE (T.O.P.) EL: 5310.1'

24 POTHOLE
2" POLY ELECTRIC
SURFACE EL: 5308.8'
TOP OF PIPE (T.O.P.) EL: 5305.6'

25 POTHOLE
18" CIP SANITARY SEWER
SURFACE EL: 5314.4'
TOP OF PIPE (T.O.P.) EL: 5305.3'

V5 VALVE NUT
8" AC WATER
SURFACE EL: 5314.9'
TOP OF VALVE (T.O.V.) EL: 5310.2'

BID SET

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
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NJC DRAWN
CMJ CHECKED

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City of Thornton Colorado

100TH AVE WATERLINE REPLACEMENT

100TH AVE WATERLINE REPLACEMENT
PLAN AND PROFILE
STA 34+60 TO STA 39+60

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
C-6
13 of 29

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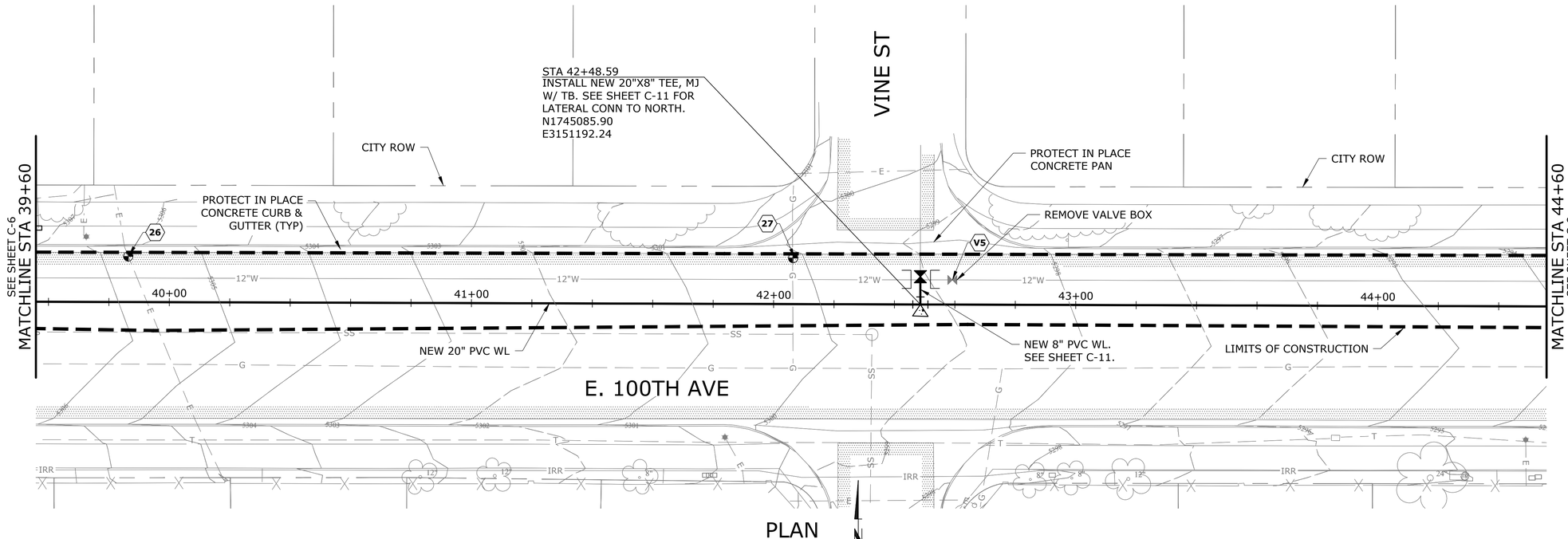
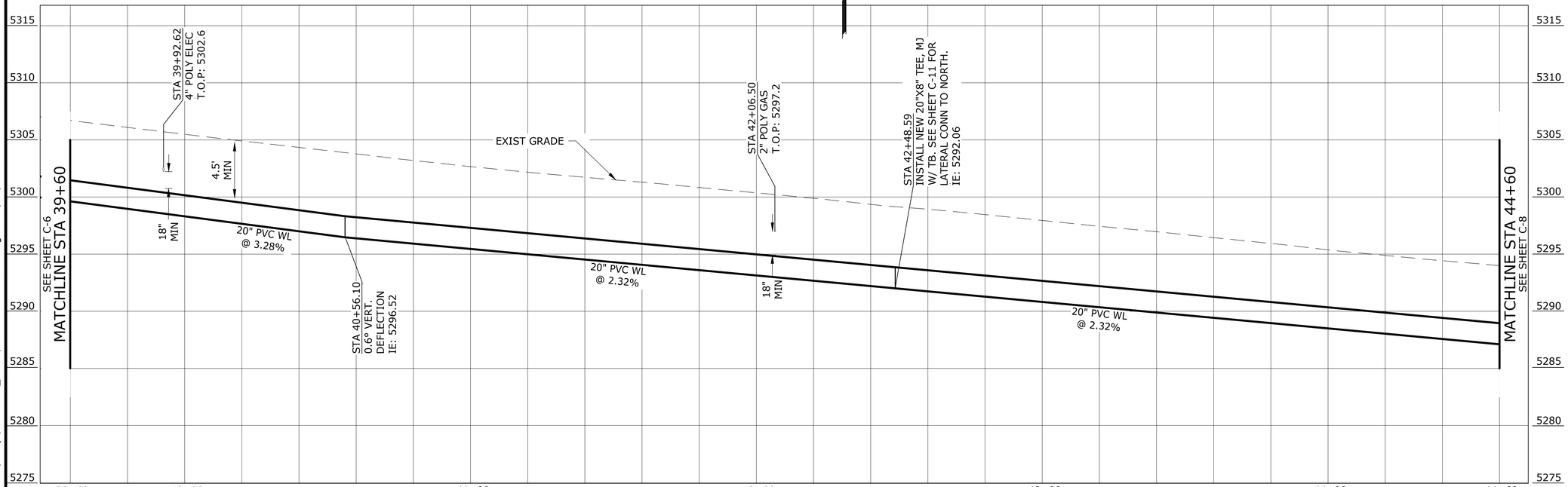


PLAN
SCALE: 1"=20'



PROFILE
SCALE: 1"=20' HORIZ; 1"=5' VERT

NOTES:

1. CONTRACTOR SHALL COMPLY WITH CITY OF THORNTON AND MUTCD TRAFFIC CONTROL REQUIREMENTS FOR ALL WORK. MAINTAIN A MINIMUM OF 1 LANE OF TRAFFIC OPEN IN BOTH DIRECTIONS AT ALL TIMES (TYP).
2. CONTRACTOR SHALL BE RESPONSIBLE FOR POTHOLING EVERY UTILITY CROSSING AND VERIFYING UTILITY DEPTHS PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL PROTECT IN PLACE ANY AND ALL UTILITIES EXPOSED WITHIN PIPE TRENCH.
4. ALL FITTINGS, BENDS, AND VALVES SHALL HAVE MECHANICALLY RESTRAINED JOINTS.
5. CONTRACTOR SHALL DOCUMENT EXISTING PAVEMENT MARKING AND WILL BE RESPONSIBLE FOR REPLACING ALL IMPACTED PAVEMENT MARKINGS PER THE CITY OF THORNTON SPECIFICATIONS.
6. All WORK SHALL OCCUR WITHIN THE CITY OF THORNTON RIGHT OF WAY. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL APPLICABLE CITY OF THORNTON PERMITS PRIOR TO CONSTRUCTION.
7. CONTRACTOR SHALL VERIFY THE SIZE OF THE WATER SERVICE PRIOR TO CONSTRUCTION AND NOTIFY THE CITY OF ANY DISCREPANCIES.
8. CONTRACTOR SHALL NOTIFY HOMEOWNERS AND THE CITY OF ANY WATER SHUT-OFF 48 HOURS PRIOR TO THE SHUT-OFF. WATER SHALL NOT BE SHUT OFF FOR LONGER THAN 8 HOURS UNDER ANY CONDITION, UNLESS TEMPORARY WATER SERVICE IS PROVIDED.
9. CONTRACTOR SHALL COORDINATE WITH CITY OF THORNTON TO FIELD FIT FINAL LOCATION FOR BUTTERFLY VALVE VAULT VENTS.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSING OF ALL MATERIALS TO BE REMOVED.
11. ALL WORK WITHIN THE CITY OF THORNTON RIGHT OF WAY SHALL BE CONDUCTED BETWEEN THE HOURS OF 8:30 A.M. AND 3:30 P.M., MONDAY THROUGH FRIDAY ONLY. NO WORK SHALL BE CONDUCTED OUTSIDE OF THESE TIMES WITHOUT PRIOR WRITTEN APPROVAL BY THE CITY.
12. CONTRACTOR IS REQUIRED TO MAINTAIN DRIVEWAY AND SIDE STREET ACCESS FOR HOMEOWNERS AT ALL TIMES.

SUBSURFACE UTILITY INFORMATION:

(26) POTHOLE
4" POLY ELECTRIC
SURFACE EL: 5305.7
TOP OF PIPE (T.O.P.) EL: 5302.6'

(27) POTHOLE
2" POLY GAS
SURFACE EL: 5300.1'
TOP OF PIPE (T.O.P.) EL: 5297.2'

(V5) VALVE NUT
12" AC WATER
SURFACE EL: 5298.8'
TOP OF VALVE (T.O.V.) EL: 5295.6'

BID SET

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City of Thornton Colorado

100TH AVE WATERLINE REPLACEMENT

100TH AVE WATERLINE REPLACEMENT
PLAN AND PROFILE
STA 39+60 TO STA 44+60

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
C-7
14 of 29

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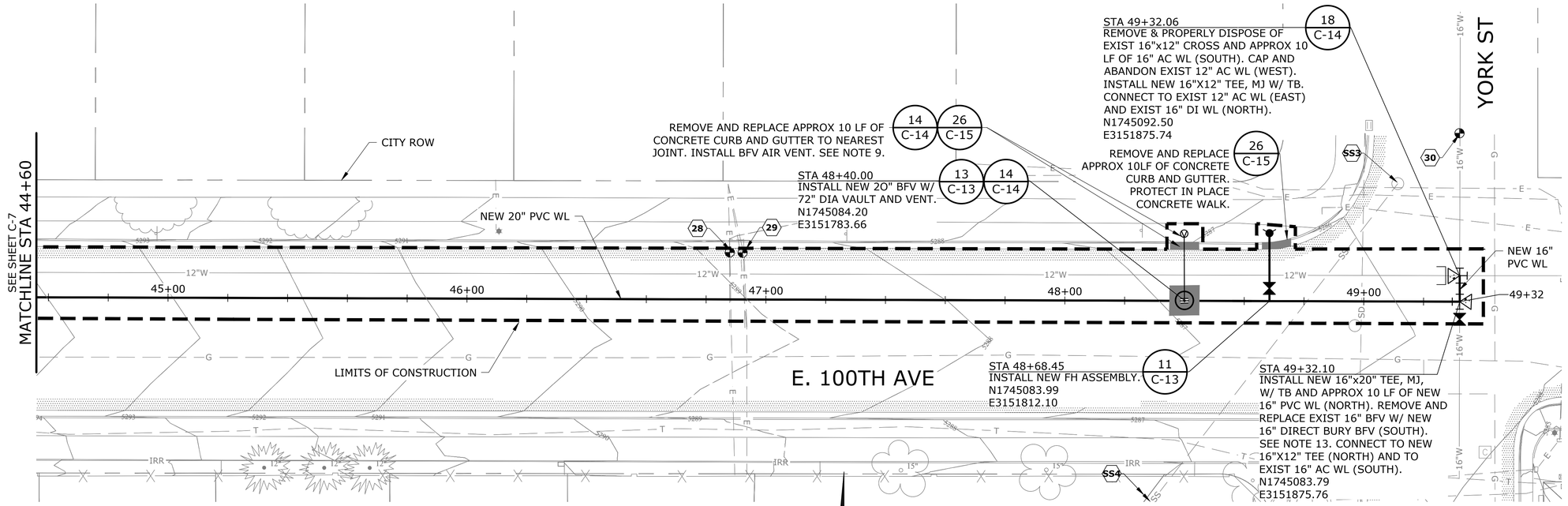
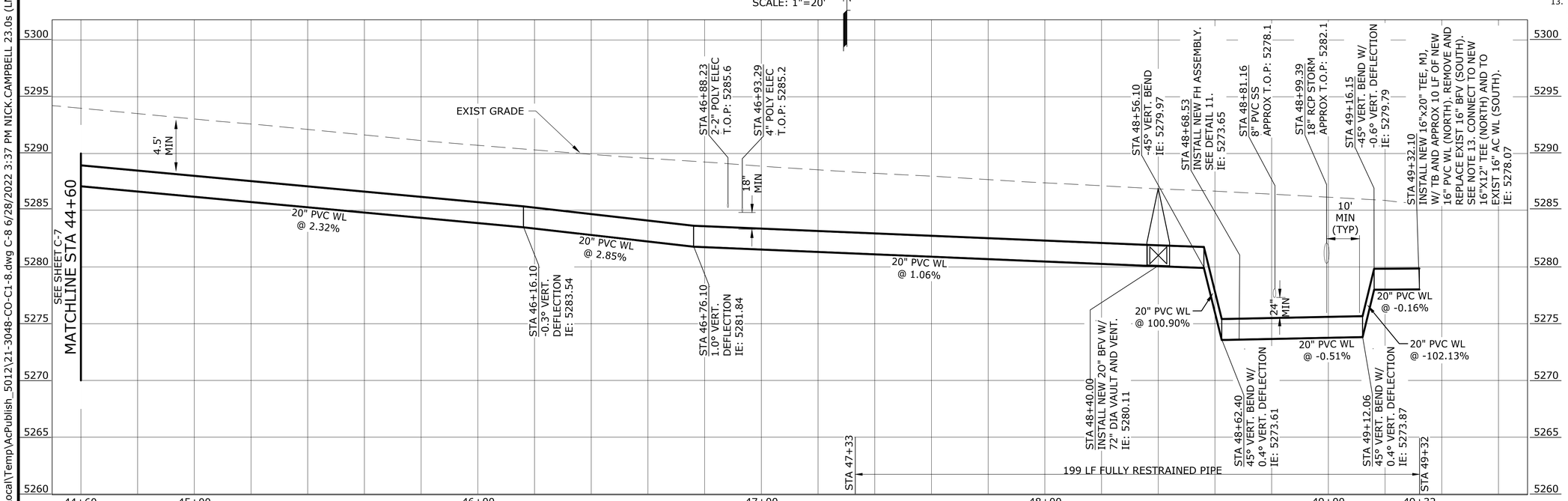


PLAN
SCALE: 1"=20'



PROFILE
SCALE: 1"=20' HORIZ; 1"=5' VERT

NOTES:

1. CONTRACTOR SHALL COMPLY WITH CITY OF THORNTON AND MUTCD TRAFFIC CONTROL REQUIREMENTS FOR ALL WORK. MAINTAIN A MINIMUM OF 1 LANE OF TRAFFIC OPEN IN BOTH DIRECTIONS AT ALL TIMES (TYP).
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3. CONTRACTOR SHALL PROTECT IN PLACE ANY AND ALL UTILITIES EXPOSED WITHIN PIPE TRENCH.
4. ALL FITTINGS, BENDS, AND VALVES SHALL HAVE MECHANICALLY RESTRAINED JOINTS.
5. CONTRACTOR SHALL DOCUMENT EXISTING PAVEMENT MARKING AND WILL BE RESPONSIBLE FOR REPLACING ALL IMPACTED PAVEMENT MARKINGS PER THE CITY OF THORNTON SPECIFICATIONS.
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7. CONTRACTOR SHALL VERIFY THE SIZE OF THE WATER SERVICE PRIOR TO CONSTRUCTION AND NOTIFY THE CITY OF ANY DISCREPANCIES.
8. CONTRACTOR SHALL NOTIFY HOMEOWNERS AND THE CITY OF ANY WATER SHUT-OFF 48 HOURS PRIOR TO THE SHUT-OFF. WATER SHALL NOT BE SHUT OFF FOR LONGER THAN 8 HOURS UNDER ANY CONDITION, UNLESS TEMPORARY WATER SERVICE IS PROVIDED.
9. CONTRACTOR SHALL COORDINATE WITH CITY OF THORNTON TO FIELD FIT FINAL LOCATION FOR BUTTERFLY VALVE VAULT VENTS.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSING OF ALL MATERIALS TO BE REMOVED.
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12. CONTRACTOR IS REQUIRED TO MAINTAIN DRIVEWAY AND SIDE STREET ACCESS FOR HOMEOWNERS AT ALL TIMES.
13. EXIST 16" BFV AND VALVE BOX ARE DIRECT BURIED AND REMOVAL OF THIS ITEM WILL NOT INCLUDE A VALVE VAULT. SIMILARLY, NEW 16" BFV WILL BE DIRECT BURIED AND THE INSTALLATION WILL ONLY INCLUDE THE NEW VALVE AND VALVE BOX.

SUBSURFACE UTILITY INFORMATION:

28 POTHOLE
2-2" POLY ELECTRIC
SURFACE EL: 5288.8'
TOP OF PIPE (T.O.P.) EL: 5285.6'

29 POTHOLE
4" POLY ELECTRIC
SURFACE EL: 5288.8'
TOP OF PIPE (T.O.P.) EL: 5285.2'

30 POTHOLE
16" PVC WATER
SURFACE EL: 5285.4'
TOP OF PIPE (T.O.P.) EL: 5280.1'
SANITARY SEWER MANHOLE

SS3 8" SANITARY SEWER
SURFACE EL: 5285.7'
TOP OF PIPE (T.O.P.) EL: 5279.4'

SANITARY SEWER MANHOLE
SS4 8" SANITARY SEWER
SURFACE EL: 5269.1'
TOP OF PIPE (T.O.P.) EL: 5260.5'
MH SS4 IS APPROX 245 LF SOUTH AND 190 LF WEST OF MH SS3.
NORTHING: 1744878.03
EASTING: 3151665.52

BID SET

NO.	DATE	BY	REVISION

NOTICE
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City of Thornton Colorado

100TH AVE WATERLINE REPLACEMENT

PRELIMINARY DESIGN
PLAN AND PROFILE
STA 44+60 TO END

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
C-8
15 of 29

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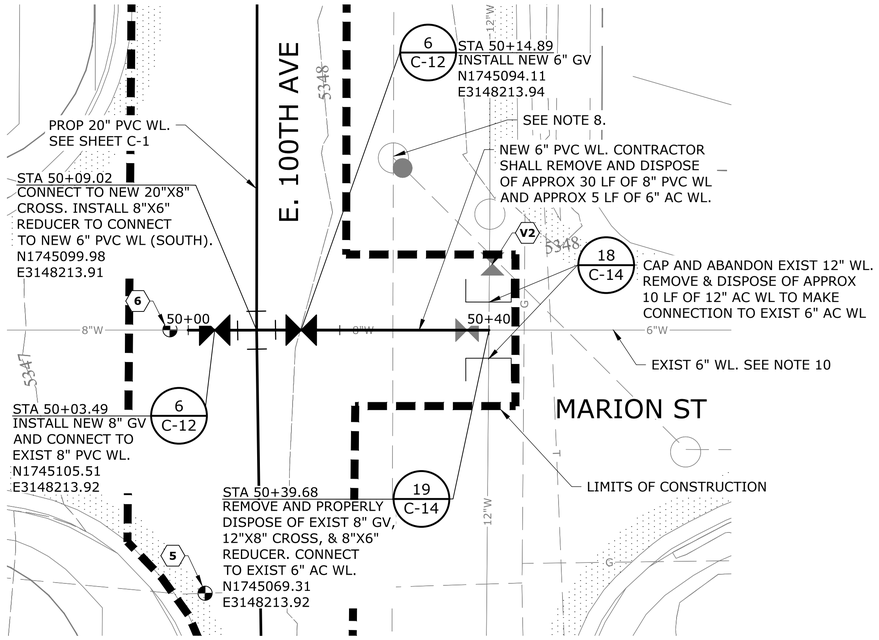
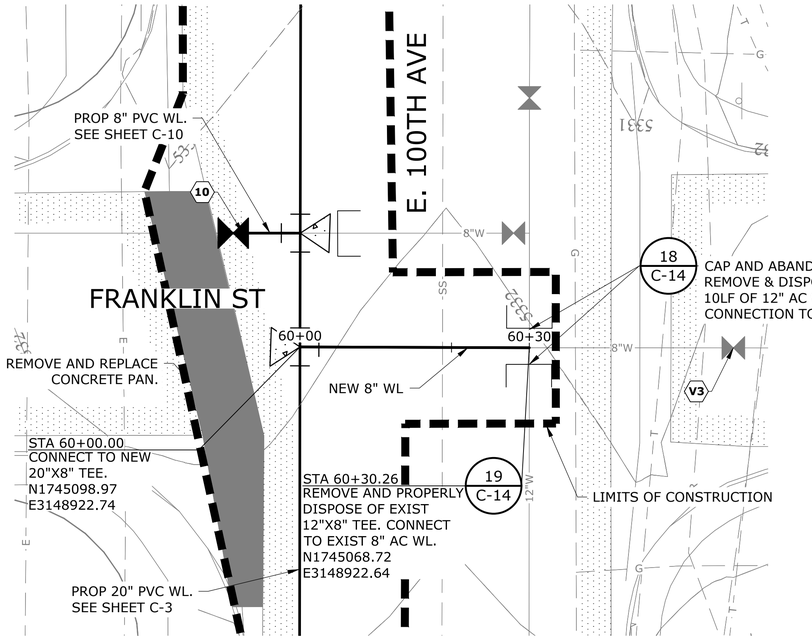


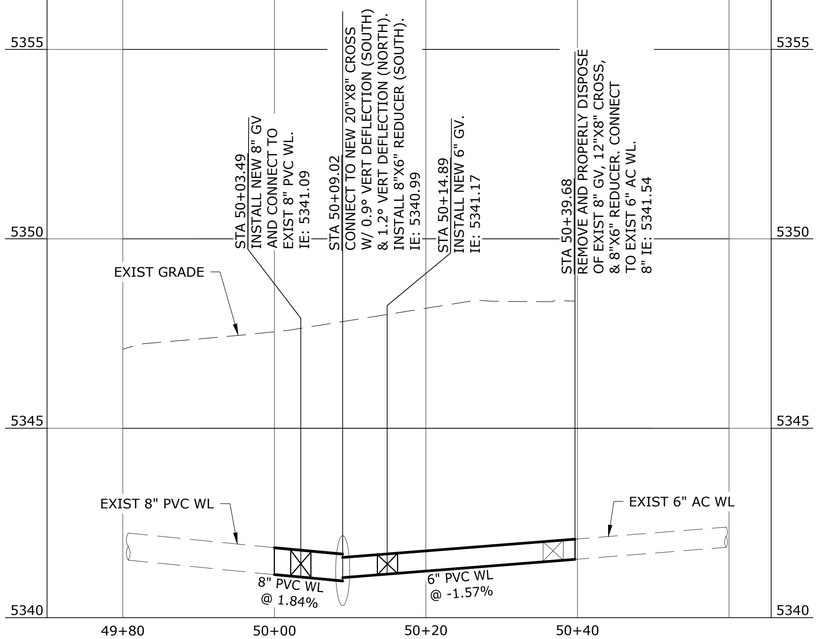
MARION STREET PLAN

SCALE: 1"=10'



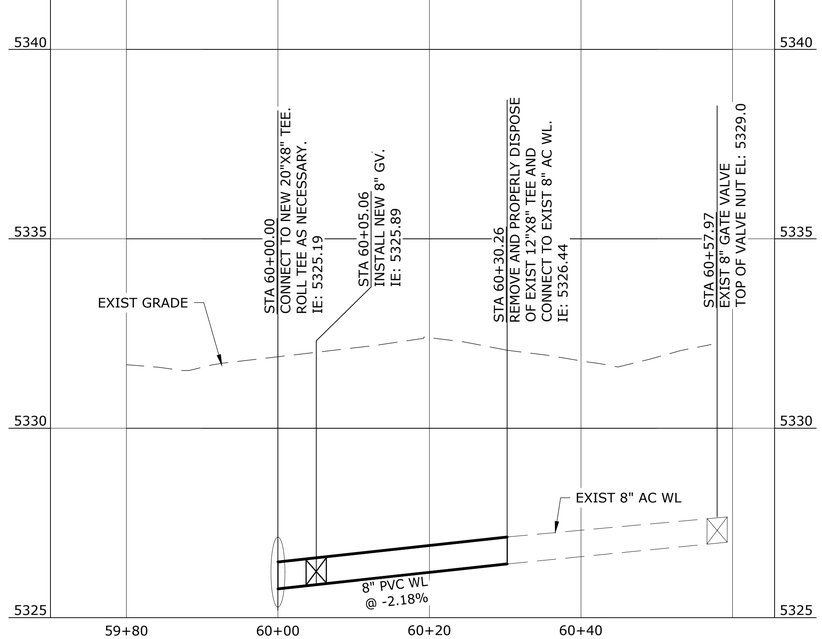
FRANKLING STREET (SOUTH) PLAN

SCALE: 1"=10'



PROFILE

SCALE: 1"=10' HORIZ; 1"=2' VERT



PROFILE

SCALE: 1"=10' HORIZ; 1"=2' VERT

NOTES:

1. CONTRACTOR SHALL COMPLY WITH CITY OF THORNTON AND MUTCD TRAFFIC CONTROL REQUIREMENTS FOR ALL WORK. MAINTAIN A MINIMUM OF 1 LANE OF TRAFFIC OPEN AT ALL TIMES (TYP).
2. CONTRACTOR SHALL BE RESPONSIBLE FOR POTHOLING EVERY UTILITY CROSSING AND WATER CONNECTION, AND VERIFYING UTILITY DEPTHS PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL PROTECT IN PLACE ANY AND ALL UTILITIES EXPOSED WITHIN PIPE TRENCH.
4. ALL FITTINGS, BENDS, AND VALVES SHALL HAVE RESTRAINED MECHANICAL JOINT ENDS.
5. CONTRACTOR SHALL DOCUMENT EXISTING PAVEMENT MARKING AND WILL BE RESPONSIBLE FOR REPLACING ALL IMPACTED PAVEMENT MARKINGS PER THE CITY OF THORNTON SPECIFICATIONS.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY DISPOSING OF ALL EXISTING MATERIAL AND PIPE TO BE REMOVED.
7. ALL WORK REQUIRED TO EXTEND THE LATERAL CONNECTIONS ACROSS 100TH AVENUE SHALL BE NIGHT WORK. CONTRACTOR SHALL BE REQUIRED TO PROVIDE LIGHTS AND MATERIAL TO CONDUCT WORK AT NIGHT PER CITY OF THORNTON PERMIT REQUIREMENTS.
8. THE EXISTING 18" SANITARY SEWER THAT WILL BE CROSSED BY ALL NEW SOUTH LATERAL WATERLINES WAS POTHOLED ON E. 100TH AVE BETWEEN MARION ST AND FRANKLIN ST (SEE SHEET C-2 FOR EXACT LOCATION OF POTHOLE), AT AN APPROX TOP DEPTH OF 5321.5'. AT THE MANHOLE AT MARION ST AND E 100TH AVE, THE IE WAS ESTIMATED AT A DEPTH OF OVER 25'.
9. ELEVATIONS OF PROPOSED CONNECTIONS TO AND SLOPES OF EXISTING 6" AND 8" WATERLINES ARE APPROXIMATE. CONTRACTOR SHALL VERIFY ELEVATION OF ALL PROPOSED CONNECTIONS TO 8" WATERLINES AND PROCURE NECESSARY WATERLINE APPURTENANCES PRIOR TO CONSTRUCTION.
10. THE EXISTING 6" WL IN MARION STREET IS THE ONLY EXISTING SOURCE OF WATER FOR THE FOLLOWING RESIDENTIAL HOMES: 9993, 9973, 9953, 9933, 9913, AND 9903 MARION STREET. AS SUCH, CONTRACTOR SHALL NOTIFY RESIDENTS OF ANY POTENTIAL WATER SHUT DOWNS AT LEAST 48 HOURS IN ADVANCE. IF THE WATER IS SHUT DOWN FOR LONGER THAN 8 HOURS, CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING RESIDENTS WITH TEMPORARY WATER SERVICE.

SUBSURFACE UTILITY INFORMATION:

5 POTHOLE
2" LP POLY GAS
SURFACE EL: 5347.7'
TOP OF PIPE (T.O.P.) EL: 5345.0'

6 POTHOLE
8" PVC WATER
SURFACE EL: 5347.5'
TOP OF PIPE (T.O.P.) EL: 5341.8'

10 POTHOLE
8" PVC WATER
SURFACE EL: 5331.4'
TOP OF PIPE (T.O.P.) EL: 5327.4'

V2 VALVE NUT
12" AC WATER
SURFACE EL: 5348.3'
TOP OF VALVE (T.O.V.) EL: 5343.9'

V3 VALVE NUT
8" AC WATER
SURFACE EL: 5332.2'
TOP OF VALVE (T.O.V.) EL: 5329.0'

BID SET

NO.	DATE	BY	REVISION

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City of Thornton Colorado

100TH AVE WATERLINE REPLACEMENT

100TH AVE WATERLINE REPLACEMENT MARION STREET & FRANKLIN STREET LATERAL CONNECTIONS

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
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16 of 29

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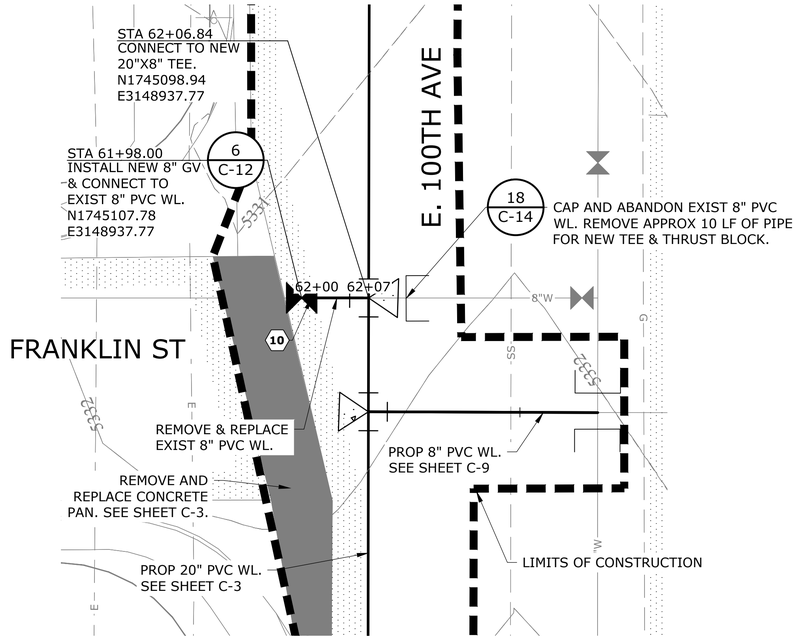
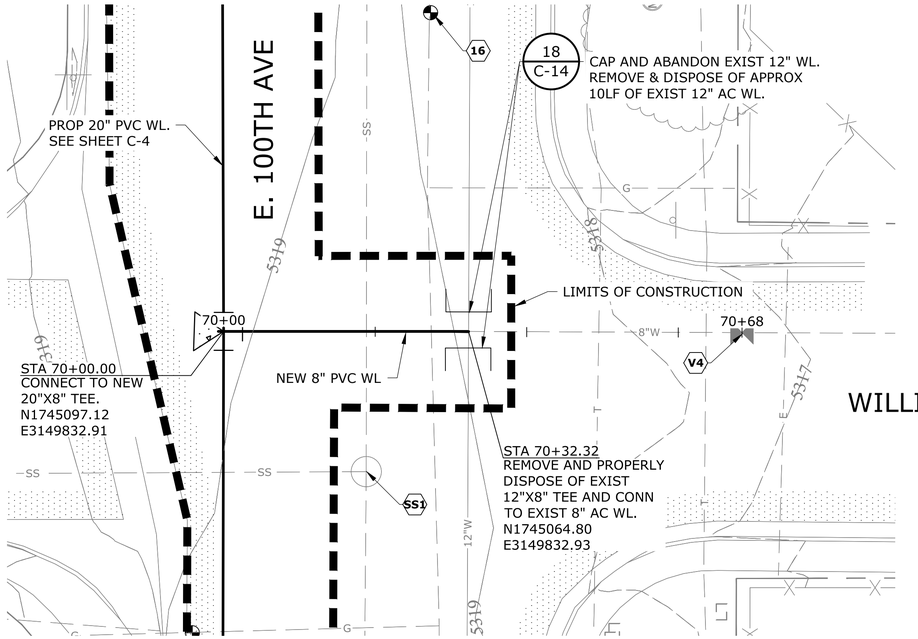


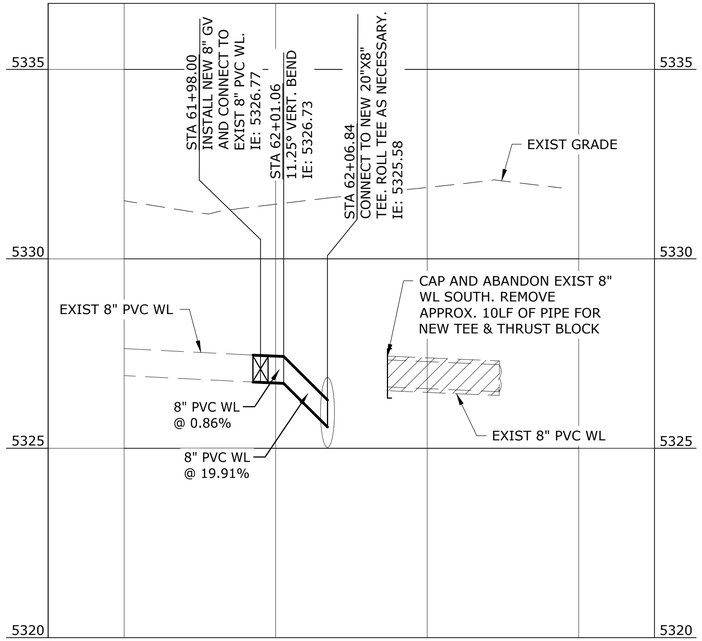
FRANKLIN STREET (NORTH) PLAN

SCALE: 1"=10'



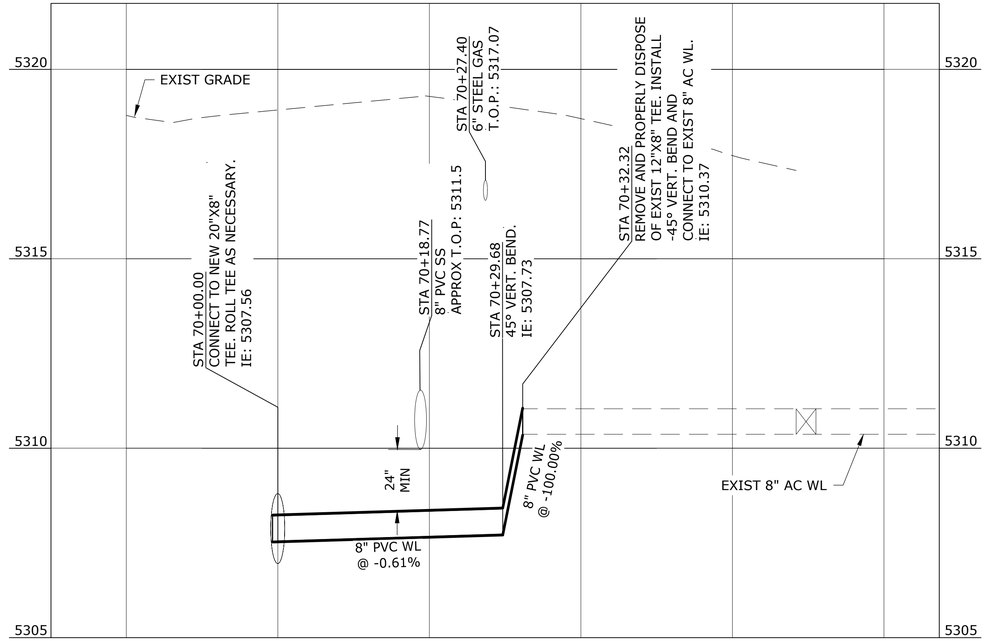
WILLIAMS STREET PLAN

SCALE: 1"=10'



PROFILE

SCALE: 1"=10' HORIZ; 1"=2' VERT



PROFILE

SCALE: 1"=10' HORIZ; 1"=2' VERT

NOTES:

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2. CONTRACTOR SHALL BE RESPONSIBLE FOR POTHOLING EVERY UTILITY CROSSING AND WATER CONNECTION, AND VERIFYING UTILITY DEPTHS PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL PROTECT IN PLACE ANY AND ALL UTILITIES EXPOSED WITHIN PIPE TRENCH.
4. ALL FITTINGS, BENDS, AND VALVES SHALL HAVE RESTRAINED MECHANICAL JOINT ENDS.
5. CONTRACTOR SHALL DOCUMENT EXISTING PAVEMENT MARKING AND WILL BE RESPONSIBLE FOR REPLACING ALL IMPACTED PAVEMENT MARKINGS PER THE CITY OF THORNTON SPECIFICATIONS.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY DISPOSING OF ALL EXISTING MATERIAL AND PIPE TO BE REMOVED.
7. ALL WORK REQUIRED TO EXTEND THE LATERAL CONNECTIONS ACROSS 100TH AVENUE SHALL BE NIGHT WORK. CONTRACTOR SHALL BE REQUIRED TO PROVIDE LIGHTS AND MATERIAL TO CONDUCT WORK AT NIGHT PER CITY OF THORNTON PERMIT REQUIREMENTS.
8. THE EXISTING 18" SANITARY SEWER THAT WILL BE CROSSED BY ALL NEW SOUTH LATERAL WATERLINES WAS POTHOLED ON E. 100TH AVE BETWEEN MARION ST AND FRANKLIN ST (SEE SHEET C-2 FOR EXACT LOCATION OF POTHOLE), AT AN APPROX TOP DEPTH OF 5321.5'. THE INVERT ELEVATION OF THIS SANITARY SEWER WAS ALSO MEASURED AT THE MH WITHIN THE INTERSECTION OF E. 100TH AVENUE AND WILLIAMS ST, AT AN APPROX TOP DEPTH OF 5311.5'.
9. ELEVATIONS OF PROPOSED CONNECTIONS TO EXISTING 8" WATERLINES ARE APPROXIMATE. CONTRACTOR SHALL VERIFY ELEVATION OF ALL PROPOSED CONNECTIONS TO 8" WATERLINES AND PROCURE NECESSARY WATERLINE APPURTENANCES PRIOR TO CONSTRUCTION.

SUBSURFACE UTILITY INFORMATION:

10 — POTHOLE
8" PVC WATER
SURFACE EL: 5331.4'
TOP OF PIPE (T.O.P.) EL: 5327.4'

16 — POTHOLE
6" STEEL GAS
SURFACE EL: 5319.2'
TOP OF PIPE (T.O.P.) EL: 5317.2'

SS1 — SANITARY SEWER MANHOLE
UTILITY
SURFACE EL: 5319.3'
TOP OF PIPE (T.O.P.) EL: 5311.5'

V4 — VALVE NUT
8" AC WATER
SURFACE EL: 5317.2'
TOP OF VALVE (T.O.V.) EL:5312.3'

BID SET

NO.	DATE	BY	REVISION

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City of Thornton Colorado

100TH AVE WATERLINE REPLACEMENT

100TH AVE WATERLINE REPLACEMENT FRANKLIN STREET & WILLIAMS STREET LATERAL CONNECTIONS

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
C-10
17 of 29

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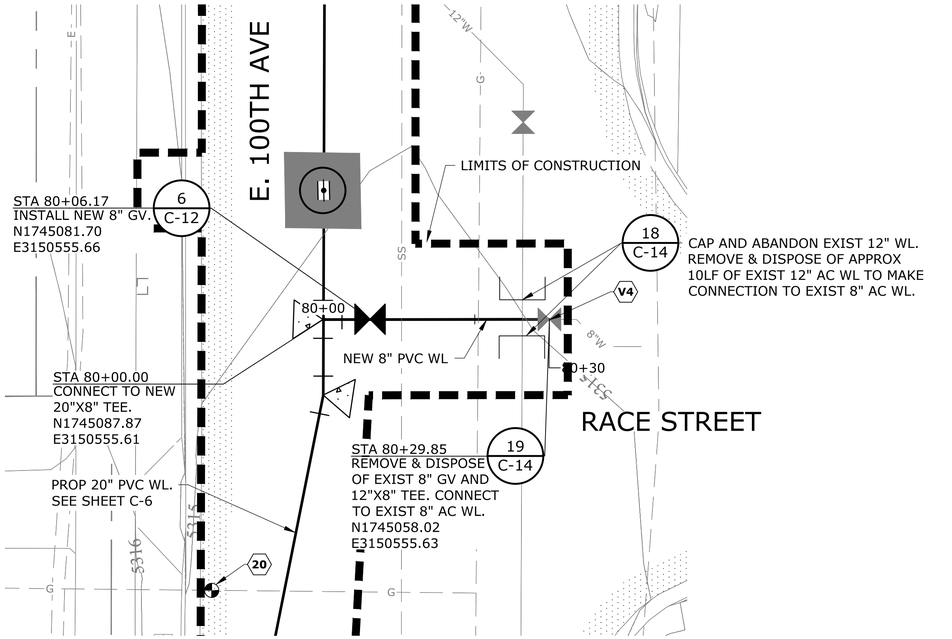
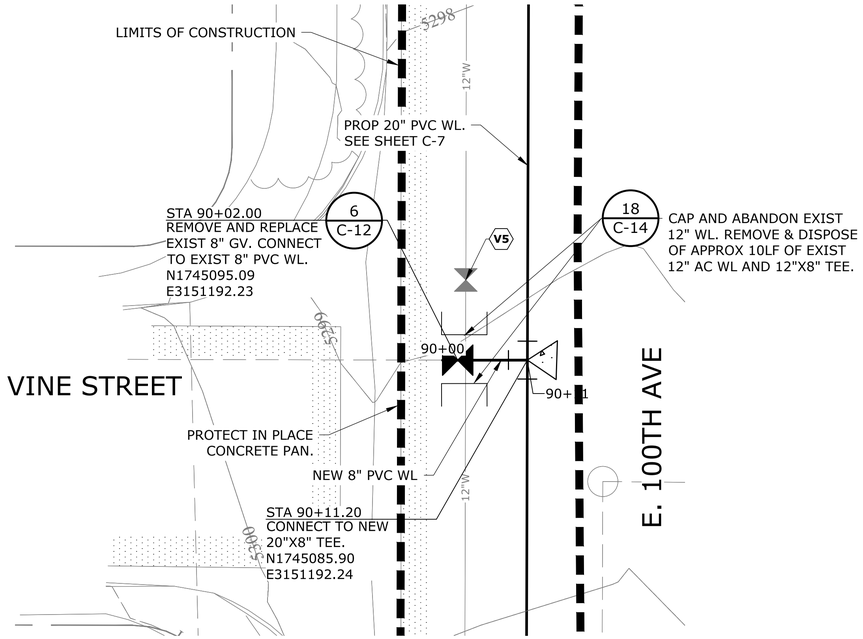


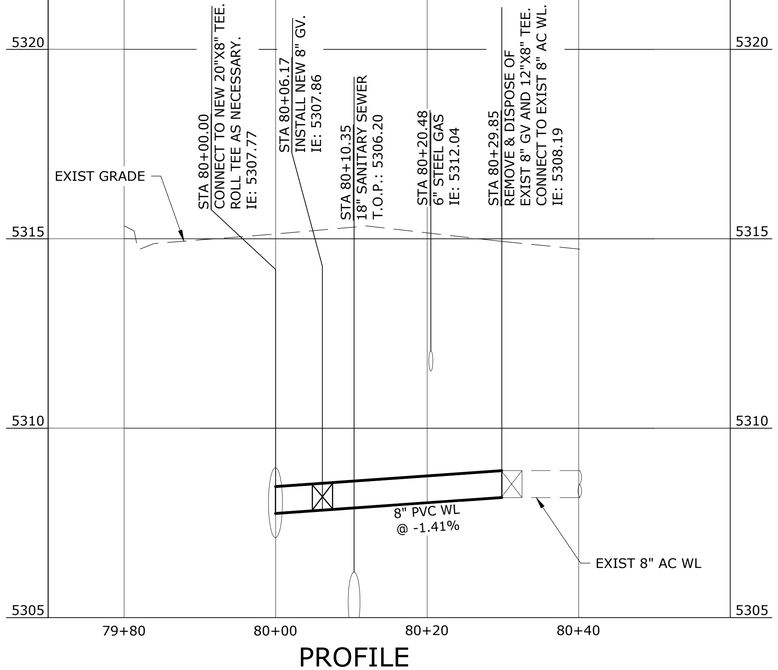
RACE STREET PLAN

SCALE: 1"=10'



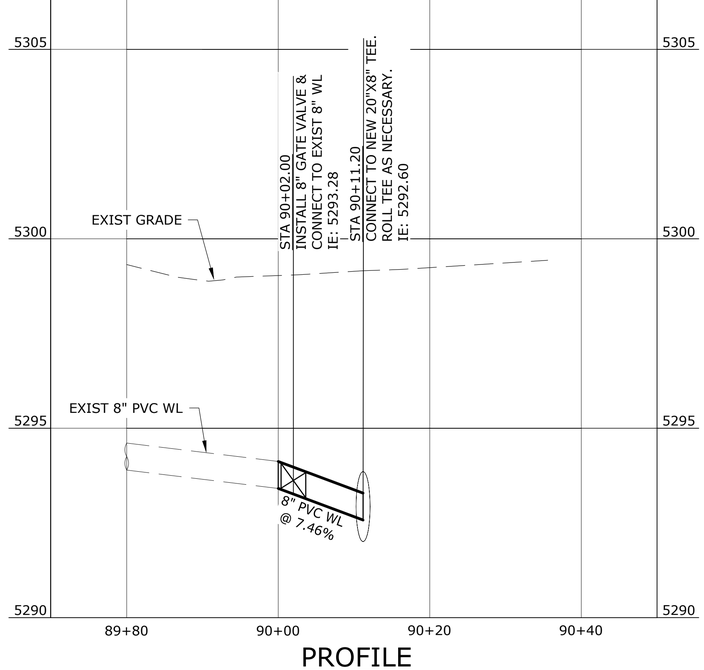
VINE STREET PLAN

SCALE: 1"=10'



PROFILE

SCALE: 1"=10' HORIZ; 1"=2' VERT



PROFILE

SCALE: 1"=10' HORIZ; 1"=2' VERT

NOTES:

1. CONTRACTOR SHALL COMPLY WITH CITY OF THORNTON AND MUTCD TRAFFIC CONTROL REQUIREMENTS FOR ALL WORK. MAINTAIN A MINIMUM OF 1 LANE OF TRAFFIC OPEN AT ALL TIMES (TYP).
2. CONTRACTOR SHALL BE RESPONSIBLE FOR POTHOLING EVERY UTILITY CROSSING AND WATER CONNECTION, AND VERIFYING UTILITY DEPTHS PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL PROTECT IN PLACE ANY AND ALL UTILITIES EXPOSED WITHIN PIPE TRENCH.
4. ALL FITTINGS, BENDS, AND VALVES SHALL HAVE RESTRAINED MECHANICAL JOINT ENDS.
5. CONTRACTOR SHALL DOCUMENT EXISTING PAVEMENT MARKING AND WILL BE RESPONSIBLE FOR REPLACING ALL IMPACTED PAVEMENT MARKINGS PER THE CITY OF THORNTON SPECIFICATIONS.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY DISPOSING OF ALL EXISTING MATERIAL AND PIPE TO BE REMOVED.
7. ALL WORK REQUIRED TO EXTEND THE LATERAL CONNECTIONS ACROSS 100TH AVENUE SHALL BE NIGHT WORK. CONTRACTOR SHALL BE REQUIRED TO PROVIDE LIGHTS AND MATERIAL TO CONDUCT WORK AT NIGHT PER CITY OF THORNTON PERMIT REQUIREMENTS.
8. ELEVATIONS OF PROPOSED CONNECTIONS TO EXISTING 8" WATERLINES ARE APPROXIMATE. CONTRACTOR SHALL VERIFY ELEVATION OF ALL PROPOSED CONNECTIONS TO 8" WATERLINES AND PROCURE NECESSARY WATERLINE APPURTENANCES PRIOR TO CONSTRUCTION.

SUBSURFACE UTILITY INFORMATION:

20 POTHOLE
GAS
NOT FOUND.
REACHED DEPTH OF 80".

V4 VALVE NUT
8" AC WATER
SURFACE EL: 5314.9'
TOP OF VALVE (T.O.V.) EL: 5310.2'

V5 VALVE NUT
8" PVC WATER
SURFACE EL: 5298.8'
TOP OF VALVE (T.O.V.) EL: 5295.6'

BID SET

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

NLO DESIGNED
NJC DRAWN
CMJ CHECKED

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City of Thornton Colorado

100TH AVE WATERLINE REPLACEMENT

100TH AVE WATERLINE REPLACEMENT
RACE STREET & VINE STREET
LATERAL CONNECTIONS

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
C-11
18 of 29

C:\Users\nick.campbell\AppData\Local\Temp\AcPublish_5012\21-3048-CO-C9-Lateralsdwg.dwg C-11 6/28/2022 4:06 PM NICK.CAMPBELL 23.0s (LMS Tech)

THRUST BLOCKS SHALL BE CONSTRUCTED AT BENDS AND FITTINGS WHICH RESULT IN UNBALANCED LINE THRUST. CARE SHALL BE TAKEN NOT TO BLOCK OUTLETS OR TO COVER BOLTS, NUTS, CLAMPS OR OTHER FITTINGS OR TO MAKE THEM INACCESSIBLE.

A BOND BREAKER SHALL BE PLACED BETWEEN THE FITTING AND THE THRUST BLOCK TO AID IN EASE OF FUTURE REMOVAL.

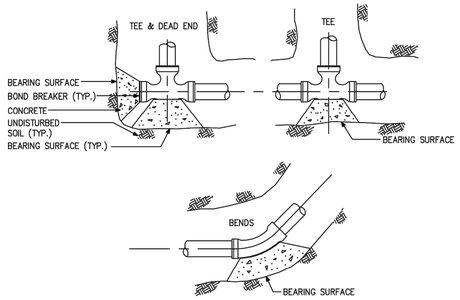
THE VERTICAL SIDES OF THE CONCRETE THRUST BLOCKS SHALL BE FORMED TO ALLOW FOR SYMMETRICAL THRUST.

WHEN IT IS IMPOSSIBLE THROUGH OVER EXCAVATION OR OTHER CAUSES TO POUR A THRUST BLOCK AGAINST UNDISTURBED EARTH, HARNESS RODS SHALL BE REQUIRED TO ANCHOR THE FITTINGS TO THE MAIN UPON APPROVAL OF THE DEVELOPMENT ENGINEERING MANAGER.

BACKFILL MAY BE PLACED OVER THE THRUST BLOCK ONCE THE SURFACE HAS SET SUFFICIENTLY TO RESIST THE WEIGHT OF THE BACKFILL.

NO DRY KICKERS SHALL BE ALLOWED.

NO HAND MIXED CONCRETE SHALL BE ALLOWED.



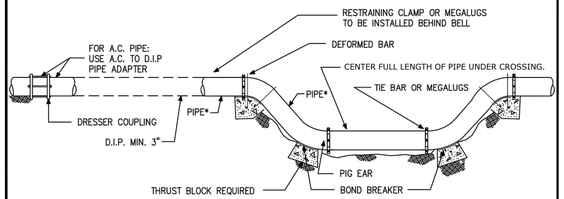
PLAN VIEW

NOTES:
1. THRUST BLOCKS MUST BE CAST IN PLACE CONCRETE.
2. NO TAMPING OR COMPACTING SHALL BE ALLOWED ABOVE THRUST BLOCK FOR A MINIMUM OF TWENTY-FOUR (24) HOURS AFTER PLACEMENT.
3. CONCRETE MUST SET A MINIMUM OF FORTY-EIGHT (48) HOURS PRIOR TO THE PERFORMANCE OF A HYDROSTATIC TEST.
4. BEARING SURFACE BASED ON BEARING STRENGTH OF 3000 P.S.F. AND MAIN PRESSURE OF 200 P.S.I.. FOR MAINS GREATER THAN 16" OR VERICAL THRUSTS, SHOW AREA REQUIREMENT ON STANDARD DETAILS.
5. BOND BREAKER TO BE MINIMUM OF 8 MIL. POLYETHYLENE PLASTIC.

N.T.S.

THRUST BLOCK DETAIL 1
SCALE: NTS

WATERMAIN LOWERING



WATER MAIN PIPE SHALL BE INSTALLED SUCH THAT THE WATER MAIN PIPE JOINTS ARE LOCATED NO LESS THAN 10 FEET AWAY FROM THE SEWER OR STORM CROSSING. IF JOINTS ARE REQUIRED WITHIN 10 FEET OF THE SEWER OR STORM CROSSING, CONCRETE OR CONTROLLED LOW STRENGTH MATERIAL (I.E. FLOWABLE FILL) ENCASEMENT EXTENDING NO LESS THAN 10-FEET EACH SIDE OF THE CROSSING SHALL BE USED.

PIPE* : D.I.P. OR PVC C-900 DR-14

DIP, STEEL PIPE, HARNESS RODS, STEEL CASING PIPE, FITTINGS, VALVES, AND VALVE BOXES SHALL BE HAND WRAPPED USING POLYETHYLENE WITH A MIN. THICKNESS OF EIGHT (8) MILS AND TWO (2) INCH WIDE, TEN (10) MIL THICK POLYETHYLENE PRESSURE SENSITIVE TAPE TO CLOSE SEAMS OR HOLD OVERLAPS. THE POLYETHYLENE SHALL BE APPLIED TO PREVENT THE CONTACT OF BACKFILL MATERIAL WITH THE FITTING. THE RAW MATERIAL USED TO MANUFACTURE POLYETHYLENE FILM SHALL BE TYPE 1, CLASS A, GRADE E-1 IN ACCORDANCE WITH ASTM STANDARD DESIGNATION D-1248. POLYETHYLENE ENCASEMENT MATERIAL SHALL BE MANUFACTURED IN ACCORDANCE WITH AWWA STANDARD C-105.

BITUMINOUS MATERIAL IS TO BE USED FOR CORROSION PROTECTION ON ALL STEEL CASING PIPES. INSTALLATION SHALL BE IN ACCORDANCE WITH ESTABLISHED AWWA STANDARDS (AWWA C-600 OR C-603).

PIPE SHALL BE INSTALLED IN ACCORDANCE WITH AWWA C-900. BEFORE THE PLACING OF PIPE IN THE TRENCH, EACH PIPE OR FITTING SHALL BE THOROUGHLY CLEANED OF FOREIGN MATERIAL, KEPT CLEAN AND EXAMINED FOR CRACKS OR DEFECTS BEFORE INSTALLATION. THE DEVELOPMENT ENGINEERING MANAGER MAY REJECT ANY PIPE WHICH SHOWS DISCOLORATION DUE TO THE SUN.

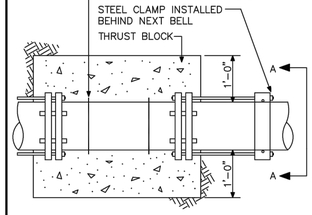
JOINT LUBRICANT SHALL BE SUPPLIED BY THE PIPE MANUFACTURER.

WHEN LAYING PIPE ON CURVES, THE PIPE SHALL BE KEPT IN ALIGNMENT BY DEFLECTING JOINTS OR USING SHORT LENGTHS OF PIPE. IF USING DEFLECTING JOINTS, RECOMMENDED PRACTICES AND ALLOWANCES AS STIPULATED BY THE MANUFACTURER MUST BE ADHERED TO. PIPE SHALL BE LAID WITH THE BELL ENDS FACING IN THE DIRECTION OF LAYING UNLESS DIRECTED OTHERWISE BY THE DEVELOPMENT ENGINEERING MANAGER.

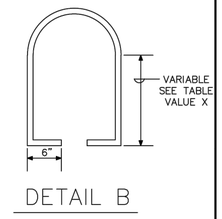
WHENEVER THE PIPE IS LEFT UNATTENDED, TEMPORARY PLUGS SHALL BE INSTALLED AT OPENINGS. TEMPORARY PLUGS SHALL BE WATERTIGHT, STANDARD CAST IRON AND SHALL BE SUBJECT TO APPROVAL BY THE DEVELOPMENT ENGINEERING MANAGER.

N.T.S.

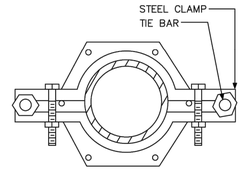
WATER LOWERING DETAIL 2
SCALE: NTS



PLAN VIEW A



DETAIL B



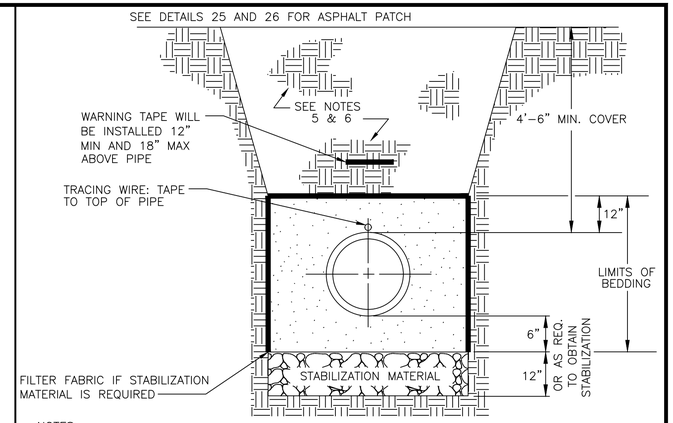
SECTION A-A

MAIN SIZE	DEFORMED BAR		TIE BAR	
	DIA.	X	DIA.	AMOUNT
8"	–	–	.375	2
12"	.500	18"	.500	2
16"	.750	20"	.750	2
24"	1.000	24"	1.000	2

NOTES:
1. PIPE USED IN LOWERING SHALL BE DUCTILE IRON PIPE WITH EIGHT (8) MIL POLYWRAP.
2. FITTINGS, PIPES & TIE BARS TO BE WRAPPED SEPARATELY IN POLYETHYLENE.
3. 45° FITTINGS SHALL BE USED.
4. FITTINGS SHALL BE RODDED TO NEXT BELL & NO JOINTS ARE ALLOWED BETWEEN FITTINGS OR UTILIZE MEGALUG CONNECTIONS.
5. FITTINGS SHALL BE M.J.
6. MEGALUG CONNECTIONS OR PIGEARS SHALL BE USED ON RODDING FOR FITTINGS UNLESS OTHERWISE APPROVED BY THE DEVELOPMENT ENGINEERING MANAGER.

N.T.S.

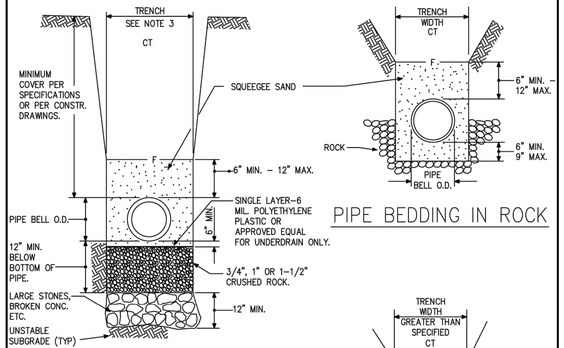
WATER LOWERING CROSS-SECTION 3
SCALE: NTS



NOTES:

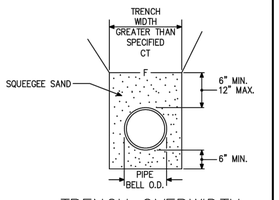
1. 12 AWG. SINGLE STRAND INSULATED COPPER WIRE SHALL BE INSTALLED AS TRACING WIRE ABOVE ALL WATER PIPES. THE WIRE SHALL BE CONNECTED AND COME TO THE SURFACE PER THE TRACER WIRE DETAILS.
2. TRENCH TO BE BRACED OR SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKMEN AND PROTECTION OF OTHER UTILITIES IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL SAFETY REGULATIONS.
3. PIPE SHALL BE BEDDED FROM 6" BELOW THE BOTTOM OF THE PIPE TO 12" ABOVE THE TOP OF THE PIPE.
4. TRENCH WIDTH SHALL NOT BE MORE THAN 24" NOR LESS THAN 12" WIDER THAN THE LARGEST OUTSIDE DIAMETER OF THE PIPE.
5. TRENCHES WITHIN LOCAL STREETS IN THE CITY OF THORNTON AND IN LANDSCAPED AREAS SHALL USE COMPACTED BACKFILL TO AT LEAST 95% OF THE MAXIMUM DENSITY OBTAINABLE USING STANDARD PROCTOR PER SPECIFICATIONS.
6. TRENCHES WITHIN ARTERIAL AND COLLECTOR STREETS IN THE CITY OF THORNTON, OR TRENCHES LOCATED WITHIN ADAMS COUNTY OR THE CITY OF FEDERAL HEIGHTS SHALL BE BACKFILLED WITH IMPORTED FLOW FILL PER THE SPECIFICATIONS.

WATER TRENCH DETAIL 4
SCALE: NTS



UNSTABLE SUBGRADE

PIPE BEDDING IN ROCK



TRENCH OVERWIDTH

CT MACHINE COMPACTED TRENCH BACKFILL.

F LIMIT OF SLOPING OR BENCHING OF TRENCH WALLS.

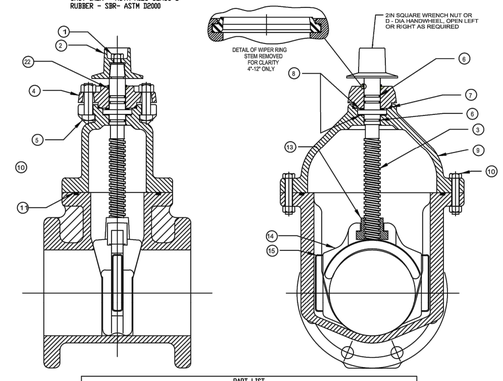
UNDISTURBED GROUND

NOTES:
1. MIN. COVER TO BE BELOW FINAL STREET GRADE WHEN AVAILABLE.
2. TRENCH TO BE BRACED OR SHEETED AS NECESSARY FOR THE PROTECTION OF OTHER UTILITIES AND TO MEET LOCAL, STATE & FEDERAL REQUIREMENTS.
3. TRENCH WIDTH SHALL NOT BE MORE THAN 16 INCHES NOR LESS THAN 12 INCHES WIDER THAN THE LARGEST OUTSIDE DIAMETER OF THE PIPE LAID THEREIN. (BELL OR COUPLING O.D., IF APPLICABLE).

N.T.S.

SPECIAL BEDDING DETAIL 5
SCALE: NTS

NOTES:
1. RUBBER ENCAPSULATED CAST IRON DISC
   CAST IRON – ASTM A126 CLASS B
   RUBBER – SBR– ASTM D2000



PART LIST				
ITEM	DESCRIPTION	REQ'D	MATERIAL	ASTM
1	CAP SCREW	1	304 STAINLESS STEEL	A193 GRADE B8
2	WRENCH NUT	1	CAST IRON	A126 CLASS B
3	STEM	1	BRONZE	B138 ALLOY C67600
4	STUFFING BOX	1	CAST IRON	A126 CLASS B
5	STUFFING BOX BOLTS STUFFING BOX NUTS	2	304 STAINLESS STEEL 304 STAINLESS STEEL	A193 GRADE B8 F594 GROUP 1
6	O-RING	3	RUBBER	D2000 NITRILE
7	O-RING	1	RUBBER	D2000 NITRILE
8	ANTI-FRICTION WASHER	2	CELCON	
9	BONNET	1	CAST IRON	A126 CLASS B
10	BONNNET BOLTS BONNET NUTS	"2"	304 STAINLESS STEEL 304 STAINLESS STEEL	A193 GRADE B8 F594 GROUP 1
11	BONNET GASKET (O-RING)	1	RUBBER	D2000 NITRILE
13	DISC NUT	1	BRONZE	B62 ALLOY C83600
14	DISC	1	SEE NOTE 1	
15	GUIDE CAP	2	CELCON	
16	BODY - FLANGE ENDS	1	CAST IRON	CLASS B
17	HANDWHEEL	1	CAST IRON	A126 CLASS B
18	BODY - MJ ENDS	1	CAST IRON	A126 CLASS B
19	BODY - SLIP-ON ENDS	1	CAST IRON	A126 CLASS B
20	BODY - FLANGE x MJ END	1	CAST IRON	A126 CLASS B
21	BODY - FLANGE x SLIP-ON END	1	CAST IRON	A126 CLASS B
22	WIPER RING	1	RUBBER	

N.T.S.

GATE VALVE DETAIL 6
SCALE: NTS

GATE VALVES

VALVES SHALL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH AWWA STANDARD C-500, "METAL-SEATED GATE VALVES FOR WATER", OR AWWA C-509 "RESILIENT-SEATED GATE VALVES, 3 THROUGH 12 NPS, FOR WATER AND SEWAGE SYSTEMS" WITH THE FOLLOWING ADDITIONAL REQUIREMENTS OR EXCEPTIONS:

VALVES MEETING AWWA STANDARD C-500 SHALL BE OF A MODIFIED WEDGE DISC CONSTRUCTION, COATED BOTH INSIDE AND OUT WITH A TOUGH, DURABLE EPOXY TO PREVENT CORROSION, CAST IRON BODY, FULLY BRONZE MOUNTED WITH NON-RISING STEMS.

VALVES SHALL BE SUITABLE FOR FREQUENT OPERATION, AS WELL AS SERVICE INVOLVING LONG PERIODS OF INACTIVITY. THE OPERATING PRESSURE FOR VALVES SIX (6) INCHES THROUGH TWELVE (12) INCHES SHALL BE 200 PSI.

VALVE STEMS SHALL BE MADE OF BRONZE AND THREADED SO THAT VALVES SHALL OPEN BY TURNING TO THE LEFT (COUNTERCLOCKWISE). EACH VALVE SHALL BE FURNISHED WITH A TWO (2) INCH SQUARE OPERATING NUT. THE OPERATING NUT SHALL HAVE AN ARROW SHOWING THE DIRECTION OF OPENING AND THE WORD "OPEN" CAST ON THE NUT. THE STEM SEAL SHALL CONSIST OF TWO (2) O-RINGS; ONE OR BOTH POSITIONED ABOVE THE THRUST COLLAR WITH THE VALVE UNDER PRESSURE IN THE FULL OPEN POSITION.

BOLTS AND HEX NUTS USED ON THE BONNET OF THE VALVE SHALL BE THE MANUFACTURER'S STANDARD FABRICATED FROM A LOW ALLOY STEEL FOR CORROSION RESISTANCE.

FLANGES SHALL BE SIZED AND DRILLED IN ACCORDANCE WITH ANSI B-16.1 CLASS 125 SPECIFICATIONS. FLANGES SHALL BE MACHINED IN A FLAT FACE OR MACHINED TO A FLAT SURFACE WITH A SERRATED FINISH IN ACCORDANCE WITH AWWA STANDARD C-207 "STEEL PIPE FLANGES."

THE COMPONENTS OF THE MECHANICAL JOINT SHALL CONFORM TO ANSI A-21.11 (AWWA STANDARD C-111). THE TEE-HEAD BOLTS AND HEXAGON NUTS SHALL BE FABRICATED FROM A HIGH STRENGTH, STAINLESS STEEL, OR AN APPROVED EQUAL.

AFTER APPROVED FACTORY ASSEMBLY, EACH VALVE SHALL BE GIVEN THE OPERATION AND HYDROSTATIC TESTS IN ACCORDANCE WITH THE REFERENCED SPECIFICATIONS.

WEDGE DISC VALVES SHALL BE LIMITED TO THE FOLLOWING MANUFACTURERS OR APPROVED EQUIVALENT: WATEROUS SERIES-500, MUELLER-A-2360, KENSEAL, CLOW R/N. RESILIENT-SEATED GATE VALVES SHALL BE LIMITED TO THE AMERICAN-80 "CRS" GATE VALVE OR THE U.S. PIPE "METROSEAL" GATE VALVE.

THE MANUFACTURER SHALL FURNISH A CERTIFIED STATEMENT THAT THE INSPECTION AND SPECIFIED TESTS HAVE BEEN MADE AND THE RESULTS THEREOF COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE STANDARD(S) HEREIN SPECIFIED. A COPY OF THE CERTIFICATION SHALL BE SENT TO THE DEVELOPMENT ENGINEERING MANAGER UPON REQUEST.

CORROSION PROTECTION SHALL BE COVERED IN SUBSECTION 204.2 OF THESE STANDARDS AND SPECIFICATIONS.

VALVES SHALL BE HANDLED IN SUCH A MANNER AS TO PREVENT ANY INJURY OR DAMAGE AND SHALL BE THOROUGHLY CLEANED BEFORE INSTALLATION. VALVES SHALL BE SET IN SUCH A MANNER THAT THE VALVE STEMS ARE PLUMB. VALVES SHALL BE LOCATED AT POINTS AS SPECIFIED IN SUBSECTION 203.8 OF THESE STANDARDS AND SPECIFICATIONS.

VALVE BOXES

VALVE BOX PARTS SHALL BE MANUFACTURED BY TYLER, SERIES 6860 OR AN APPROVED EQUIVALENT MANUFACTURER AND MADE OF GRAY CAST IRON, BUFFALO TYPE WITH NO. 160 OVAL BASE. A FIVE AND ONE-QUARTER (5 ¼) INCH SCREW-TYPE SHAFT SHALL BE ADJUSTABLE FROM 45 INCHES TO 66 INCHES. VALVE BOX LIDS SHALL BE MARKED WITH THE WORD "WATER" AND SHALL HAVE A LIP OR FLANGE EXTENDING INTO THE VALVE BOX SHAFT. NO SLIP-TYPE BOXES SHALL BE ALLOWED. THE VALVE BOX SHALL BE OF A DESIGN WHICH SHALL NOT TRANSMIT SHOCK OR STRESS TO THE VALVE AND SHALL BE CENTERED AND PLUMB OVER THE OPERATING NUT OF THE VALVE WITH THE BOX COVER FLUSH WITH THE SURFACE OF THE PAVEMENT. IN NON-PAVED AREAS, A 24 INCH SQUARE CONCRETE COLLAR IS REQUIRED AROUND VALVE BOX COVER AS PER THE STANDARD DETAIL. IN SECTION 200 OF THESE STANDARDS AND SPECIFICATIONS, IN UNIMPROVED ROADWAYS THE VALVE BOX COVER SHALL BE SET SIX (6) INCHES BELOW FINAL GRADE WITH A MARKER POST INDICATING THE LOCATION AS PER THE STANDARD DETAIL DRAWING.

THE MANUFACTURER SHALL FURNISH A CERTIFIED STATEMENT THAT THE INSPECTION AND SPECIFIED TESTS HAVE BEEN MADE AND THE RESULTS THEREOF COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE STANDARD(S) HEREIN SPECIFIED. A COPY OF THE CERTIFICATION SHALL BE SENT TO THE DEVELOPMENT ENGINEERING MANAGER UPON REQUEST.

FOR VALVE BOXES ALONG FIRE SPRINKLER LINES THE LID SHALL BE LABELED "FIRE".

CORROSION PROTECTION SHALL BE COVERED IN SUBSECTION 204.2 OF THESE STANDARDS AND SPECIFICATIONS.

FINAL ELEVATION OF VALVE BOXES SHALL BE LEFT TO THE DISCRETION OF THE DEVELOPMENT ENGINEERING MANAGER.

VALVE BOXES SHALL BE INSTALLED PLUMB.

VALVE BOXES WHICH HAVE SHIFTED DURING BACKFILL OPERATIONS AND ARE NO LONGER PLUMB, SHALL BE RE-EXCAVATED AND RE-ALIGNED TO THE SATISFACTION OF THE DEVELOPMENT ENGINEERING MANAGER.

FOR GREENBELT AREA APPLICATION, REFER TO DETAIL 200-7

N.T.S.

NOT USED 7
SCALE: NTS

BID SET

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

NLO DESIGNED
NJC DRAWN
CMJ CHECKED

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City of Thornton Colorado

100TH AVE WATERLINE REPLACEMENT

CIVIL DETAILS -1

SHEET C-12
19 of 29

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

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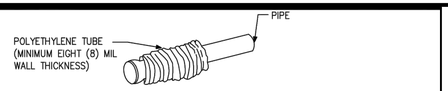
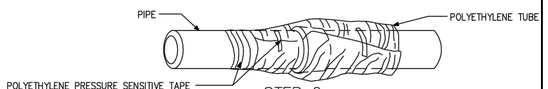
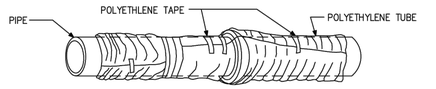
FOR D.I.P.:



STEP 1



STEP 2



STEP 3

NOTE: POLYETHYLENE ENCASEMENT MATERIAL SHALL BE MANUFACTURED IN ACCORDANCE WITH CURRENT ASTM STANDARD. THE RAW MATERIAL USED TO MANUFACTURE POLYETHYLENE FILM SHALL BE TYPE I, CLASS A, GRADE E-1 IN ACCORDANCE WITH CURRENT ASTM STANDARD.

STEP 1 – PLACE TUBE OF POLYETHYLENE MATERIAL ON PIPE PRIOR TO LOWERING IT INTO TRENCH.

STEP 2 – PULL THE TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO PIPE AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH TAPE TO HOLD THE PLASTIC TUBE IN PLACE.

STEP 3 – OVERLAP FIRST TUBE WITH ADJACENT TUBE AND SECURE WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE SHALL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED ON TOP OF PIPE AND TAPED IN PLACE.

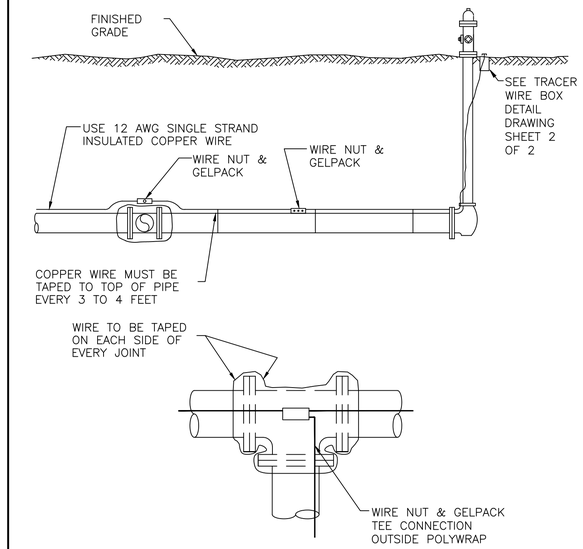
FOR STEEL:

BITUMINOUS MATERIAL IS TO BE USED FOR CORROSION PROTECTION ON ALL STEEL PIPES.

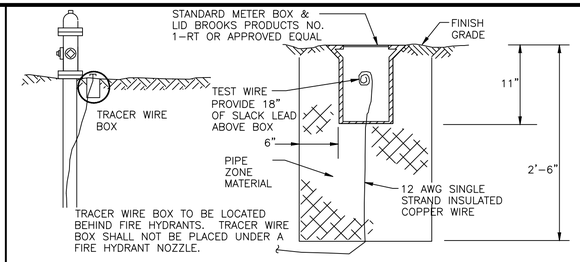
SOIL RESISTIVITY TESTS:

SOIL RESISTIVITY TESTS AND/OR ANY OTHER SOIL TESTS ARE REQUIRED WITH THE UTILIZATION OF METAL PIPING OR AT THE SOLE DISCRETION OF THE DEVELOPMENT ENGINEERING MANAGER. OTHER MEANS OF CORROSION PROTECTION MUST BE SPECIFICALLY APPROVED BY THE DEVELOPMENT ENGINEERING MANAGER. THE RESPONSIBLE PARTY SHALL INCUR THE COSTS OF ALL SOIL TESTING AS REQUIRED. N.T.S.

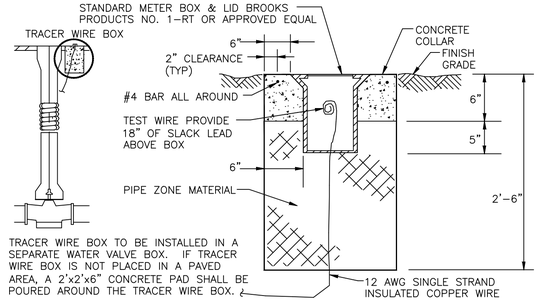
CORROSION PROTECTION
SCALE: NTS — 8 / -



TRACER WIRE
SCALE: NTS — 9 / -



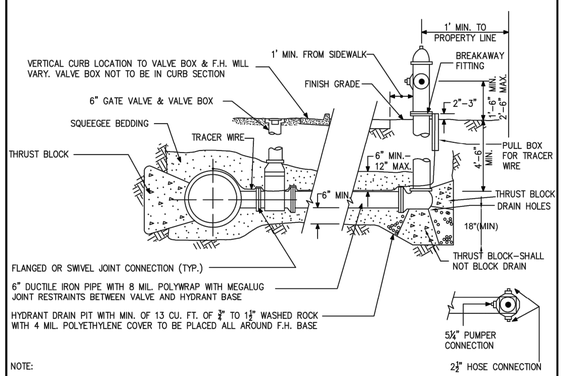
TRACER WIRE BOX AT FIRE HYDRANT



TRACER WIRE BOX FOR AREA WITH NO FIRE HYDRANT

TRACER WIRE TERMINATION
SCALE: NTS — 10 / -

FIRE HYDRANT ASSEMBLY



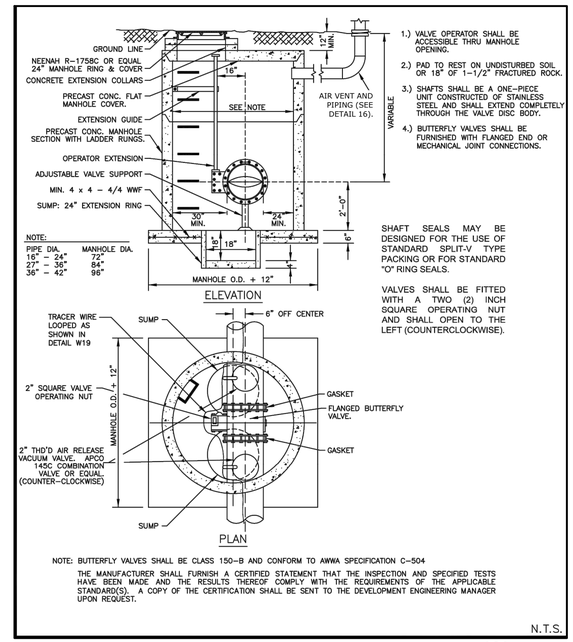
NOTE:

FIRE HYDRANTS SHALL BE LIMITED TO THE FOLLOWING MANUFACTURERS ONLY:
1) MUELLER COMPANY 5-1/4 SUPER CENTURION
2) WATEROUS COMPANY (1) MODEL WB-250-PACER
SHOE AND BARREL SHALL BE CONNECTED WITH HIGH STRENGTH STAINLESS BOLTS AND NUTS
HYDRANT SHALL HAVE A FIVE (5') FOOT CLEAR ZONE ON EACH SIDE OF HYDRANT (TEN (10') FOOT EASEMENT AROUND).
MINIMUM DISTANCE FROM DRIVEWAYS SHALL BE SIX (6) FEET.
HYDRANTS SHALL CONFORM TO AND BE TESTED IN ACCORDANCE WITH AWWA SPECIFICATION C-502.
HYDRANTS SHALL BE MADE OF CAST IRON WITH FULL BRONZE MOUNTINGS.
INLET SHALL FIT SIX (6) INCH PIPE WITH BARREL LENGTH SUFFICIENT FOR A FIVE (5) FOOT TRENCH.
ONLY TWO (2) HEIGHT EXTENSIONS MAY BE USED PER HYDRANT.
HYDRANT BASES SHOULD NOT BE ANY DEEPER THAN SIX (6) FEET FROM THE TOP OF FINISHED GRADE.
MAIN VALVE OPENING IN THE HYDRANT SHALL BE NO LESS THAN FIVE (5) INCHES IN DIAMETER.
THREADS ON NOZZLES SHALL BE NATIONAL STANDARD.
OPERATING NUT & NOZZLE COVERS SHALL BE NATIONAL STANDARD PENTAGON MEASURING ONE AND ONE-HALF (1½) INCHES FRO
POINT TO OPPOSITE FLAT AND SHALL OPEN CLOCKWISE.
HYDRANTS SHALL BE PLUMBED VERTICALLY WITH PUMPER NOZZLE FACING STREET.
NO WATER SERVICE MAIN TAPS SHALL BE MADE TO A DISTRIBUTION MAIN WITHIN FIVE (5) FEET OF A FIRE HYDRANT BRANCH MAIN.
NO HORIZONTAL BENDS OR OFFSETS SHALL BE USED IN INSTALLING FIRE HYDRANT BRANCH MAINS.

EACH HYDRANT SHALL BE PAINTED WITH OSHA ENAMEL, SAFETY YELLOW, OR AN APPROVED EQUIVALENT.
FIRE HYDRANT ASSEMBLIES SHALL BE MEGALUGGED IN ACCORDANCE WITH SUBSECTION 204.1 (N) N.T.S.

FIRE HYDRANT ASSEMBLY
SCALE: NTS — 11 / -

NOT USED
SCALE: NTS — 12 / -



NOTE: BUTTERFLY VALVES SHALL BE CLASS 150-B AND CONFORM TO AWWA SPECIFICATION C-504
THE MANUFACTURER SHALL FURNISH A CERTIFIED STATEMENT THAT THE INSPECTION AND SPECIFIED TESTS HAVE BEEN MADE AND THE RESULTS THEREOF COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE STANDARD(S). A COPY OF THE CERTIFICATION SHALL BE SENT TO THE DEVELOPMENT ENGINEERING MANAGER UPON REQUEST.
N.T.S.

BUTTERFLY VALVE VAULT DETAIL
SCALE: NTS — 13 / -

BID SET

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

NLO DESIGNED
NJC DRAWN
CMJ CHECKED

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City of Thornton Colorado

100TH AVE WATERLINE REPLACEMENT

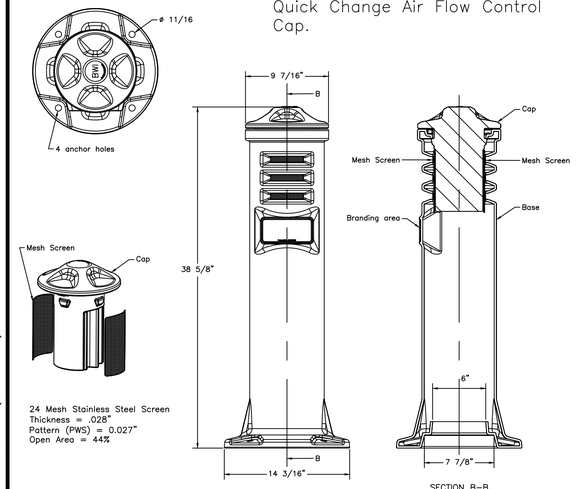
CIVIL DETAILS - 2

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

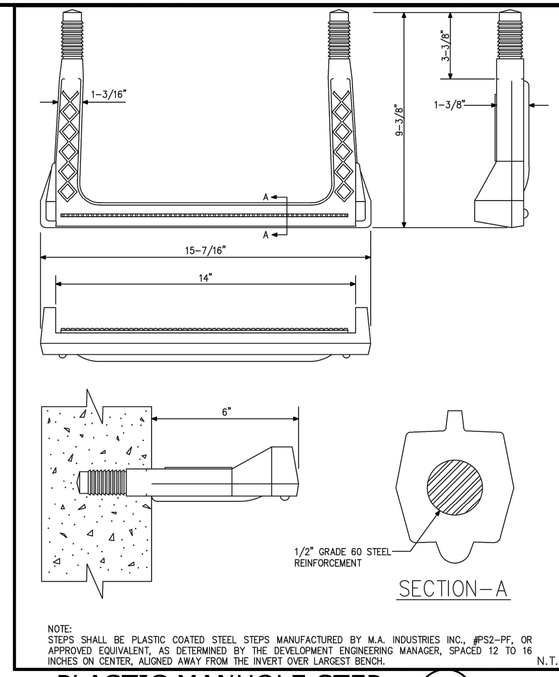
SHEET
C-13
20 of 29

I:\BOI_Projects\21\3048 - Thornton - 100th Ave Waterline Replacement\CAD\Sheets\21-3048-CO-DET.dwg C-14 6/9/2022 3:57 PM NICK.CAMPBELL 23.0s (LMS Tech)

Blue Water Innovations
Description: Husky Street Vent
Properties: LLDPE
150 1B. Flange Bolthole Pattern
Quick Change Air Flow Control
Cap.



HUSKY VENT DETAIL 14
SCALE: NTS



NOTE:
STEPS SHALL BE PLASTIC COATED STEEL STEPS MANUFACTURED BY M.A. INDUSTRIES INC., #PS2-PF, OR APPROVED EQUIVALENT, AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER, SPACED 12 TO 16 INCHES ON CENTER, ALIGNED AWAY FROM THE INVERT OVER LARGEST BENCH.

N.T.S.

PLASTIC MANHOLE STEP 15
SCALE: NTS

SERVICE PIPE TWO (2) INCHES OR LESS IN DIAMETER SHALL BE CONNECTED TO THE MAIN BY MEANS OF A BRONZE CORPORATION STOP OF THE SAME SIZE. NO UNDERGROUND JOINTS ARE PERMITTED IN THE COPPER SERVICE PIPE BETWEEN THE CORPORATION STOP AND THE CURB STOP AND/OR METER EXCEPT AT REDUCERS. OVERSIZING OF SERVICE LINES IS PERMITTED, AND SHOULD BE OUTSIDE OF THE PIT OR VAULT.

ALL JOINTS MUST BE OF A SWEAT COPPER DESIGN. SOLDER USED IN CONNECTION OF THE JOINTS SHALL BE OF A LEAD CONTENT OF 0.20 OR LESS.

CORPORATION STOPS SHALL BE AWWA TAPER THREAD TO COPPER CONNECTION OF PACK JOINT AND SHALL BE A FORD TYPE F600 OR AN APPROVED EQUAL. TAPS SHALL BE MADE BY THE RESPONSIBLE PARTY.

NO TAPS SHALL BE MADE UNTIL AFTER THE SERVICE PIPE IS SET IN PLACE AND THE COPPER SETTER (ON RESIDENTIALS) OR CURB STOP (ON COMMERCIALS) HAS BEEN INSTALLED.

UNDER NO CIRCUMSTANCES IS A WATER MAIN TO BE TAPPED DIRECTLY. ONLY SADDLES UTILIZING A CAST BRONZE CASTING WITH DOUBLE SILICONE BRONZE STRAPS SHALL BE PERMITTED.

WHEN TAPPING EXISTING ASBESTOS CEMENT PIPE, THE SIZE OF TAPS MUST BE ONE (1) PIPELINE SIZE SMALLER THAN THE SIZE OF THE PIPE BEING TAPPED.

TAPS SHALL NOT BE MADE ON A WATER MAIN UNTIL THE MAIN HAS PASSED THE CHLORINE AND HYDROSTATIC PRESSURE TESTS AND CLEARWATER TESTS.

CARE SHALL BE TAKEN TO PROPERLY INSTALL WATER SERVICE SO THAT ENOUGH SLACK IS IN THE SERVICE TO PROTECT AGAINST PULLOUT PROBLEMS.

WATER MAINS SHALL BE TAPPED AT A 45 DEGREE ANGLE FROM THE HORIZONTAL CENTER LINE OF THE WATER MAIN ON THE SAME SIDE OF THE PIPE AS THE WATER METER.

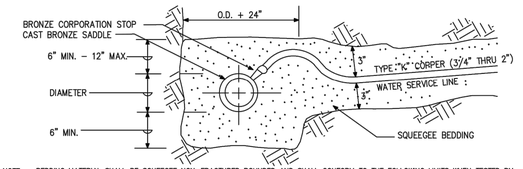
TAPPING MAINS MAY REQUIRE DIGGING OUT BEDDING MATERIAL AND CUTTING OR REMOVING PART OF THE CORROSION PROTECTIVE WRAPPING. AFTER THE TAPS ARE MADE, THE WRAP SHALL BE REPAIRED OR REPLACED BY THE INSTALLING RESPONSIBLE PARTY IN SUCH A MANNER AS TO PROTECT BOTH THE PIPE AND THE MAIN.

SERVICE TAPS SHALL HAVE A MINIMUM SEPARATION OF TWENTY FOUR (24) INCHES AND BE NO CLOSER THAN TWENTY-FOUR (24) INCHES TO A COUPLING OR PIPE JOINT OR FITTING. NO MORE THAN FOUR (4) SERVICE TAPS SHALL BE PERMITTED ON ANY ONE (1) JOINT OF PIPE.

ALL SERVICE PIPE MUST BE LAID AT LEAST FOUR AND ONE-HALF (4½) FEET BELOW THE ESTABLISHED GRADE OF THE STREET IN WHICH THEY WILL BE LAID AND ALL OTHER PLACES AT LEAST FOUR AND ONE-HALF (4½) FEET BELOW THE SURFACE OF THE GROUND.

IF AFTER A SERVICE PIPE HAS BEEN INSTALLED, THE GRADE OF THE SURFACE OF THE GROUND IS LOWERED, THE SERVICE PIPE MUST BE LOWERED TO PROVIDE AT LEAST FOUR AND ONE-HALF (4½) FEET OF COVER.

WATER SERVICE LOCATIONS SHALL BE MARKED WITH A "V" ON THE CURB. SANITARY SEWER SERVICE LOCATIONS SHALL BE MARKED WITH AN "X" ON THE CURB. MARKINGS SHALL BE NEATLY STAMPED, CHISELED, OR SAWCUT, NOT PAINTED.

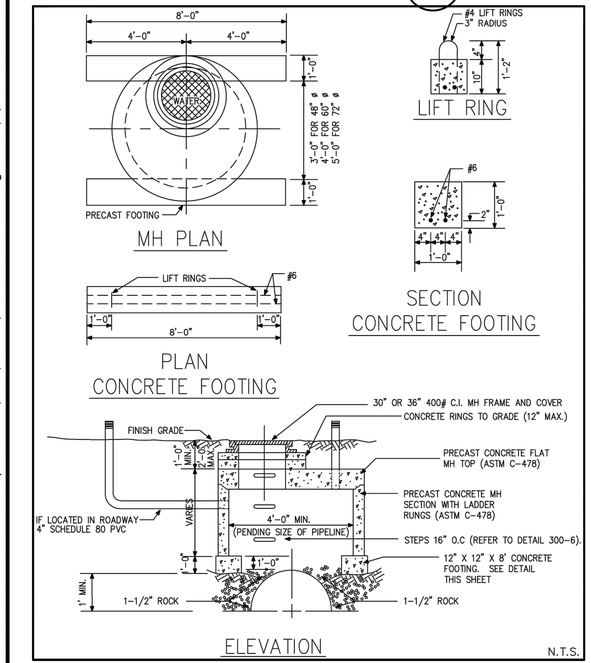


NOTE: BEDDING MATERIAL SHALL BE SQUEEGEE NON-FRACTURED ROUNDED AND SHALL CONFORM TO THE FOLLOWING LIMITS WHEN TESTED BY MEANS OF LABORATORY SIEVES:

SIEVE SIZE	TOTAL % PASSING BY WEIGHT
3/8- INCH	100
NO. 200	0–5

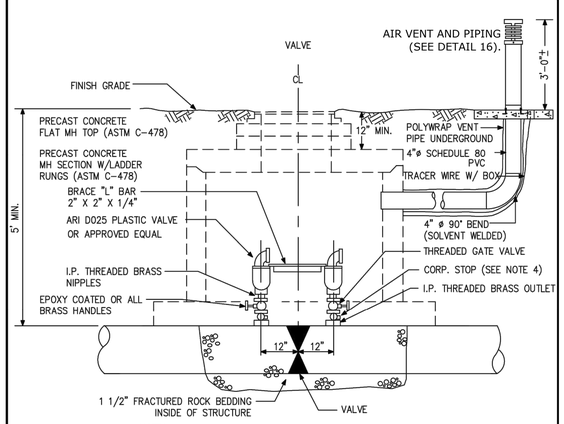
N.T.S.

SERVICE CONNECTION DETAIL 16
SCALE: NTS



N.T.S.

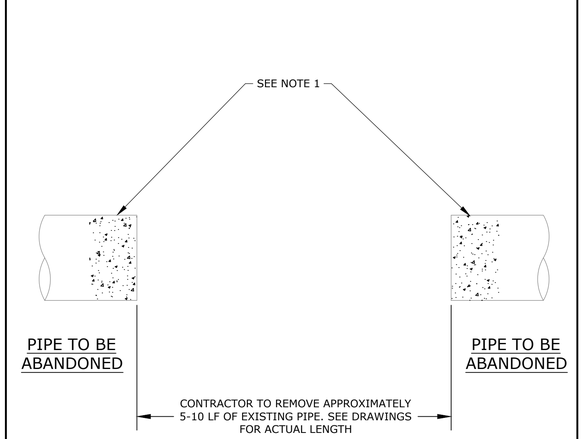
AIR RELIEF VALVE ASSEMBLY AND VAULT 17
SCALE: NTS



NOTES:

1. 1–1/2" FRACTURED ROCK SHALL BE PLACED IN BOTTOM OF MH TO CROWN OF PIPE ONLY.
2. PIPE AND FITTINGS SHALL BE BRASS.
3. PIPELINES 24" IN DIAMETER AND LARGER SHALL HAVE MH DIAMETERS OF 60" MINIMUM. MH DIAMETER SHALL BE DETERMINED BY ENGINEER.
4. WITH I.P. THREADED OUTLET, CORP. STOP SHALL BE I.P. THREADED BOTH ENDS (MUELLER H–10012 OR APPROVED EQUAL), FOR DIRECT TAP ON PIPE, CORP. STOP SHALL BE MUELLER (CC) THREADED ONE END, I.P. THREADED OTHER (H–10003 OR OTHER APPROVED BY THE DEVELOPMENT ENGINEERING MANAGER).

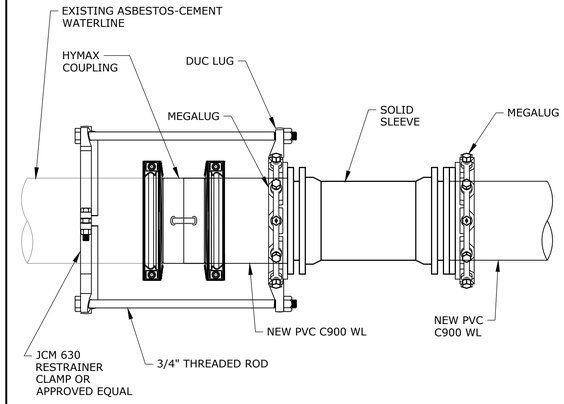
N.T.S.



NOTES

1. INSTALL CONCRETE GROUT TWO FEET INTO EXISTING PIPE ON EACH SIDE OF REMOVED SECTION OF EXISTING PIPE AND CAP.
2. CONTRACTOR TO VERIFY EXISTING ASBESTOS-CEMENT PIPE OUTSIDE DIAMETER PRIOR TO CONSTRUCTION.

PIPE ABANDONMENT 18
SCALE: NTS



NOTES

1. CONTRACTOR TO VERIFY EXISTING ASBESTOS-CEMENT PIPE OUTSIDE DIAMETER PRIOR TO CONSTRUCTION.

AC PIPE CONNECTION 19
SCALE: NTS

BID SET

NO.	DATE	BY	REVISION

NOTICE
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100TH AVE WATERLINE REPLACEMENT

CIVIL DETAILS - 3

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
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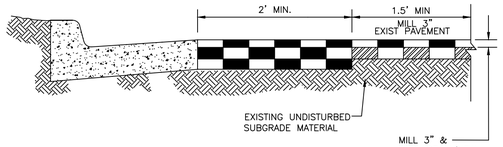
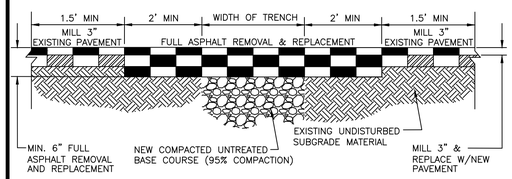


PATCHBACK ADJACENT TO CURB

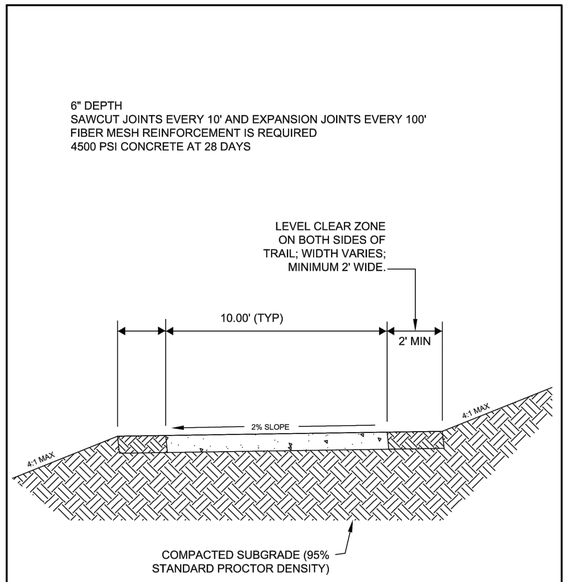


PATCHBACK FOR UTILITY AND SERVICE TRENCHES

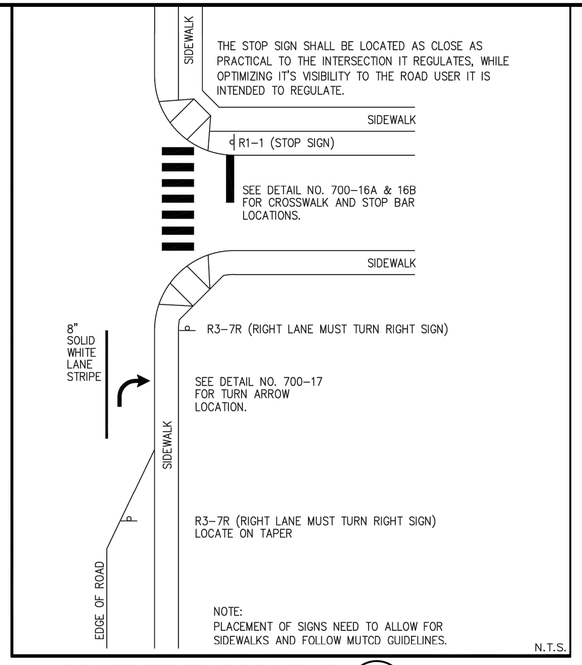
NOTE:

1. IF ASPHALT PATCH THICKNESS IS NOT IDENTIFIED ON PLANS USE 6" MIN ASPHALT PATCH OR MATCH EXISTING THICKNESS PLUS AN ADDITIONAL 1", WHICH EVER THICKNESS IS GREATER.
2. MINIMUM DEPTH OF WEARING COURSE SHALL BE 1.5" AND SHALL BE GRADING SX ASPHALT.
3. MINIMUM DEPTH OF INTERMEDIATE COURSE SHALL BE 5" AND BE INSTALLED IN 2 LIFTS. INTERMEDIATE COURSE SHALL BE GRADING S OR G ASPHALT.
4. PATCH SHALL BE PLACED AND COMPACTED IN LIFTS A MAXIMUM OF 3" IN DEPTH.
5. APPLY SS-I TACK COAT TO EXISTING ASPHALT AND/OR CONCRETE VERTICAL SURFACES.
6. TRENCHES LESS THAN 2' IN WIDTH MUST RECEIVE PRIOR APPROVAL FROM THE CITY OF THORNTON AND SHALL BE FLOW-FILLED.
7. PROVIDE 28 DAY 60 PSI CONTROLLED LOW STRENGTH FLOWABLE FILL AS SPECIFIED. USE FILL THAT FLOWS EASILY AND VIBRATION IS NOT REQUIRED. CURE TO INITIAL SET BEFORE PLACING NEW UNTREATED BASE COURSE OR NEW ASPHALT PAVEMENT. USE FLOWABLE FILL IN EXCAVATIONS THAT ARE TOO NARROW TO RECEIVE COMPACTION EQUIPMENT.
8. REMOVE ADDITIONAL PAVEMENT TO A PAINTED LANE STRIPE, A LIP OF GUTTER, A CURB, AN EXISTING PAVEMENT PATCH, OR AN EDGE OF THE PAVEMENT IF SUCH STREET FEATURE IS WITHIN ONE AND A HALF FEET OF THE SECOND SAW CUT.
9. PROVIDE UNTREATED BASE COURSE MATERIAL. DO NOT USE GRAVEL OR WASHED ROCK. PLACE NEW MATERIAL IN LIFTS NOT EXCEEDING 8" AFTER COMPACTION. COMPACT TO A MODIFIED PROCTOR DENSITY OF 95% OR GREATER.
10. STRAIGHT SAWCUT OR BLADECUT THE EXISTING ASPHALT PAVEMENT WHEN JOINING WITH NEW ASPHALT PAVEMENT.

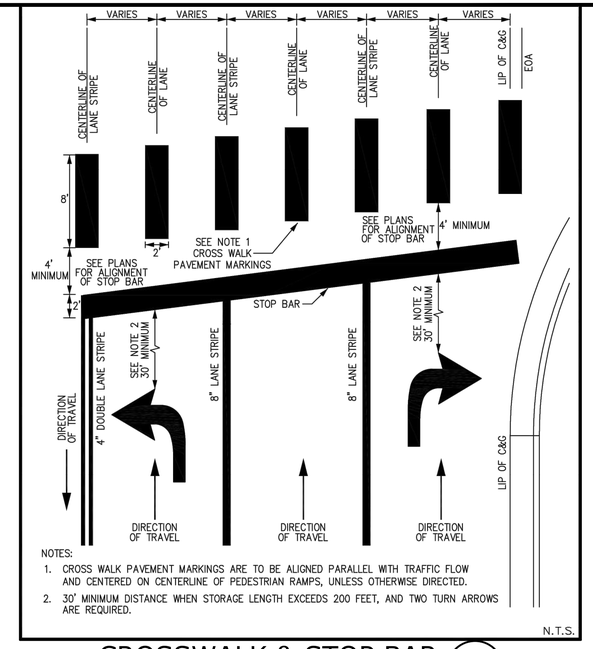
TRENCH PATCH 20
SCALE: NTS



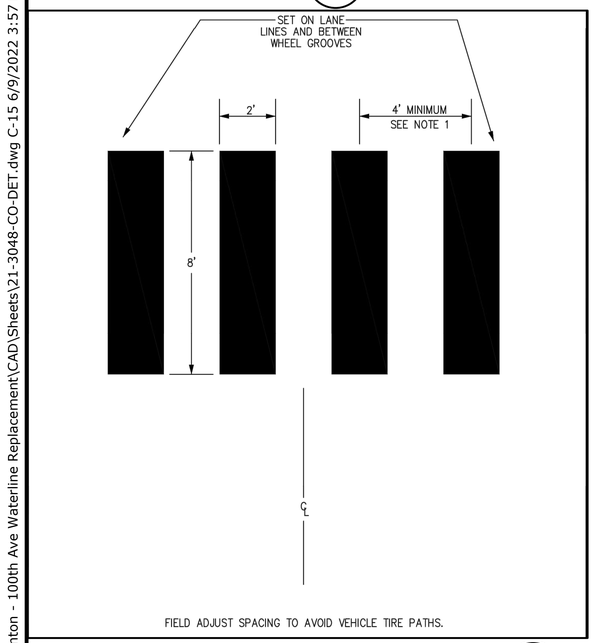
CONCRETE WALK 21
SCALE: NTS



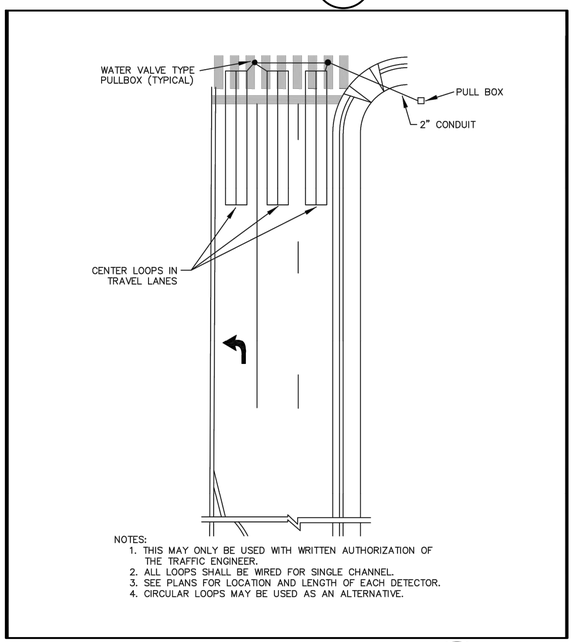
PAVEMENT MARKING 22
SCALE: NTS



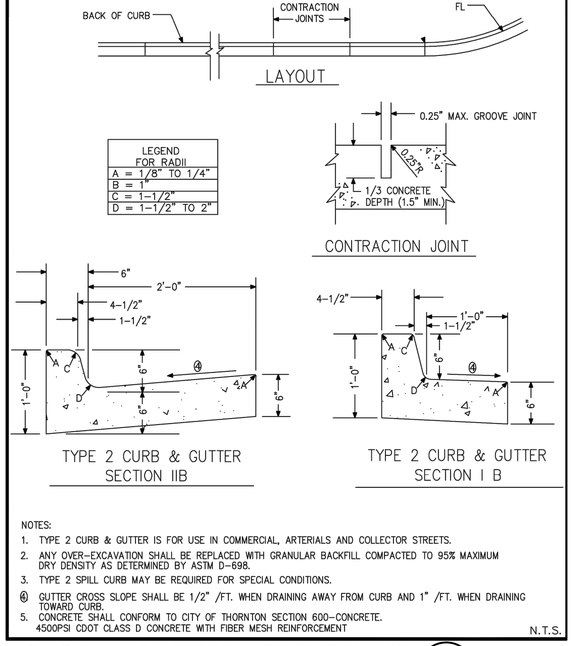
CROSSWALK & STOP BAR PAVEMENT MARKING 23
SCALE: NTS



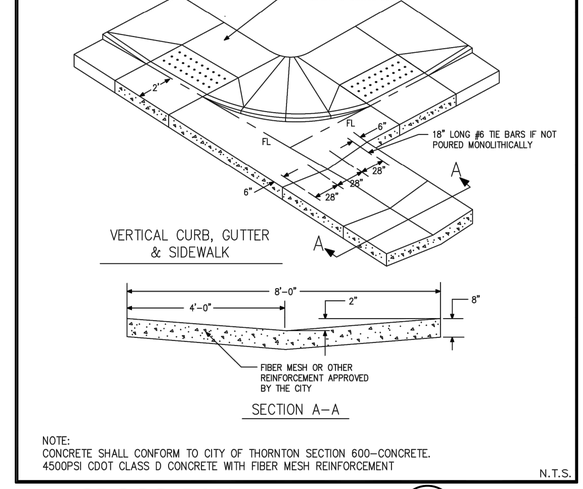
CROSSWALK PAVEMENT MARKING 24
SCALE: NTS



TYPICAL LOOP PLACEMENT 25
SCALE: NTS



CURB & GUTTER - TYPE II- IB 26
SCALE: NTS



CROSS-PAN 27
SCALE: NTS

BID SET

NO.	DATE	BY	REVISION

NOTICE
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100TH AVE WATERLINE REPLACEMENT

CIVIL DETAILS - 4

SHEET C-15
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PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

I:\BOI_Projects\21\3048 - Thornton - 100th Ave Waterline Replacement\CAD\Sheets\21-3048-CO-DET.dwg C-15 6/9/2022 3:57 PM NICK.CAMPBELL 23.0s (LMS Tech)

CITY OF THORNTON GENERAL EROSION AND SEDIMENT CONTROL NOTES

1. **CONTRACTOR SHALL OBTAIN A STORMWATER CONSTRUCTION PERMIT FROM THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY CONTROL DIVISION, PRIOR TO CLEARING, GRADING, OR EXCAVATING A SITE OF ONE (1) ACRE OR MORE. A COPY OF THE APPROVED PERMIT MUST BE SUBMITTED TO THE CITY OF THORNTON PRIOR TO THE START OF CLEARING, GRADING, OR EXCAVATING OF THE SITE. A COPY OF THE APPROVED PERMIT MUST ALSO BE AVAILABLE ON THE PROJECT SITE AT ALL TIMES DURING CONSTRUCTION. IN ADDITION, CONTRACTOR SHALL COMPLETE AND SUBMIT CITY OF THORNTON SWMP TEMPLATE TO THE CITY PRIOR TO THE NOTICE TO PROCEED. THE TEMPLATE HAS BEEN PARTIALLY PREPARED BY MURRAYSMITH AND WILL BE TRANSFERRED TO CONTRACTOR TO COMPLETE AFTER NOTICE OF AWARD.**
2. CONTROL MEASURES SHALL BE INSTALLED BEFORE ANY EARTH DISTURBING ACTIVITIES COMMENCE.
3. THE CONTRACTOR SHALL NOTIFY THE THORNTON INSPECTOR ONCE ALL INITIAL CONTROL MEASURES HAVE BEEN INSTALLED FOR AN INITIAL INSPECTION AT LEAST FORTY EIGHT (48) HOURS PRIOR TO THE INSPECTION. CONSTRUCTION ACTIVITY CANNOT BEGIN UNTIL A PASSING INITIAL INSPECTION HAS OCCURRED.
4. STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES SHALL NOT CAUSE, HAVE THE REASONABLE POTENTIAL TO CAUSE, OR MEASURABLY CONTRIBUTE TO EXCEED ANY WATER QUALITY STANDARD.
5. CONSTRUCTION SHALL BE PHASED IN A MANNER TO LIMIT EARTH DISTURBING ACTIVITIES (I.E. THE ENTIRE PROJECT SITE SHOULD NOT BE DISTURBED IF CONSTRUCTION WILL ONLY BE OCCURRING IN ONE PARTICULAR SECTION).
6. SEDIMENT CAUSED BY ACCELERATED SOIL EROSION SHALL BE REMOVED FROM RUNOFF WATER BEFORE IT LEAVES THE CONSTRUCTION SITE.
7. BULK STORAGE STRUCTURES FOR PETROLEUM PRODUCTS AND ANY OTHER CHEMICALS SHALL HAVE SECONDARY CONTAINMENT OR EQUIVALENT PROTECTION TO CONTAIN ALL SPILLS AND PREVENT ANY SPILLED MATERIAL FROM ENTERING THE MS4 OR STATE WATERS.
8. A COPY OF THE SWMP AND EROSION AND SEDIMENT CONTROL (ESC) PLANS MUST BE AVAILABLE AT ALL TIMES ON THE CONSTRUCTION SITE UNLESS OTHERWISE APPROVED BY CDPHE OR THORNTON.
9. THE SWMP AND EC PLAN SHALL BE CONTINUOUSLY UPDATED TO REFLECT NEW OR REVISED CONTROL MEASURES (CM) DUE TO CHANGES IN DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE OF THE CONSTRUCTION SITE. UPDATES MUST BE MADE WITHIN 72-HOURS FOLLOWING THE CHANGE IN CONTROL MEASURES.
10. THE CONTRACTOR SHALL INSPECT THE CONSTRUCTION SITE (INCLUDING ALL CONTROL MEASURES, STORAGE CONTAINERS, AND CONSTRUCTION EQUIPMENT) AT A MINIMUM OF EVERY **7 CALENDAR DAYS OR EVERY 14 CALENDAR DAYS.** IF ON THE 14 DAY FREQUENCY A 24-HOUR POST STORM INSPECTION MUST BE CONDUCTED AFTER A PRECIPITATION EVENT OR SNOW MELT**.** INSPECTIONS SHALL CONTINUE UNTIL AN INACTIVATION NOTICE IS FILED WITH CDPHE.
11. THE OWNER/CONTRACTOR SHALL KEEP A RECORD OF ALL INSPECTIONS ON SITE AND AVAILABLE FOR REVIEW BY CDPHE OR CITY STAFF. INSPECTION REPORTS MUST IDENTIFY ANY INCIDENTS OF NON-COMPLIANCE WITH THE TERMS AND CONDITIONS OF THE PERMIT.
12. CONTROL MEASURES REQUIRING MAINTENANCE OR ADJUSTMENT SHALL BE REPAIRED IMMEDIATELY AFTER OBSERVATION OF THE FAILING CONTROL MEASURE.
13. SILT FENCE PATCHING: PATCHING IS ONLY ALLOWED ON THE TOP HALF OF THE FENCE. NOT MORE THAN TWO (2) PATCHES PER SECTION OF FENCE. SILT FENCE WITH HOLES OR DETERIORATION ON THE LOWER HALF OF THE FENCE MUST BE REPLACED. REPAIR TYPICALLY INVOLVES REPLACING THE SILT FENCE TO MAINTAIN THE CMS EFFECTIVENESS TO DRAIN SLOWLY AND FUNCTION AS ORIGINALLY DESIGNED.
14. FOR ALL INSTANCES OF NONCOMPLIANCE BASED ON ENVIRONMENTAL HAZARDS AND CHEMICAL SPILLS AND RELEASES, ALL NEEDED INFORMATION MUST BE PROVIDED ORALLY TO CDPHE SPILL REPORTING LINE (24-HOUR NUMBER FOR ENVIRONMENTAL HAZARDS AND CHEMICAL SPILLS AND RELEASES: 1-877-518-5608) WITHIN **24-HOURS** FROM THE TIME THE OWNER/CONTRACTOR BECOMES AWARE OF THE CIRCUMSTANCES.
15. STRAW BALES **SHALL NOT** BE USED FOR PRIMARY EROSION OR SEDIMENT CONTROL (I.E. STRAW BALES MAY BE USED FOR REINFORCEMENT BEHIND ANOTHER BMP SUCH AS SILT FENCE).
16. CONTROL MEASURES REFERRED TO AS "CUTBACK CURB" ARE **NOT ALLOWED**. THE CUTBACK CURB MAY BECOME INEFFECTIVE AND MAY ALSO COMPROMISE THE INTEGRITY OF THE CURB AND IN MOST CASES DOES NOT PROVIDE ANY WATER QUALITY BENEFIT FOR FILTERING OUT SEDIMENT.
17. INLET PROTECTION AND VEGETATIVE BUFFER CONTROL MEASURES **SHALL NOT** BE USED AS STANDALONE CMS. THESE METHODS MUST BE UTILIZED WITH AT LEAST ONE ADDITIONAL CM.
18. CONTROL MEASURES INTENDED FOR SHEET FLOW SEDIMENT RUNOFF SHALL BE PLACED PARALLEL TO THE SLOPE.
19. ALL CONTROL MEASURES SHALL BE CLEANED WHEN SEDIMENT LEVELS ACCUMULATE TO HALF THE DESIGN OF THE CM UNLESS OTHERWISE SPECIFIED.
20. A VEHICLE TRACKING CONTROL (VTC) SHALL BE PLACED AT ALL ENTRANCES/EXITS FROM THE SITE AS WELL AS ANY EGRESS FROM EXPOSED DIRT TO PAVED AREAS TO PREVENT TRACK-OUT ONTO STREETS. IF TRACK-OUT DOES OCCUR, THE OWNER/CONTRACTOR SHALL IMMEDIATELY SWEEP THE STREET OF DEBRIS. RECYCLED CRUSHED CONCRETE OR ASPHALT **SHALL NOT** BE USED FOR VEHICLE TRACKING PADS.
21. FOR RESIDENTIAL PROJECTS, BACK OF CURB PROTECTION IS REQUIRED ALONG ALL INTERIOR LOTS.
22. ALL SEDIMENT COLLECTED IN CONTROL MEASURES SHALL BE REMOVED UPON INITIAL ACCEPTANCE.
23. WIND EROSION AND DUST CONTROL MEASURES MUST BE UTILIZED TO MINIMIZE AIRBORNE PARTICULATE DUST. CONTROL MEASURES MAY INCLUDE MINIMIZING DISTURBED AREAS, WATERING, AND/OR PROVIDING TEMPORARY STABILIZATION.
24. PERMANENT EROSION CONTROL MEASURES FOR SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN **14 CALENDAR DAYS** AFTER FINAL GRADING OR THE FINAL EARTH DISTURBANCE HAS BEEN COMPLETED. WHEN IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE A DISTURBED AREA AFTER AN EARTH DISTURBANCE HAS BEEN COMPLETED OR WHERE SIGNIFICANT EARTH DISTURBANCE ACTIVITY CEASES, TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED WITHIN 14 CALENDAR DAYS. TEMPORARY EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION MEASURES ARE IMPLEMENTED.
25. FINAL STABILIZATION HAS BEEN ACHIEVED WHEN ALL EARTH DISTURBING ACTIVITIES AT THE SITE HAVE BEEN COMPLETED, AND UNIFORM VEGETATIVE COVER HAS BEEN ESTABLISHED WITH AN INDIVIDUAL PLANT DENSITY OF AT LEAST **70 PERCENT** OF PRE-DISTURBANCE LEVELS, OR EQUIVALENT PERMANENT, PHYSICAL EROSION REDUCTION METHODS HAVE BEEN EMPLOYED.
26. ALL TEMPORARY CONTROL MEASURES SHALL BE REMOVED FROM THE SITE UPON SUBMITTING THE INACTIVATION NOTICE.
27. CONCRETE WASHOUT LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE LOCATIONS OF ALL CONCRETE WASHOUT AREAS WILL BE DETERMINED BY THE CONTRACTOR.

CONSTRUCTION SEQUENCE

1. INSTALL VEHICLE TRACKING CONTROL AT ALL PROJECT ENTRANCE(S).
2. CONSTRUCT TEMPORARY CONSTRUCTION GATE AT THE PROJECT ENTRANCE(S) .
3. FURNISH AND INSTALL CONSTRUCTION FENCING, SILT FENCE, GRAVEL CURB OR COIR ROLL ALONG THE LIMITS OF DISTURBANCE.
4. INSTALL INLET PROTECTION AT ALL STORM DRAIN INLETS WITHIN PROJECT LIMITS OR THAT MAY BE AFFECTED BY OVERFLOW OR DRAINAGE.
5. CLEAR AND GRUB SITE . CUT AND DISPOSE OF ANY DEBRIS PRODUCED DURING THE CLEARING AND GRUBBING ACTIVITY.
6. PROVIDE STOCKPILE LOCATIONS AND PROTECT FROM RAINFALL EROSION AT ALL TIMES WITH SILT FENCE.
7. BEGIN SITE EXCAVATION FOR FOUNDATIONS
8. INSTALLATION OF UNDERGROUND UTILITY TRENCHES AND STRUCTURE EXCAVATIONS SHALL BE PROTECTED FROM SEDIMENT AT ALL TIMES.
9. AS THE SITE IMPROVEMENTS ARE BEING COMPLETED, ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED.
10. INSPECT AND MAINTAIN ALL SEDIMENT AND EROSION CONTROL MEASURES AT REQUIRED FREQUENCY.
11. REMOVE ANY TEMPORARY CONTROL MEASURES NOT NEEDED AFTER STABILIZATION IS COMPLETE.
12. DUST SHALL BE CONTROLLED DURING CONSTRUCTION BY ADEQUATE USE OF WATER AND STREET SWEEPING.

SEQUENCE PROVIDED HERE IS FOR EROSION AND SEDIMENT CONTROL PURPOSES ONLY. CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION ACTIVITY PLANNING AND SEQUENCING TO ENSURE COMPLIANCE WITH ALL REGULATIONS AND PERMITS.

NO.	DATE	BY	REVISION

NOTICE
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100TH AVE WATERLINE REPLACEMENT

EROSION CONTROL GENERAL NOTES

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
ESC-1
23 of 29

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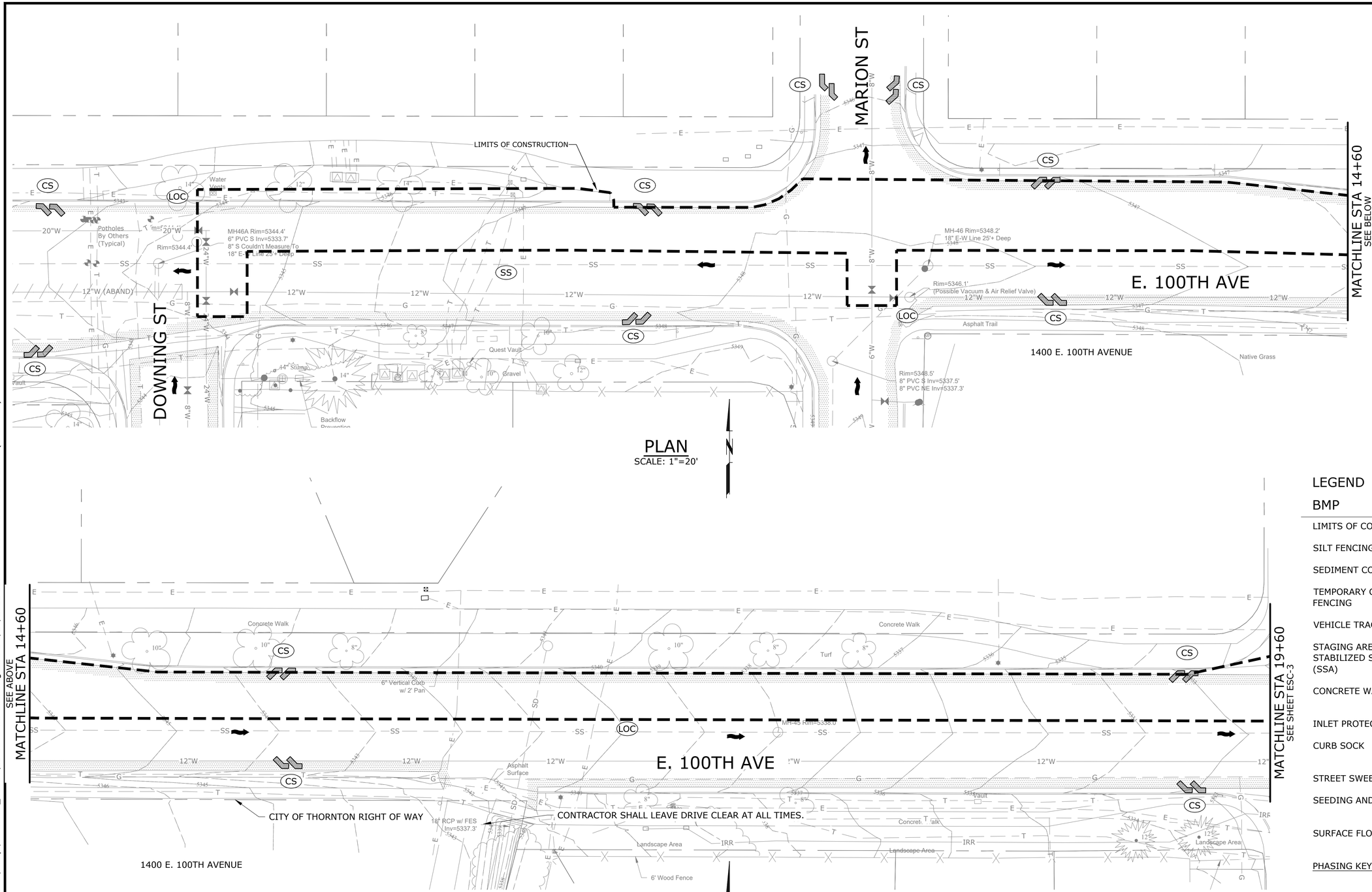

PLAN
SCALE: 1"=20'

PLAN
SCALE: 1"=20'

NOTES:

1. THE PROPOSED STAGING AREAS IDENTIFIED ON THE PLANS MAY BE SUBJECT TO CHANGE. CONTRACTOR SHALL COORDINATE WITH CITY FOR FINAL STAGING LOCATION PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOT STORE MATERIALS IN A WAY THAT BLOCKS ANY DRIVEWAYS OR OTHER MEANS OF RESIDENTIAL ACCESS FOR RESIDENTS. CONTRACTOR SHALL MAINTAIN AT LEAST ONE LANE OF TRAFFIC OPEN AT ALL TIMES.
2. CURB SOCK LOCATIONS ARE APPROXIMATE ONLY. MORE CURB SOCKS MAY BE NECESSARY DEPENDING ON THE SITE CONDITIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR MODIFYING BMP'S AS NECESSARY TO PREVENT THE TRANSPORT OF SEDIMENT.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING PERIMETER CONTROLS AROUND ALL STOCKPILES PER THE STOCKPILE MANAGEMENT DETAIL ON SHEET ESC-7.
4. THE LOCATIONS OF ALL CONCRETE WASHOUT AREAS WILL BE DETERMINED BY THE CONTRACTOR. A PROPRIETARY MOBILE CONCRETE WASHOUT SYSTEM MAY BE USED, BUT THE CORRESPONDING DETAIL AND PLAN OF USE MUST BE APPROVED PRIOR TO CONSTRUCTION.

LEGEND

BMP	PHASING	SYMBOLS
LIMITS OF CONSTRUCTION	1, 2, 3	LOC
SILT FENCING	1, 2	SF
SEDIMENT CONTROL LOGS	1, 2	SCL
TEMPORARY CONSTRUCTION FENCING	1, 2	CF
VEHICLE TRACKING CONTROL	2	VTC
STAGING AREA (SSA-R) / STABILIZED STAGING AREA (SSA)	2	SSA-R SSA
CONCRETE WASHOUT	2	CWA
INLET PROTECTION	1, 2	IP
CURB SOCK	1, 2	CS
STREET SWEEPING	2	SS
SEEDING AND MULCHING	3	SM
SURFACE FLOW		

PHASING KEY: 1 = INITIAL
2 = INTERIM
3 = FINAL

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100TH AVE WATERLINE REPLACEMENT

EROSION AND SEDIMENT CONTROL STA 10+00 TO STA 19+60

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
ESC-2
24 of 29

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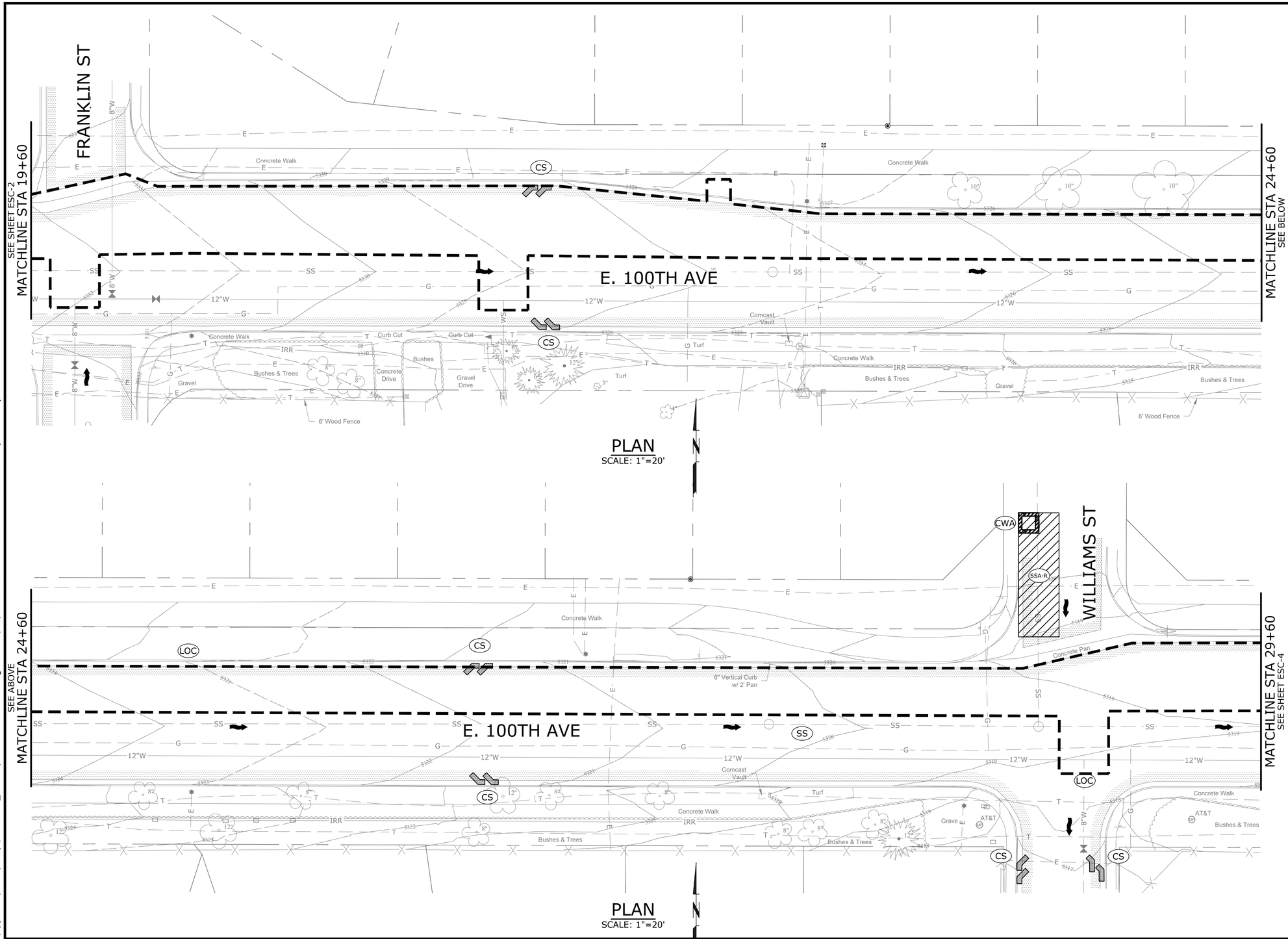

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3. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING PERIMETER CONTROLS AROUND ALL STOCKPILES PER THE STOCKPILE MANAGEMENT DETAIL ON SHEET ESC-7.
4. THE LOCATIONS OF ALL CONCRETE WASHOUT AREAS WILL BE DETERMINED BY THE CONTRACTOR. A PROPRIETARY MOBILE CONCRETE WASHOUT SYSTEM MAY BE USED, BUT THE CORRESPONDING DETAIL AND PLAN OF USE MUST BE APPROVED PRIOR TO CONSTRUCTION.

LEGEND

BMP	PHASING	SYMBOLS
LIMITS OF CONSTRUCTION	1, 2, 3	LOC
SILT FENCING	1, 2	SF
SEDIMENT CONTROL LOGS	1, 2	SCL
TEMPORARY CONSTRUCTION FENCING	1, 2	CF
VEHICLE TRACKING CONTROL	2	VTC
STAGING AREA (SSA-R) / STABILIZED STAGING AREA (SSA)	2	SSA-R / SSA
CONCRETE WASHOUT	2	CWA
INLET PROTECTION	1, 2	IP
CURB SOCK	1, 2	CS
STREET SWEEPING	2	SS
SEEDING AND MULCHING	3	SM
SURFACE FLOW		

PHASING KEY: 1 = INITIAL
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3 = FINAL

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100TH AVE WATERLINE REPLACEMENT

EROSION AND SEDIMENT CONTROL STA 19+60 TO STA 29+60

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
ESC-3
25 of 29

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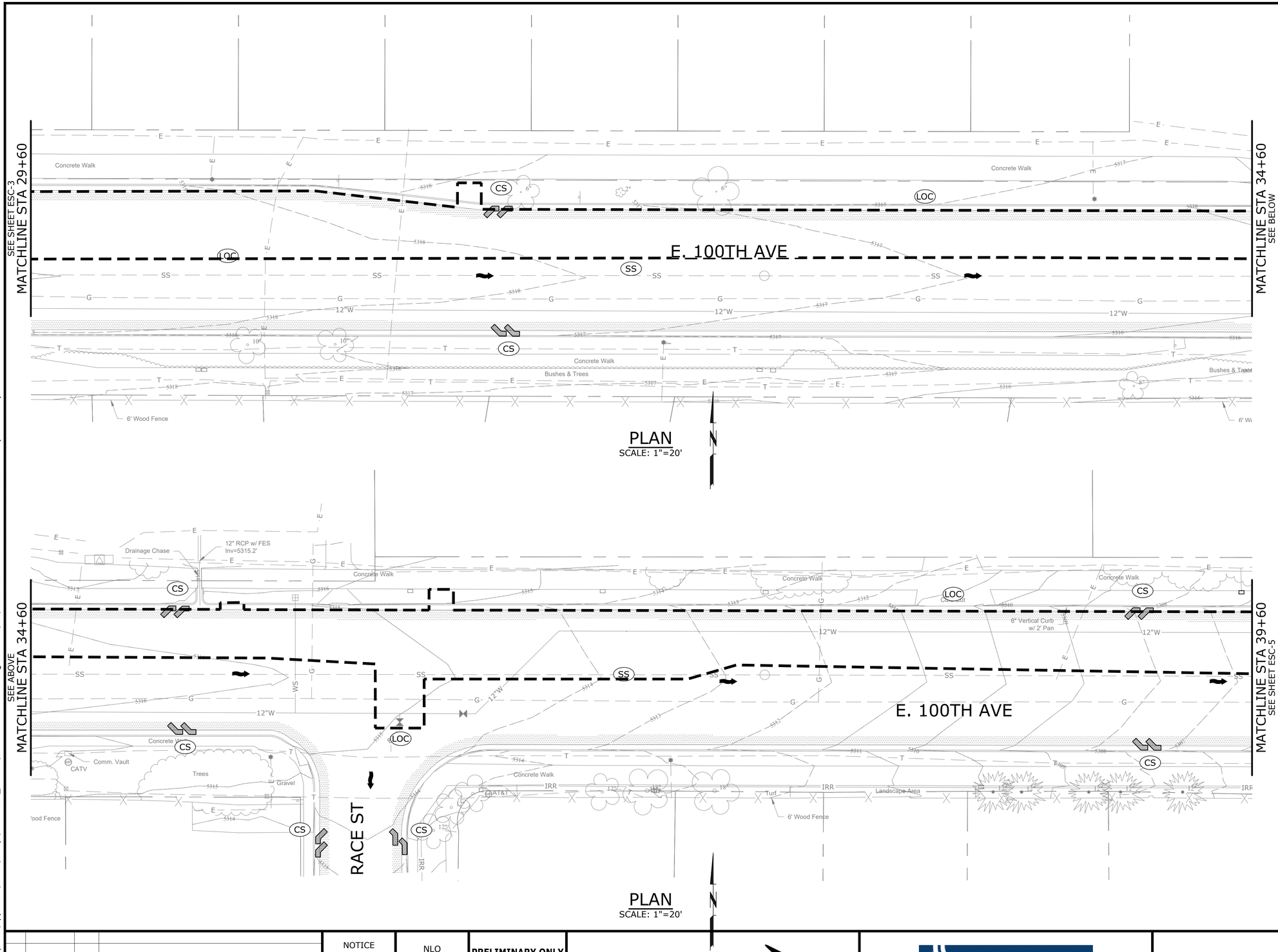

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3. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING PERIMETER CONTROLS AROUND ALL STOCKPILES PER THE STOCKPILE MANAGEMENT DETAIL ON SHEET ESC-7.
4. THE LOCATIONS OF ALL CONCRETE WASHOUT AREAS WILL BE DETERMINED BY THE CONTRACTOR. A PROPRIETARY MOBILE CONCRETE WASHOUT SYSTEM MAY BE USED, BUT THE CORRESPONDING DETAIL AND PLAN OF USE MUST BE APPROVED PRIOR TO CONSTRUCTION.

LEGEND

BMP	PHASING	SYMBOLS
LIMITS OF CONSTRUCTION	1, 2, 3	LOC
SILT FENCING	1, 2	SF
SEDIMENT CONTROL LOGS	1, 2	SCL
TEMPORARY CONSTRUCTION FENCING	1, 2	CF
VEHICLE TRACKING CONTROL	2	VTC
STAGING AREA (SSA-R) / STABILIZED STAGING AREA (SSA)	2	SSA-R / SSA
CONCRETE WASHOUT	2	CWA
INLET PROTECTION	1, 2	IP
CURB SOCK	1, 2	CS
STREET SWEEPING	2	SS
SEEDING AND MULCHING	3	SM
SURFACE FLOW		

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100TH AVE WATERLINE REPLACEMENT

EROSION AND SEDIMENT CONTROL STA 29+60 TO STA 39+60

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
ESC-4
26 of 29

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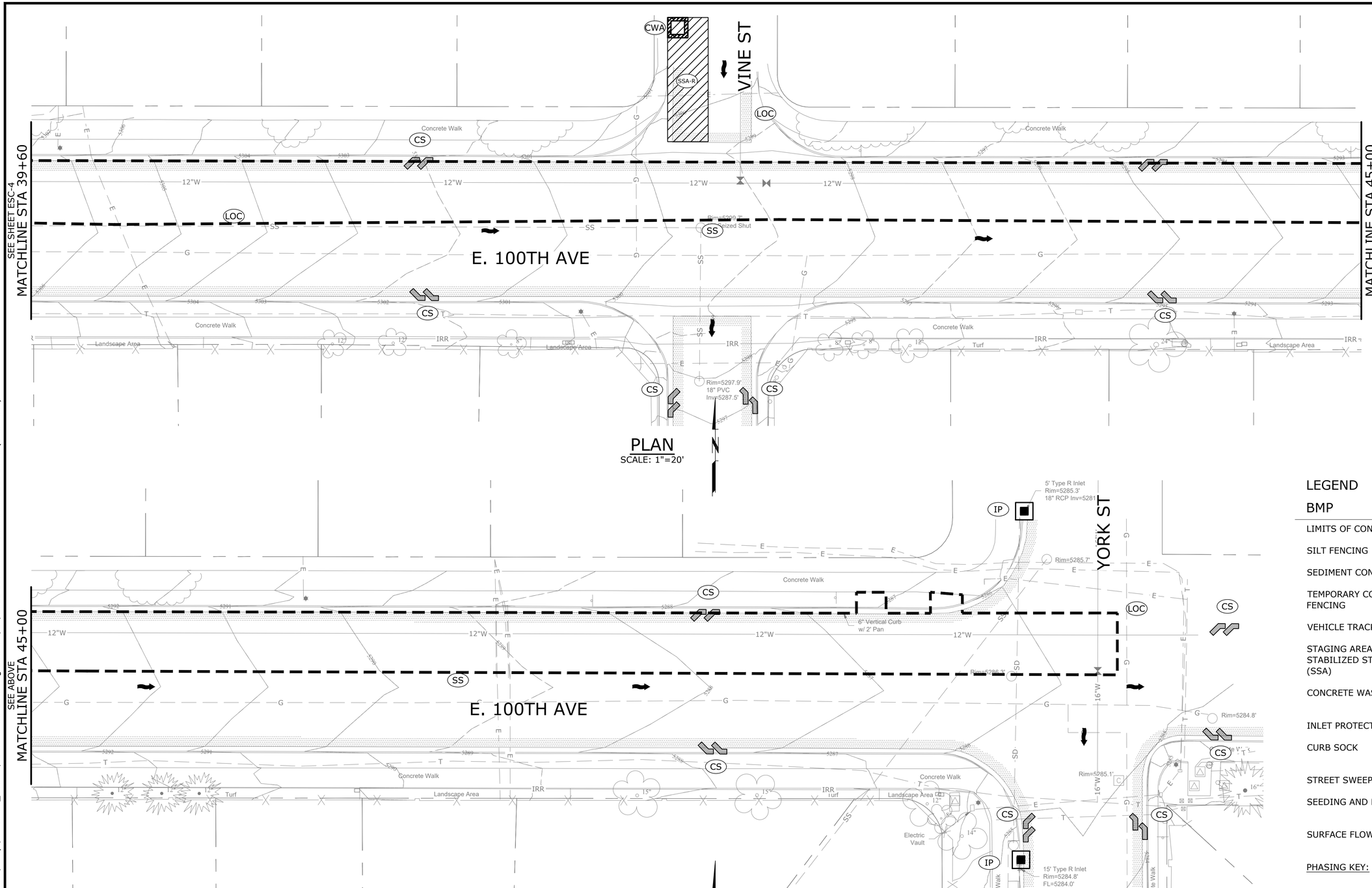

NOTES:

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2. CURB SOCK LOCATIONS ARE APPROXIMATE ONLY. MORE CURB SOCKS MAY BE NECESSARY DEPENDING ON THE SITE CONDITIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR MODIFYING BMP'S AS NECESSARY TO PREVENT THE TRANSPORT OF SEDIMENT.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING PERIMETER CONTROLS AROUND ALL STOCKPILES PER THE STOCKPILE MANAGEMENT DETAIL ON SHEET ESC-7.
4. THE LOCATIONS OF ALL CONCRETE WASHOUT AREAS WILL BE DETERMINED BY THE CONTRACTOR. A PROPRIETARY MOBILE CONCRETE WASHOUT SYSTEM MAY BE USED, BUT THE CORRESPONDING DETAIL AND PLAN OF USE MUST BE APPROVED PRIOR TO CONSTRUCTION.

LEGEND

BMP	PHASING	SYMBOLS
LIMITS OF CONSTRUCTION	1, 2, 3	LOC
SILT FENCING	1, 2	SF
SEDIMENT CONTROL LOGS	1, 2	SCL
TEMPORARY CONSTRUCTION FENCING	1, 2	CF
VEHICLE TRACKING CONTROL	2	VTC
STAGING AREA (SSA-R) / STABILIZED STAGING AREA (SSA)	2	SSA-R / SSA
CONCRETE WASHOUT	2	CWA
INLET PROTECTION	1, 2	IP
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SURFACE FLOW		

PHASING KEY: 1 = INITIAL
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100TH AVE WATERLINE REPLACEMENT

EROSION AND SEDIMENT CONTROL STA 39+60 TO END

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
ESC-5
27 of 29

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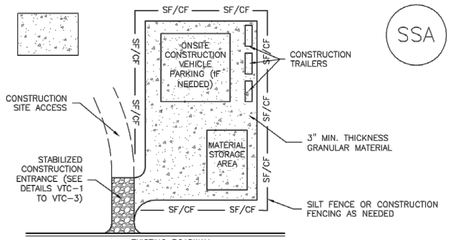
Stabilized Staging Area (SSA) — SM-6



SSA–1. STABILIZED STAGING AREA

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF STAGING AREA(S).
   –CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.
2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.
3. STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.
4. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" THICK GRANULAR MATERIAL.
5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.
6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

STABILIZED STAGING AREA MAINTENANCE NOTES

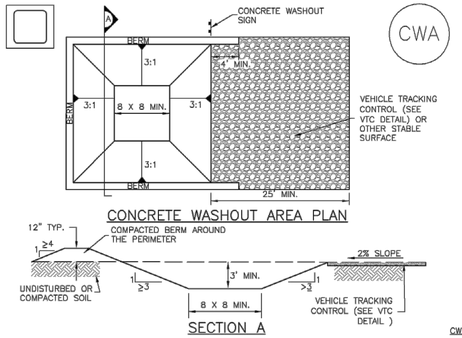
1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.
5. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.
6. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

NOTE: MANY MUNICIPALITIES PROHIBIT THE USE OF RECYCLED CONCRETE AS GRANULAR MATERIAL FOR STABILIZED STAGING AREAS DUE TO DIFFICULTIES WITH RE-ESTABLISHMENT OF VEGETATION IN AREAS WHERE RECYCLED CONCRETE WAS PLACED.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)

Concrete Washout Area (CWA) — MM-1



CWA–1. CONCRETE WASHOUT AREA

CWA INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –CWA INSTALLATION LOCATION.
2. DO NOT LOCATE AN UNLINED CWA WITHIN 400' OF ANY NATURAL DRAINAGE PATHWAY OR WATERBODY. DO NOT LOCATE WITHIN 1,000' OF ANY WELLS OR DRINKING WATER SOURCES. IF SITE CONSTRAINTS MAKE THIS INFEASIBLE, OR IF HIGHLY PERMEABLE SOILS EXIST ON SITE, THE CWA MUST BE INSTALLED WITH AN IMPERMEABLE LINER (16 MIL MIN. THICKNESS) OR SURFACE STORAGE ALTERNATIVES USING PREFABRICATED CONCRETE WASHOUT DEVICES OR A LINED ABOVE GROUND STORAGE ARE SHOULD BE USED.
3. THE CWA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.
4. CWA SHALL INCLUDE A FLAT SUBSURFACE PIT THAT IS AT LEAST 8' BY 8' SLOPES LEADING OUT OF THE SUBSURFACE PIT SHALL BE 3:1 OR FLATTER. THE PIT SHALL BE AT LEAST 3' DEEP.
5. BERM SURROUNDING SIDES AND BACK OF THE CWA SHALL HAVE MINIMUM HEIGHT OF 1'.
6. VEHICLE TRACKING PAD SHALL BE SLOPED 2% TOWARDS THE CWA.
7. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CWA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CWA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.
8. USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

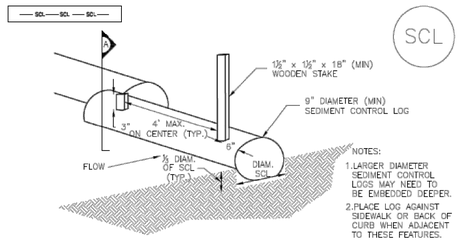
CWA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. THE CWA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS, ACCUMULATED IN PIT, SHALL BE REMOVED ONCE THE MATERIALS HAVE REACHED A DEPTH OF 2'.
5. CONCRETE WASHOUT WATER, WASTED PIECES OF CONCRETE AND ALL OTHER DEBRIS IN THE SUBSURFACE PIT SHALL BE TRANSPORTED FROM THE JOB SITE IN A WATER-TIGHT CONTAINER AND DISPOSED OF PROPERLY.
6. THE CWA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT IS PLACED.
7. WHEN THE CWA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, SEED AND MULCH OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

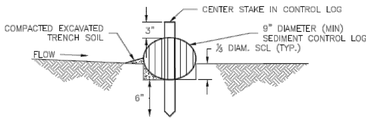
(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD).

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

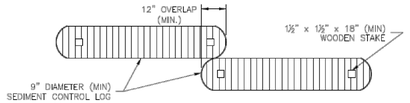
Sediment Control Log (SCL) — SC-2



TRENCHED SEDIMENT CONTROL LOG



SECTION Ⓐ
TRENCHED SEDIMENT CONTROL LOG



LOG JOINTS

SCL–1. TRENCHED SEDIMENT CONTROL LOG

SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATION AND LENGTH OF SEDIMENT CONTROL LOGS.
2. SEDIMENT CONTROL LOGS THAT ACT AS A PERIMETER CONTROL SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND-DISTURBING ACTIVITIES.
3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BE FREE OF ANY NOXIOUS WEED SEEDS OR DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.
4. SEDIMENT CONTROL LOGS MAY BE USED AS SMALL CHECK DAMS IN DITCHES AND SWALES. HOWEVER, THEY SHOULD NOT BE USED IN PERENNIAL STREAMS.
5. IT IS RECOMMENDED THAT SEDIMENT CONTROL LOGS BE TRENCHED INTO THE GROUND TO A DEPTH OF APPROXIMATELY ⅓ OF THE DIAMETER OF THE LOG. IF TRENCHING TO THIS DEPTH IS NOT FEASIBLE AND/OR DESIRABLE (SHORT TERM INSTALLATION WITH DESIRE NOT TO DAMAGE LANDSCAPE) A LESSER TRENCHING DEPTH MAY BE ACCEPTABLE WITH MORE ROBUST STAKING. COMPOST LOGS THAT ARE 8 LB/FT DO NOT NEED TO BE TRENCHED.
6. THE UPHILL SIDE OF THE SEDIMENT CONTROL LOG SHALL BE BACKFILLED WITH SOIL OR FILTER MATERIAL THAT IS FREE OF ROCKS AND DEBRIS. THE SOIL SHALL BE TIGHTLY COMPACTED INTO THE SHAPE OF A RIGHT TRIANGLE USING A SHOVEL OR WEIGHTED LAWN ROLLER OR BLOWN IN PLACE.
7. FOLLOW MANUFACTURERS' GUIDANCE FOR STAKING. IF MANUFACTURERS' INSTRUCTIONS DO NOT SPECIFY SPACING, STAKES SHALL BE PLACED ON 4' CENTERS AND EMBEDDED A MINIMUM OF 6" INTO THE GROUND. 3" OF THE STAKE SHALL PROTRUDE FROM THE TOP OF THE LOG. STAKES THAT ARE BROKEN PRIOR TO INSTALLATION SHALL BE REPLACED. COMPOST LOGS SHOULD BE STAKED 10' ON CENTER.

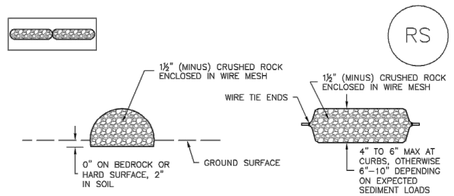
SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.
5. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION.COMPOST FROM COMPOST LOGS MAY BE LEFT IN PLACE AS LONG AS BAGS ARE REMOVED AND THE AREA SEEDED. IF DISTURBED AREAS EXIST AFTER REMOVAL, THEY SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

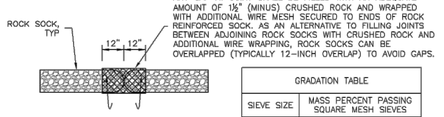
(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, JEFFERSON COUNTY, COLORADO, DOUGLAS COUNTY, COLORADO, AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

SC-5 — Rock Sock (RS)



ROCK SOCK SECTION — ROCK SOCK PLAN



ROCK SOCK JOINTING

GRADATION TABLE	
SIEVE SIZE	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 M43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.	

ROCK SOCK INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION(S) OF ROCK SOCKS.
2. CRUSHED ROCK SHALL BE 1½" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET (1½" MINUS).
3. WIRE MESH SHALL BE FABRICATED OF 10 GAGE POULTRY MESH, OR EQUIVALENT, WITH A MAXIMUM OPENING OF ½", RECOMMENDED MINIMUM ROLL WIDTH OF 48"
4. 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.
5. SOME MUNICIPALITIES MAY ALLOW THE USE OF FILTER FABRIC AS AN ALTERNATIVE TO WIRE MESH FOR THE ROCK ENCLOSURE.

RS–1. ROCK SOCK PERIMETER CONTROL

ROCK SOCK MAINTENANCE NOTES

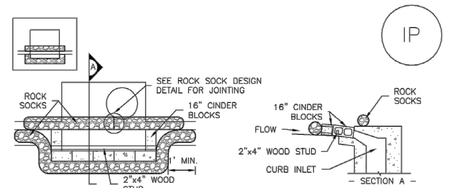
1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. ROCK SOCK'S SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, OR DAMAGED BEYOND REPAIR.
5. SEDIMENT ACCUMULATED UPSTREAM OF ROCK SOCKS SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE ROCK SOCK.
6. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.
7. WHEN ROCK SOCKS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF ROCK SOCK INSTALLATION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY OTHER SIMILAR PROPRIETARY PRODUCTS ON THE MARKET. UDFCD NEITHER NDORSES NOR DISCOURAGES USE OF PROPRIETARY PROTECTION PRODUCTS; HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.

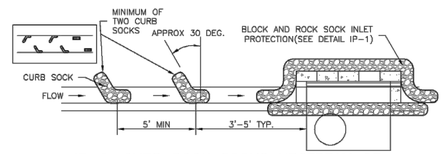
SC-6 — Inlet Protection (IP)



IP–1. BLOCK AND ROCK SOCK SUMP OR ON GRADE INLET PROTECTION

BLOCK AND CURB SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.
2. CONCRETE "CINDER" BLOCKS SHALL BE LAID ON THEIR SIDES AROUND THE INLET IN A SINGLE ROW, ABUTTING ONE ANOTHER WITH THE OPEN END FACING AWAY FROM THE CURB.
3. GRAVEL BAGS SHALL BE PLACED AROUND CONCRETE BLOCKS, CLOSELY ABUTTING ONE ANOTHER AND JOINTED TOGETHER IN ACCORDANCE WITH ROCK SOCK DESIGN DETAIL.



IP–2. CURB ROCK SOCKS UPSTREAM OF INLET PROTECTION

CURB ROCK SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL INSTALLATION REQUIREMENTS.
2. PLACEMENT OF THE SOCK SHALL BE APPROXIMATELY 30 DEGREES FROM PERPENDICULAR IN THE OPPOSITE DIRECTION OF FLOW.
3. SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED A MINIMUM OF 5 FEET APART.
4. AT LEAST TWO CURB SOCKS IN SERIES ARE REQUIRED UPSTREAM OF ON-GRADE INLETS.

GENERAL INLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION OF INLET PROTECTION.
   –TYPE OF INLET PROTECTION (IP.1, IP.2, IP.3, IP.4, IP.5, IP.6)
2. INLET PROTECTION SHALL BE INSTALLED PROMPTLY AFTER INLET CONSTRUCTION OR PAVING IS COMPLETE (TYPICALLY WITHIN 48 HOURS). IF A RAINFALL/RUNOFF EVENT IS FORECAST, INSTALL INLET PROTECTION PRIOR TO ONSET OF EVENT.
3. MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

INLET PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED AS NECESSARY TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN STORAGE VOLUME REACHES 50% OF CAPACITY, A DEPTH OF 6" WHEN SILT FENCE IS USED, OR ¼ OF THE HEIGHT FOR STRAW BALES.
5. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED, UNLESS THE LOCAL JURISDICTION APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.
6. WHEN INLET PROTECTION AT AREA INLETS IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF INLET PROTECTION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY PROPRIETARY INLET PROTECTION METHODS ON THE MARKET. UDFCD NEITHER ENDORSES NOR DISCOURAGES USE OF PROPRIETARY INLET PROTECTION; HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.

NOTE: SOME MUNICIPALITIES DISCOURAGE OR PROHIBIT THE USE OF STRAW BALES FOR INLET PROTECTION; CHECK WITH LOCAL JURISDICTION TO DETERMINE IF STRAW BALE INLET PROTECTION IS ACCEPTABLE.

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

NLO DESIGNED
NJC DRAWN
CMJ CHECKED

PRELIMINARY ONLY
DO NOT USE FOR CONSTRUCTION
JULY 2022
Murraysmith
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City of Thornton Colorado

100TH AVE WATERLINE REPLACEMENT

EROSION CONTROL DETAILS - 1

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

SHEET
ESC-6
28 of 29

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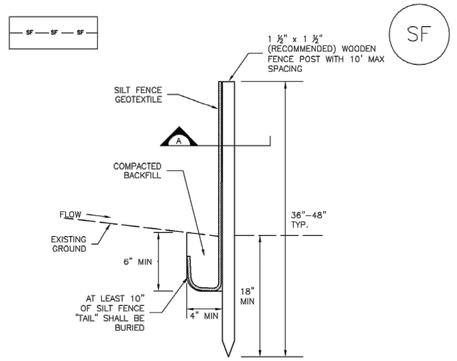
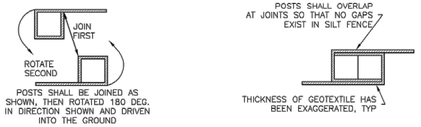


SILT FENCE



SECTION A

SILT FENCE INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2–5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.

2. A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.

3. COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.

4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.

5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.

6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J-HOOK." THE "J-HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' – 20').

7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 6".

5. REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.

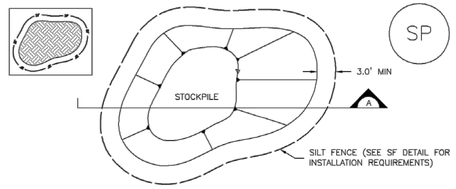
6. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.

7. WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

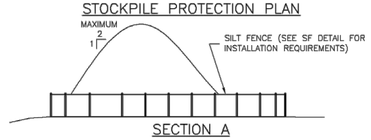
(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Stockpile Management (SP) MM-2



STOCKPILE PROTECTION PLAN



SECTION A

SP–1. STOCKPILE PROTECTION

STOCKPILE PROTECTION INSTALLATION NOTES

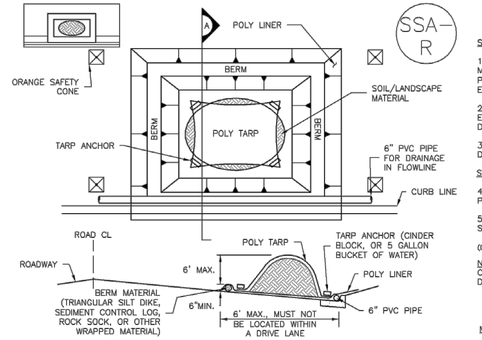
1. SEE PLAN VIEW FOR:
   –LOCATION OF STOCKPILES.
   –TYPE OF STOCKPILE PROTECTION.

2. INSTALL PERIMETER CONTROLS IN ACCORDANCE WITH THEIR RESPECTIVE DESIGN DETAILS. SILT FENCE IS SHOWN IN THE STOCKPILE PROTECTION DETAILS; HOWEVER, OTHER TYPES OF PERIMETER CONTROLS INCLUDING SEDIMENT CONTROL LOGS OR ROCK SOCKS MAY BE SUITABLE IN SOME CIRCUMSTANCES. CONSIDERATIONS FOR DETERMINING THE APPROPRIATE TYPE OF PERIMETER CONTROL FOR A STOCKPILE INCLUDE WHETHER THE STOCKPILE IS LOCATED ON A PERVIOUS OR IMPERVIOUS SURFACE, THE RELATIVE HEIGHTS OF THE PERIMETER CONTROL AND STOCKPILE, THE ABILITY OF THE PERIMETER CONTROL TO CONTAIN THE STOCKPILE WITHOUT FAILING IN THE EVENT THAT MATERIAL FROM THE STOCKPILE SHIFTS OR SLUMPS AGAINST THE PERIMETER, AND OTHER FACTORS.

3. STABILIZE THE STOCKPILE SURFACE WITH SURFACE ROUGHENING, TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS, OR SOIL BINDERS. SOILS STOCKPILED FOR AN EXTENDED PERIOD (TYPICALLY FOR MORE THAN 60 DAYS) SHOULD BE SEEDED AND MULCHED WITH A TEMPORARY GRASS COVER ONCE THE STOCKPILE IS PLACED (TYPICALLY WITHIN 14 DAYS). USE OF MULCH ONLY OR A SOIL BINDER IS ACCEPTABLE IF THE STOCKPILE WILL BE IN PLACE FOR A MORE LIMITED TIME PERIOD (TYPICALLY 30–60 DAYS).

4. FOR TEMPORARY 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.

Stockpile Management (SP) MM-2



SP–2. MATERIALS STAGING IN ROADWAY

MATERIALS STAGING IN ROADWAYS INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF MATERIAL STAGING AREA(S).
   –CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.

2. FEATURE MUST BE INSTALLED PRIOR TO EXCAVATION, EARTHWORK OR DELIVERY OF MATERIALS.

3. MATERIALS MUST BE STATIONED ON THE POLY LINER. ANY INCIDENTAL MATERIALS DEPOSITED ON PAVED SECTION OR ALONG CURB LINE MUST BE CLEANED UP PROMPTLY.

4. POLY LINER AND TARP COVER SHOULD BE OF SIGNIFICANT THICKNESS TO PREVENT DAMAGE OR LOSS OF INTEGRITY.

5. SAND BAGS MAY BE SUBSTITUTED TO ANCHOR THE COVER TARP OR PROVIDE BERMING UNDER THE BASE LINER.

6. FEATURE IS NOT INTENDED FOR USE WITH WET MATERIAL THAT WILL BE DRAINING AND/OR SPREADING OUT ON THE POLY LINER OR FOR DEMOLITION MATERIALS.

7. THIS FEATURE CAN BE USED FOR:
   –UTILITY REPAIRS.
   –WHEN OTHER STAGING LOCATIONS AND OPTIONS ARE LIMITED.
   –OTHER LIMITED APPLICATION AND SHORT DURATION STAGING.

STOCKPILE PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

STOCKPILE PROTECTION MAINTENANCE NOTES

4. IF PERIMETER PROTECTION MUST BE MOVED TO ACCESS SOIL STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORKDAY.

5. STOCKPILE PERIMETER CONTROLS CAN BE REMOVED ONCE ALL THE MATERIAL FROM THE STOCKPILE HAS BEEN USED.

(DETAILS ADAPTED FROM PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

MATERIALS STAGING IN ROADWAY MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. INSPECT PVC PIPE ALONG CURB LINE FOR CLOGGING AND DEBRIS. REMOVE OBSTRUCTIONS PROMPTLY.

5. CLEAN MATERIAL FROM PAVED SURFACES BY SWEEPING OR VACUUMING.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM AURORA, COLORADO)

Temporary and Permanent Seeding (TS/PS) EC-2

Seeding dates for the highest success probability of perennial species along the Front Range are generally in the spring from April through early May and in the fall after the first of September until the ground freezes. If the area is irrigated, seeding may occur in summer months, as well. See Table TS/PS-3 for appropriate seeding dates.

Table TS/PS-1. Minimum Drill Seeding Rates for Various Temporary Annual Grasses

Species[a] (Common name)	Growth Season[b]	Pounds of Pure Live Seed (PLS)/acre[c]	Planting Depth (inches)
1. Oats	Cool	35 - 50	1 - 2
2. Spring wheat	Cool	25 - 35	1 - 2
3. Spring barley	Cool	25 - 35	1 - 2
4. Annual ryegrass	Cool	10 - 15	½
5. Millet	Warm	3 - 15	½ - ¾
6. Sudangrass	Warm	5–10	½ - ¾
7. Sorghum	Warm	5–10	½ - ¾
8. Winter wheat	Cool	20–35	1 - 2
9. Winter barley	Cool	20–35	1 - 2
10. Winter rye	Cool	20–35	1 - 2
11. Triticale	Cool	25–40	1 - 2

[a] Successful seeding of annual grass resulting in adequate plant growth will usually produce enough dead-plant residue to provide protection from wind and water erosion for an additional year. This assumes that the cover is not disturbed or mowed closer than 8 inches.

Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1 or where access limitations exist. When hydraulic seeding is used, hydraulic mulching should be applied as a separate operation, when practical, to prevent the seeds from being encapsulated in the mulch.

[b] See Table TS/PS-3 for seeding dates. Irrigation, if consistently applied, may extend the use of cool season species during the summer months.

[c] Seeding rates should be doubled if seed is broadcast, or increased by 50 percent if done using a Brillion Drill or by hydraulic seeding.

EC-2 Temporary and Permanent Seeding (TS/PS)

Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses

Common[a] Name	Botanical Name	Growth Season[b]	Growth Form	Seeds/ Pound	Pounds of PLS/acre
Alakali Soil Seed Mix					
Alkali sacaton	*Sporobolus airoides*	Cool	Bunch	1,750,000	0.25
Basin wildrye	*Elymus cinereus*	Cool	Bunch	165,000	2.5
Sodar streambank wheatgrass	*Agropyron riparium 'Sodar'*	Cool	Sod	170,000	2.5
Jose tall wheatgrass	*Agropyron elongatum 'Jose'*	Cool	Bunch	79,000	7.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**17.75**
Fertile Loamy Soil Seed Mix					
Ephriam crested wheatgrass	*Agropyron cristatum 'Ephriam'*	Cool	Sod	175,000	2.0
Dural hard fescue	*Festuca ovina 'duriuscula'*	Cool	Bunch	565,000	1.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Sodar streambank wheatgrass	*Agropyron riparium 'Sodar'*	Cool	Sod	170,000	2.5
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	7.0
Total					**15.5**
High Water Table Soil Seed Mix					
Meadow foxtail	*Alopecurus pratensis*	Cool	Sod	900,000	0.5
Redtop	*Agrostis alba*	Warm	Open sod	5,000,000	0.25
Reed canarygrass	*Phalaris arundinacea*	Cool	Sod	68,000	0.5
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Pathfinder switchgrass	*Panicum virgatum 'Pathfinder'*	Warm	Sod	389,000	1.0
Alkar tall wheatgrass	*Agropyron elongatum 'Alkar'*	Cool	Bunch	79,000	5.5
Total					**10.75**
Transition Turf Seed Mix[c]					
Ruebens Canadian bluegrass	*Poa compressa 'Ruebens'*	Cool	Sod	2,500,000	0.5
Dural hard fescue	*Festuca ovina 'duriuscula'*	Cool	Bunch	565,000	1.0
Citation perennial ryegrass	*Lolium perenne 'Citation'*	Cool	Sod	247,000	3.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Total					**7.5**

Temporary and Permanent Seeding (TS/PS) EC-2

Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses (cont.)

Common Name	Botanical Name	Growth Season[b]	Growth Form	Seeds/ Pound	Pounds of PLS/acre
Sandy Soil Seed Mix					
Blue grama	*Bouteloua gracilis*	Warm	Sod-forming bunchgrass	825,000	0.5
Camper little bluestem	*Schizachyrium scoparium 'Camper'*	Warm	Bunch	240,000	1.0
Prairie sandreed	*Calamovilfa longifolia*	Warm	Open sod	274,000	1.0
Sand dropseed	*Sporobolus cryptandrus*	Cool	Bunch	5,298,000	0.25
Vaughn sideoats grama	*Bouteloua curtipendula 'Vaughn'*	Warm	Sod	191,000	2.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**10.25**
Heavy Clay, Rocky Foothill Seed Mix					
Ephriam crested wheatgrass[d]	*Agropyron cristatum 'Ephriam'*	Cool	Sod	175,000	1.5
Oahe Intermediate wheatgrass	*Agropyron intermedium 'Oahe'*	Cool	Sod	115,000	5.5
Vaughn sideoats grama[e]	*Bouteloua curtipendula 'Vaughn'*	Warm	Sod	191,000	2.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**17.5**

[a] All of the above seeding mixes and rates are based on drill seeding followed by crimped straw mulch. These rates should be doubled if seed is broadcast and should be increased by 50 percent if the seeding is done using a Brillion Drill or is applied through hydraulic seeding. Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1. If hydraulic seeding is used, hydraulic mulching should be done as a separate operation.

[b] See Table TS/PS-3 for seeding dates.

[c] If site is to be irrigated, the transition turf seed rates should be doubled.

[d] Crested wheatgrass should not be used on slopes steeper than 6H to 1V.

[e] Can substitute 0.5 lbs PLS of blue grama for the 2.0 lbs PLS of Vaughn sideoats grama.

EC-2 Temporary and Permanent Seeding (TS/PS)

Table TS/PS-3. Seeding Dates for Annual and Perennial Grasses

	Annual Grasses (Numbers in table reference species in Table TS/PS-1)		Perennial Grasses	
Seeding Dates	**Warm**	**Cool**	**Warm**	**Cool**
January 1–March 15			✓	✓
March 16–April 30	4	1,2,3	✓	✓
May 1–May 15	4		✓	
May 16–June 30	4,5,6,7			
July 1–July 15	5,6,7			
July 16–August 31				
September 1–September 30		8,9,10,11		
October 1–December 31			✓	✓

Mulch

Cover seeded areas with mulch or an appropriate rolled erosion control product to promote establishment of vegetation. Anchor mulch by crimping, netting or use of a non-toxic tackifier. See the Mulching BMP Fact Sheet for additional guidance.

Maintenance and Removal

Monitor and observe seeded areas to identify areas of poor growth or areas that fail to germinate. Reseed and mulch these areas, as needed.

An area that has been permanently seeded should have a good stand of vegetation within one growing season if irrigated and within three growing seasons without irrigation in Colorado. Reseed portions of the site that fail to germinate or remain bare after the first growing season.

Seeded areas may require irrigation, particularly during extended dry periods. Targeted weed control may also be necessary.

Protect seeded areas from construction equipment and vehicle access.

NO.	DATE	BY	REVISION

NOTICE
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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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City of Thornton Colorado

100TH AVE WATERLINE REPLACEMENT

EROSION CONTROL DETAILS - 2

PROJECT NO.: 21-3048 | SCALE: AS SHOWN | DATE: JULY 2022

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29 of 29

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