LETTING DATE
April 28, 2020

N. 4TH AVENUE IMPROVEMENTS

PLANS OF PROPOSED IMPROVEMENTS FOR

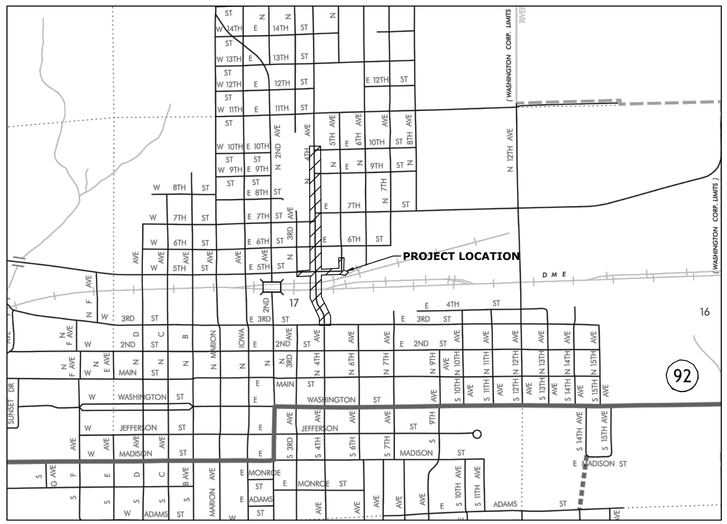
N. 4TH AVENUE IMPROVEMENTS

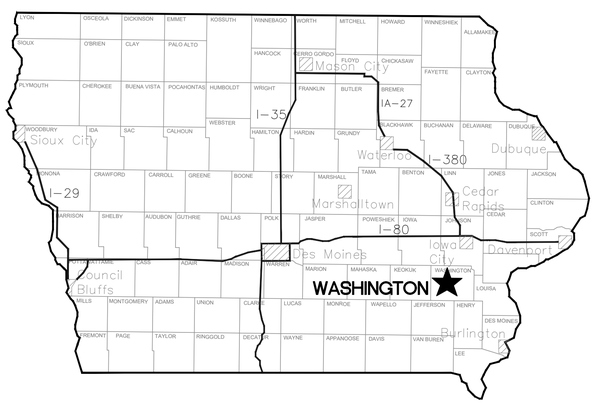
N. 4TH AVENUE IMPROVEMENTS
WASHINGTON, IOWA

LOCATION MAP

NORTH

1" = 1000'





IOWA ONE CALL℠
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

GENERAL NOTE: ALL UTILITIES ARE ONLY GENERALLY LOCATED. CONTRACTOR IS RESPONSIBLE FOR LOCATING AND EXPOSING ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION BEFORE CONSTRUCTION BEGINS.

INDEX OF SHEETS

THIS PROJECT IS COVERED BY THE IOWA DEPARTMENT OF NATURAL RESOURCES NPDES GENERAL PERMIT NO. 2. THE CONTRACTOR SHALL CARRY OUT THE TERMS AND CONDITIONING OF GENERAL PERMIT NO. 2 AND STORM WATER POLLUTION PREVENTION PLAN WHICH IS PART OF THESE CONTRACT DOCUMENTS. REFER TO SECTION 2602 OF THE IOWA DOT STANDARD SPECIFICATION FOR ADDITIONAL INFORMATION.

THE STATEWIDE URBAN DESIGN AND SPECIFICATIONS (SUDAS 2020) AND THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS PLUS GENERAL SUPPLEMENTAL SPECIFICATIONS; AND APPLICABLE SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, AND SPECIAL PROVISIONS, AND ALL APPROPRIATE ADDENDUMS AND REVISIONS SHALL APPLY TO THE CONSTRUCTION WORK ON THIS PROJECT UNLESS NOTED ON THE PLANS OR IN THE CONTRACT.

CITY OF WASHINGTON

215 EAST WASHINGTON STREET
WASHINGTON, IOWA 52353

MAYOR

JARON ROSIEN

CITY COUNCIL

DANIELLE PETTIT
STEVEN GAULT
BRENDAN DELONG
FRAN STIGERS
MILLIE YOUNGQUIST
ELAINE MOORE

CITY OF WASHINGTON IOWA

FOX engineering

ENGINEER:
FOX ENGINEERING
414 SOUTH 17TH STREET, SUITE 107
AMES, IOWA 50010
PHONE: (515) 233-0000
FAX: (515) 233-0103

90% DESIGN SUBMITTAL
02/07/20

LICENSED PROFESSIONAL ENGINEER STEVEN P. SOUPIR 18924 IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

PRELIMINARY

STEVEN P. SOUPIR, P.E. DATE
License Number 18924
My license renewal date is December 31, 2021.

Pages or sheets covered by this seal:
ALL LISTED IN INDEX ON THIS SHEET

DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\General\7114-19A Cover and Details.dwg : G1.1

CIVIL LEGEND

LINEWORK

EXISTING	PROPOSED	
		BUILDING
		CONCRETE PAVING
		ASPHALT PAVING
		SIDEWALK
		PROPERTY LINE
		EASEMENT
		BUILDING SETBACK LINE
x x x	x x x	FENCE –BARBED WIRE
o	o	FENCE –CHAIN LINK
□ □ □	□ □ □	FENCE –VINYL
▫	▫	FENCE –WOOD
		FENCE –SILT
W	W	WATER MAIN
		STORM SEWER / CULVERT
SAN	SAN	SANITARY SEWER
FM	FM	FORCE MAIN
OHE	OHE	ELECTRIC –OVERHEAD
UGE	UGE	ELECTRIC –UNDERGROUND
OT		TELEPHONE –OVERHEAD
T		TELEPHONE –UNDERGROUND
FO		FIBER OPTIC
G	G	NATURAL GAS
		TREE LINE
		CROP LINE
880 881	880 881	GROUND SURFACE CONTOURS
		LIMITS OF CONSTRUCTION

SYMBOLS

EXISTING	PROPOSED		EXISTING	PROPOSED	
		BOLLARD			STORM SEWER INTAKE, SW–501/ 502
		BUSH			
T		CABLE TV PEDESTAL			STORM SEWER INTAKE, SW–503/ 504
		CONTROL/ TRAVERSE POINT			
S	S	CURB STOP			STORM SEWER INTAKE, SW–505
E		ELECTRICAL PEDESTAL			
E		ELECTRICAL MANHOLE			STORM SEWER INTAKE, SW–506
TR		ELECTRICAL TRANSFORMER			
FO		FIBER OPTIC PEDESTAL			STORM SEWER INTAKE, SW–507/ 508
G		GAS METER			STORM SEWER INTAKE, SW–509/ 510
GV		GAS VALVE			
		FIRE HYDRANT			STORM SEWER INTAKE, SW–511
JB		JUNCTION BOX			STORM SEWER INTAKE, SW–512/ BEEHIVE
		LIGHT POLE			STORM SEWER INTAKE, SW–513
		MAIL BOX			
MH		MANHOLE (UNKNOWN)			STORM SEWER, FLARED END SECTION
		PROPERTY CORNER –FOUND			
P		POWER POLE			STORM SEWER MANHOLE
		RIGHT OF WAY RAIL			STORM SEWER SUBDRAIN CLEANOUT
		SANITARY CLEANOUT	T		TELEPHONE MANHOLE
S	S	SANITARY MANHOLE	T		TELEPHONE PEDESTAL
		SECTION CORNER –FOUND			TRAFFIC POLE
		SIGN	W		WATER MANHOLE
		STUMP	W		WATER METER
		TREE –DECIDUOUS	WV	WV	WATER VALVE
					WITNESS POST
		TREE –EVERGREEN	Y	Y	YARD HYDRANT

ABBREVIATIONS

FG – FORM GRADE (GUTTER)	FL – FLOWLINE	BOP – BEGINNING OF PROJECT
TOC – TOP OF CURB	INV – INVERT	EOP – END OF PROJECT
TOW – TOP OF WALK	PL – PROPERTY LINE	PC – POINT OF CURVATURE
FFE – FINISH FLOOR ELEVATION	ROW – RIGHT OF WAY	PT – POINT OF TANGENCY
TOB – TOP OF BANK	PUE – PUBLIC UTILITY EASEMENT	PI – POINT OF INTERSECTION
TOE – TOE OF SLOPE	CL – CENTER LINE	

FOX Engineering Associates, Inc.
414 South 17th Street, Suite 107
Ames, Iowa 50010
Phone: (515) 233-0000
FAX: (515) 233-0103

GENERAL CONSTRUCTION NOTES

1. Confirm location and depth of all existing utilities prior to construction to eliminate conflicts. Locations of underground utilities are provided by utility companies. Owner and Engineer do not guarantee correctness of alignments shown. Call 1-800-292-8989 for utility locations 48 hours prior to digging. It shall be the duty of the Contractor to ascertain whether any additional facilities other than those shown on the plans may be present. The Contractor shall immediately notify the Engineer of any potential conflicts. Utilities damaged or broken by the Contractor's operations shall be repaired at no additional cost to the Owner.
2. Utility Warning: The Utilities shown have been located from field survey information and/or records obtained. The Engineer makes no guarantee that the utilities shown comprise all such utilities in the area, either in service or abandoned. The Engineer further does not warrant that the utilities shown are in the exact location indicated. Verify location of all utilities before construction.
3. Existing utility facilities such as utility poles underground conduit, guy wires, underground carrier pipe, and service lines shall be relocated, removed or adjusted by the respective utility companies. All utility work does not appear on the plans. Coordination with utility companies for the location and access for relocation of their lines shall be the responsibility of the Contractor.
4. Any and all discrepancies shall be reported to the Engineer immediately. All quantities are for Contractor convenience. Where conflicts occur, drawings shall prevail.
5. All Bench Mark elevations are to NAVD 88 datum and are to be provided by FOX Engineering.
6. Removal of existing features shall be considered incidental to other items of work on the project if not outlined specifically as a bid item. Contractor shall legally and properly dispose of all materials removed as part of this project.
7. The contractor shall take care not to remove or damage public or private property not marked for removal on the plan. Items not scheduled for removal shall be replaced at no cost to the Owner if removed or damaged.
8. The cost incurred when a section of removal is skipped or where paving is done in sections in order to maintain access to adjacent properties shall be incidental to the project. Contractor shall maintain access to residences at all times, unless noted otherwise on the plans.
9. The contractor is cautioned not to obstruct or remove unnecessary pavement or to disturb the existing traffic pattern more than necessary for the proper execution of work.
10. The means of the work and the safety of the Contractor's employees are solely the responsibility of the Contractor. The Contractor has a contractual obligation to comply with all applicable laws and regulations including those of OSHA. At no time will either the Owner or the Owner's representative take responsibility for either the means of the work or the safety of the contractor's employees.
11. The contractor shall be responsible for protection of existing valves, fire hydrants, manholes, trees, poles, guys, and existing facilities.
12. Contractor will not be compensated for any quantity over-runs unless prior approval is obtained from the engineer.
13. Any work required to complete the scope of the project as specified or shown on the plans, but not set forth as a specific bid item shall be considered incidental to the project.
14. Construction fence is required around all unattended open excavations. Fence shall be constructed and maintained in an upright position at all times. Contractor shall use extreme caution while installing fence not to damage underground utilities. Temporary fencing is incidental to the work and is not a paid bid item.
15. All construction and tree protection fence shall be installed by the contractor and approved by owner prior to start of construction activities.
16. Care shall be taken when working around trees to prevent damage. The contractor shall minimize the operation of heavy equipment under the drip line of the trees not designated for removal.
17. All landscaping including trees, shrubs, bushes, and grass or turf not called out to be removed on the drawings shall be replaced if damaged during construction. Where trees, bushes, and shrubs are not protected, or are otherwise destroyed or damaged by the contractor, the trees, bushes, and shrubs shall be replaced with new plants of the same variety and size as the plant damaged or destroyed. Where grass or turf is destroyed or damaged during construction, the surface shall be restored to the condition that existed prior to construction.
18. Contractor shall be responsible for a licensed surveyor resetting any monuments, property corners, et. disturbed by construction. The Contractor is responsible for preservation and/or replacement of property pins damaged or removed by construction.
19. All disturbed areas shall be restored in accordance with the specifications.
20. Construction activities are to be limited to the existing right-of-way, easements, and work limits as shown on plans. If additional areas are needed for staging, storage, etc. it is the contractors' responsibility to obtain written permission from the property owner(s). Copies of the agreements shall be submitted to the owner's representative prior to use of the property.
21. All roadways and drives shall be kept open at all times unless noted otherwise in the plans. The contractor must perform the work in a manner that will maintain uninterrupted vehicular and pedestrian traffic.
22. Where a section of pavement, curb, and gutter or sidewalk is cut or otherwise damaged by contractor, the entire section shall be removed and replaced. Pavement, curbs, gutters, and sidewalks shall be removed to the nearest joint (A minimum of two feet beyond the edge of the trench cut). Contractor and owner's representative are to document (or Photograph) all cracked PCC pavement or damaged ACC pavement prior to construction. If new cracks in PCC pavement develop or ACC pavement is damaged due to construction traffic (extends beyond construction limits). Contractor shall replace damaged area at no additional cost to the owner.
23. Site cleanup shall be performed on a daily basis. Public roadways shall be kept clean at all times.

GENERAL UTILITY NOTES

Coordinate all utility connections. Wherever possible, sewer mains shall be laid at least 10 feet, horizontally, from any existing or new waterline main. Should local conditions prevent a lateral separation of 10 feet, the sewer line may be laid as close as 6 feet provided that the line is in a separate trench and the top of the sewer line is installed at least 18 inches below the bottom of the waterline.

Water line and building sewer laterals shall be separated by undisturbed or compacted earth. Water service and building sewer shall not be placed in the same trench unless the bottom of the water service at all points is a min. of 12 inches above the top of the highest point of the sewer; and the water service line is placed on a solid shelf excavated at one side of the common trench.

Underground utilities shall be installed in trenches with bedding as per SUDAS specifications, and as indicated on the plans and details.

All utility work shall be visually observed by the City prior to backfilling trenches, with all deficiencies corrected by the Contractor. The Contractor shall be responsible for notification of appropriate officials prior to commencement of work.

Final acceptance shall not be made until all work shown on approved utility plans is completed included grading, and all required adjustments and shall be subject to approval by the City.

UTILITY NOTES

1. It shall be the contractor's responsibility to contact each utility's operating authority and schedule joint meet locates. The contractor shall verify with each utility's operating authority that locates have been performed. Iowa one call system: 1-800-292-8989. The contractor shall protect all existing utilities. The contractor shall work to explore and verify the location or elevation of all utilities at least 100 feet in advance of the excavation work. In the event that a utility is discovered that was not shown on the drawings or a substantial deviation in location or elevation of a known utility exists, the contractor shall report it to the owner's representative as soon as discovered. It is the contractor's responsibility to repair all damaged utilities that have been located properly.
2. Notify utility companies whose facilities are shown on the plans or known to be within construction limits of the schedule prior to each stage of construction.
3. The contractor shall be responsible for the coordination of existing utilities as required for the improvements and shall coordinate temporary disruption of service with the City of Washington and affected utility company.
4. Shoring is incidental to utility installation. Shoring for utility installation may not be shown on the plans. It is the contractor's responsibility to ascertain if shoring is needed in addition to what is shown on the drawings based on the owner's requirements for vegetation, structure, and paving protection. It is the contractor's responsibility to plan all shoring, submit design of shoring prepared by and sealed by a licensed engineer to the owner and FOX Engineering for review prior to installation. No additional compensation will be provided from the owner for shoring or shoring design.
5. All pipes must be temporarily capped overnight with water tight fittings.
6. Coordinate all utility outages with owner of utility. Phase work to meet utility outage and project schedule requirements. Provide a 3 day notice to owner and engineer of any utility outage.
7. The contractor is responsible to furnish and install all utilities unless specifically indicated to be installed by others.
8. Contractor shall use extreme caution when working within the vicinity of the high pressure gas mains. A natural gas representative shall be contacted prior to excavating within 100-feet of the utilities. Heavy wheeled or track driven equipment shall not be allowed to operate over the gas pipelines unless otherwise approved by the natural gas utility.

TESTING INFORMATION

1. Soils compaction testing and pavement testing will be the responsibility of the Owner. Contractor shall coordinate all testing with the Owner's testing representative.

SITE RESTORATION & GRADING NOTES

1. All disturbed areas shall be final graded in preparation for seeding.
2. Seed all disturbed areas. See restoration plans for seeding limits. Seed all disturbed areas prior to May 31. If additional areas are disturbed beyond May 31 the remainder of the permanent seeding will be allowed to be planted between August 10 and September 30. Contractor shall install temporary type 4 seed mix on disturbed areas between May 31 and August 10. Contractor must maintain SWPPP and erosion control until final restoration is complete.
3. Site to be graded to match existing unless otherwise stated in the plans. Grading shall be done in a manner which maintains positive site drainage at all times. Fulfillment of the grading requirements will be at the owner's discretion.
4. Adjust all new and existing valves, hydrants, castings, pull boxes, etc to match the finished elevations indicated on the plans. All rim elevations within paved surfaces shall be adjusted to match finished paving.

WORK TO BE COMPLETED PRIOR TO CONSTRUCTION:

Joint utility locate meeting. Contractor shall set up a One-Call meeting.

Preconstruction meeting with the Contractor, the Engineer, City, utilities and other parties that may have interest in the construction. Contractor shall complete exploratory digging and/or potholing at all potential utility conflict locations prior to beginning construction.

COORDINATION REQUIREMENTS

Any conflicts between Contractors, subcontractors, City, utilities or others may be reconciled by the Engineer/ Owner.

WORK BY PUBLIC UTILITIES

Work by public utilities shall be coordinated by the Contractor. This shall include, but not be limited to, the relocation of overhead power lines, telephone lines, fiber optic lines, cable, etc.

LAND FOR CONSTRUCTION PURPOSES

Contractor will be permitted to use available land belonging to or leased by the Owner, on or near the site of the Work, for construction purposes and for the storage of materials and equipment. The location and extent of the areas available to the Contractor shall be as indicated on the Drawings. Any additional right-of-way desired by the Contractor shall be acquired at their expense, and the Contractor shall hold harmless the Owner and Engineer from claims for damages made by the owners of such additional right-of-way. Disturbed areas shall be restored upon final project completion. Refer to plan sheets for restoration plan.

SITE ACCESS

All construction access shall be from available public access areas as shown on the plans. No construction traffic shall be allowed through residential areas unless otherwise indicated on the plans.

NOTICES

Contractor shall notify owners of adjacent properties and utilities when prosecution of the Work may affect them. When it is necessary to temporarily deny access by owners or tenants to their property, or when any utility service connection must be interrupted, the Contractor shall give notices sufficiently in advance to enable the affected persons to provide for their needs. Notices whether given orally or in writing shall include appropriate information concerning the interruption and instruction on how to limit their inconvenience.

LINES AND GRADES

All Work shall be done to the lines, grades, and elevations indicated on the Drawings. Survey and staking shall be completed the the owner's representative. The Contractor shall verify all match points during the phasing of the work and maintain drainage paths during the work to prevent ponding of water.

CONNECTIONS TO EXISTING FACILITIES

Unless otherwise specified or indicated, Contractor shall make all necessary connections to existing facilities, including structures, drainlines, and utilities such as water, sanitary sewer, gas, telecommunications, storm sewer and electric. In each case, Contractor shall receive permission from Owner or the owning utility prior to undertaking connections. Contractor shall protect facilities against deleterious substances and damage.

Connections to existing facilities, which are in service, shall be thoroughly planned in advance, and all required equipment, materials, and labor shall be on hand at the time of undertaking the connections. Work shall proceed continuously if necessary to complete connections in the minimum time possible. Operations of valves, hydrants, or other appurtenances on existing utilities, when required, shall be by or under the direct supervision of the owning utility.

UNFAVORABLE CONSTRUCTION CONDITIONS

During unfavorable weather, wet ground, or other unsuitable construction conditions, the Contractor shall confine his operations to work, which will not be affected adversely by such conditions. No portion of the Work shall be constructed under conditions, which would affect adversely the quality or efficiency thereof, unless special means or precautions are taken by the Contractor to perform the work in a proper and satisfactory manner.

CLEAN UP

Contractor shall keep the premises occupied by the Contractor free from accumulations of waste materials and rubbish at all times. Contractor shall provide separate recycling and trash receptacles about the work site, promptly empty containers when filled, and properly dispose of waste materials at his expense. Waste shall not be buried or burned on the site or disposed of in trenches, storm drains, sewer, streams, or waterways.

Construction materials such as forms and scaffolding shall be neatly stacked by Contractor when not in use. Contractor shall promptly remove splattered concrete, asphalt, oil, paint, corrosive liquids, and cleaning solutions from surfaces to prevent marring or other damage.

DETERMINATION OF QUANTITIES

See bid item descriptions. The Contractor may request a digital copy of the plans by calling John Washington at FOX Engineering at 515-233-0000. The Engineer does not assume any liability for providing the digital drawing to the Contractor.

SITE EROSION NOTES

Silt fencing should be constructed as shown on the plans. Additional silt fencing shall be installed if field conditions dictate, or as directed by the Owner or Engineer.

Seed, fertilize, and mulch all disturbed areas. Temporary seeding mixture for areas that will not be disturbed for 14 days or greater shall be seeded as per SUDAS.

Outside the normal fall seeding window, temporary erosion control measures shall be placed and maintained until seeding can begin. Silt fence shall be maintained weekly. Dispose of accumulated sediment and silt. See Pollution Prevention Plan Sheet for additional information.

ITEM NO.	BID ITEMS AND QUANTITIES	UNIT	QUANTITY	RECORD QUANTITY
	DIVISION 1 - GENERAL			
1.01	MOBILIZATION	LS	1	
1.02	TRAFFIC CONTROL	LS	1	
	DIVISION 2 - EARTHWORK			
2.01	CLEARING AND GRUBBING	LS	1	
2.02	TOPSOIL, FURNISH AND SPREAD	CY	550	
2.03	EXCAVATION, CLASS 10 / EMBANKMENT	CY	1,500	
2.04	SUBGRADE PREPARATION, 12-INCH	SY	4,542	
2.05	MODIFIED SUBBASE, 6-INCH	SY	4,542	
2.06	GRANULAR SURFACING - TEMPORARY	LS	1	
2.07	GRANULAR SURFACING - PERMANENT	TON	50	
2.08	REMOVAL OF PIPE, EXISTING STORM SEWER	LF	250	
2.09	COMPACTION TESTING	LS	1	
	DIVISION 3 - TRENCH AND TRENCHLESS CONSTRUCTION			
3.01	TRENCH FOUNDATION	TON	200	
3.02	REPLACEMENT OF UNSUITABLE BACKFILL MATERIAL	CY	200	
3.03	GROUTING EXISTING UTILITIES	CY	225	
	DIVISION 4 - SEWERS AND DRAINS			
4.01	STORM SEWER, TRENCHED, 18-INCH, AS SUBDRAIN	LF	248	
4.02	STORM SEWER, TRENCHED, 21-INCH, AS SUBDRAIN	LF	97	
4.03	STORM SEWER, TRENCHED, 12-INCH	LF	65	
4.04	STORM SEWER, TRENCHED, 15-INCH	LF	93	
4.05	STORM SEWER, TRENCHED, 18-INCH	LF	170	
4.06	STORM SEWER, TRENCHED, 21-INCH	LF	360	
4.07	STORM SEWER, TRENCHED, 24-INCH	LF	131	
4.08	STORM SEWER, TRENCHED, 30-INCH	LF	415	
4.09	STORM SEWER, CONNECT TO EXISTING STRUCTURE	EA	2	
4.10	SANITARY SEWER SERVICE REPLACEMENT, 4-INCH	LF	500	
4.11	SANITARY SEWER SERVICE CONNECTION	EA	15	
4.12	SANITARY SEWER, GRAVITY, TRENCHED, 24-INCH	LF	778	
4.13	SANITARY SEWER, CONNECT TO EXISTING STRUCTURE	EA	2	
4.14	SANITARY SEWER, TESTING	LS	1	
4.15	SUBDRAIN, 4-INCH	LF	935	
4.16	SUBDRAIN CLEANOUT, 8-INCH DIAMETER	EA	7	
	DIVISION 5 - WATER MAIN AND APPURTENANCES			
5.01	WATER MAIN, CONNECT TO EXISTING	EA	2	
5.02	WATER MAIN LOWERING	EA	4	
5.03	WATER MAIN TAP FOR SERVICE	EA	15	
5.04	WATER SERVICE	LF	500	
5.05	WATER SERVICE CURB STOP	EA	15	
5.06	WATER MAIN PIPE, 10-INCH	LF	1,640	
5.07	RESILIENT WEDGE GATE VALVE, 10-INCH	EA	7	
5.08	FIRE HYDRANT ASSEMBLY	EA	3	
5.09	WATER MAIN TESTING AND DISINFECTION	LS	1	
5.10	TEMPORARY MAIN AND WATER SERVICE CONNECTION	LS	1	
	DIVISION 6 - STRUCTURES FOR SANITARY AND STORM SEWERS			
6.01	STORM SEWER MANHOLE, SW-401, 48-INCH	EA	9	
6.02	INTAKE, SW-501	EA	8	
6.03	INTAKE, SW-511	EA	2	
6.04	SANITARY SEWER MANHOLE, SW-301, 48-INCH	EA	1	
6.05	SANITARY SEWER MANHOLE, SW-301, 60-INCH	EA	2	
6.06	SANITARY SEWER MANHOLE, SW-303, 60-INCH	EA	1	
6.07	REMOVE EXISTING SANITARY MANHOLE	EA	3	
	DIVISION 7 - PAVEMENT AND APPURTENANCES			
7.01	PCC PAVING, 7.5-INCH, MAINLINE	SY	4,089	
7.02	PCC PAVING COMMERCIAL/ALLEY, 7-INCH	SY	325	
7.03	PCC PAVING RESIDENTIAL, 6-INCH	SY	210	
7.04	PCC SIDEWALK, 5-INCH	SY	1,628	
7.05	HMA ASPHALT PAVING, 5-INCH, LOW TRAFFIC (LT)	SY	472	
7.06	REMOVAL OF PAVEMENT, MAINLINE	SY	4,350	
7.07	REMOVAL OF PAVEMENT, SIDEWALK/ALLEY/DRIVEWAY/PARKING	SY	1,553	
7.08	PAINTED PAVEMENT MARKINGS	LS	1	
7.09	SIGNAGE	LS	1	
7.10	PCC PAVEMENT SAMPLES AND TESTING	LS	1	
7.11	DETECTABLE WARNING	SF	364	
	DIVISION 8 - TRAFFIC SIGNALS (NOT USED)			
	DIVISION 9 - SITE WORK AND LANDSCAPING			
9.01	SEEDING, FERTILIZING, AND MULCHING - TYPE 1	AC	3	
9.02	STABILIZED CONSTRUCTION ENTRANCE	SY	180	
9.03	MOWING/TRIMMING	AC	3	
9.04	TEMPORARY SEEDING AND MULCHING	AC	3	
9.05	SILT FENCE, INSTALL & REMOVE	LF	300	
9.06	FILTER SOCK	LF	1,500	
9.07	INTAKE PROTECTION, DROP-IN	EA	13	

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ESTIMATE REFERENCE INFORMATION

Item Code	Unit	Description
		SPECIFICATIONS ALL WORK SHALL BE IN ACCORDANCE WITH THE CURRENT IOWA STATEWIDE URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS PLUS ANY SUPPLEMENTAL ADDENDUM, SPECIAL PROVISIONS, OR MODIFICATIONS PREPARED AS MODIFIED BY THESE PLANS AND SPECIFICATIONS BY FOX ENGINEERING. ANY REFERENCE TO IDOT SPECIFICATIONS SHALL BE THE IOWA DEPARTMENT OF TRANSPORTATION ENGLISH STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2009 AND ALL APPROPRIATE SUPPLEMENTAL SPECIFICATIONS.
BID ITEM NO.	**UNIT**	**BID ITEMS AND DESCRIPTIONS:**
		DIVISION 1 - GENERAL
1.01	**LS**	**MOBILIZATION** Mobilization shall consist of preparatory work and operations for all items under the contract, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; bonds and insurance; equipment and product storage; and for the establishment of all offices, buildings, and other facilities which must be performed or costs incurred prior to beginning of work on the various items on the project site. This item shall include demobilization costs and all work required for phasing of construction that is not called out for the measurement and payment under other items of work. Payment shall be lump sum and progress payments shall be as per Section 1090, 1.05 of SUDAS.
1.02	**LS**	**TRAFFIC CONTROL** Site access to construct the utilities and roadway shall be from public right-of-ways and easements as shown on the drawings. Work limits are shown on the plans and shall not be modified for any reason unless directed by the Engineer. The Contractor shall maintain access to specific locations and properties as indicated on the plans. Maintaining access to properties shall consist of grading the site and providing temporary surfacing where necessary. This item includes full compensation for furnishing and maintaining all materials, labor and equipment necessary to control traffic for the duration of the project. Temporary rock surfacing for transitioning grades between stages and for stabilization of grade is included under another item of construction. This item includes furnishing, storing, installing, maintaining, moving, relocating, and removing all traffic control devices including barricades, drums, channelizers, diverters, lights, standard signs, flaggers, uniformed officers, temporary pavement markings, and safety fence. Traffic Control and Staging shall comply with the current edition (including supplements and revisions) of the Manual on Uniform Traffic Control Devices (MUTCD) and plan details as well as the Iowa DOT. Payment for this item is lump sum.
		DIVISION 2 - EARTHWORK
2.01	**LS**	**CLEARING AND GRUBBING** This item includes all equipment, labor and materials necessary for removal of existing vegetation necessary for construction of the project as per the plans. In the event that tree removal is necessary, backfilling and seeding the rootball excavation will be necessary. All cleared vegetation, trees and brush shall become the property of the Contractor and shall be disposed of off-site at a location determined by the Contractor and approved by the Engineer and meeting the requirements of the City and County. Replacement of trees removed or damaged outside of the construction limits shall be replaced in-kind and considered incidental to this bid item. Payment shall be lump sum.
2.02	**CY**	**TOPSOIL, FURNISH AND SPREAD** This item consists of the furnishing, hauling and placement of clean black topsoil or compost-amended topsoil in order to achieve a total topsoil depth of 6-inches for areas disturbed by construction and within the construction limits (outside of pavement areas). Off-site topsoil shall meet the requirements of SUDAS 2010 2.01 C. If good topsoil (in the opinion of the Engineer) is available on-site, it shall be used in the place of this item (reducing this quantity accordingly). The Engineer has provided the Contractor an estimated quantity in order to establish a unit price. Measurement shall be per cubic yard of topsoil as determined by truck tickets or another method as determined prior to construction. Areas beyond the work limits that necessitate topsoil shall not be measured and shall be paid for at the Contractor's expense.
2.03	**CY**	**EXCAVATION, CLASS 10 / EMBANKMENT** Per SUDAS 2010, this item includes onsite excavation and embankment as indicated on the plans. Over excavation as indicated on the plans is incidental to this item although over excavation quantity is not included in the quantity for this item. The Contractor is responsible for determining their own quantities. A digital version of the plan may be obtained from FOX Engineering. Payment is plan quantity, meaning that the contractor will be paid for the Engineer's estimated amount. The contractor will not be paid for any excavation, over excavation, or embankment required for the project in excess of the Engineers estimated amount. Any rock encountered during excavation shall be removed incidental to the cost of excavation. Embankment shall be executed per SUDAS guidelines. For cohesive soils in critical backfill areas (under or near pavement) compaction shall be 95% standard proctor. For cohesionless soils in critical backfill areas (under or near pavement) compaction shall be 98% standard proctor.
2.04	**SY**	**SUBGRADE PREPARATION, 12-INCH** Work shall be as per SUDAS, except the depth of scarification is a minimum of 12-inches and shall be completed in 2 lifts. The prepared subgrade shall be compaction tested to 95% of maximum standard proctor density with a moisture content of 0-4% above optimum moisture. Subgrade preparation shall be done for all mainline and side street paving plus 2-feet on each side except as described herein. Subgrade preparation for driveways, sidewalks, and temporary pavement shall not be included in this item as it is included in other items of work. Payment is per square yard of preparation area.
2.05	**SY**	**MODIFIED SUBBASE, 6-INCH** Per SUDAS, work includes furnishing, placing, compacting, and trimming to the proper grade modified subbase under all mainline and side street paving plus 2-feet on each side. Material shall comply with Iowa DOT Specifications Section 4123 except crushed PCC is not an approved material. The Engineer may authorize a change in gradation, subject to materials available locally at time of construction. Measurement is per square yard. Payment is per square yard.
2.06	**LS**	**GRANULAR SURFACING - TEMPORARY** Work includes placement of Class A Roadstone or Modified Subbase (or approved equal) at 6-inch nominal thickness for transitioning between construction phases, temporary access roads, temporary driveways, temporary utility crossings and temporary pedestrian access as indicated on the plans. Topsoil strip, salvage and respread for these temporary areas is incidental to this item. Seeding of areas disturbed by addition of roadstone for this item shall be paid for with another item. Granular surfacing shall be disposed of off-site or reused as directed by the Engineer in existing gravel surface areas. After completion of work, Contractor shall remove all rock, debris, and all other construction related disturbances and return the area to the condition prior to construction. Final grading shall include eliminating all soil lumps larger than 2-inches, removal of all rock and debris, and preparation surface for planting and shall be considered incidental. All grading, soil import/placement, compaction, drainage pipe, temporary fencing, and removal and disposal of entrance materials after construction shall be considered incidental. It will be the Contractor's responsibility to determine how much rock will be needed during construction. It is in the Contractor's best interest to reuse temporary rock as much as possible. Payment is Lump Sum.

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Item Code	Unit	Description
2.07	**TON**	**GRANULAR SURFACING - PERMANENT** Work includes placement of Class A Roadstone or Modified Subbase (or approved equal) as directed by the Engineer for proposed gravel driveways, field entrances, shoulders, etc. Granular material shall be placed and compacted at a nominal thickness of 6-inches. The Engineer has provided the Contractor an estimated quantity in order to establish a unit price. Payment is per ton of granular surfacing placed as directed by the Engineer and as measured in the field and evidenced by truck tickets (less any stone delivered and stockpiled but not used).
2.08	**LF**	**REMOVAL OF PIPE, EXISTING STORM SEWER** Per SUDAS, removal of existing pipe item shall include bypassing flows as necessary. The Contractor is responsible for disposal of the removed material. On-site disposal is NOT allowed. This item applies to all storm sewer and culvert pipe indicated on the plans to be removed and shall include any minor items such as aprons or rip rap removal associated with the removed pipe. Payment for this item shall be per linear foot of pipe removed.
2.09	**LS**	**COMPACTION TESTING** Per Section 3010 of SUDAS. The Contractor is responsible for compaction testing performed by an independent testing laboratory. Contractor shall complete compaction testing periodically during the construction process prior to completion of backfill operations. The Contractor will be responsible for payments associated with all retesting resulting from failure of initial tests. Engineer shall be notified immediately when conditions exist that prohibit proper trench compaction. It will be necessary for the Contractor to rework, recompact and retest as necessary until specified compaction and moisture content is achieved in all areas of the trench. The Engineer may require retesting as deemed necessary. Payment shall be lump sum.
		DIVISION 3 - TRENCH AND TRENCHLESS CONSTRUCTION
3.01	**TON**	**TRENCH FOUNDATION** Per SUDAS Section 3010. This item consists of the removal (core-out) and disposal of over-excavated material required to stabilize trench foundation; and furnishing, hauling, and placing stabilization material where the unstable condition of the trench bottom so demands. A sufficient thickness of foundation material shall be placed to provide stable bedding for the pipe. Trench foundation required to correct unauthorized over-excavation will not be measured. The Engineer has provided the Contractor an estimated quantity in order to establish a unit price and shall be paid as determined during construction and approved by the Engineer. Payment shall be per ton furnished and placed as evidenced by weight tickets (less any rock delivered and stockpiled but not used) and as approved by the Engineer.
3.02	**CY**	**REPLACEMENT OF UNSUITABLE BACKFILL MATERIAL** Per SUDAS Section 3010. This item shall include all equipment, labor and materials necessary for furnishing, hauling, and placing fill, and granular backfill material required to replace unsuitable backfill encountered during trench excavation. If suitable backfill is used, the material shall extend the full trench width, from the elevation necessary to replace the unsuitable excavated material to the top of the secondary backfill. Included under this item is the replacement of any and all unsuitable rock excavation material (as defined by SUDAS). Contractor shall provide an estimated density for volume to weight calculation to use during construction. The Engineer has provided the Contractor an estimated quantity in order to establish a unit price. Payment for suitable backfill shall be based on the actual cubic yards of material placed in the trench as evidenced by delivery tickets and as measured by the Engineer less any material delivered and stockpiled but not used.
3.03	**CY**	**GROUTING EXISTING UTILITIES** Per SUDAS Section 3010. Sanitary sewer abandonment (and other abandoned utilities) as indicated on the plans shall be filled with grout. This item shall include all equipment, labor, and materials to provide concrete fill material (CLSM) of the existing sanitary sewer (and other abandoned utilities) to be abandoned. Material specifications shall be submitted to the Engineer and shall be a minimum of 50 to 100 psi backfill material with Type 'C' fly ash. The flowable fill shall be installed as to completely fill pipe a minimum of 1 foot above the top of the pipe as evidenced by temporary vent tubes on each end of the fill area. Contractor shall verify all connections to the existing sanitary sewer by whatever means necessary prior to filling to verify no connections are active. The Engineer has provided the Contractor an estimated quantity in order to establish a unit price and shall be paid as the quantity used during construction and approved by the Engineer. Payment shall be per cubic yard of CLSM placed as indicated by truck tickets and approved by the Engineer.
		DIVISION 4 - SEWERS AND DRAINS
4.01	**LF**	**STORM SEWER, TRENCHED, 18-INCH, AS SUBDRAIN** Per SUDAS 4020, item includes, but is not limited to, trench excavation, dewatering, furnishing bedding and backfill material, placing bedding and backfill material, fittings, pipe, pipe joints, pipe connections, testing, and inspection. Pipe material shall be per SUDAS Section 4020 2.01 A, RCP with fabric wrapped joints. All storm sewer identified "as subdrain" in pipe tabulation, shall be backfilled with 1-inch clean bedding material from 4" below the bottom of the pipe to the bottom of the modified subbase for the roadway or as otherwise indicated in the plans in order for the storm sewer to function as a subdrain (incidental to this item). The pipe bedding, haunch support, and primary backfill shall be compacted in 6-inch lifts using mechanical vibrating methods or knifing to achieve a minimum of 75% relative density. This item is measured in linear feet along the centerline of the pipe from center of intake or manhole to center of intake or manhole. Where the end of the pipe discharges to a ditch or waterway, measurement will be to the end of the pipe, exclusive of aprons. Lengths of elbows and tees will be included in the length of pipe measured. The final trench backfill shall be compacted to at least 95% (grass areas) and 98% (paved areas) Standard Proctor Density. Payment is per lineal foot.
4.02	**LF**	**STORM SEWER, TRENCHED, 21-INCH, AS SUBDRAIN** Same as item 4.01
4.03	**LF**	**STORM SEWER, TRENCHED, 12-INCH** As per Section 4020 of SUDAS. This item shall include all equipment, labor, and materials necessary to place Class III RCP. Item includes trench excavation, dewatering, furnishing and placing bedding and backfill material, joint wrapping, connectors, and testing. Televising of storm sewer for pipe runs greater than 40-feet is required per City of Grimes standard notes. All joints shall be fabric wrapped unless otherwise indicated on the plans. Dewatering, bypass pumping or other means of handling of storm water flows during construction are incidental to this item. Payment for this item shall be per linear foot of pipe installed.
4.04	**LF**	**STORM SEWER, TRENCHED, 15-INCH** Same as item 4.03
4.05	**LF**	**STORM SEWER, TRENCHED, 18-INCH** Same as item 4.03

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Item Code	Unit	Description
4.06	**LF**	**STORM SEWER, TRENCHED, 21-INCH** Same as item 4.03
4.07	**LF**	**STORM SEWER, TRENCHED, 24-INCH** Same as item 4.03
4.08	**LF**	**STORM SEWER, TRENCHED, 30-INCH** Same as item 4.03
4.09	**EA**	**STORM SEWER, CONNECT TO EXISTING STRUCTURE** Per SUDAS, this item includes connection of proposed storm sewer to existing storm sewer structure and shall include core drilling and grouting new storm sewer pipe into existing structure and adjustment of existing invert as necessary. Payment is for each connection of existing storm sewer to existing structure.
4.10	**LF**	**SANITARY SEWER SERVICE REPLACEMENT, 4-INCH** Per SUDAS 4010. This item includes all equipment, labor, and materials necessary for removal of existing sanitary sewer services between the right of way and the existing sewer main and replacement with new 4-inch SDR 23.5 (minimum) between the right of way and the new main. Street removal/replacement shall be to the limits as indicated on the plan in the area of work and shall be paid for under other items of construction. Temporary granular surfacing (another bid item) will be required where existing pavement is removed so that N 4th Ave. can remain open after the service replacement takes place but before the paving phase begins. Where existing services are in conflict with proposed storm sewer, new services shall be lowered to go under the proposed storm sewer as per the details on the plans. Lowering of sanitary service and any fittings required to do so shall be incidental to this item. Contractor shall investigate (incidental to this item) each service shown on the plans and listed in the "sanitary service replacement table" and replace unless otherwise directed by the Engineer. Connection to sewer main and to existing service is a separate bid item. Payment shall be per linear foot of sanitary sewer service installed.
4.11	**EA**	**SANITARY SEWER SERVICE CONNECTION** This item includes all equipment, labor, and materials necessary for connection of a newly installed 4-inch sanitary sewer service (another item of construction) to the existing sanitary sewer service and new sewer main. Connection to new main shall be made by utilizing a wye fitting, inserta tee, or other Engineer Approved equal. Means of connection shall be specifically for the pipe materials being connected. Connection of the new service to the existing service near the right of way shall be made with a non-shear coupling. Payment shall be per each connected service consisting of a connection on each end.
4.12	**LF**	**SANITARY SEWER, GRAVITY, TRENCHED, 24-INCH** Per SUDAS 4010. This item shall include all equipment, labor, and materials necessary to place sanitary sewer. Item includes trench excavation, dewatering, furnishing and placing bedding and backfill material and connectors. Materials may be those allowed by SUDAS, excluding, VCP, DIP, and RCP, however, pipe materials may be Triple Wall Polypropylene Pipe (PP). Waterstops as per SW-105 are required every 800-feet. Payment is per linear foot.
4.13	**EA**	**SANITARY SEWER, CONNECT TO EXISTING STRUCTURE** Per SUDAS, this item includes connection of proposed sanitary sewer to existing sanitary sewer structure and shall include core drilling and grouting new sanitary sewer pipe into existing structure and adjustment of existing invert as necessary. Payment is for each connection of existing sanitary sewer to existing structure.
4.14	**LS**	**SANITARY SEWER, TESTING** This item includes testing of all sanitary sewers and manholes as required by the City of Washington. Engineer/Owner representative shall be present at the time of testing. Two copies of the CCTV video and reports shall be made available to the City after project is completed. Payment is lump sum.
4.15	**LF**	**SUBDRAIN, 4-INCH** All subdrains shall be per the details on the plans. Pipe shall be PVC and have a smooth interior and a corrugated exterior. Item includes connections to intakes, pipe and porous backfill per the details. Connections to intakes include pipe, non-shrink grout, coupling bands, fittings and rodent guards. Engineering fabric is not required. Slots shall be placed in the down orientation. Payment is per lineal foot of subdrain installed as measured at the centerline of the pipe.
4.16	**EA**	**SUBDRAIN CLEANOUT, 8-INCH DIAMETER** Cleanouts shall be SUDAS Type A-1. Payment is per each cleanout installed.
		DIVISION 5 - WATER MAIN AND APPURTENANCES
5.01	**EA**	**WATER MAIN, CONNECT TO EXISTING** Per SUDAS, this item shall include all equipment, labor, and materials necessary to connect to the existing water main. This item shall include any necessary additional fittings (bends and reducer) in order to connect the existing water main to the proposed water main. Complete the work in accordance with the plans and specifications and any special provisions included in the Contract Documents. Payment shall be for each water main connection to existing.
5.02	**EA**	**WATER MAIN LOWERING** This item includes lowering of water main where necessary to avoid conflict with proposed storm sewer. All materials, labor and coordination required are incidental to this item. Tracer wire shall be relocated and spliced if necessary. Storm sewer pipe shall be non-perforated and shall have gasketed joints within 10-feet of the water main crossing. Vertical clearance shall be 18-inch unless directed otherwise by the Engineer. Payment for this item is for each water main lowering completed.
5.03	**EA**	**WATER MAIN TAP FOR SERVICE** This item includes the installation of new water main tap at locations to be determined by the engineer or owner during construction. Payment for this item is per each water main tap installed. The Engineer has provided the Contractor a quantity in order to establish a unit price.

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5.04	LF	**WATER SERVICE** This item includes adjustment or replacement of existing water service to be determined by the engineer or owner during construction. Payment for this item is per lineal foot of service pipe length installed. Pipe material and size shall match existing. The Engineer has provided the Contractor a quantity in order to establish a unit price.
5.05	EA	**WATER SERVICE CURB STOP** This item includes the installation of new water service curb stop at locations to be determined by the engineer or owner during construction. Payment for this item is per each curb stop installed. The Engineer has provided the Contractor a quantity in order to establish a unit price.
5.06	LF	**WATER MAIN PIPE, 10-INCH** Per SUDAS. All pipe material shall be AWWA C900/C905 PVC DR18 or Class 350 DIP according to AWWA C151. DIP shall be polyethylene encased (incidental). Backfill shall be Class P-1 for pressure pipe trench bedding (see detail SW-104). Bedding shall be considered incidental. Excavation, bedding, backfill, tracer wire w/accessories, tracer wire stations, restrained joints, tees, bends, fittings, and caps shall be considered incidental. Fittings, restrained joints, and/or thrust blocking shall be considered incidental. Restrained joints shall be installed according to the restrained pipe length as indicated on the plans. Stabilization rock and/or special backfill if necessary is paid for under a separate item. Testing is paid for under a separate item. Payment shall be per linear foot of pipe installed.
5.07	EA	**RESILIENT WEDGE GATE VALVE, 10-INCH** This item shall include all equipment, labor, and materials necessary to construct resilient wedge gate valves as per SUDAS 5020 and as described below. This item shall include, but it not limited to, all appurtenances attached to the valve or required for its complete installation, including underground or above ground operator, square valve operation nut (2-inch), valve box alignment device, valve box and cover, stem extensions, and fittings. Water main valves shall be open counterclockwise (CCW). All gate valves shall be Waterous or equal. Epoxy coated resilient wedge type with O-ring seals and (SS) stainless steel bolts. (If valves are deeper than a six-foot bury, they shall have (SS pin) pinned extension operators). Over five foot of depth a three piece variable valve box will be required. Both valve box types shall have a drop in lid marked WATER. Valves in pavement shall have slide type shaft extensions. Tops of valve boxes shall be placed 1/2-inch below the pavement surface. Tops of valve boxes shall match existing grade and provide enough adjustment to reach proposed grade if proposed grade is not yet constructed. Payment is per each valve installed.
5.08	EA	**FIRE HYDRANT ASSEMBLY** Per SUDAS 5020, unit price includes, but is not limited to, the fire hydrant, barrel extensions sufficient to achieve proper bury depth of anchoring pipe and height of fire hydrant above finished grade, and components to connect the fire hydrant to the water main, including anchoring pipe, fittings, thrust blocks, pea gravel or porous backfill material, and fire hydrant gate valve and appurtenances. Hydrant type shall be per city standards. Payment is per assembly installed.
5.09	LS	**WATER MAIN TESTING AND DISINFECTION** This item includes all work and materials for testing and disinfection of new water mains as per SUDAS 5030. Bacteria testing and sampling shall be the responsibility of the contractor and coordinated with the City of Washington. Testing pressure shall be at 150 psi. All testing must be witnessed by City (or representative) before it will be accepted. The water for initial testing will be free to the contractor, the contractor shall pay for water required if any retesting is necessary. Payment shall be lump sum.
5.10	LS	**TEMPORARY MAIN AND WATER SERVICE CONNECTION** Need to determine if this is necessary/preferred.
		DIVISION 6 - STRUCTURES FOR SANITARY AND STORM SEWERS
6.01	EA	**STORM SEWER MANHOLE, SW-401, 48-INCH** As per Section 6010 of SUDAS, this item includes all equipment, labor, and materials necessary to construct a storm sewer manhole structure. Unit price includes, but is not limited to, excavation, placing bedding and backfill material, compaction, base, structural concrete, reinforcing steel, precast units (if used), castings, grates, adjustment rings, designed connections, grouting, collars, soil removal/disposal. Steps are not required. Payment is per each constructed manhole.
6.02	EA	**INTAKE, SW-501** As per Section 6010 of SUDAS, this item includes all equipment, labor, and materials necessary to construct an intake storm sewer structure. Unit price includes, but is not limited to, excavation, placing bedding and backfill material, compaction, base, structural concrete, reinforcing steel, precast units (if used), castings, grates, adjustment rings, designed connections, grouting, collars, soil removal/disposal. Steps are not required. Payment is per each constructed intake.
6.03	EA	**INTAKE, SW-511** Same as item 6.02 except SW-511
6.04	EA	**SANITARY SEWER MANHOLE, SW-301, 48-INCH** Per SUDAS 6010. All manholes shall be Type SW-301. All manholes shall be exterior coated with bituminous waterproofing. All manholes shall have steps. Manhole adjustment rings shall only be reinforced concrete. The manhole infiltration barrier shall only be Heat Shrink Sleeve. Manhole bases shall be of sized to resist uplift forces due to buoyancy (extended bases shall be incidental). All manholes greater than 15-ft in depth shall be 12-inch (minimum) extended bases. Payment shall be per each manhole.
6.05	EA	**SANITARY SEWER MANHOLE, SW-301, 60-INCH** Same as item 6.05 except 60-inch diameter
6.06	EA	**SANITARY SEWER MANHOLE, SW-303, 60-INCH** Same as item 6.05 except SW-303 and 60-inch diameter
6.07	EA	**REMOVE EXISTING SANITARY MANHOLE** Item includes removal of existing sanitary sewer manhole as indicated on the plans. Removed manhole shall become the property of the contractor and shall be properly disposed of at an approved offsite location. Payment is per each sanitary manhole removed.

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Item Code	Unit	Description
		DIVISION 7 - PAVEMENT AND APPURTENANCES
7.01	SY	**PCC PAVING, 7.5-INCH, MAINLINE** This item is for placement of PCC mainline paving and adjacent side streets as indicated on the drawings. Modulus of Rupture for cured concrete shall meet or exceed 600 psi as determined by beam tests (paid for under testing item). Joints shall be as indicated on the plans and as per SUDAS. All mainline PCC pavement is underlain by modified subbase and subgrade preparation which are paid for under other items. Mainline paving shall be completed with a slipform paver or laser screed. Handwork is allowed for boxouts and for areas approved by the Engineer prior to the bid. Boxouts are required for manholes in paving. See plans for details on types of joints around boxouts. Surface curing and temperature protection covering are incidental to this bid item. Sawcutting shall be completed by a wet saw or early saw method unless approved by Engineer. The slurry shall be removed from the pavement prior to drying. The slurry cannot be discharged into the sanitary or storm sewer and shall be the contractors disposal responsibility. Adjustment or removal of valve boxes is incidental to this item. Payment for this item is per SY of pavement placed. Incentive for Smoothness will NOT be awarded for this project. However, in lieu of the 10-ft straightedge test, a profilograph (calibrated accordingly) shall be used to detect bumps and dips. Contractor shall retain independent testing lab for purpose of profilograph bump and dip detection. Areas showing high spots of more than 1/4 of an inch in 10 feet will be marked. Complete surface corrections according to the procedures in Iowa DOT Section 2316 to an elevation where the area or spot will not show surface deviations in excess of 1/8 inch when tested with a 10 foot straightedge. Surface corrections will be completed at the direction of the Engineer with no additional cost to the owner. Thickness cores shall be taken as per SUDAS (PCC samples & testing item). Contractor shall provide on-grade lab (air, slump, beams and cylinders). Note the target air content shall be 8.0%, with a tolerance of plus or minus 2.0% when measured on the grade just prior to consolidation. Air content for non-machine placed paving shall be 7.0% plus or minus 1.5%. Air targets shall be as per current Iowa DOT Specifications. Target air content may be adjusted by the Engineer based on random tests of the consolidated concrete behind the paving machine. Work includes stamping of curb (top & face) with letter irons to mark location of sanitary service, water service, and sump service (to be done during paving). City will supply stamps.
7.02	SY	**PCC PAVING COMMERCIAL/ALLEY, 7-INCH** This item is for paving of new commercial driveways and alley approaches. This item also applies to driveway extensions beyond the back of sidewalk where indicated on the plans. 6-inch subgrade prep (scarify and recompact) is required and is incidental to this item. Payment for this item is per SY placed.
7.03	SY	**PCC PAVING RESIDENTIAL, 6-INCH** Per SUDAS Figure 7030.101, Type A w/flares. Sidewalk joints should be carried through driveways (incidental). This item also applies to driveway extensions beyond the back of sidewalk where indicated on the plans. 6-inch subgrade prep (scarify and recompact) is required and is incidental to this item. Payment is per SY of residential driveway placed.
7.04	SY	**PCC SIDEWALK, 5-INCH** Per SUDAS. Item is for sidewalk pavement along streets and also for those sidewalks that lead into private properties from the street sidewalks as indicated on the plans. Concrete mix design shall be Class C mix. Coarse aggregate shall be Class 3 durability. Testing for sidewalk is not required. The Engineer must approve jointing patterns selected by the Contractor. 6-inch subgrade prep (scarify and recompact) is required and is incidental to this item. Payment for this item is per SY of sidewalk placed.
7.05	SY	**HMA ASPHALT PAVING, 5-INCH, LOW TRAFFIC (LT)** Per Section 7020 of SUDAS, this item shall include all equipment, labor, and materials necessary for placement of 5-inch HMA. Payment is per SY.
7.06	SY	**REMOVAL OF PAVEMENT, MAINLINE** Existing pavement thickness is variable depth HMA/sealcoat and brick. Fluctuations in pavement depth will not be paid for as extra and shall be included within this item. Pavement removal boundary shall be as shown on the plans. Small deviations in removal limits are allowed based on field determined existing joint line locations as approved by Engineer. All removals will require a vertical, full-depth, clean sawcut joints where proposed paving will abut existing pavement. Removal of valve boxes within existing mainline paving as noted on the plans, is incidental to this item and shall include the removal and disposal of the top valve box section or sections within the proposed subgrade preparation depth. Saw cutting at all removal limits shall be considered incidental. It will be the contractors responsibility to protect remaining pavement beyond removal limits. If additional pavement is damaged beyond these limits by the contractor, removal and replacement of this damaged paving will be the contractors responsibility. It is in the Contractor's best interest to "double sawcut" to reduce amount of total pavement removal. The Contractor is responsible for disposal of the removed material at a site located by Contractor and approved by the Engineer. On-site disposal is NOT allowed. The Contractor shall not stockpile pavement rubble or unsuitable backfill material on the site for disposal at a later date. Payment for this item is per SY of pavement removed.
7.07	SY	**REMOVAL OF PAVEMENT, SIDEWALK/ALLEY/DRIVEWAY/PARKING** Same as item 7.06. Sawcut to nearest jointline.
7.08	LS	**PAINTED PAVEMENT MARKINGS** This item shall include all equipment, labor, and materials necessary to furnish and apply pavement markings as indicated on the plans. Grooving of pavement prior to applying pavement markings shall be as indicated on the plans and is incidental to this item. Payment shall be Lump Sum
7.09	LS	**SIGNAGE** This item shall include all equipment, labor, and materials necessary to furnish and apply signage as indicated on the plans. Payment shall be Lump Sum
7.10	LS	**PCC PAVEMENT SAMPLES AND TESTING** This item includes all air, slump, cylinders (6-inch), beams, thickness, and smoothness testing required per Section 7010 of SUDAS. Note that Contractor is ultimately responsible for ALL materials certifications and testing as listed in Table 7010.02 within said specifications section. Payment for this item is lump sum.

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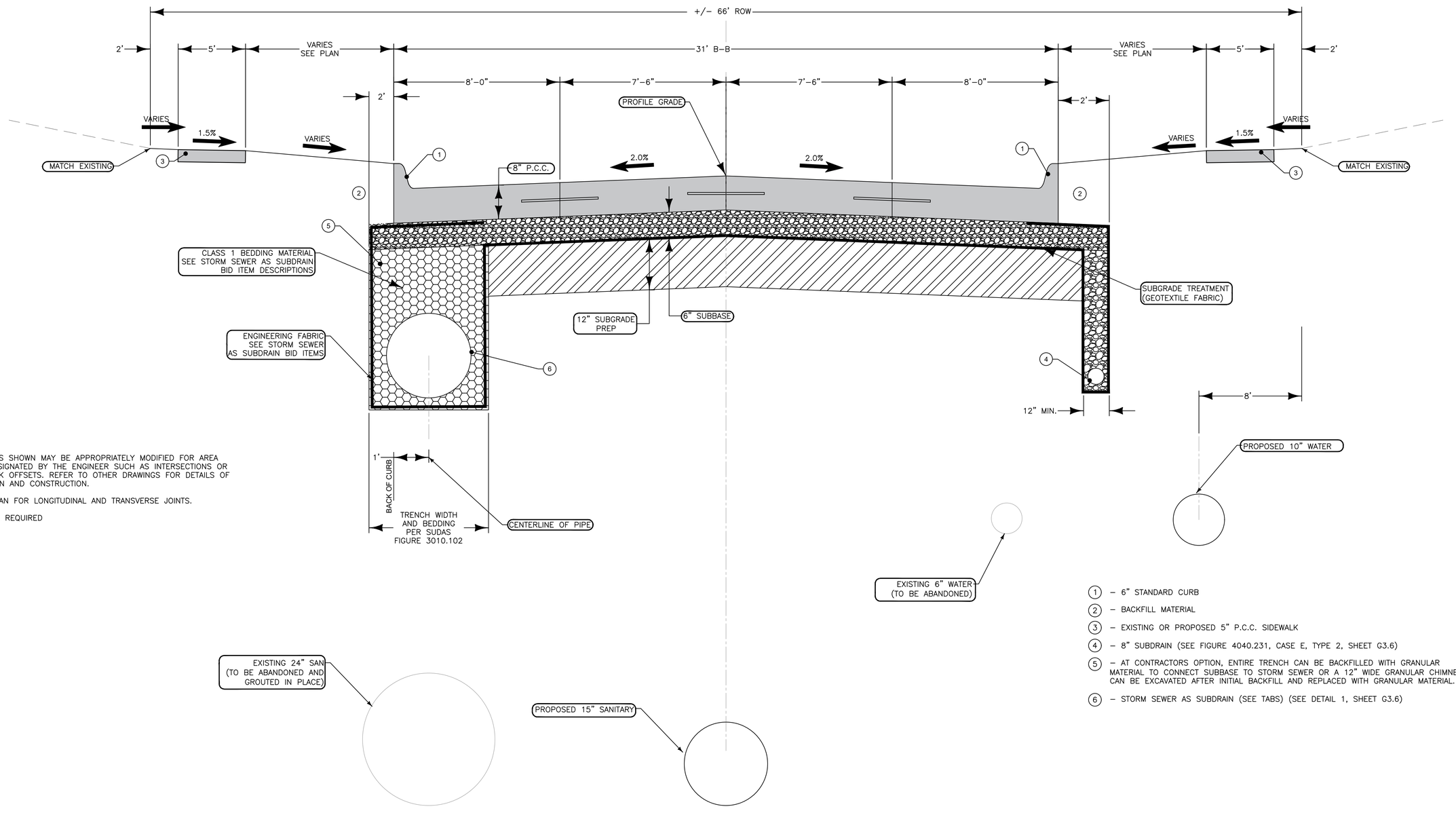
7.11	SF	**DETECTABLE WARNING** Detectable warnings panels shall be Armor-Tile, cast in place. City shall select color. Item shall be installed per manufacturer's recommendations. Payment for this item is per SF installed.
		DIVISION 8 - TRAFFIC SIGNALS (NOT USED)
		DIVISION 9 - SITE WORK AND LANDSCAPING
9.01	AC	**SEEDING, FERTILIZING, AND MULCHING - TYPE 1** Per SUDAS 9010. This item applies to the seed bed preparation, conventional seeding, fertilizing, and hydro mulching of all areas as indicated on plans, details, and as directed by the Engineer). The seed mixture shall be urban seed mix Type 1. PRIOR to seeding, the Engineer shall observe that all disturbed areas were left in a prepared seedbed condition. The seed shall be placed conventionally on the finished seedbed, and then hydro mulched using a wood cellulose mulch. Full coverage of the soil surface is required. The Contractor shall water all seeded areas for a minimum of 21 days. After 21 days, the responsibility of watering belongs to the property owner. Mowing is under a separate bid item. Work includes removal of rock and other debris from the area, repairing rills and washes, preparing the seedbed, furnishing and placing seed, including any treatment required including furnishing and placing fertilizer and mulch. Seed bed shall be prepared so that all rocks larger than 1/2-inch and all lumps larger than one inch are removed. Complete the work in accordance with the plans and these technical specifications and any special provisions included in the Contract Documents. Areas outside of construction limits or easement limits will not be measured for payment unless prior approval is provided by the Engineer. Payment for this item is per acre or part thereof as measured in the field.
9.02	SY	**STABILIZED CONSTRUCTION ENTRANCE** Per SUDAS 9040. Work under this item shall include the installation of a stabilized construction entrance. Complete the work in accordance with the plans and specifications and any special provisions included in the Contract Documents. Payment shall be per square yard installed as measured in the field.
9.03	AC	**MOWING/TRIMMING** This item shall include mowing and trimming of seeded areas as directed by the Engineer/Owner. Mowing shall be by finish mower or equal, clippings need not be collected but shall be cleared from hard surfaces. Trimming around all posts, outlets, curbs, or other surface features shall be incidental to this item. The Engineer has provided the Contractor an estimated quantity in order to establish a unit price. Payment shall be per acre or part thereof, mowing and trimming as measured in the field and as directed by the Owner or Engineer.
9.04	AC	**TEMPORARY SEEDING AND MULCHING** Per SUDAS 9010. This item applies to temporary seeding and mulching of all disturbed areas due to construction within the grading limits of the project as directed by the Owner/Engineer. Seeding shall be Type 4. Complete the work in accordance with the plans and specifications and any special provisions included in the Contract Documents. Mulch may be applied by Conventional or hydraulic methods. The Engineer has provided the Contractor an estimated quantity in order to establish a unit price. Payment shall be per acre of temporary seeding and mulching as measured in the field.
9.05	LF	**SILT FENCE, INSTALL & REMOVE** Per SUDAS 9040, item as per the Storm Water Pollution Prevention Plan (SWPPP), and the plans. The Contractor shall maintain the silt fence until the City has accepted all work and the site has been seeded and fully stabilized. Cleaning and removal of silt fence shall be considered incidental and shall be completed as required by the SWPPP and as directed by the Engineer. Any silt fence damaged during construction shall be replaced by the contractor at no additional cost to the owner. Payment for this item is per LF of silt fence installed.
9.06	LF	**FILTER SOCK** Same as item 9.05 except filter sock. The Engineer has provided the Contractor an estimated quantity in order to establish a unit price. Place as directed by the Engineer/Owner.
9.07	EA	**INTAKE PROTECTION, DROP-IN** Item is for installation, maintenance, and removal of drop-in intake protection as per SUDAS and the Storm Water Pollution Prevention Plan (SWPPP). Intake protection shall be kept in place and maintained until ground cover is fully established in the opinion of the Engineer. Payment for this item is per each intake protection installed. Removal of intake protection is required and incidental to this item.

FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103



NOTES:

- NORMAL SECTIONS SHOWN MAY BE APPROPRIATELY MODIFIED FOR AREA SPECIFICALLY DESIGNATED BY THE ENGINEER SUCH AS INTERSECTIONS OR SPECIAL SIDEWALK OFFSETS. REFER TO OTHER DRAWINGS FOR DETAILS OF SHOULDER DESIGN AND CONSTRUCTION.
- SEE JOINTING PLAN FOR LONGITUDINAL AND TRANSVERSE JOINTS.
- CD BASKETS ARE REQUIRED

1 – 6" STANDARD CURB

2 – BACKFILL MATERIAL

3 – EXISTING OR PROPOSED 5" P.C.C. SIDEWALK

4 – 8" SUBDRAIN (SEE FIGURE 4040.231, CASE E, TYPE 2, SHEET G3.6)

5 – AT CONTRACTORS OPTION, ENTIRE TRENCH CAN BE BACKFILLED WITH GRANULAR MATERIAL TO CONNECT SUBBASE TO STORM SEWER OR A 12" WIDE GRANULAR CHIMNEY CAN BE EXCAVATED AFTER INITIAL BACKFILL AND REPLACED WITH GRANULAR MATERIAL.

6 – STORM SEWER AS SUBDRAIN (SEE TABS) (SEE DETAIL 1, SHEET G3.6)

1 TYPICAL ROADWAY CROSS SECTION

NTS

LOCATION		
ROAD IDENTIFICATION	STATION TO STATION	
N 4TH AVENUE	108+46.8	117+40.5

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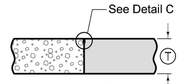
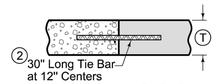
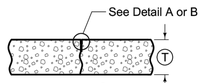
414 South 17th Street, Suite 107
Ames, Iowa 50010
Phone: (515) 233-0000
FAX: (515) 233-0103



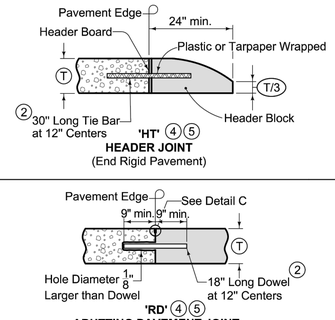
'B' ⑤
PLAIN JOINT
(Abutting Pavement Slabs)



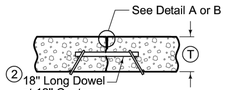
'DW' ③④⑦
DAY'S WORK JOINT(Non-working)



'C' ⑥
CONTRACTION JOINT

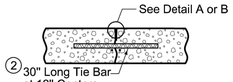


'HT' ④⑤
HEADER JOINT
(End Rigid Pavement)

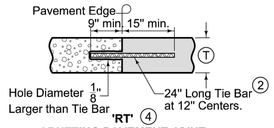


'CD' ①④⑥
DOWELED CONTRACTION JOINT

'RD' ④⑤
ABUTTING PAVEMENT JOINT



'CT' ④
TIED CONTRACTION JOINT



'RT' ④
ABUTTING PAVEMENT JOINT
RIGID TIE

① See dowel assemblies for fabrication details.

② See Bar Size Table for Contraction Joints on Sheet 2.

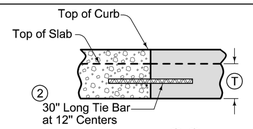
③ Locate 'DW' joint at a mid-panel location between future 'C' or 'CD' joints. Place no closer than 5 feet to a 'C' or 'CD' joint.

④ Place bars within the limits shown under dowel assemblies.

⑤ Edge with 1/8 inch tool for length of joint. For HT joint, remove header block and board when second slab is placed.

⑥ Unless specified otherwise, use 'CD' transverse contraction joints in mainline pavement when Ⓣ is greater or equal to 8 inches. Use 'C' joints when Ⓣ is less than 8 inches.

⑦ 'RT' joint may be used in lieu of 'DW' joint at the end of the days work. Remove any pavement damaged due to the drilling at no additional cost to the Contracting Authority.



'DW - CG' ③④
DAY'S WORK JOINT
CURB AND GUTTER UNIT

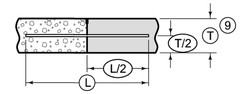
LEGEND
Existing Pavement
Proposed Pavement

SUDAS | IOWA DOT | REVISION 9 04-16-19
FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 | SHEET 1 of 8
REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.
SUDAS DIRECTOR | DESIGN METHODS ENGINEER

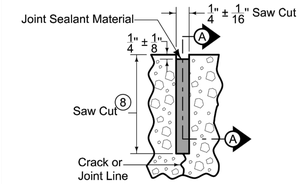
JOINTS

FIGURE 7010.101 | SHEET 1 OF 8

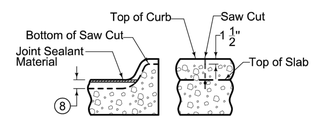
TRANSVERSE CONTRACTION



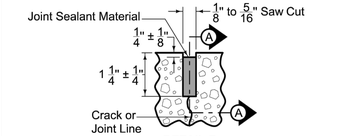
BAR PLACEMENT
(Applies to all joints unless otherwise detailed.)



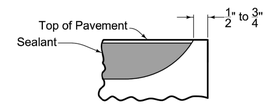
DETAIL A
(Saw cut formed by conventional concrete sawing equipment.)



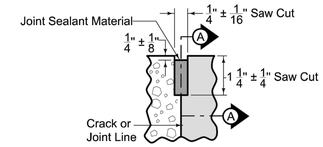
'C' JOINT IN CURB
(Match 'CT', 'CD', or 'C' joint in pavement.)



DETAIL B
(Saw cut formed by approved early concrete sawing equipment.)



SECTION A-A
(Detail at Edge of Pavement)



DETAIL C

⑧ Saw 'CD' joint to a depth of T/3 ± 1/4"; saw 'C' joint to a depth of T/4 ± 1/4".

⑨ When tying into old pavement, Ⓣ represents the depth of sound PCC.

BAR SIZE TABLE FOR CONTRACTION JOINTS			
Ⓣ	Solid Dowel Diameter	Tubular Dowel Diameter	Tie Bar Size
< 8"	3/4"	7/8"	#6
≥ 8" but < 10"	1 1/4"	1 3/8"	#10
≥ 10"	1 1/2"	1 5/8"	#11
Tubular Dowel Bars will not be allowed for RD joints.			

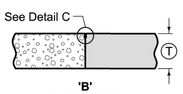
LEGEND
Existing Pavement
Proposed Pavement

SUDAS | IOWA DOT | REVISION 9 04-16-19
FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 | SHEET 2 of 8
REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.
SUDAS DIRECTOR | DESIGN METHODS ENGINEER

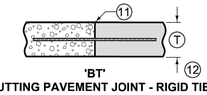
JOINTS

FIGURE 7010.101 | SHEET 2 OF 8

TRANSVERSE CONTRACTION

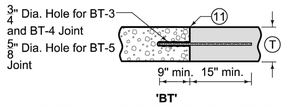


'B'
PLAIN JOINT
(Abutting Pavement Slabs)



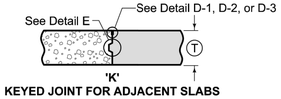
'BT'
ABUTTING PAVEMENT JOINT - RIGID TIE

Ⓣ	Joint	Bars	Bar Length and Spacing
< 8"	'BT-1'	#4	36" Long at 30" Centers
		#5	30" Long at 30" Centers
≥ 8"	'BT-2'	#5	36" Long at 30" Centers

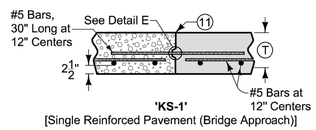


'BT'
ABUTTING PAVEMENT JOINT - RIGID TIE (Drilled)

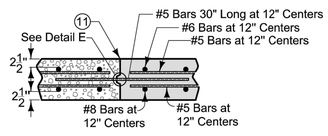
Ⓣ	Joint	Bars	Bar Length and Spacing
< 8"	'BT-5'	#4	24" Long at 30" Centers
≥ 8"	'BT-3'	#5	24" Long at 30" Centers
	'BT-4'		24" Long at 15" Centers



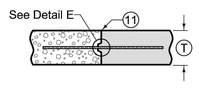
'K'
KEYED JOINT FOR ADJACENT SLABS
(Where T is 8" or more)



'KS-1'
[Single Reinforced Pavement (Bridge Approach)]



'KS-2'
[Double Reinforced Pavement (Bridge Approach)]



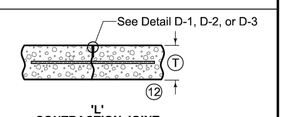
'KT' ⑩⑫
ABUTTING PAVEMENT JOINT - KEYWAY TIE

Ⓣ	Joint	Bars	Bar Length and Spacing
< 8"	'KT-1'	#4	30" Long at 30" Centers
≥ 8"	'KT-2'	#5	30" Long at 30" Centers
	'KT-3'		30" Long at 15" Centers

⑩ Bar supports may be necessary for fixed form paving to ensure the bar remains in a horizontal position in the plastic concrete.

⑪ Sawing or sealing of joint not required.

⑫ The following joints are interchangeable, subject to the pouring sequence:
'BT-1', 'L-1', and 'KT-1'
'KT-2' and 'L-2'
'KT-3' and 'L-3'



'L'
CONTRACTION JOINT

Ⓣ	Joint	Bars	Bar Length and Spacing
< 8"	'L-1'	#4	36" Long at 30" Centers
≥ 8"	'L-2'	#5	36" Long at 30" Centers
	'L-3'		36" Long at 15" Centers

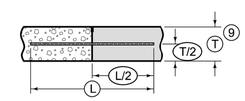
LEGEND
Existing Pavement
Proposed Pavement

SUDAS | IOWA DOT | REVISION 9 04-16-19
FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 | SHEET 3 of 8
REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.
SUDAS DIRECTOR | DESIGN METHODS ENGINEER

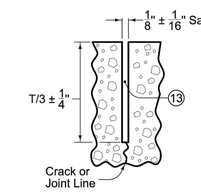
JOINTS

FIGURE 7010.101 | SHEET 3 OF 8

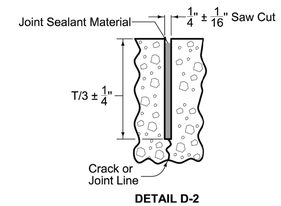
LONGITUDINAL CONTRACTION



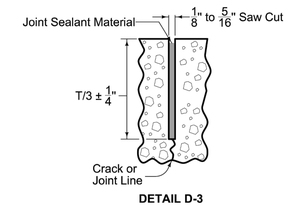
TIE BAR PLACEMENT
(Applies to all joints unless otherwise detailed.)



DETAIL D-1
(Required when specified in the contract documents.)



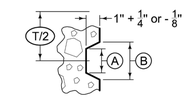
DETAIL D-2
(Required when the Department of Transportation is not the Contracting Authority, or when specified in the contract documents)



DETAIL D-3
(Required when the Department of Transportation is the Contracting Authority, or when specified in the contract documents)

⑨ When tying into old pavement, Ⓣ represents the depth of sound PCC.

⑬ Sealant or cleaning not required.



DETAIL E

KEYWAY DIMENSIONS			
Keyway Type	Pavement Thickness Ⓣ	Ⓐ	Ⓑ
Standard	8" or greater	1 3/4"	2 3/4"
Narrow	Less than 8"	1"	2"

LEGEND
Existing Pavement
Proposed Pavement

SUDAS | IOWA DOT | REVISION 9 04-16-19
FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 | SHEET 4 of 8
REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.
SUDAS DIRECTOR | DESIGN METHODS ENGINEER

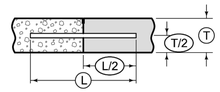
JOINTS

FIGURE 7010.101 | SHEET 4 OF 8

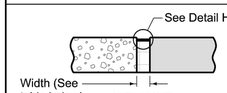
LONGITUDINAL CONTRACTION

G3.1	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	TYPICAL DETAILS N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	G3.1

DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\General\7114-19A Cover and Details.dwg : G3.1

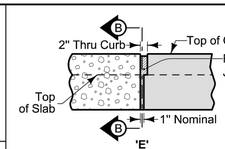


DOWEL PLACEMENT
(Applies to all joints unless otherwise detailed.)

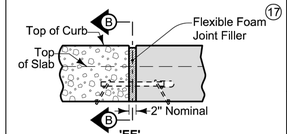


'CF' JOINT

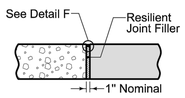
TYPE	WIDTH
CF-1	2"
CF-2	$2\frac{1}{2}$"
CF-3	3"
CF-4	$3\frac{1}{2}$"



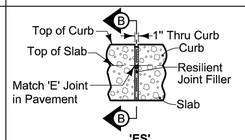
'E'
JOINT IN CURB
(View at Back of Curb)



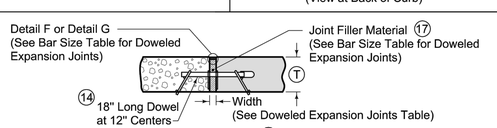
'EE'
JOINT IN CURB
(View at Back of Curb)



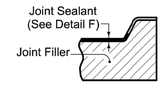
'E'
1" EXPANSION JOINT



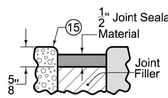
'ES'
JOINT IN CURB
(View at Back of Curb)



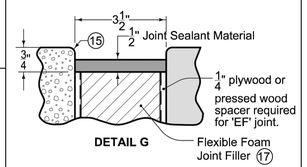
'ED', 'EE', 'EF' 16
DOWELED EXPANSION JOINT



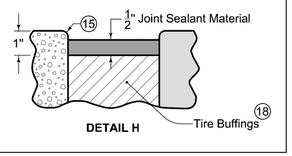
SECTION B-B



DETAIL F



DETAIL G



DETAIL H

EXPANSION

14 See Bar Size Table for Doweled Expansion Joints.

15 Edge with 1/4 inch tool for length of joint indicated if formed; edging not required when cut with diamond blade saw.

16 See Dowel Assemblies for fabrication details and placement limits. Coat the free end of dowel bar to prevent bond with pavement. At intake locations, dowel bars may be cast-in-place.

17 Predrill or preform holes in joint material for appropriate dowel size.

18 Compact tire buffings by spading with a square-nose shovel.

DOWELED EXPANSION JOINTS		
TYPE	WIDTH	FILLER MATERIAL 17
ED	1"	Resilient (Detail F)
EE	2"	Flexible Foam (Detail F)
EF	$3\frac{1}{2}$"	Flexible Foam (Detail G)

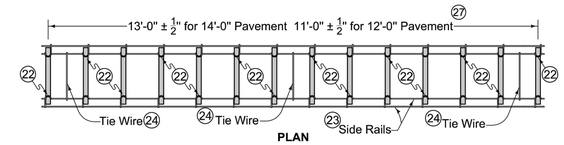
BAR SIZE TABLE FOR DOWELED EXPANSION JOINTS			
T	< 8"	≥ 8" but < 10"	≥ 10"
Dowel Diameter	$\frac{3}{4}$"	$1\frac{1}{4}$"	$1\frac{1}{2}$"
Tubular Dowel Bars will not be allowed for expansion joints.			

LEGEND
Existing Pavement
Proposed Pavement

SUDAS | IOWA DOT | REVISION 9 04-16-19
FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 | SHEET 5 of 8
REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.
SUDAS DIRECTOR | DESIGN METHODS ENGINEER
JOINTS

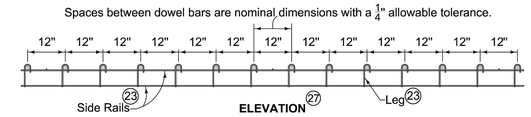
FIGURE 7010.101 SHEET 5 OF 8

CONTRACTION JOINTS

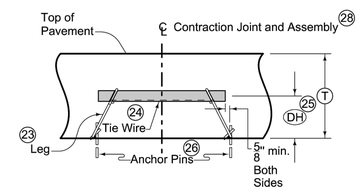


PLAN

Spaces between dowel bars are nominal dimensions with a $\frac{1}{4}$" allowable tolerance.



ELEVATION 27



LONGITUDINAL SECTION

DOWEL ASSEMBLIES 19 20 21

DOWEL HEIGHT AND DIAMETER FOR DOWELED CONTRACTION JOINTS			
T	DH 25	Diameter (Solid)	Diameter (Tubular)
7" to $7\frac{1}{2}$"	$3\frac{1}{2}$"	$\frac{3}{4}$"	$\frac{7}{8}$"
8" to $9\frac{1}{2}$"	$4\frac{1}{4}$"	$1\frac{1}{4}$"	$1\frac{3}{8}$"
10" to $11\frac{1}{2}$"	$5\frac{1}{4}$"	$1\frac{1}{2}$"	$1\frac{5}{8}$"
12" to 13"	$6\frac{1}{4}$"	$1\frac{1}{2}$"	$1\frac{5}{8}$"
Tubular Dowel Bars will not be allowed for RD joints.			

19 Use 18 inch long dowel bars with a tolerance of ± 1/8 inch. Ensure the centerlines of individual dowels are parallel to the other dowels in the assembly within ± 1/8 inch.

20 Use wires with a minimum tensile strength of 50 ksi.

21 Details apply to both transverse contraction and expansion joints.

22 Weld alternately throughout.

23 0.306 inch diameter wire. Wire sizes shown are the minimum required.

24 Maximum 0.177 inch diameter wire, welded or friction fit to upper side rail, both sides.

25 Measured from the centerline of dowel bar to bottom of lower side rail + 1/4 inch.

26 Per lane width, install a minimum of 8 anchor pins evenly spaced (4 per side), to prevent movement of assembly during construction. Anchor assemblies placed on pavement or PCC base with devices approved by the Engineer.

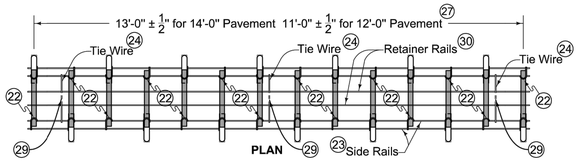
27 If dowel basket assemblies are required for curbed pavements, the assembly length is based on the jointing layout. See PV-101, sheet 8.

28 Ensure dowel basket assembly centerline is within 2 inches of the intended joint location longitudinally and has no more than 1/4 inch horizontal skew from end of basket to end of basket.

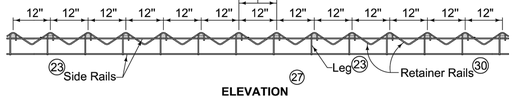
SUDAS | IOWA DOT | REVISION 9 04-16-19
FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 | SHEET 6 of 8
REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.
SUDAS DIRECTOR | DESIGN METHODS ENGINEER
JOINTS

FIGURE 7010.101 SHEET 6 OF 8

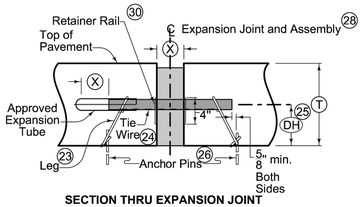
EXPANSION JOINTS



Spaces between dowel bars are nominal dimensions with a $\frac{1}{4}$" allowable tolerance.



ELEVATION



SECTION THRU EXPANSION JOINT

JOINT OPENING AND EXPANSION TUBE EXTENSION		
Joint Type	X	Minimum Tube Length
"ED"	1"	6"
"EE"	2"	7"
"EF"	$3\frac{1}{2}$"	9"

DOWEL HEIGHT AND DIAMETER FOR DOWELED EXPANSION JOINTS		
T	DH 25	Diameter
7" to $7\frac{1}{2}$"	$3\frac{1}{2}$"	$\frac{3}{4}$"
8" to $9\frac{1}{2}$"	$4\frac{1}{4}$"	$1\frac{1}{4}$"
10" to $11\frac{1}{2}$"	$5\frac{1}{4}$"	$1\frac{1}{2}$"
12" to 13"	$6\frac{1}{4}$"	$1\frac{1}{2}$"
Tubular Dowel Bars will not be allowed for expansion joints.		

DOWEL ASSEMBLIES 19 20 21

19 Use 18 inch long dowel bars with a tolerance of ± 1/8 inch. Ensure the centerlines of individual dowels are parallel to the other dowels in the assembly within ± 1/8 inch.

20 Use wires with a minimum tensile strength of 50 ksi.

21 Details apply to both transverse contraction and expansion joints.

22 Weld alternately throughout.

23 0.306 inch diameter wire. Wire sizes shown are the minimum required.

24 Maximum 0.177 inch diameter wire, welded or friction fit to upper side rail, both sides.

25 Measured from the centerline of dowel bar to bottom of lower side rail + 1/4 inch.

26 Per lane width, install a minimum of 8 anchor pins evenly spaced (4 per side), to prevent movement of assembly during construction. Anchor assemblies placed on pavement or PCC base with devices approved by the Engineer.

27 If dowel basket assemblies are required for curbed pavements, the assembly length is based on the jointing layout. See PV-101, sheet 8.

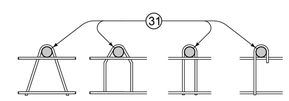
28 Ensure dowel basket assembly centerline is within 2 inches of the intended joint location longitudinally and has no more than 1/4 inch horizontal skew from end of basket to end of basket.

29 Clip and remove center portion of tie during field assembly.

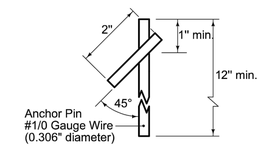
30 1/4 inch diameter wire.

SUDAS | IOWA DOT | REVISION 9 04-16-19
FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 | SHEET 7 of 8
REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.
SUDAS DIRECTOR | DESIGN METHODS ENGINEER
JOINTS

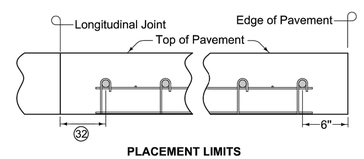
FIGURE 7010.101 SHEET 7 OF 8



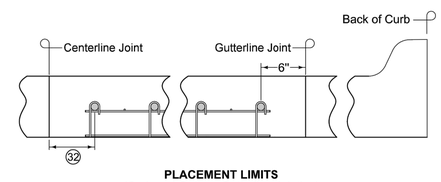
OPTIONAL LEG SHAPES



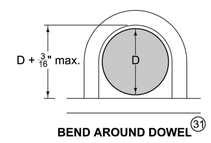
ANCHOR PIN



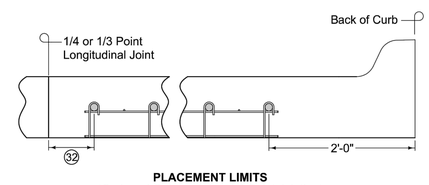
PLACEMENT LIMITS
(Rural Section)



PLACEMENT LIMITS
(Curb and Gutter - Gutterline Jointing)



BEND AROUND DOWEL 31



PLACEMENT LIMITS
(Curb and Gutter - 1/4 or 1/3 Point Jointing)

DOWEL ASSEMBLIES 19 20 21

19 Use 18 inch long dowel bars with a tolerance of ± 1/8 inch. Ensure the centerlines of individual dowels are parallel to the other dowels in the assembly within ± 1/8 inch.

20 Use wires with a minimum tensile strength of 50 ksi.

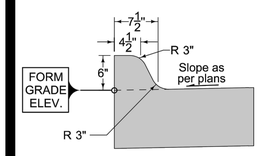
21 Details apply to both transverse contraction and expansion joints.

31 Diameter of bend around dowel is dowel diameter + 1/8 to 3/16 inches.

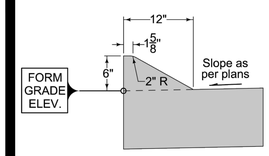
32 For uniform lane widths: 3" - 6". For taper and variable width pavements: 3" - 12".

SUDAS | IOWA DOT | REVISION 9 04-16-19
FIGURE 7010.101 | STANDARD ROAD PLAN | PV-101 | SHEET 8 of 8
REVISIONS: Added tubular dowel option to transverse contraction joints. Modified circle note 2. Added new circle note 14 and renumbered remaining notes.
SUDAS DIRECTOR | DESIGN METHODS ENGINEER
JOINTS

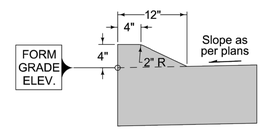
FIGURE 7010.101 SHEET 8 OF 8



6" STANDARD CURB



6" SLOPED CURB



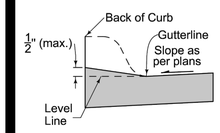
4" SLOPED CURB

For joint details, see PV-101.

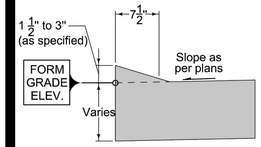
① 6" Standard Curb, 6" Sloped Curb, or 4" Sloped Curb as specified.

② 1/8" if Proposed Pavement is HMA. No elevation difference if Proposed Pavement is PCC.

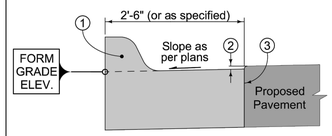
③ 'BT' , 'KT', or 'L' joint if Proposed Pavement is PCC. 'B' joint if Proposed Pavement is HMA.



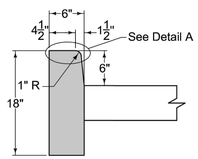
DROP CURB AT SIDEWALK



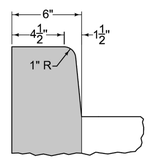
DRIVEWAY DROP CURB



CURB AND GUTTER UNIT



BEAM CURB*
*For short replacement sections, match existing curb profile



DETAIL A

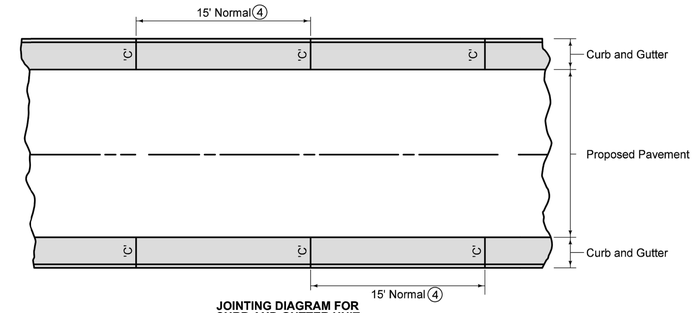
FIGURE 7010.102 | SHEET 1 OF 2

SUDAS	IOWA DOT	REVISION 4 10-18-16
FIGURE 7010.102	STANDARD ROAD PLAN	PV-102 SHEET 1 of 2

REVISIONS: Added note, 'Slope as per plans' on Drop Curb views on page 1. Updated DOT logo to new version.

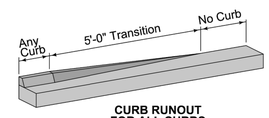
SUDAS DIRECTOR — DESIGN METHODS ENGINEER

PCC CURB DETAILS

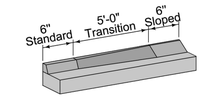


JOINTING DIAGRAM FOR CURB AND GUTTER UNIT

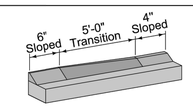
④ If proposed pavement is PCC, match joint spacing for proposed pavement. Place 'E' joints in curb and gutter section where expansion joints are to be placed in proposed pavement.



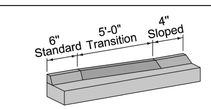
CURB RUNOUT FOR ALL CURBS



CURB TRANSITION FROM 6" STANDARD TO 6" SLOPED



CURB TRANSITION FROM 6" SLOPED TO 4" SLOPED



CURB TRANSITION FROM 6" STANDARD TO 4" SLOPED

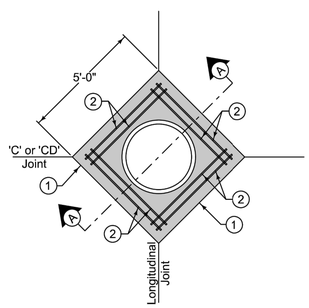
FIGURE 7010.102 | SHEET 2 OF 2

SUDAS	IOWA DOT	REVISION 4 10-18-16
FIGURE 7010.102	STANDARD ROAD PLAN	PV-102 SHEET 2 of 2

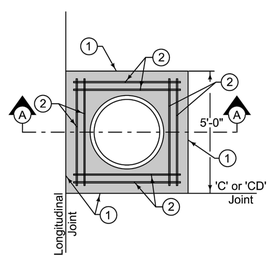
REVISIONS: Added note, 'Slope as per plans' on Drop Curb views on page 1. Updated DOT logo to new version.

SUDAS DIRECTOR — DESIGN METHODS ENGINEER

PCC CURB DETAILS



AT JOINT INTERSECTION



OFFSET AT JOINT INTERSECTION

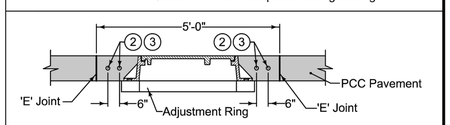
Construct boxout with Class C concrete or match pavement class. Minimum 2 inches clear on reinforcement. Center casting within boxout area.

① 'KT-1', 'KT-2', 'BT-1', or 'BT-2' joint if three-piece floating casting (SW 601 Type B and D or SW-602 Type F) is used. 'E' joint if two-piece fixed casting (SW 601 Type A and C or SW-602 Type E) is used.

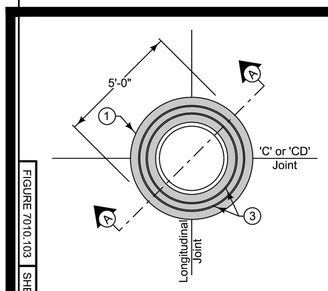
② 4 foot 8 inch (typ.) #4 bar. Place at mid-slab.

③ #4 hoops (variable length). Place at mid-slab.

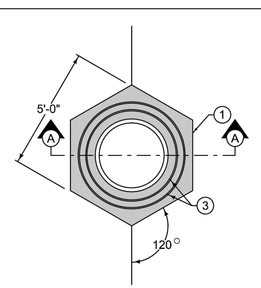
④ No boxout is required for three-piece floating castings (SW 601 Type B and D or SW-602 Type F). If a boxout is used with a three-piece casting, construct as detailed in Section A-A for three-piece floating casting.



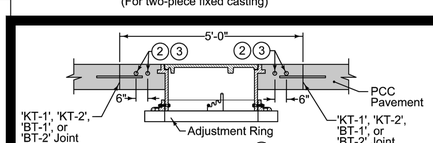
SECTION A-A
(For two-piece fixed casting)



CIRCULAR



AT A SINGLE JOINT



SECTION A-A ④
(For three-piece floating casting)

FIGURE 7010.103 | SHEET 1 OF 1

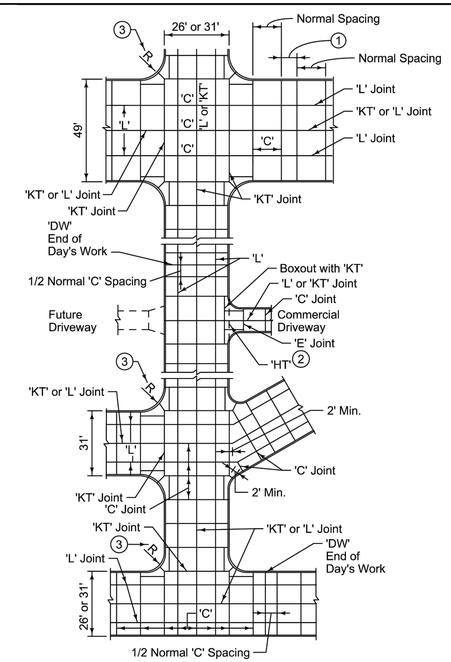
SUDAS	Iowa Department of Transportation	REVISION New 04-19-11
FIGURE 7010.103	STANDARD ROAD PLAN	PV-103 SHEET 1 of 1

REVISIONS: New. Joint Standard with SUDAS.

SUDAS DIRECTOR — DESIGN METHODS ENGINEER

MANHOLE BOXOUTS IN PCC PAVEMENT

FIGURE 7010.904 | SHEET 1 OF 1



PLAN VIEW

Refer to Figure 7010.901 for maximum transverse joint spacing.

Where new and existing pavements meet, and no existing dowels, tie bars, or keyed joints are present, provide a 'BT', 'RT', or 'RD' joint.

① Shorten jointing pattern on either side of openings to allow joints to intersect round castings and fall at the edges of intake boxouts.

② Where pavement abuts an unimproved street, terminate with a type 'HT' joint.

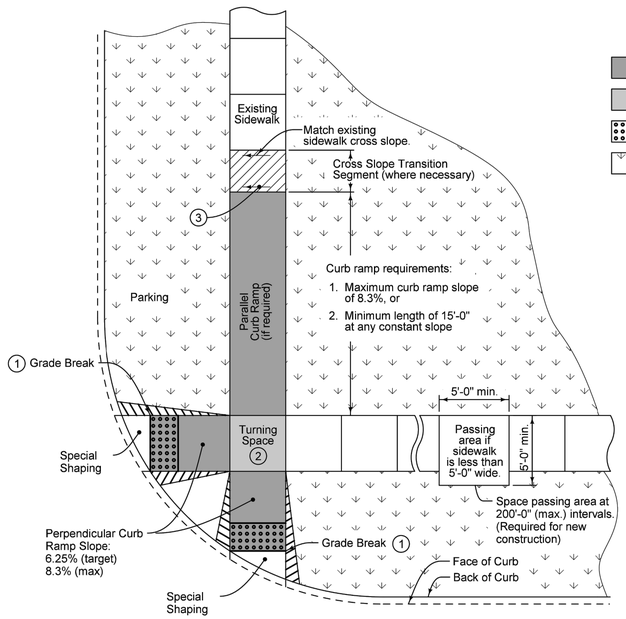
③ When radius exceed 20 feet, add one additional 'C' joint at radius intersections.

SUDAS	REVISION New 10-19-10
SUDAS Standard Specifications	7010.904 SHEET 1 of 1

TYPICAL JOINTING LAYOUT

G3.3	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	TYPICAL DETAILS N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	G3.3

DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\General\7114-19A Cover and Details.dwg : G3.3



Key

- Curb Ramp
- Turning Space
- Detectable Warning
- Grass

1. Match pedestrian street crossing slope, or flatter.
2. Minimum 4 feet by 4 feet. Target cross slope of 1.5% with a maximum cross slope of 2.0%.
3. Target cross slope of 1.5% with a maximum cross slope of 2.0%.

FIGURE 7030.204 SHEET 1 OF 1

SUDAS

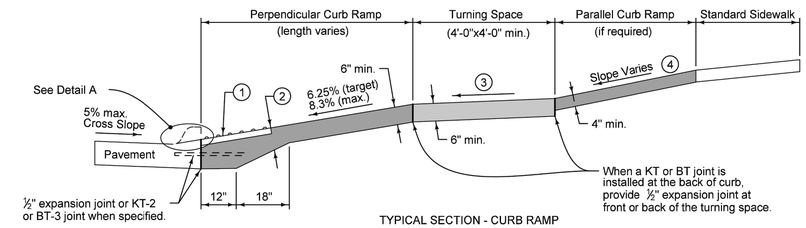
REVISION 3 10-20-15

7030.204

SHEET 1 of 1

SUDAS Standard Specifications

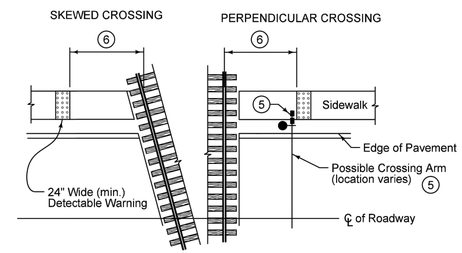
GENERAL FEATURES OF AN ACCESSIBLE SIDEWALK



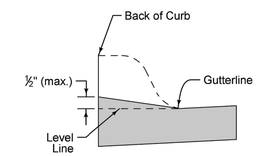
TYPICAL SECTION - CURB RAMP

Key

- Curb Ramp
- Turning Space
- Detectable warning



DETECTABLE WARNING LOCATION AT RAILROAD CROSSING



DETAIL A

1. Provide a minimum 2 foot width of detectable warning surfaces in the direction of pedestrian travel across the full width of the curb ramp or turning space, exclusive of curbs or flares.
2. Provide a minimum of 6 inches of concrete below the detectable warning panel.
3. Minimum 4 feet by 4 feet. Target cross slope of 1.5% with a maximum cross slope of 2.0%.
4. If normal sidewalk elevation cannot be achieved with the perpendicular ramp between the street and landing due to limited ramp length, provide a parallel ramp to make up the elevation difference between the landing and the standard sidewalk.

   The length of the parallel ramp is not required to exceed 15 feet, regardless of the resulting slope. Do not exceed 8.3% slope for parallel ramps shorter than 15 feet.
5. If crossing gate conflicts with location of detectable warning or if pedestrian crossing gate is provided, place detectable warning panel in advance of the crossing gate.
6. Locate front edge of detectable warning panel 12 to 15 feet from centerline of nearest rail. Orient truncated domes parallel to the direction of pedestrian travel.

FIGURE 7030.205 SHEET 1 OF 1

SUDAS

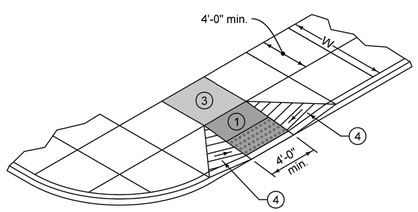
REVISION 1 10-20-15

7030.205

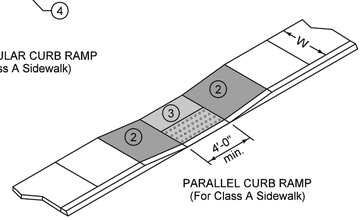
SHEET 1 of 1

SUDAS Standard Specifications

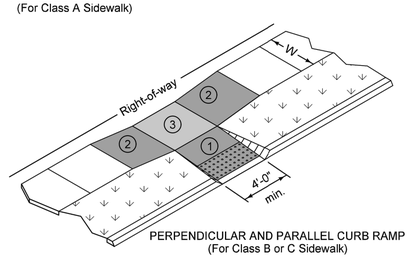
GENERAL SIDEWALK AND CURB RAMP DETAILS



PERPENDICULAR CURB RAMP
(For Class A Sidewalk)



PARALLEL CURB RAMP
(For Class A Sidewalk)



PERPENDICULAR AND PARALLEL CURB RAMP
(For Class B or C Sidewalk)

Key

- Curb Ramp
- Turning Space
- Detectable Warning

1. Perpendicular Curb Ramp: Target running slope of 6.25% with maximum running slope of 8.3%. Match pedestrian street crossing cross slope at back of curb. At mid-block crossings, cross slope may exceed 2.0% to match roadway grade.
2. Parallel Curb Ramp: Target cross slope of 1.5% with a maximum cross slope of 2.0%. The length of the parallel ramp is not required to exceed 15 feet, regardless of resulting slope. Do not exceed 8.3% slope for parallel ramps shorter than 15 feet.
3. Turning Space: Target slope of 1.5%, with a maximum slope perpendicular to the travel directions of 2.0%. At mid-block crossings, cross slope of landing may exceed 2.0% to match roadway grade. Minimum 4 feet by 4 feet.
4. Flare (10:1 max.) required if ramp is contiguous with sidewalk.

FIGURE 7030.206 SHEET 1 OF 1

SUDAS

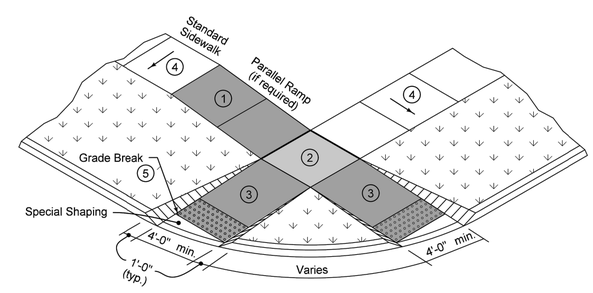
REVISION New 10-16-12

7030.206

SHEET 1 of 1

SUDAS Standard Specifications

CURB RAMPS OUTSIDE OF INTERSECTION RADIUS



Key

- Curb Ramp
- Turning Space
- Detectable warning
- Grass

1. Parallel Curb Ramp: If normal sidewalk elevation cannot be achieved with the perpendicular ramp between the street and landing due to limited ramp length, provide a parallel ramp to make up the elevation difference between the landing and the standard sidewalk.

   The length of the parallel ramp is not required to exceed 15 feet, regardless of the resulting slope. Do not exceed 8.3% slope for parallel ramps shorter than 15 feet.
2. Turning Space: Target slope of 1.5% with maximum slope perpendicular to the travel directions of 2.0%. Minimum 4 feet by 4 feet.
3. Perpendicular Curb Ramp: Target running slope of 6.25% with maximum running slope of 8.3%.
4. Target cross slope of 1.5% with a maximum cross slope of 2.0%.
5. Match pedestrian street crossing cross slope or flatter.

FIGURE 7030.207 SHEET 1 OF 1

SUDAS

REVISION New 10-16-12

7030.207

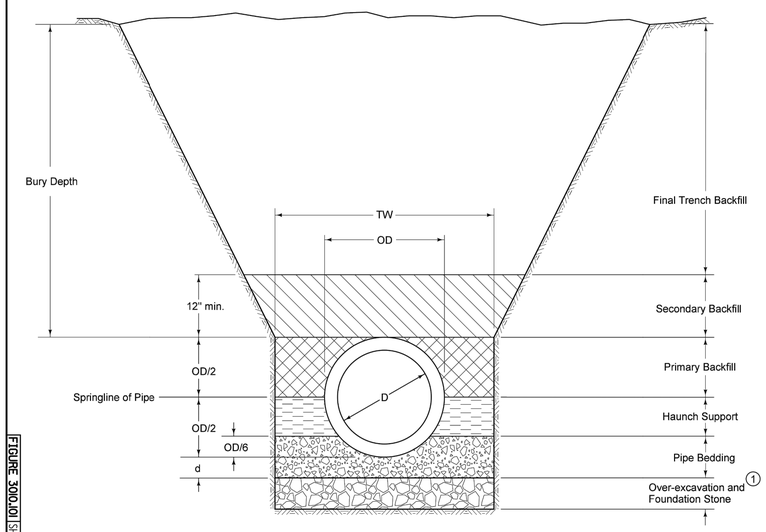
SHEET 1 of 1

SUDAS Standard Specifications

CURB RAMP FOR CLASS B OR C SIDEWALK

Refer to the contract documents for specific material and placement requirements.

(1) Required only when specified in the contract documents or when directed by the Engineer.



Key

OD = Outside diameter of pipe

D = Inside diameter of pipe

TW = Trench width at top of pipe

d = Depth of bedding material below pipe

FIGURE 3010.101 SHEET 1 OF 1

SUDAS | IOWADOT | REVISION 1 04-17-15

FIGURE 3010.101 | STANDARD ROAD PLAN | SW-101 | SHEET 1 of 1

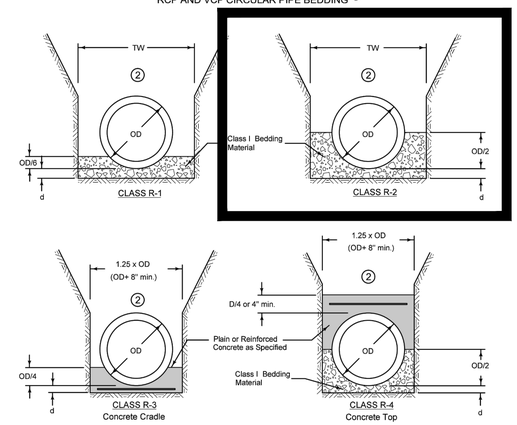
REVISIONS: Replaced Iowa DOT and SUDAS logos.

SUDAS DIRECTOR | DESIGN METHODS ENGINEER

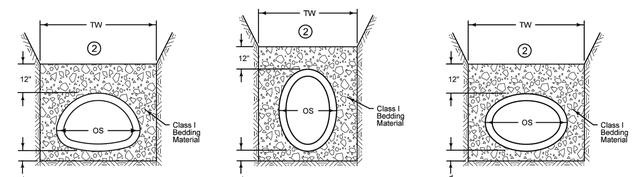
TRENCH BEDDING AND BACKFILL ZONES

FIGURE 3010.102 SHEET 1 OF 2

RCP AND VCP CIRCULAR PIPE BEDDING (1)



REINFORCED CONCRETE ARCH AND ELLIPTICAL PIPE BEDDING



Refer to sheet 2 for bury depth restrictions.

(1) Use Bedding Class R-1 or R-2 unless specified otherwise.

(2) Place remainder of bedding and backfill materials as specified in the contract documents.

Key

OD = Outside diameter of pipe

OS = Outside span of pipe

TW = Trench width at top of pipe:
Min. = OD+18 inches
Max.= 1.25xOD+12 inches OR
54 inches (whichever is greater)

d = Depth of bedding material below pipe:
OD/8 or OS/8, OR 4 inches
(whichever is greater)

SUDAS | IOWADOT | REVISION 3 04-16-19

FIGURE 3010.102 | STANDARD ROAD PLAN | SW-102 | SHEET 1 of 2

REVISIONS: Changed Class 1 to Class I in CLASS R-5 Vertical Elliptical detail.

SUDAS DIRECTOR | DESIGN METHODS ENGINEER

RIGID GRAVITY PIPE TRENCH BEDDING

ALLOWABLE BURY DEPTH

CLASS III RCP

Pipe Diameter (in)	Class R-1 Bedding	Class R-2 Bedding	Class R-3 & R-4 Bedding		
			No Steel	As=0.4%	As=1.0%
12	7'	10'	15'	19'	27'
15	8'	10'	16'	19'	27'
18	8'	11'	16'	20'	40'
21	8'	11'	18'	26'	40'
24	8'	12'	23'	36'	40'
27	10'	15'	30'	40'	40'
30	11'	15'	29'	40'	40'
33	11'	15'	28'	40'	40'
36	11'	15'	27'	40'	40'
42	11'	15'	26'	38'	40'
48	11'	15'	26'	36'	40'
54	11'	15'	25'	34'	40'
60	11'	15'	25'	33'	40'
66	11'	15'	24'	32'	40'
72	11'	15'	24'	32'	40'

As = Area of Steel Reinforcing

CLASS IV RCP

Pipe Diameter (in)	Class R-1 Bedding	Class R-2 Bedding	Class R-3 & R-4 Bedding		
			No Steel	As=0.4%	As=1.0%
12	12'	15'	23'	28'	40'
15	12'	16'	23'	30'	40'
18	13'	16'	29'	40'	40'
21	13'	18'	40'	40'	40'
24	16'	23'	40'	40'	40'
27	19'	30'	40'	40'	40'
30	19'	29'	40'	40'	40'
33	19'	28'	40'	40'	40'
36	19'	28'	40'	40'	40'
42	18'	27'	40'	40'	40'
48	18'	26'	40'	40'	40'
54	18'	25'	40'	40'	40'
60	18'	25'	40'	40'	40'
66	18'	25'	40'	40'	40'
72	18'	24'	40'	40'	40'

As = Area of Steel Reinforcing

CLASS V RCP

Pipe Diameter (in)	Class R-1 Bedding	Class R-2 Bedding	Class R-3 & R-4 Bedding		
			No Steel	As=0.4%	As=1.0%
12	18'	23'	35'	40'	40'
15	19'	24'	40'	40'	40'
18	19'	30'	40'	40'	40'
21	25'	40'	40'	40'	40'
24	34'	40'	40'	40'	40'
27	40'	40'	40'	40'	40'
30	40'	40'	40'	40'	40'
33	40'	40'	40'	40'	40'
36	40'	40'	40'	40'	40'
42	37'	40'	40'	40'	40'
48	35'	40'	40'	40'	40'
54	33'	40'	40'	40'	40'
60	32'	40'	40'	40'	40'
66	31'	40'	40'	40'	40'
72	31'	40'	40'	40'	40'

As = Area of Steel Reinforcing

EXTRA STRENGTH VCP

Pipe Dia. (in)	Bedding Class				
	R-1	R-2	R-3 & R-4		
			No Steel	As=0.4%	As=1.0%
6	25'	30'	30'	30'	30'
8	20'	26'	30'	30'	30'
10	18'	23'	30'	30'	30'
12	16'	20'	30'	30'	30'
15	15'	19'	28'	30'	30'
18	14'	18'	30'	30'	30'
21	15'	22'	30'	30'	30'
24	18'	28'	30'	30'	30'
27	20'	30'	30'	30'	30'
30	19'	29'	30'	30'	30'
33	20'	30'	30'	30'	30'
36	20'	30'	30'	30'	30'
39	19'	29'	30'	30'	30'
42	18'	26'	30'	30'	30'

As = Area of Steel Reinforcing

CONCRETE ARCH PIPE

Pipe Size (in x in)	Equiv. Dia. (in)	Pipe Class	
		A-III	A-IV
18 x 11	15	6'	11'
22 x 13	18	6'	11'
26 x 15	21	6'	13'
29 x 18	24	7'	15'
36 x 22	30	8'	15'
44 x 27	36	8'	14'
51 x 31	42	8'	15'
58 x 36	48	8'	15'
65 x 40	54	8'	15'
73 x 45	60	8'	14'
88 x 54	72	9'	14'

Based on Class R-5 bedding

HORIZONTAL ELLIPTICAL RCP

Pipe Size (in x in)	Equiv. Dia. (in)	Pipe Class	
		HE-III	HE-IV
14 x 23	18	12'	22'
19 x 30	24	15'	29'
22 x 34	27	15'	28'
24 x 38	30	15'	27'
27 x 42	33	15'	27'
29 x 45	36	15'	26'
32 x 49	39	15'	26'
34 x 54	42	15'	25'
38 x 60	48	15'	25'
43 x 68	54	15'	24'
48 x 76	60	15'	24'
53 x 83	66	15'	24'
58 x 91	72	15'	24'
63 x 98	78	15'	23'
68 x 106	84	15'	23'

Based on Class R-5 bedding

VERTICAL ELLIPTICAL RCP

Pipe Size (in x in)	Equiv. Dia. (in)	Pipe Class			
		VE-III	VE-IV	VE-V	VE-VI
23 x 14	18	10'	15'	22'	33'
30 x 19	24	10'	16'	34'	40'
34 x 22	27	11'	20'	40'	40'
38 x 24	30	12'	23'	40'	40'
42 x 27	33	15'	30'	40'	40'
45 x 29	36	15'	29'	40'	40'
49 x 32	39	15'	29'	40'	40'
54 x 34	42	15'	28'	40'	40'
60 x 38	48	15'	27'	40'	40'
68 x 43	54	15'	27'	40'	40'
76 x 48	60	15'	26'	40'	40'
83 x 53	66	15'	25'	40'	40'
91 x 58	72	15'	25'	40'	40'
98 x 63	78	15'	25'	40'	40'
106 x 68	84	15'	24'	40'	40'

Based on Class R-5 bedding

FIGURE 3010.102 SHEET 2 OF 2

SUDAS | IOWADOT | REVISION 3 04-16-19

FIGURE 3010.102 | STANDARD ROAD PLAN | SW-102 | SHEET 2 of 2

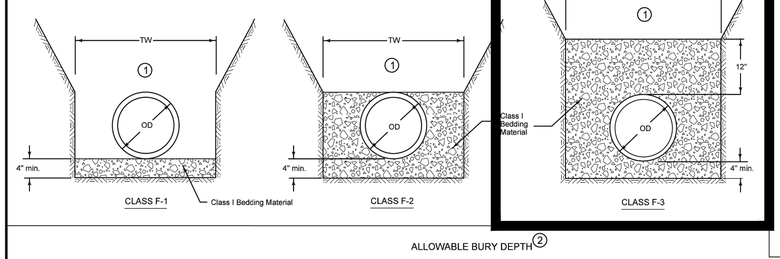
REVISIONS: Changed Class 1 to Class I in CLASS R-5 Vertical Elliptical detail.

SUDAS DIRECTOR | DESIGN METHODS ENGINEER

RIGID GRAVITY PIPE TRENCH BEDDING

FIGURE 3010.103 SHEET 1 OF 1

BEDDING CLASSES



ALLOWABLE BURY DEPTH (2)

(1) Place remainder of bedding and backfill materials as specified in the contract documents.

(2) Minimum depth of bury 12 inches or as specified by the manufacturer.

ALLOWABLE BEDDING CLASSES

PIPE MATERIAL	STORM SEWER	SANITARY SEWER
Ductile Iron	F-1, F-2, F-3	F-1, F-2, F-3
HDPE	F-2, F-3	Not allowed
Polypropylene	F-2, F-3	F-3
PVC	F-2, F-3	F-3

Key

OD = Outside diameter of pipe

TW = Trench width at top of pipe:
Min. = OD+18 inches OR 1.25xOD+12 inches
(whichever is greater)

PVC PIPE

Pipe Diameter (in)	ASTM D 3034			ASTM F 679	ASTM F 949	ASTM F 1803	ASTM D 2680
	Solid Wall			Solid Wall	Corrug. Exterior	Closed Profile	Composite (Truss Type)
	SDR 23.5	SDR 26	SDR 35	SDR 35			
8	30'	28'	24'	---	24'	---	32'
10	30'	28'	24'	---	24'	---	32'
12	30'	28'	24'	---	24'	---	32'
15	30'	28'	24'	---	24'	---	32'
18	---	---	---	24'	24'	---	---
21	---	---	---	24'	24'	24'	---
24	---	---	---	24'	24'	24'	---
27	---	---	---	24'	---	24'	---
30	---	---	---	24'	24'	24'	---
33	---	---	---	24'	---	---	---
36	---	---	---	24'	24'	24'	---
42	---	---	---	24'	---	24'	---
48	---	---	---	24'	---	24'	---
54	---	---	---	---	---	24'	---
60	---	---	---	---	---	24'	---

DUCTILE IRON, AWWA C151, CLASS 52

Pipe Diameter (in)	Class F-1 Bedding	Class F-2 Bedding	Class F-3 Bedding
4	40'	40'	40'
6	40'	40'	40'
8	40'	40'	40'
10	40'	40'	40'
12	37'	40'	40'
14	31'	40'	40'
16	28'	37'	40'
18	25'	34'	40'
20	23'	32'	40'
24	20'	29'	38'
30	18'	23'	31'
36	18'	22'	30'
42	17'	21'	29'
48	16'	19'	27'
54	16'	19'	27'

HDPE PIPE

Pipe Diameter (in)	AASHTO M 294
12	8'
15	9'
18	9'
24	9'
30	9'
36	9'
42	8'
48	8'
54	8'
60	8'

POLYPROPYLENE PIPE

Pipe Diameter (in)	ASTM F 2764
12	24'
15	25'
18	22'
24	20'
30	22'
36	21'
42	22'
48	23'
54	21'
60	21'

SUDAS | IOWADOT | REVISION 3 04-16-19

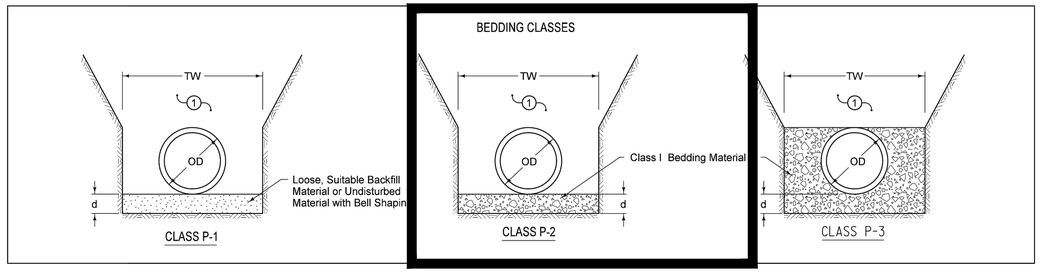
FIGURE 3010.103 | STANDARD ROAD PLAN | SW-103 | SHEET 1 of 1

REVISIONS: Removed ASTM F 2736 from Polypropylene Pipe table. Changed Class 1 to Class I in the CLASS F-2 and CLASS F-3 details.

SUDAS DIRECTOR | DESIGN METHODS ENGINEER

FLEXIBLE GRAVITY PIPE TRENCH BEDDING

FOX Engineering Associates, Inc.
414 South 17th Street, Suite 107
Ames, Iowa 50010
Phone: (515) 233-0000
FAX: (515) 233-0103



ALLOWABLE BURY DEPTH

DUCTILE IRON, AWWA C151, CLASS 52

Pipe Diameter (inches)	Class P-1 Bedding	Class P-2 Bedding	Class P-3 Bedding
4	40'	40'	40'
6	40'	40'	40'
8	40'	40'	40'
10	36'	40'	40'
12	31'	40'	40'
14	26'	40'	40'
16	23'	37'	40'
18	20'	34'	40'
20	18'	32'	40'
24	16'	29'	38
30	13'	23'	31'
36	13'	22'	30'
42	13'	21'	29'
48	13'	19'	27'
54	13'	19'	27'

PVC, AWWA C900 & C905, DR18

Pipe Diameter (inches)	Class P-1 Bedding	Class P-2 Bedding	Class P-3 Bedding
4	19'	23'	40'
6	19'	23'	40'
8	19'	23'	40'
10	19'	23'	40'
12	19'	23'	40'
14	19'	23'	40'
16	19'	23'	40'
18	19'	23'	40'
20	19'	23'	40'
24	19'	23'	40'

(1) Place remainder of bedding and backfill material as specified in the contract documents.

Key

OD = Outside diameter of pipe

TW = Trench width at top of pipe:
Min. = OD+18 inches OR 1.25xOD+12 inches
(whichever is greater)

d = Depth of bedding material below pipe:
Min. = OD/8 OR 4 inches
(whichever is greater)

SUDAS | IOWA DOT | REVISION 1 04-17-18
FIGURE 3010.104 | STANDARD ROAD PLAN | SW-104 | SHEET 1 of 1

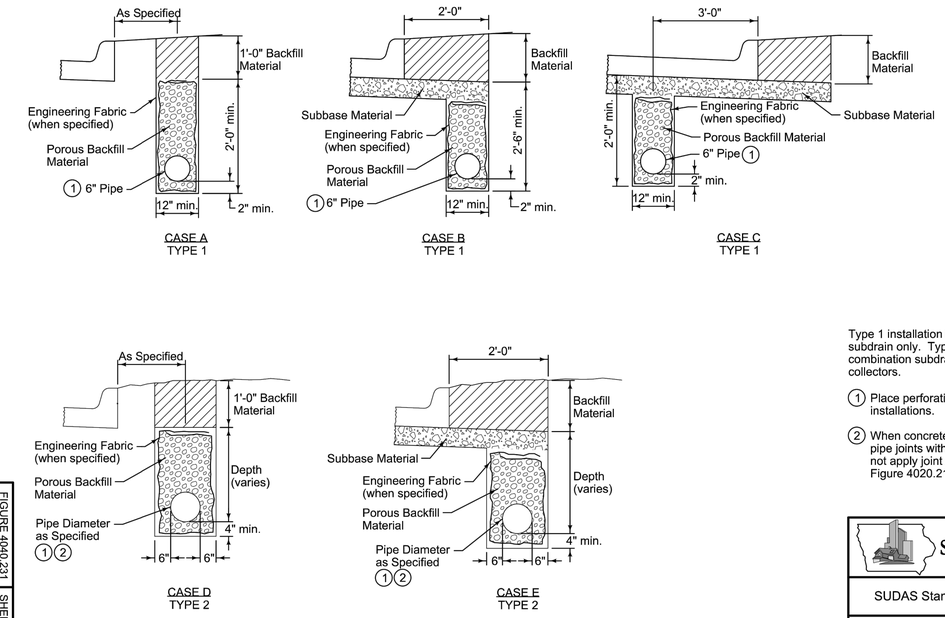
REVISIONS: Replaced Iowa DOT and SUDAS logos.

SUDAS DIRECTOR | DESIGN METHODS ENGINEER

PRESSURE PIPE TRENCH BEDDING

FIGURE 3010.104 SHEET 1 OF 1

FIGURE 4040.231 SHEET 1 OF 1



Type 1 installation is for longitudinal subdrain only. Type 2 installation is for combination subdrain/footing drain collectors.

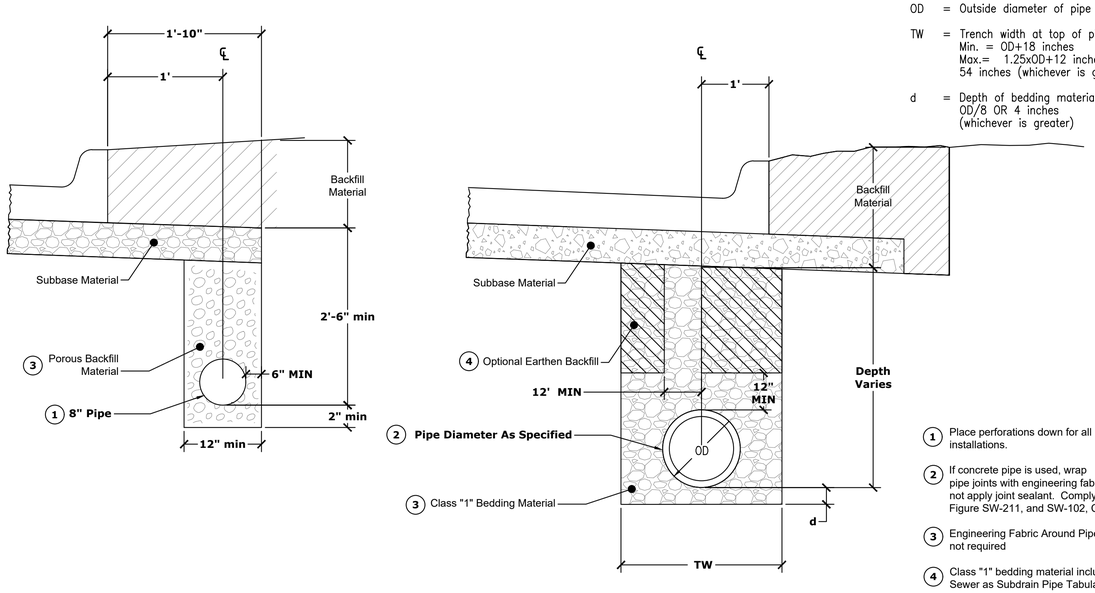
(1) Place perforations down for all installations.

(2) When concrete pipe is specified, wrap pipe joints with engineering fabric. Do not apply joint sealant. Comply with Figure 4020.211

SUDAS | REVISION 1 10-21-14
4040.231 | SHEET 1 of 1

SUDAS Standard Specifications

SUBDRAINS



Key

OD = Outside diameter of pipe

TW = Trench width at top of pipe:
Min. = OD+18 inches
Max.= 1.25xOD+12 inches OR 54 inches (whichever is greater)

d = Depth of bedding material below pipe:
OD/8 OR 4 inches
(whichever is greater)

(1) Place perforations down for all installations.

(2) If concrete pipe is used, wrap pipe joints with engineering fabric. Do not apply joint sealant. Comply with Figure SW-211, and SW-102, Class R-1.

(3) Engineering Fabric Around Pipe Trench is not required

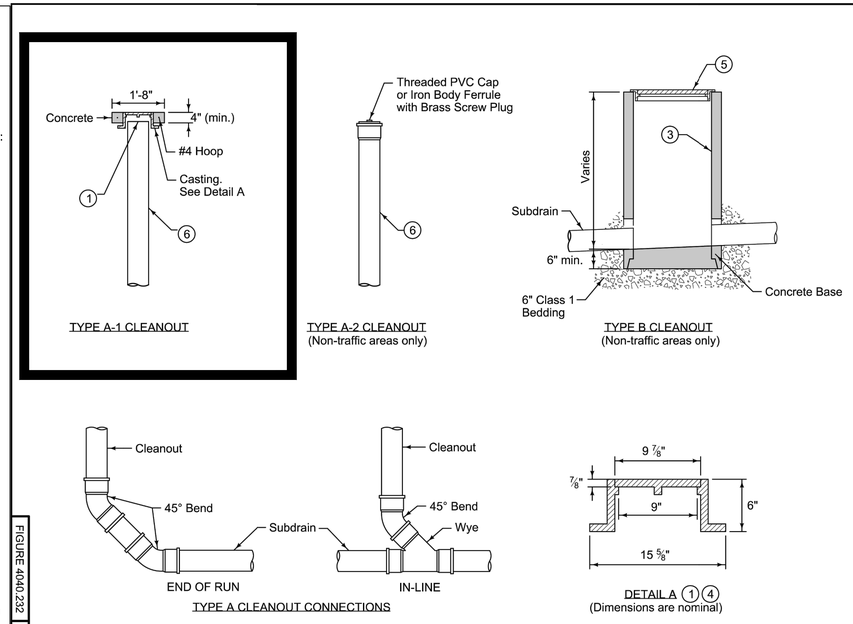
(4) Class "1" bedding material included in Storm Sewer as Subdrain Pipe Tabulation

8" LONGITUDINAL SUBDRAIN

STORM SEWER AS SUBDRAIN

(1) STORM SEWER AND SUBDRAIN INSTALLATION DETAILS

FIGURE 4040.232 SHEET 1 OF 1



(1) Heavy duty casting. Label lid with "Storm" or "Storm C.O."

(2) Do not allow casting to bear on top of riser pipe; provide 2 inch clearance, minimum.

(3) 24 inch diameter RCP for subdrain 8 inches or smaller; 30 inch diameter RCP for 10 to 12 inch subdrain. A manufactured cleanout may be used in lieu of a Type B cleanout, if approved by the Engineer.

(4) Design is intended for use in conjunction with 8 inch PVC riser pipe. Other sized caps may be used with smaller pipe, as approved by the Engineer.

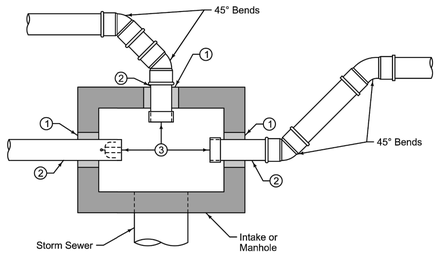
(5) Provide Type G casting, as required to fit pipe size.

(6) PVC riser pipe; match diameter of subdrain (8 inches maximum).

SUDAS | REVISION 1 10-21-14
4040.232 | SHEET 1 of 1

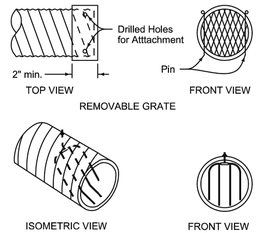
SUDAS Standard Specifications

SUBDRAIN CLEANOUTS



PLAN VIEW

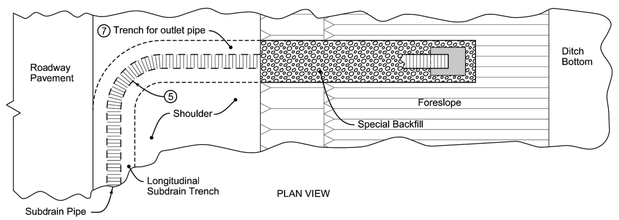
OUTLET INTO STRUCTURE



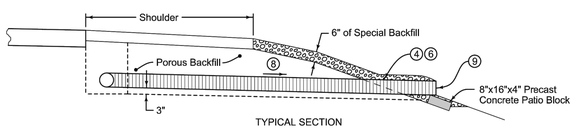
RODENT GUARD DETAILS

Transverse and backslope subdrains require only single outlets. Install double outlet pipes on all longitudinal subdrain systems, except at the beginning and end of the system. At these locations, install a single outlet pipe.

1. Fill annular space with non-shrink grout.
2. Outlets through intake walls to be CMP; corrugated, double-walled HDPE; or PVC.
3. Extend outlet pipe into structure as required to install removable rodent guard.
4. Construct subdrain outlet to ditch with the same type and size of pipe as used for the subdrain.
5. Provide a minimum 1 foot radius for all bends or use two 45° fittings
6. If a CMP outlet is specified in the contract documents, construct the final 10 to 12 feet of the subdrain outlet to ditch with CMP 2 inches larger than the subdrain pipe. Connect pipes with a manufactured coupler or concrete collar.
7. Provide a minimum trench width of 12 inches for a single outlet and 24 inches for a double outlet.
8. Provide a 6 inch minimum drop in elevation between longitudinal subdrain and outlet.
9. Use only fork type rodent guard for subdrain outlet to ditch.



PLAN VIEW



TYPICAL SECTION

SUBDRAIN OUTLET TO DITCH

FIGURE 4040.233 SHEET 1 OF 1

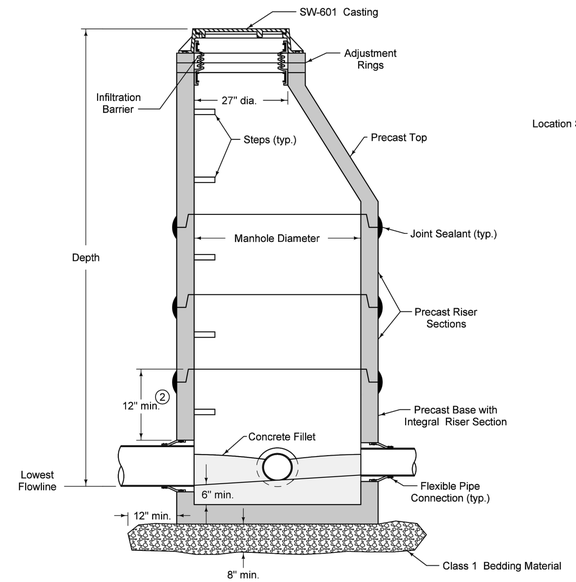
SUDAS | REVISION 3 10-18-16 | 4040.233 | SHEET 1 of 1

SUDAS Standard Specifications

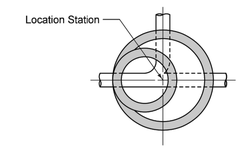
SUBDRAIN OUTLETS

FIGURE 6010.301 SHEET 1 OF 1

1. For additional configurations, maintain a minimum of 12 inches of concrete between vertical edges of pipe openings.
2. 12 inch minimum riser height above all pipe openings.



TYPICAL SECTION



PLAN

Manhole Diameter (inches)	Maximum Pipe Diameter (inches) for 2 Pipes 1	
	At 180° Separation	At 90° Separation
48	24	18
60	36	24
72	42	30
84	48	36
96	60	42

NOTE: BITUMINOUS EXTERIOR COATING IS REQUIRED ON ALL SANITARY MANHOLES

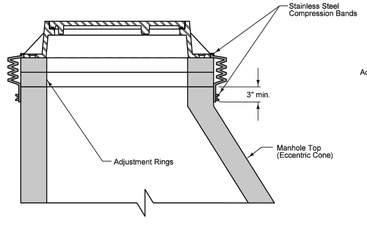
SUDAS | IOWA DOT | REVISION 2 04-17-18 | FIGURE 6010.301 | STANDARD ROAD PLAN | SW-301 | SHEET 1 of 1

REVISIONS: Changed "Insert" to "Concrete Fillet".

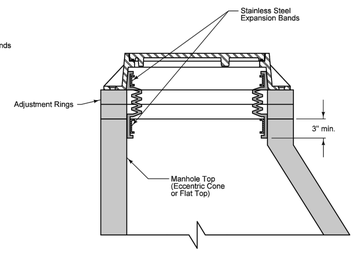
SUDAS COORDINATOR — DESIGN METHODS ENGINEER

CIRCULAR SANITARY SEWER MANHOLE

CHIMNEY SEALS FOR 2-PIECE CASTINGS

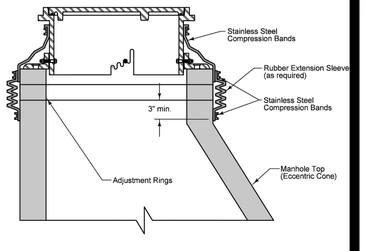


EXTERNAL SEAL

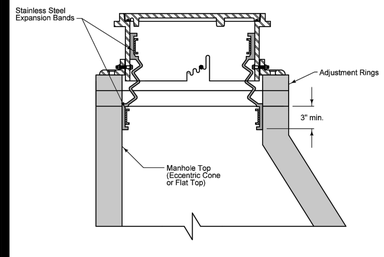


INTERNAL SEAL

CHIMNEY SEALS FOR 3-PIECE CASTINGS



EXTERNAL SEAL



INTERNAL SEAL

FIGURE 6010.306 SHEET 1 OF 1

SUDAS | IOWA DOT | REVISION 1 04-21-15 | FIGURE 6010.306 | STANDARD ROAD PLAN | SW-306 | SHEET 1 of 1

REVISIONS: Revised 3-piece casting configuration.

SUDAS COORDINATOR — DESIGN METHODS ENGINEER

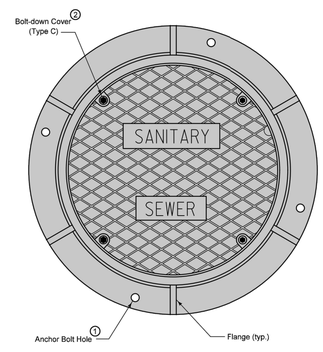
CHIMNEY SEALS FOR SANITARY SEWER MANHOLES

TYPE A

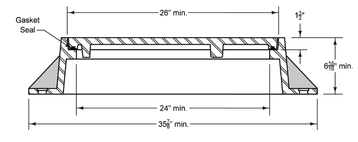
Two-piece fixed casting

TYPE C

Two-piece fixed casting with bolt-down cover 2



PLAN



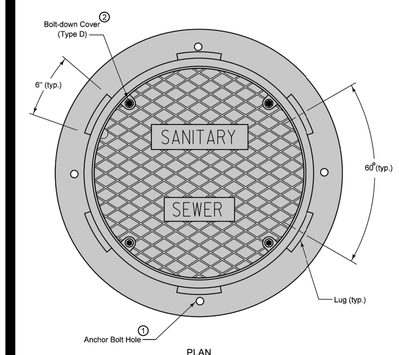
TYPICAL SECTION

TYPE B

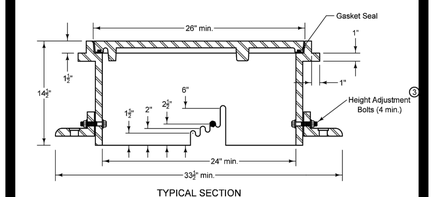
Three-piece floating casting

TYPE D

Three-piece floating casting with bolt-down cover 2



PLAN



TYPICAL SECTION

Frame Notes:
Size and spacing of lugs and flanges may vary.

Cover Notes:
Roughness pattern and text style may vary.
Minimum one concealed pickhole.

1. When the contract documents require the frame to be attached to the structure, drill four $\frac{3}{8}$" diameter holes or slots, equally spaced around frame.
2. If specified, furnish bolt down frame and cover with four $\frac{3}{4}$" x $2\frac{1}{2}$" stainless steel, hex head, recessed cap screws. Secure cover with screws, washers, and rubber gasket seals.
3. Set casting at proper grade using one of the adjustment slots. Remove bolts upon completion of paving.

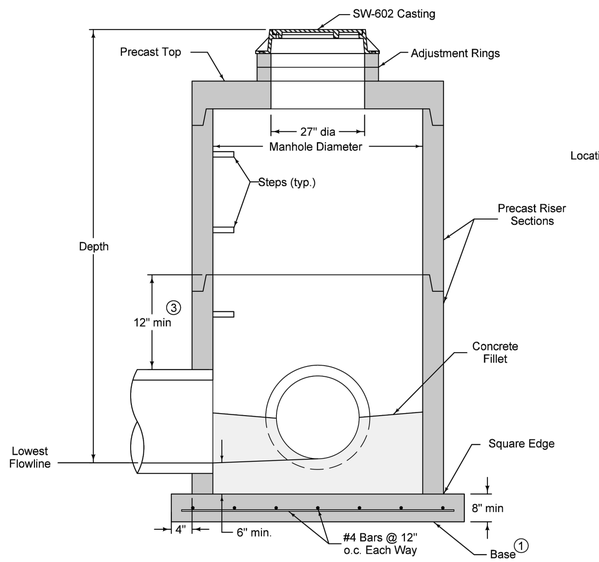
SUDAS | IOWA DOT | REVISION 3 04-21-15 | FIGURE 6010.601 | STANDARD ROAD PLAN | SW-601 | SHEET 1 of 1

REVISIONS: Minor revision to depict adjustability of TYPE B and TYPE D casting. Modified circle note 3.

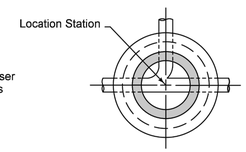
SUDAS COORDINATOR — DESIGN METHODS ENGINEER

CASTINGS FOR SANITARY SEWER MANHOLES

FIGURE 6010.601 SHEET 1 OF 1



TYPICAL SECTION



PLAN

1. Cast-in-place base shown. If base is precast integral with bottom riser, the footprint of the base is not required to extend beyond the outer edge of the riser.
2. For additional configurations, maintain a minimum of 12 inches of concrete between vertical edges of pipe openings.
3. 12 inch minimum riser height above all pipe openings.

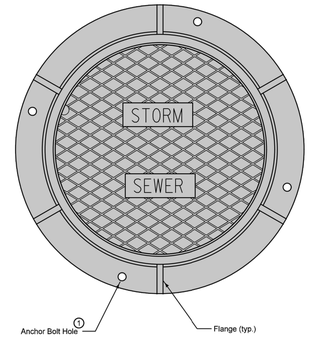
Manhole Diameter (inches)	Maximum Pipe Diameter (2) (inches) for 2 Pipes	
	At 180° Separation	At 90° Separation
48	24	18
60	36	24
72	42	30
84	48	36
96	60	42

SUDAS | IOWA DOT | REVISION 1 04-17-18
FIGURE 6010.401 | STANDARD ROAD PLAN | SW-401 | SHEET 1 of 1
REVISIONS: Changed "invert" callout to "Concrete Fillet". Updated linework and Sudas and DOT logo.
SUDAS DIRECTOR | DESIGN METHODS ENGINEER
CIRCULAR STORM SEWER MANHOLE

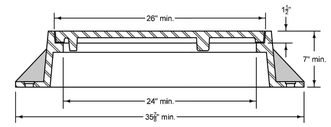
FIGURE 6010.401 | SHEET 1 OF 1

TYPE E

Two-piece fixed casting



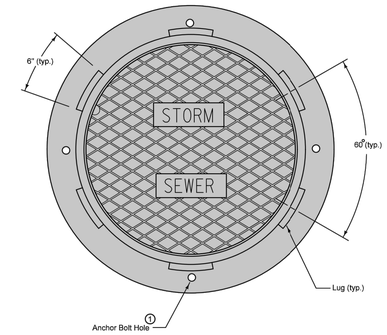
PLAN



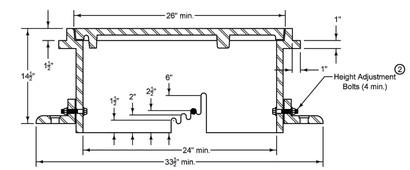
TYPICAL SECTION

TYPE F

Three-piece floating casting



PLAN



TYPICAL SECTION

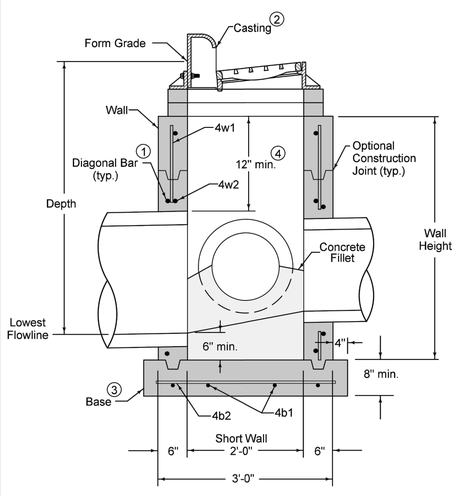
Frame Notes:
Size and spacing of lugs and flanges may vary.

Cover Notes:
Roughness pattern and text styles may vary.
Minimum one concealed pickhole.

1. When the contract documents require the frame to be attached to the structure, drill four ¾" diameter holes or slots, equally spaced around frame.
2. Set casting at proper grade using one of the adjustment slots. Remove bolts upon completion of paving.

SUDAS | IOWA DOT | REVISION 3 04-21-15
FIGURE 6010.602 | STANDARD ROAD PLAN | SW-602 | SHEET 1 of 2
REVISIONS: Revised three-piece casting configuration. Modified circle note 2.
SUDAS DIRECTOR | DESIGN METHODS ENGINEER
CASTINGS FOR STORM SEWER MANHOLES

FIGURE 6010.602 | SHEET 1 OF 2

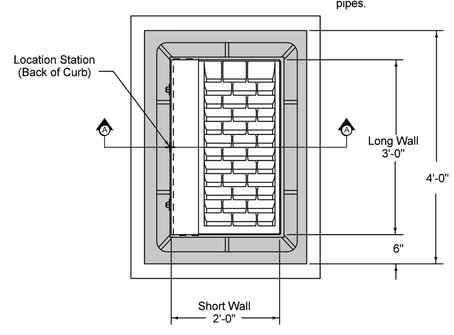


SECTION A-A

REINFORCING BAR LIST						
Mark	Size	Location	Shape	Length	Count	Spacing
4w1	4	Walls	———	Wall Height minus 4"	14	12"
4w2	4	Long Walls	———	3'-8"	Varies	12"
4w3	4	Short Walls	———	2'-8"	Varies	12"
4b1	4	Base	———	4'-2"	4	10"
4b2	4	Base	———	3'-2"	5	10"

Refer to SW-514 for boxout details.

1. Install four #4 diagonal bars at all pipe openings.
2. SW-603 Type R unless Type Q is specified in the contract documents.
3. Cast-in-place base shown. If base is precast integral with walls, the footprint of the base is not required to extend beyond the outer edge of the walls.
4. 12 inch minimum wall height above all pipes.

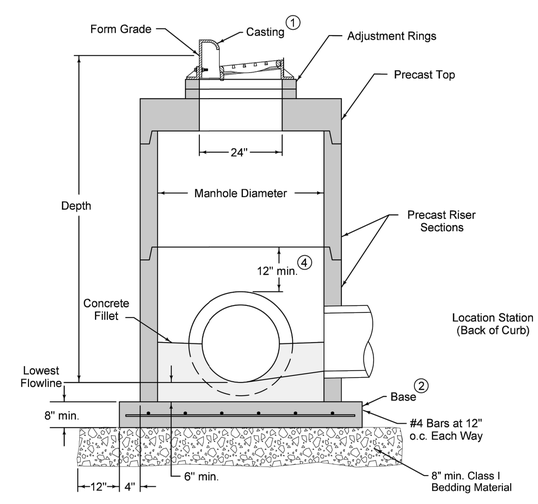


PLAN

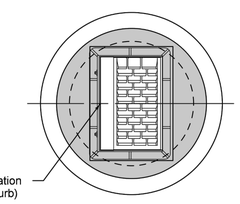
MAXIMUM PIPE DIAMETERS		
Pipe Location	Precast Structure	Cast-in-place Structure
Short Wall	15"	18"
Long Wall	24"	30"

SUDAS | IOWA DOT | REVISION 2 04-17-18
FIGURE 6010.501 | STANDARD ROAD PLAN | SW-501 | SHEET 1 of 1
REVISIONS: Changed "invert" callout to "Concrete Fillet". Updated DOT and SUDAS logo.
SUDAS DIRECTOR | DESIGN METHODS ENGINEER
SINGLE GRATE INTAKE

FIGURE 6010.501 | SHEET 1 OF 1



TYPICAL SECTION



PLAN

Refer to SW-514 for boxout details.

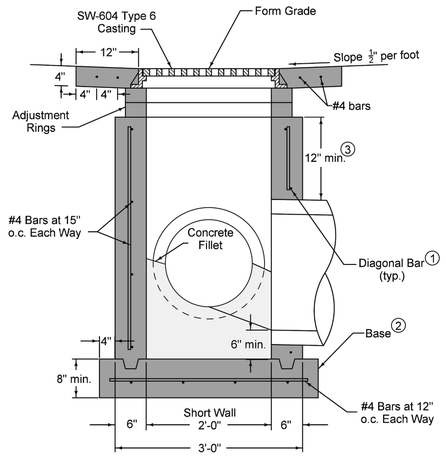
1. SW-603 Type R unless Type Q is specified in the contract documents.
2. Cast-in-place base shown. Base may be square. If base is precast integral with walls, the footprint of the base is not required to extend beyond the outer edge of the walls.
3. For additional configurations, maintain a minimum of 12 inches of concrete between vertical edges of pipe openings.
4. 12 inch minimum riser height above all pipes.

Manhole Diameter (inches)	Maximum Pipe Diameter (3) (inches) for 2 Pipes	
	at 180° Separation	at 90° Separation
48	24	18
60	36	24
72	42	30
84	48	36
96	60	42

SUDAS | IOWA DOT | REVISION 1 04-21-20
FIGURE 6010.502 | STANDARD ROAD PLAN | SW-502 | SHEET 1 of 1
REVISIONS: Added Class I Bedding Material.
SUDAS DIRECTOR | DESIGN METHODS ENGINEER
CIRCULAR SINGLE GRATE INTAKE

FIGURE 6010.502 | SHEET 1 OF 1

FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103

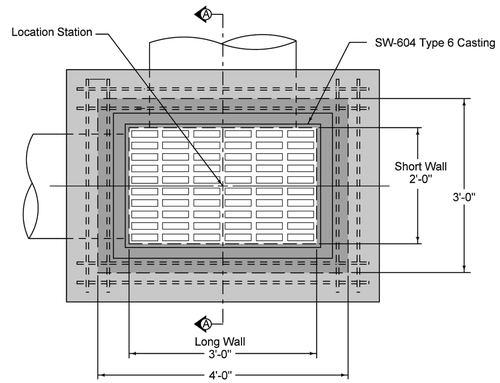


SECTION A-A

① Install four #4 diagonal bars at all pipe openings.

② Cast-in-place base shown. If base is precast integral with walls, the footprint of the base is not required to extend beyond the outer edge of the walls.

③ 12 inch minimum wall height above all pipes.



PLAN

MAXIMUM PIPE DIAMETERS		
Pipe Location	Precast Structure	Cast-in-place Structure
Short Wall	15"	18"
Long Wall	24"	30"

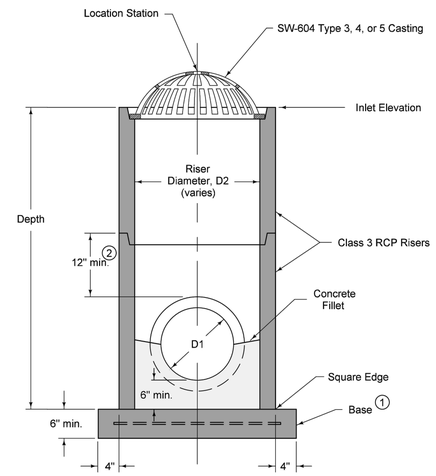
SUDAS	IOWA DOT	REVISION 4 04-17-18
FIGURE 6010.511	STANDARD ROAD PLAN	SW-511 SHEET 1 of 1

REVISIONS: Changed "cover" callout to "Concrete Fillet". Updated line work and Iowa DOT and SUDAS logo.

SUDAS DIRECTOR / DESIGN METHODS ENGINEER

RECTANGULAR AREA INTAKE

FIGURE 6010.511 SHEET 1 OF 1



TYPICAL SECTION

CASE 1

① Precast (shown) or cast-in-place base:

- Precast: 6 inch thick concrete with #6 welded wire mesh on 4 inch centers (WWF 4" x 4"). Center mesh vertically within base.
- Cast-in-place: 8 inch thick non-reinforced concrete.

② 12 inch minimum riser height above all pipes.

INTAKE SIZE - CASE 1	
Outlet Pipe Diameter, D1	Minimum Riser Diameter, D2
12"	18"
15"	24"
18"	24"
21"	30"
24"	30"
27"	36"

SUDAS	IOWA DOT	REVISION 4 04-21-20
FIGURE 6010.512	STANDARD ROAD PLAN	SW-512 SHEET 1 of 2

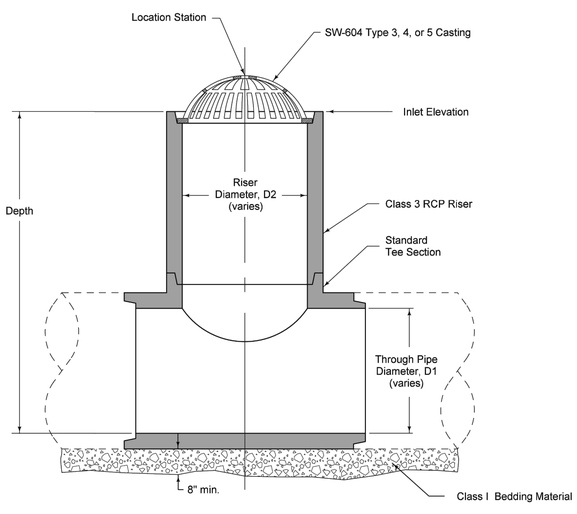
REVISIONS: Changed 1 to 1 on Bedding Material.

SUDAS DIRECTOR / DESIGN METHODS ENGINEER

CIRCULAR AREA INTAKE

FIGURE 6010.512 SHEET 1 OF 2

③ Minimum riser diameter is 18 inches.



TYPICAL SECTION

CASE 2

INTAKE SIZE - CASE 2	
Through Pipe Diameter, D1	Maximum ③ Riser Diameter, D2
18"	18"
21"	18"
24"	24"
27"	24"
30"	30"
36" or more	36"

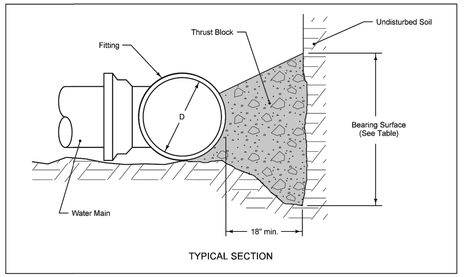
SUDAS	IOWA DOT	REVISION 4 04-21-20
FIGURE 6010.512	STANDARD ROAD PLAN	SW-512 SHEET 2 of 2

REVISIONS: Changed 1 to 1 on Bedding Material.

SUDAS DIRECTOR / DESIGN METHODS ENGINEER

CIRCULAR AREA INTAKE

FIGURE 6010.512 SHEET 2 OF 2



TYPICAL SECTION

Extend thrust blocks to undisturbed soil. Excavation into trench wall may be necessary.

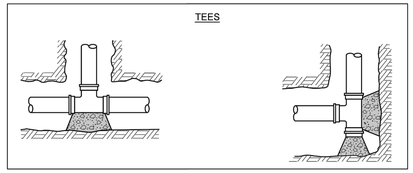
Form vertical surfaces of poured concrete thrust blocks except on bearing surface.

Encase all fittings in polyethylene wrap. Do not allow concrete to directly contact joints or fitting bolts.

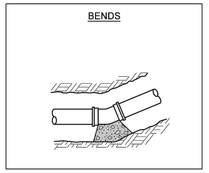
Diameter of Pipe, D (inches)	MINIMUM BEARING SURFACE (sf)				
	Bends				Tees and Dead Ends
	11¼°	22½°	45°	90°	
4	1	1	2	4	3
6	1	2	4	8	6
8	2	4	7	14	10
10	3	6	11	21	15
12	4	8	16	29	21
14	5	11	21	39	28
16	7	14	27	50	36
18	9	17	34	63	45
20	11	21	42	78	55
24	15	31	60	111	78
30	24	47	92	171	120
36	34	67	132	244	173

Minimum surface area based on water pressure of 150 psi and allowable soil pressure of 1,000 psf.

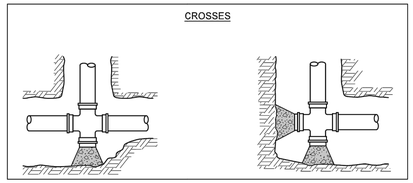
TEES



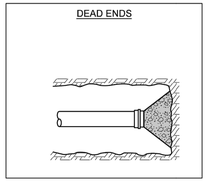
BENDS



CROSSES



DEAD ENDS



TYPICAL PLAN

SUDAS	IOWADOT	REVISION 1 10-18-16
FIGURE 5010.101	STANDARD ROAD PLAN	WM-101 SHEET 1 of 2

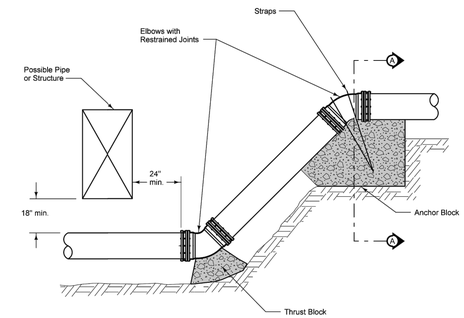
REVISIONS: Replaced Iowa DOT and SUDAS logos with new logos.

SUDAS DIRECTOR — DESIGN METHODS ENGINEER

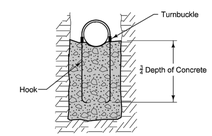
THRUST BLOCKS

FIGURE 5010.101 SHEET 1 OF 2

CHANGES IN PIPE DEPTH



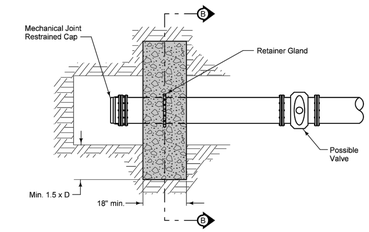
ELEVATION



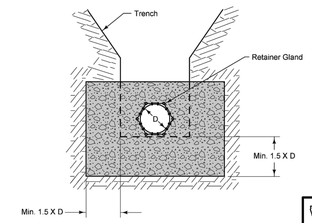
SECTION A-A

DEAD ENDS (ALTERNATE METHOD)

Use only when allowed by the Engineer, or when specified in the contract documents.



PLAN



SECTION B-B

SUDAS	IOWADOT	REVISION 1 10-18-16
FIGURE 5010.101	STANDARD ROAD PLAN	WM-101 SHEET 2 of 2

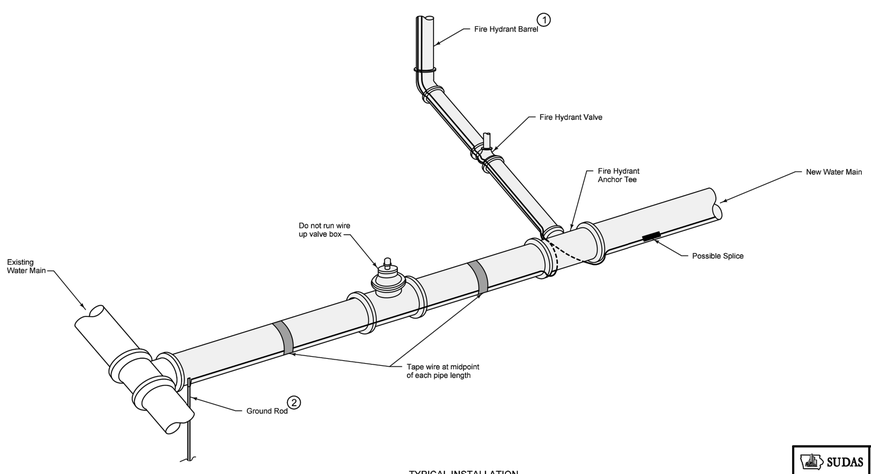
REVISIONS: Replaced Iowa DOT and SUDAS logos with new logos.

SUDAS DIRECTOR — DESIGN METHODS ENGINEER

THRUST BLOCKS

FIGURE 5010.101 SHEET 2 OF 2

1. Extend tracer wire up fire hydrant barrel to internal terminals of tracer wire station and back down. Refer to WM-201 for details of fire hydrant assembly.
2. Clamp tracer wire to ground rod at system termination points.



TYPICAL INSTALLATION

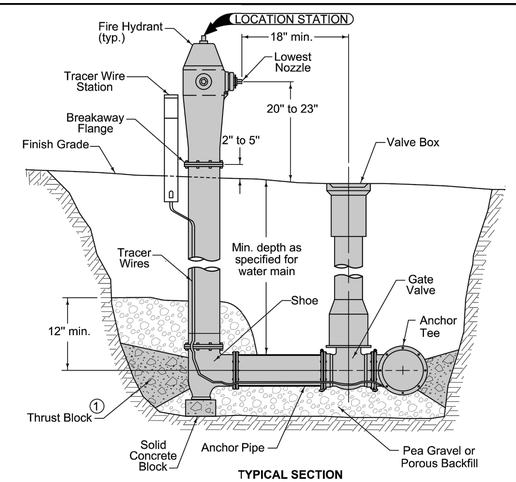
SUDAS	IOWADOT	REVISION 1 10-18-16
FIGURE 5010.102	STANDARD ROAD PLAN	WM-102 SHEET 1 of 1

REVISIONS: Replaced Iowa DOT and SUDAS logos with new logos.

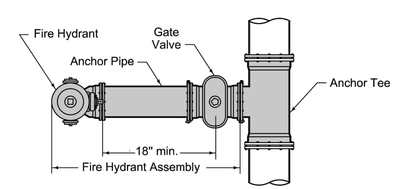
SUDAS DIRECTOR — DESIGN METHODS ENGINEER

TRACER SYSTEM

FIGURE 5010.102 SHEET 1 OF 1



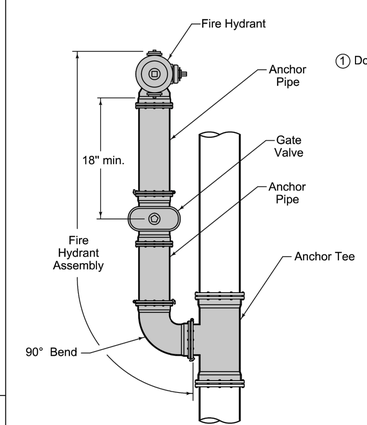
TYPICAL SECTION



TYPICAL PLAN

Use ductile iron pipe with restrained mechanical joints for fire hydrant assembly and anchor tee.

1. Do not cover drain holes or tracer wire.



ALTERNATE PLAN

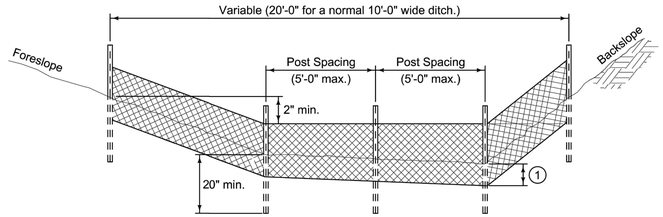
SUDAS	IOWADOT	REVISION 2 04-18-17
FIGURE 5020.201	STANDARD ROAD PLAN	WM-201 SHEET 1 of 1

REVISIONS: Updated SUDAS and DOT logos.

SUDAS DIRECTOR — DESIGN METHODS ENGINEER

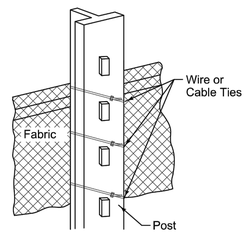
FIRE HYDRANT ASSEMBLY

FIGURE 5020.201 SHEET 1 OF 1



TYPICAL SILT FENCE DITCH CHECK

1 Insert 12 inches of fabric a minimum of 6 inches deep (fabric may be folded below the ground line).



ATTACHMENT TO POST

FIGURE 9040.119 SHEET 1 OF 2

SUDAS

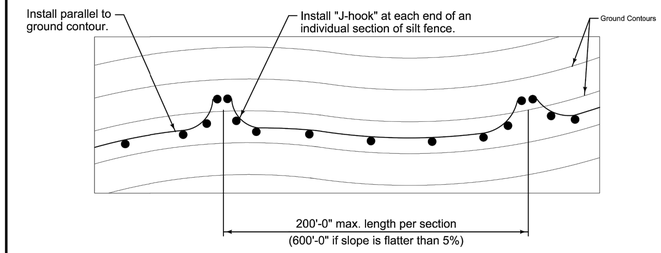
REVISION 2 10-21-14

9040.119

SHEET 1 of 2

SUDAS Standard Specifications

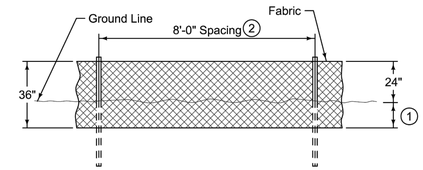
SILT FENCE



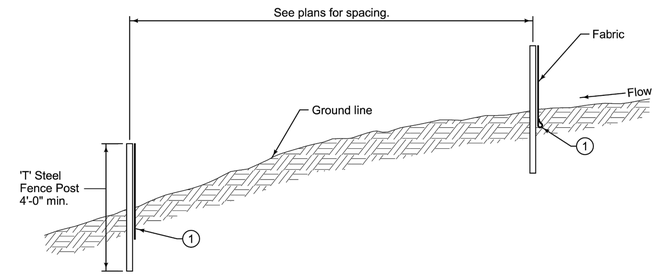
TYPICAL SILT FENCE INSTALLATION ON LONGITUDINAL SLOPES
(Plan View)

1 Insert 12 inches of fabric a minimum of 6 inches deep (fabric may be folded below the ground line).

2 Reduce post spacing to 5'-0" at water concentration areas, or as required to adequately support fence.



DETAILS OF SILT FENCE ON LONGITUDINAL SLOPES



TYPICAL SILT FENCE INSTALLATION ON LONGITUDINAL SLOPES
(Profile View)

FIGURE 9040.119 SHEET 2 OF 2

SUDAS

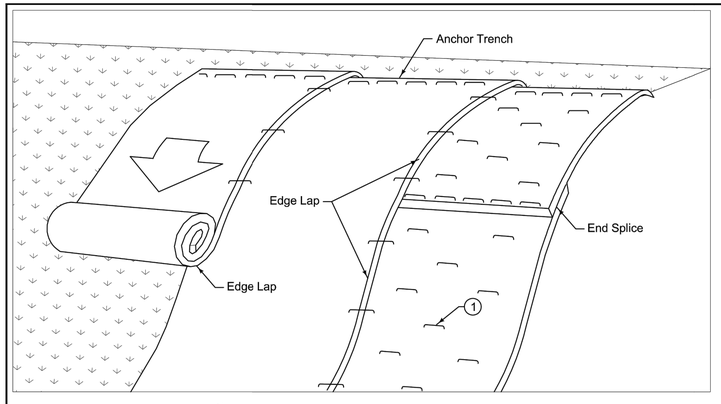
REVISION 2 10-21-14

9040.119

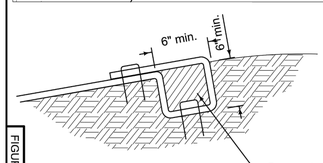
SHEET 2 of 2

SUDAS Standard Specifications

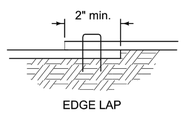
SILT FENCE



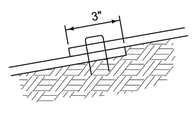
1 Secure blanket to ground according to manufacturer's recommended anchoring pattern and minimum shown in Table 1.



ANCHOR TRENCH
(12" min. anchor spacing)



EDGE LAP
(4'-0" min. anchor spacing)



END SPLICE
(18" min. anchor spacing)

TABLE 1

Max. slope	Min. anchors
≤ 3:1	1.5/yd²
2:1	2/yd²
1:1	2.5/yd²

FIGURE 9040.103 SHEET 1 OF 1

SUDAS

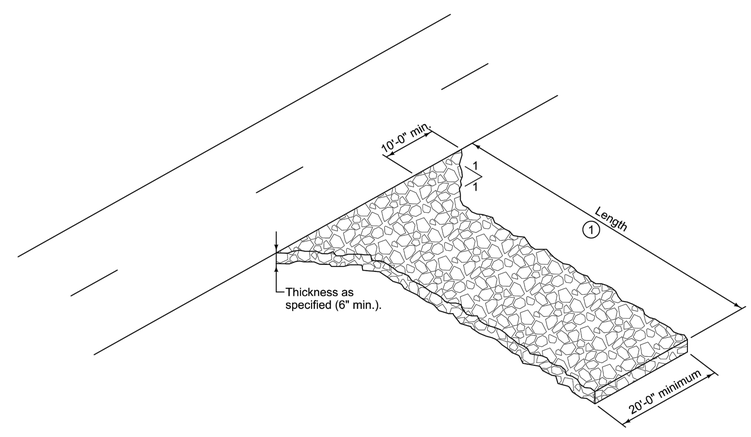
REVISION 2 10-21-14

9040.103

SHEET 1 of 1

SUDAS Standard Specifications

ROLLED EROSION CONTROL
PRODUCT (RECP)
INSTALLATION ON SLOPES



1 Entrance length: 50 foot minimum (30 foot for single family residential), or as specified in the contract documents. Length of entrance may be increased if sediment track-out occurs.

FIGURE 9040.120 SHEET 1 OF 1

SUDAS

REVISION 2 10-21-14

9040.120

SHEET 1 of 1

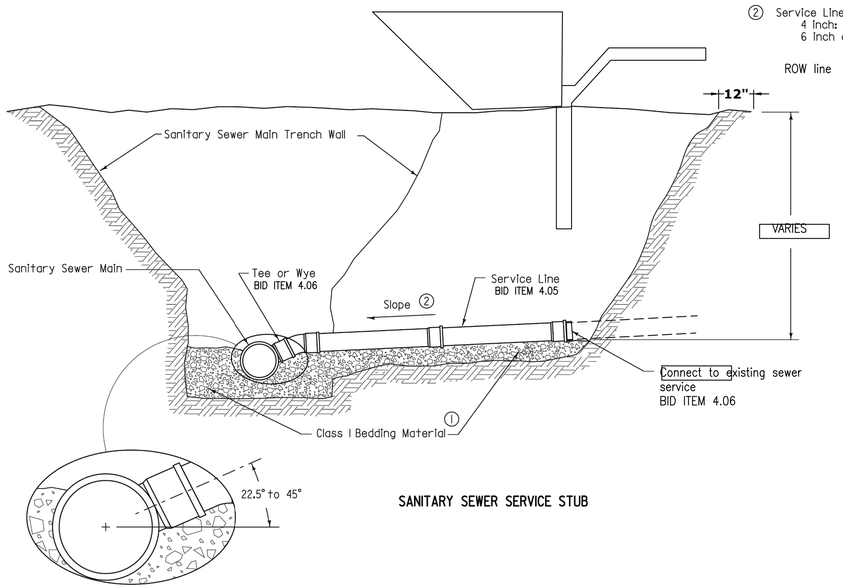
SUDAS Standard Specifications

STABILIZED
CONSTRUCTION ENTRANCE

FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103

① Place bedding and backfill material as required for sewer main.

② Service Line Slope:
4 Inch: 2% to 5%
6 Inch and greater: 1% to 5%



SANITARY SEWER SERVICE STUB

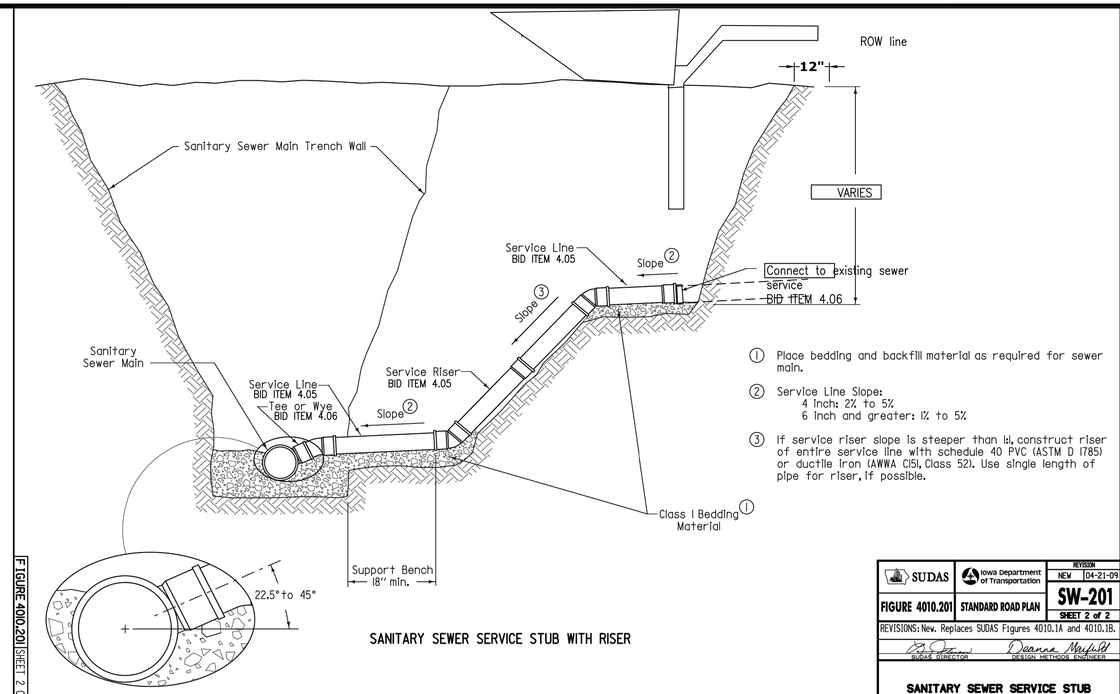
FIGURE 4010.201 SHEET 1 OF 2

SUDAS	Iowa Department of Transportation	REVISION NEW 04-21-09
FIGURE 4010.201	STANDARD ROAD PLAN	SW-201 SHEET 1 of 2

REVISIONS: New. Replaces SUDAS Figures 4010.1A and 4010.1B.

SUDAS DIRECTOR — DESIGN METHODS ENGINEER

SANITARY SEWER SERVICE STUB



① Place bedding and backfill material as required for sewer main.

② Service Line Slope:
4 Inch: 2% to 5%
6 Inch and greater: 1% to 5%

③ If service riser slope is steeper than 1:1, construct riser of entire service line with schedule 40 PVC (ASTM D 1785) or ductile iron (AWWA C151, Class 52). Use single length of pipe for riser, if possible.

SANITARY SEWER SERVICE STUB WITH RISER

FIGURE 4010.201 SHEET 2 OF 2

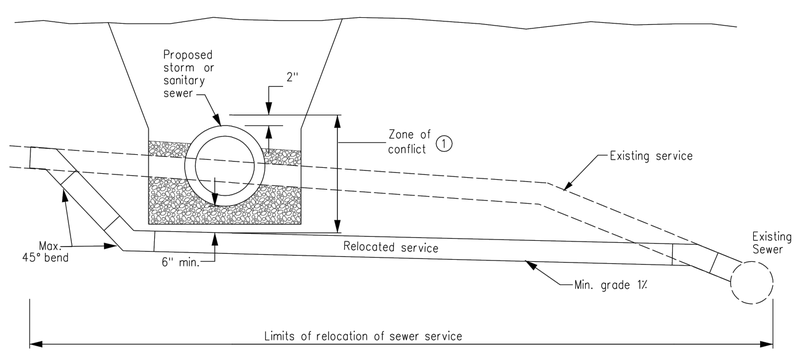
SUDAS	Iowa Department of Transportation	REVISION NEW 04-21-09
FIGURE 4010.201	STANDARD ROAD PLAN	SW-201 SHEET 2 of 2

REVISIONS: New. Replaces SUDAS Figures 4010.1A and 4010.1B.

SUDAS DIRECTOR — DESIGN METHODS ENGINEER

SANITARY SEWER SERVICE STUB

① Zone of conflict is from 6 inches below the bottom of the sewer pipe to 2 inches above the top of pipe.

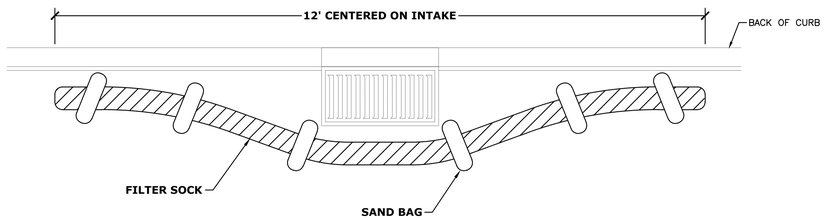


	Service Status	Contractor's Responsibility	Compensation
1.	Service located outside zone of conflict.	Provide protection. If damaged, repair in compliance with plumbing code.	Incidental to other work.
2.	Service located in zone of conflict.	Relocate service according to Section 4010, 3.07.	Bid item: Relocate sanitary sewer service.
3.	Service located in zone of conflict, but elevations do not allow simple relocation as detailed above. Special design required.	Relocate service as directed by the Engineer.	Change order.

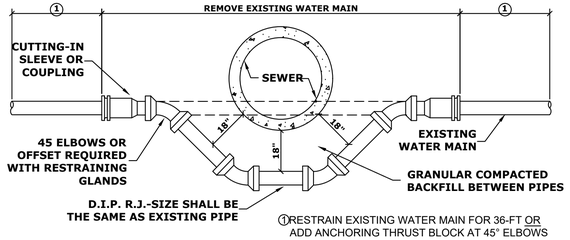
FIGURE 4010.901 SHEET 1 OF 1

SUDAS	REVISION NEW 10/21/08
FIGURE 4010.901	SHEET 1 OF 1

RELOCATE SANITARY SEWER SERVICE IN CONFLICT WITH NEW SEWER



1 CURB INTAKE PROTECTION DETAIL
NTS



2 WATER MAIN LOWERING DETAIL
NOT TO SCALE

STORM WATER POLLUTION PREVENTION PLAN

All contractors/subcontractors shall conduct their operations in a manner that minimizes erosion and prevents sediments from leaving the roadway right-of-way and prevents chemical contamination of soil and water. The Prime Contractor shall be responsible for compliance and implementation of the Pollution Prevention Plan (PPP) for their entire contract. This responsibility shall be further shared with subcontractors whose work is a source of potential pollution as defined in this PPP. All work necessary to be in compliance with the PPP shall be considered incidental to the project. Therefore, it is in the best interest of the Contractor to disturb as little land as possible.

Phase 1 - Site Evaluation and Design Development

Existing soil information: See the Washington County Soil Survey, NW Quarter of Section 17 of T75N, R07W.

Existing runoff quality: Existing data on runoff water quality is not available.

Location of surface water on site: None.

Name of receiving stream: unnamed tributary to South Fork of Long Creek a tributary of the Iowa River.

Construction activity description: General soil disturbing activities associated with grading and utility installation including excavation, stockpiling, trenching, backfilling, paving and seeding.

This Pollution Prevention Plan (PPP) is for North 4th Avenue Improvements; Washington, Iowa. This PPP covers approximately 1.91 acres with an estimated less than 1.91 of the acres being disturbed.

The PPP is located in an area of one (1) type of soil association: Tainter silty clay loam (279). The estimated average NRCS runoff curve number for this PPP after completion will be 89.

Refer to the Plans (7114-19A) for locations of typical slopes, ditch grades, and major structural and non-structural controls. A copy of this plan will be on file at the Project Engineer's office. All runoff will eventually flow into tributaries of the Iowa River.

Site map: The plans show slopes after grading, disturbed areas, drainage patterns, and discharge points.

Potential Sources of Pollution:

Site sources of pollution generated as a result of this work relate to silts and sediment that may be transported as a result of a storm event. However, this PPP provides conveyance for other (non-project related) operations. These other operations have storm water runoff, the regulation of which is beyond the control of this PPP. Potentially this runoff can contain various pollutants related to site-specific land uses. Examples are:

a. Rural Agricultural Activities:

Runoff from agricultural land use can potentially contain chemicals including herbicides, pesticides, fungicides and fertilizers.

b. Commercial and Industrial Activities:

Runoff from commercial and industrial land use may contain constituents associated with the specific operation. Such operations are subject to potential leaks and spills that could be commingled with run-off from the facility. Pollutants associated with commercial and industrial activities are not readily available since they are typically proprietary.

Municipal Utilities: Site is located in the City of Washington corporate limits.

Phase 2 - Control Selection/Plan Design

(A) Select Erosion and Sediment Controls

The Contractor shall submit specifications for temporary and permanent measures to be used for controlling erosion and sediment. Demolition or clearing and grading should not be started until a firm construction schedule is known and can be effectively coordinated with the grading and clearing activity.

The following Stabilization measures will be utilized:

Temporary seeding - Exposed areas subject to erosion should be covered as quickly as possible. Under Iowa's General Permit No. 2., disturbed areas of the construction site that will not be re-disturbed for 14 days or more, on any portion of the site, the area shall be stabilized by day zero, the last day of land disturbing activities.

Permanent seeding, sod and planting - Permanent seeding or sod shall be done in accordance with the Seeding Plan. The seeding schedule shall follow the Iowa Department of Transportation (IDOT) specifications. Temporary seeding shall be utilized for erosion control until permanent seeding can be established.

Mulching - Temporary vegetation will be used as mulch when permanent seeding is completed.

Preservation of Natural Vegetation - Natural Vegetation shall be preserved where possible within the construction limits. Natural vegetation shall not be disturbed outside of the construction limits. Vegetation may be mowed or harvested for hay crop.

Vegetative Strips - Vegetative strips may be utilized to slow runoff velocities and deposit sediments from disturbed areas.

Soil Retaining Measures - Soil to be reused will be stockpiled onsite as indicated on the plans. Silt fence will be utilized to maintain soils onsite. See City of Washington requirements for topsoil replacement.

Minimization of land exposure - Exposure of disturbed land shall be minimized in terms of area and time.

Roadways - Roadways will be surfaced or otherwise stabilized as soon as feasible.

Topsoil - shall be preserved, onsite, unless infeasible and de-compacted prior to final stabilization. Re-spread minimum depth of eight-inches (8") of topsoil with at least 3% organic matter, per SUDAS.

The following structural practices will be utilized:

Earthen Berm or Dike - Earthen dikes may be used to divert water around disturbed areas and around intakes as directed by the Engineer.

Silt fence - Silt fence shall be placed on the perimeter of the disturbed area, and other locations, as shown on the drawings. Additional silt fence shall be provided at the discretion of the Engineer.

Gravel Construction Entrance - A gravel or crushed aggregate construction entrance will be used to reduce or eliminate offsite tracking of soil or debris.

Sediment Trap - To be placed at location(s) indicated on the plans.

Check Dam - Rock check dam shall be placed in drainage channel as indicated on the plans.

Blanket and Matting (RECP - Type 2.C) - Erosion control matting on slopes as indicated on the plans.

Inlet and Outlet Protection - To be placed at location(s) indicated on the plans.

(B) Select other controls

Disposal of construction site waste materials - The Contractor will be responsible for making sure that all construction wastes are properly disposed of at facilities permitted to accept these types of wastes. In the event of a conflict with other governmental laws, rules and regulations, the more restrictive laws, rules or regulations shall apply.

Treatment or disposal of sanitary wastes generated onsite - The Contractor will be responsible for providing sanitary facilities for workers in accordance with local and state requirements. Facilities shall be secured from overturning. The Contractor will be responsible for disposing of sanitary waste in accordance with local and state requirements.

Prevent off-site tracking of sediments and generation of dust - The Contractor shall prevent the tracking of sediments offsite. A construction entrance shall be installed as shown on the plans. The Contractor will be responsible for immediate cleanup of any tracked mud or debris. Contractor will need to provide appropriate labor and equipment to keep roadway clean during hauling operations.

The Contractor will also be responsible for preventing dust generation from construction activities. The Contractor shall take reasonable measures to prevent unnecessary dust. Earth surfaces subject to dusting shall be kept moist with water or by application of a chemical dust suppressant. Dust prone materials in piles or in transit shall be covered when practical to prevent blowing. Buildings and operating facilities which are affected adversely by dust shall be adequately protected from dust. Existing and new equipment which may be adversely affected by dust shall be adequately protected.

The Contractor will be responsible for preventing chemical contamination of soil and water.

PCC waste - The Contractor shall provide and maintain a containment facility for waste paving product (i.e. PCC washout station). Perform maintenance when washout station is at 75% capacity.

Materials Management - All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure. See specifications for further recommendations. Waste materials which can easily become airborne will be contained to prevent materials from leaving the site. Dumpsters shall have a cover to minimize rain water from entering the container.

Equipment servicing - Contractor shall prevent spilling of petroleum products. Spill shall be cleaned up immediately. If spill is hazardous, utilize appropriate notification and clean-up measures. Used petroleum containers are to be disposed of correctly and not buried on-site.

Building Trade Waste - The general contractor and trade contractors will be responsible for preventing contamination of soil and water. Trades (including brick / block layers, drywall / sheetrock, painters, pipe fitters, caulking, etc.) are required to clean or perform maintenance to equipment or dispose of excess material in a manner that protects water quality (no illicit discharges). This may require measures similar to a PCC washout station.

(C) Inspection and Maintenance Plan

The contractor will be responsible for installation and all associated costs of erosion and stormwater management controls during the contract period. Details of control measures are shown on the plans.

Inspections shall be made by the Contractor every seven calendar days. The Contractor shall immediately begin corrective action on all deficiencies found. The findings of this inspection shall be recorded in the project diary. Based on the results of the inspection, pollution prevention measures identified in the plan shall be revised at the construction site as appropriate as soon as practicable after the inspection and to the plan as soon as practicable after the inspection but in no case more than 7 calendar days following the inspection. If the permittee determines that making these changes at the construction site or to the plan less than 72 hours after the inspection is impracticable, the permittee shall document in the plan why it is impracticable and indicate an estimated date by which the changes will be made.

Maintenance - the contractor is required to maintain all temporary erosion control measures in proper working order, including cleaning, repairing, or replacing them throughout the contract period. Cleaning of silt control devices shall begin when the features have lost 50% of their capacity. Cleaning of PCC washout station shall take place when control is at, or before, 75% capacity.

(D) Control Description

Description of controls can be found in section (A). The Contractor will be responsible for submitting specifications of the selected controls. The location of determined controls can be found on the plans. Additional controls may be required at the discretion of the Engineer.

(E) Schedule of major activities

Prior to initiating construction, the Contractor shall submit a schedule of major activities including:

1. Land clearing and grading in relation to the corresponding schedule for all excavation work. If possible, clearing should immediately precede the construction activity.
2. Installation and anticipated completion date of each control measure.

(A) Non-Storm Discharges

1. Water from water line flushing.
2. Uncontaminated ground water from dewatering.
3. Pavement wash waters where spills of leaks of hazardous material has not occurred.
4. Building wash waters not containing hazardous chemicals.

(A) Prohibited Discharges

1. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials.
2. Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance.
3. Soaps or solvents used in vehicle and equipment washing.

(A) Materials Management

1. Hazardous materials shall be stored in areas where the contamination of storm water is minimized in the event of a spill.
2. Contractor shall be responsible for using, storing and disposing of materials in accordance with state and local law.
3. See SWPPP narrative for additional material management requirements.

Phase 3 - Plan Implementation

Contractor Certification

All Contractors and subcontractors, including short-term contractors and subcontractors coming on-site, must sign the Contractor certification statement before conducting any professional service at the site identified in the plan. The certification must be signed by an authorized representative (i.e., principal executive officer, president, secretary, treasurer or vice president, general partner, proprietor, ranking elected official). Upon signing the certification, the Contractor or subcontractor becomes a co-permittee with the Owner and other co-permittee Contractors. In signing the plan, the authorized representative certifies that the information is true and assumes liability for the plan. Note that Section 309 of the Clean Water Act provides for significant penalties where information is false or the permittee violates, either knowingly or negligently, permit requirements.

The General Contractor will be responsible for collecting and maintaining signatures. The Contractor shall provide copies of signed certifications to the Owner and Engineer upon request and at the termination of the contract.

Contractor Certification Statement

"I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activities from the construction site as a part of this certification. Further, by my signature, I understand that I am becoming a co-permittee, along with the owner(s) and other contractors and subcontractors signing such certifications, to the Iowa Department of Natural Resources NPDES General Permit No. 2 for "Storm Water Discharge Associated with Industrial Activities" at the identified site. As a co-permittee, I understand that I, and my company, are legally required under the Clean Water Act and the Code of Iowa, to ensure compliance with the terms and conditions of the storm water pollution plan developed under this NPDES permit and the terms of the NPDES permit."

(A) Notice of Intent (NoI)

The Owner or an agent of the Owner will fulfill the public notice requirement and submit the Notice of Intent for coverage under General Permit No. 2. The project required the obtaining of a NPDES General Permit for storm water discharge associated with industrial activity for construction activities. The Owner and the Contractor have a copy of this permit. The Contractor and all subcontractors shall be responsible for compliance and fulfilling all requirements of the NPDES General Permit including the Storm Water Pollution Prevention Plan.

Phase 4 - Plan Implementation

The Contractor shall follow the schedule as submitted under Phase 2 (E). The Contractor shall keep the Engineer informed of any deviation of the schedule or plan.

(A) Inspection and Maintenance Reports

A copy of the inspection log shall be maintained at the site.

(B) Records of Construction Activities

In addition to the installation and maintenance of erosion control implementation, the Contractor should keep records of the construction activity on the site. In particular, the Contractor should keep a record of the following information:

-The dates when major grading activities occur in a particular area.

-The dates when construction activities cease in an area, temporarily or permanently.

-The dates when an area is stabilized, temporarily or permanently.

-These records can be used to make sure that areas where there is no construction activity will be stabilized within the required time frame.

(C) Plan Updates

The pollution prevention plan shall be updated expeditiously:

-When it does not accurately reflect the site features and operations.

-When the Contractor, Owner, or Engineer observes that it is not effective in minimizing pollutant discharge from the site.

-To include Contractors identified after the submittal of the Notice of Intent. These Contractors shall certify the plan and be identified as co-permittees and

-To identify any change in ownership or transference of the permit and permit responsibilities.

If, at any time during the effective period of the permit, the IDNR finds that the plan does not meet one or more of the minimum standards established in the general permit, the IDNR will notify the permittee of required changes necessary to bring the plan up to standard. Permittees shall have 3 days after notification to make the necessary changes and shall submit to the Department a written certification that the changes have been made.

(D) Report of Hazardous Conditions

Because construction activities may include handling of certain hazardous substances over the course of the project, spills of these substances may create a hazardous condition and are required to be reported. Iowa Code, 455B.386, requires that as soon as possible, but not more than six hours after the onset of a hazardous condition, the IDNR and local Sheriff's Office or the office of the Sheriff of the affected county be notified. The Owner and Engineer should also be informed of the hazardous condition in a timely manner. Contractor is responsible for spill clean-up, remediation and reporting.

IDNR (515) 725 - 8694, Washington County Sheriff's Office (319) 653 - 2107

The Contractor shall submit a report to the Engineer within 14 calendar days of a hazardous condition. The report shall describe the release and the circumstances leading to the release. Steps to prevent the reoccurrence of such releases are to be identified in the plan and implemented.

(E) Plan location and access

Plan location - A copy of the Pollution Prevention Plan must be kept at the construction site, or at a readily available alternative site approved by the Department, from the time construction begins until the site has reached final stabilization.

Retention of records - G. P. #2 (3.01.2018) requires that copies of the Storm Water Pollution Prevention Plan and all other reports required by the permit, as well as all of the data used to complete the Notice of Intent, be retained for 3 years after the completion of final site stabilization.

Access - Although plans and associated records are not necessarily required to be submitted to the Iowa Department of Natural Resources (IDNR), these documents must be made available upon request, within 3 hours, to the IDNR. If storm water runoff is discharged to a municipal separate storm sewer system, the plans must be made available upon request to the municipal operator of the system.

Phase 5 - Final Stabilization and Notice of Discontinuation (NoD)

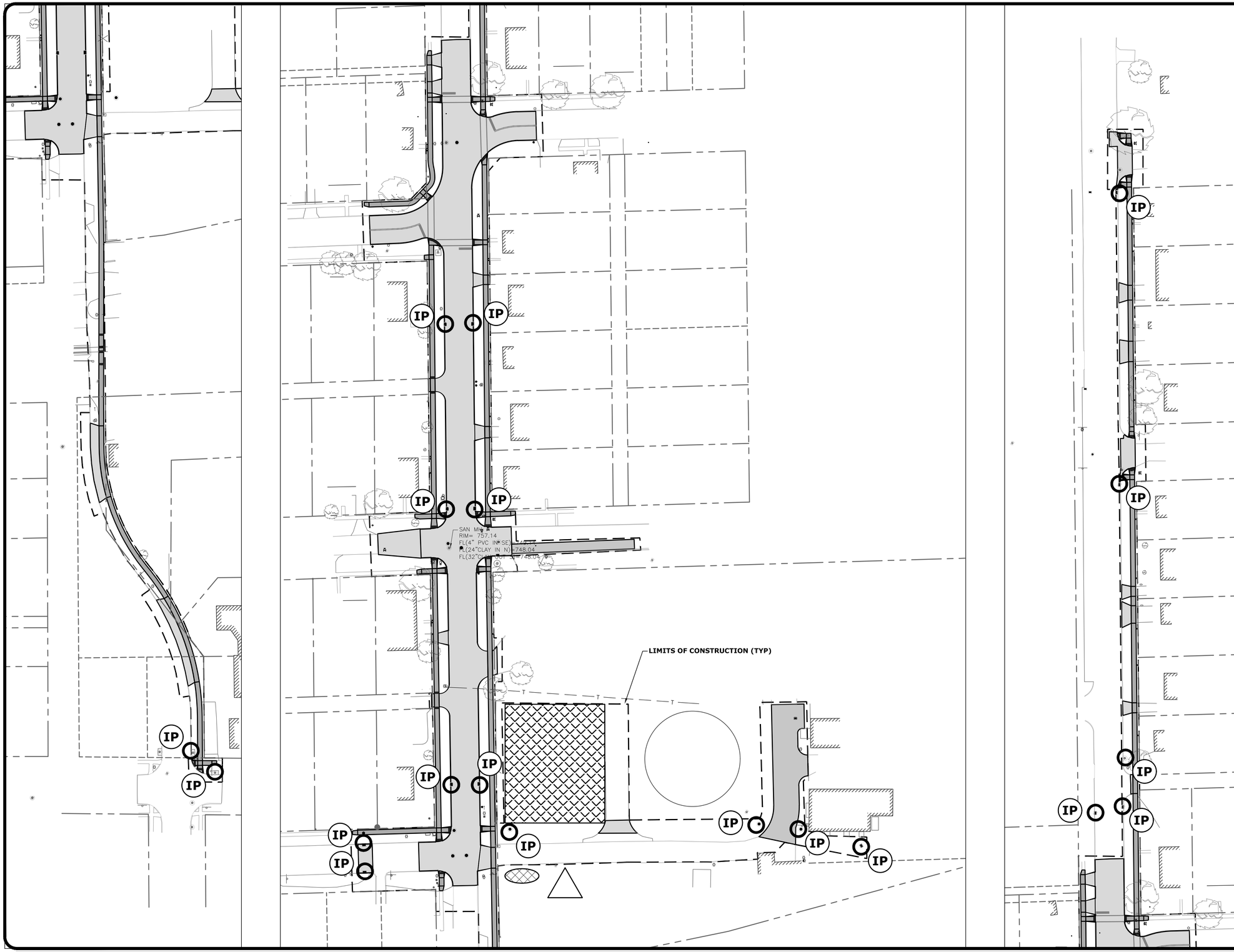
(A) Final Stabilization

Final stabilization is defined in the general permit as meaning that all soil disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of 70%, sufficient to preclude erosion, for the entire disturbed area of the permitted project has been established or equivalent stabilization measures have been employed or which has been returned to agricultural production.

The Contractor shall notify the permit holder and Engineer of final stabilization in accordance with the contract documents. The Owner and Engineer will review the site before finalizing the contract and taking control of the site. The Contractor will be required to provide a copy of all inspection and maintenance logs, schedule of construction activities, and Contractor Certifications to the Owner at this time.

(B) Notice of Discontinuation (NoD)

The permit holder (Owner) will be required to submit the Notice of Discontinuation once control of the site has been obtained from the Contractor. All temporary control (i.e. silt fence) shall be removed by contractor prior to filing the NoD.



LEGEND

- CONCRETE, PAINT, AND GROUT WASHOUT AREA
- DESIGNATED STAGING AREA FOR PORTABLE RESTROOMS, TEMPORARY FUEL TANKS, WASTE CONTAINERS, AND OTHER CHEMICALS.
- SPILL KIT
- IP INLET PROTECTION

0 50' 100'

G4.2	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	STORW WATER POLLUTION PREVENTION PLAN N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	G4.2

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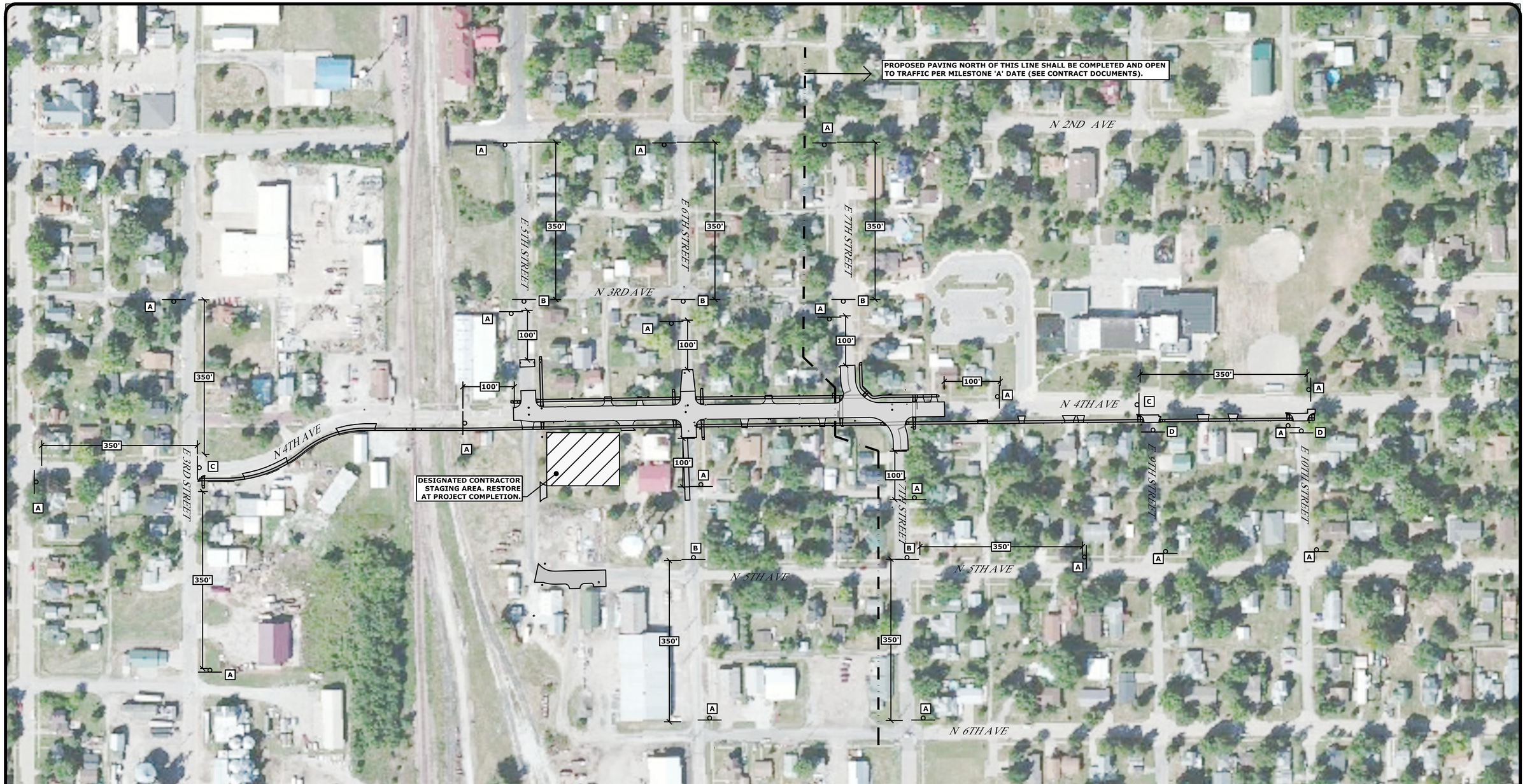

TRAFFIC CONTROL LEGEND

- **A** W20-3 "ROAD CLOSED AHEAD"
- **B** R11-4 "ROAD CLOSED TO THROUGH TRAFFIC" ON TYPE III BARACADE
- **C** R11-4 "ROAD CLOSED TO THROUGH TRAFFIC" ON TYPE III BARACADE
  DETOUR EAST TO N. 12TH AVE
  OR DETOUR WEST TO N. 2ND AVE
- **D** LOCALIZED TEMPORARY ROAD CLOSURE REQUIRED FOR PROPOSED WORK.
  FOLLOW IDOT & MUTCD GUIDELINES

0 100' 200'

G5.1	LAST UPDATE: 01/20/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	STAGING & TRAFFIC CONTROL PLAN — N 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 01/20/20	G5.1

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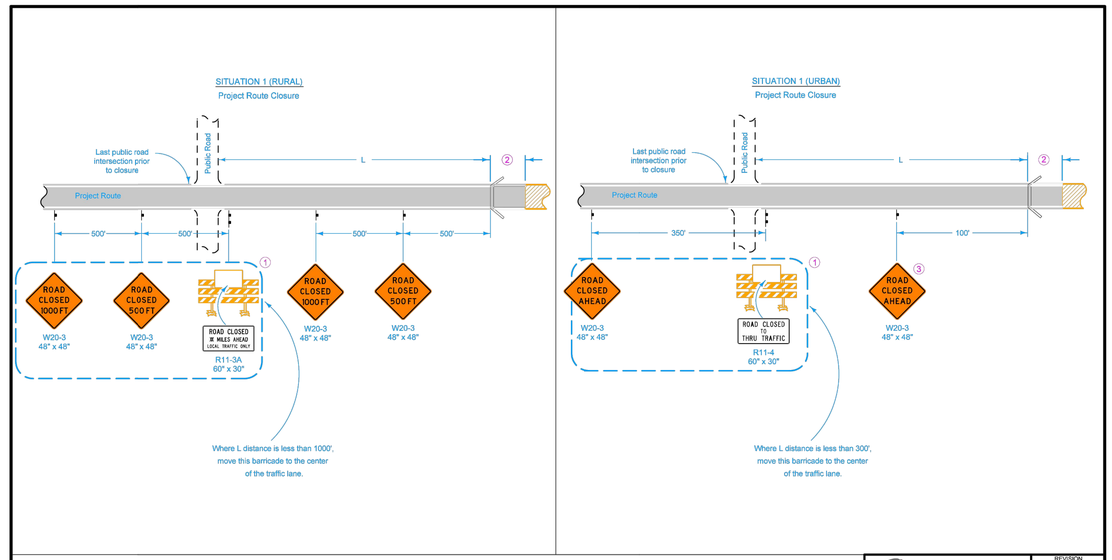
SIGN PLACEMENT ON
TYPE III BARRICADES

Typical Sign Placement

Sign Placement with
Supplemental Sign

IOWA DOT
STANDARD ROAD PLAN
REVISION 6 04-19-16
TC-252
SHEET 1 of 3
REVISIONS: Added circle note 3 to page 2 and changed circle note 3 to 4 on page 3. Modified the SITUATION 1 (URBAN) detail on page 2.
APPROVED BY DESIGN METHODS ENGINEER
ROUTES CLOSED TO TRAFFIC



LEGEND
- Traffic Sign
- Type III Barricade
- Work Area
- Road Closure

1. In situation 1, if the intersection is the point of detour these signs and barricade will become the responsibility of the contracting authority and may be modified by the contracting authority to fit detour signing.
2. When possible, a 100' buffer is desirable.
3. When L is less than 300 feet, omit the ROAD CLOSED AHEAD sign.

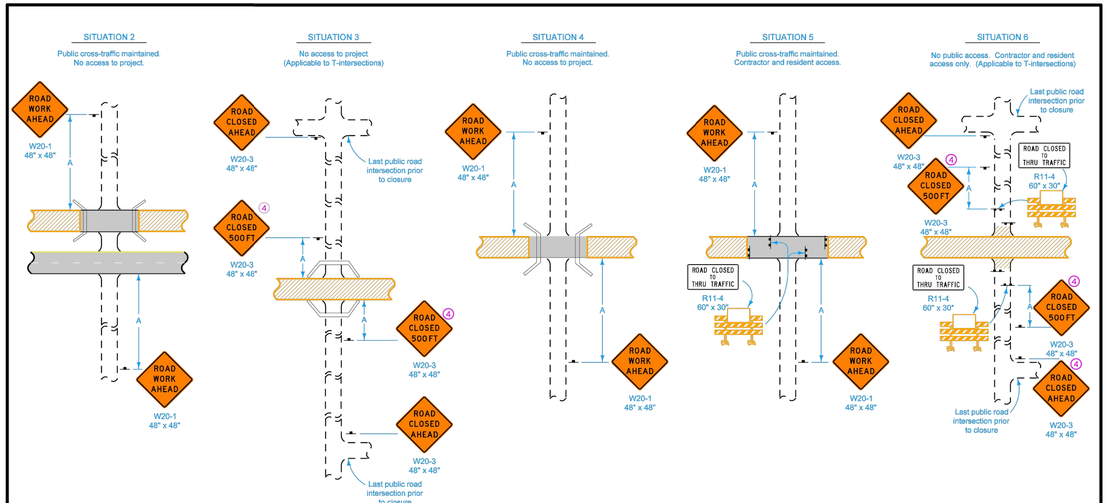
Possible Contract Items:

Traffic Control
Safety Closures

Possible Tabulation:

108-13A

IOWA DOT
STANDARD ROAD PLAN
REVISION 6 04-19-16
TC-252
SHEET 2 of 3
REVISIONS: Added circle note 3 to page 2 and changed circle note 3 to 4 on page 3. Modified the SITUATION 1 (URBAN) detail on page 2.
APPROVED BY DESIGN METHODS ENGINEER
ROUTES CLOSED TO TRAFFIC



During suspension of work, (such as over winter):

- Use Situation 2 on two-lane to four-lane projects.
- Situation 5 is preferred where cross-traffic is maintained.

4. When the distance between the last public road intersection and the ROAD CLOSED or ROAD CLOSED TO THRU TRAFFIC barricade is less than 1,000 feet, omit the ROAD CLOSED 500 FT sign.

LEGEND
- Traffic Sign
- Type III Barricade
- Work Area
- Road Closure

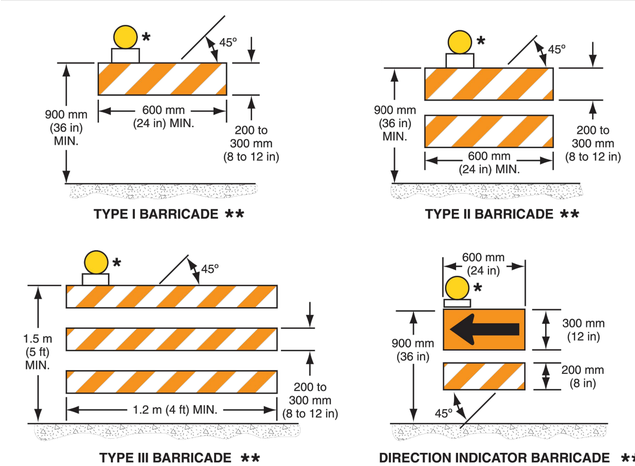
Location	A
Urban	200'
Rural	500'

IOWA DOT
STANDARD ROAD PLAN
REVISION 6 04-19-16
TC-252
SHEET 3 of 3
REVISIONS: Added circle note 3 to page 2 and changed circle note 3 to 4 on page 3. Modified the SITUATION 1 (URBAN) detail on page 2.
APPROVED BY DESIGN METHODS ENGINEER
ROUTES CLOSED TO TRAFFIC

W20-3
Road Closed (Distance)

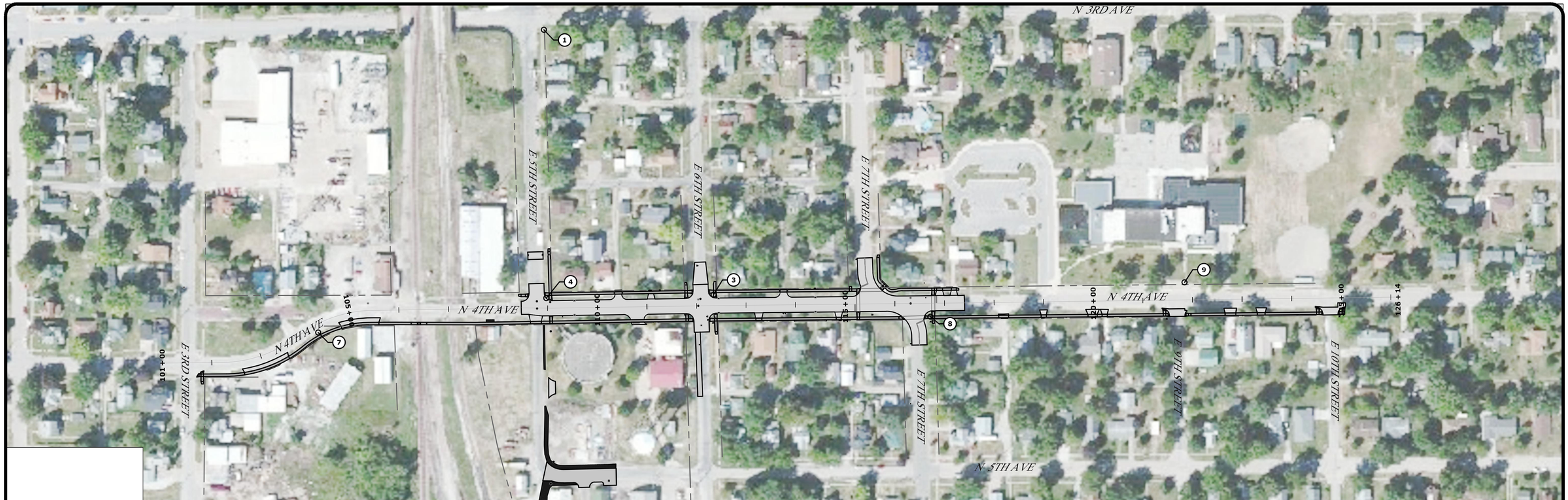
R11-4
Road Closed To Thru Traffic

Figure 6F-7. Channelizing Devices *(Sheet 2 of 2)*



* Warning lights (optional)
** Rail stripe widths shall be 150 mm (6 in), except that 100 mm (4 in) wide stripes may be used if rail lengths are less than 900 mm (36 in). The sides of barricades facing traffic shall have retroreflective rail faces.

Note: If barricades are used to channelize pedestrians, there shall be continuous detectable bottom and top rails with no gaps between individual barricades to be detectable to users of long canes. The bottom of the bottom rail shall be no higher than 150 mm (6 in) above the ground surface. The top of the top rail shall be no lower than 900 mm (36 in) above the ground surface.



Alignment: N 4TH AVE

Tangent Data

Description	PT Station	Northing	Easting
Start:	101+00.000	479241.899	2138265.32
End:	102+20.863	479362.755	2138263.99

Tangent Data

Parameter	Value	Parameter	Value
Length:	120.863	Course:	N 00° 37' 49.5334" W

Curve Point Data

Description	Station	Northing	Easting
PC:	102+20.863	479362.755	2138263.99
RP:		479360.004	2138014.005
PT:	103+65.620	479499.101	2138221.736

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	33° 10' 32.9201"	Type:	LEFT
Radius:	250		
Length:	144.757	Tangent:	74.471
Mid-Ord:	10.404	External:	10.856
Chord:	142.743	Course:	N 17° 13' 05.9935" W

Tangent Data

Description	PT Station	Northing	Easting
Start:	103+65.620	479499.101	2138221.736
End:	104+02.290	479529.571	2138201.333

Tangent Data

Parameter	Value	Parameter	Value
Length:	36.67	Course:	N 33° 48' 22.4535" W

Curve Point Data

Description	Station	Northing	Easting
PC:	104+02.290	479529.571	2138201.333
RP:		479668.667	2138409.064
PT:	105+45.436	479664.306	2138159.103

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	32° 48' 23.8488"	Type:	RIGHT
Radius:	250		
Length:	143.146	Tangent:	73.595
Mid-Ord:	10.176	External:	10.607
Chord:	141.198	Course:	N 17° 24' 10.5291" W

Tangent Data

Description	PT Station	Northing	Easting
Start:	105+45.436	479664.306	2138159.103
End:	108+46.709	479965.533	2138153.847

Tangent Data

Parameter	Value	Parameter	Value
Length:	301.273	Course:	N 00° 59' 58.6047" W

Tangent Data

Description	PT Station	Northing	Easting
Start:	108+46.709	479965.533	2138153.847
End:	109+09.264	480028.085	2138154.459

Tangent Data

Parameter	Value	Parameter	Value
Length:	62.555	Course:	N 00° 33' 40.0724" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	109+09.264	480028.085	2138154.459
End:	112+43.544	480362.325	2138149.295

Tangent Data

Parameter	Value	Parameter	Value
Length:	334.28	Course:	N 00° 53' 06.8409" W

Tangent Data

Description	PT Station	Northing	Easting
Start:	112+43.544	480362.325	2138149.295
End:	117+29.513	480848.265	2138143.971

Tangent Data

Parameter	Value	Parameter	Value
Length:	485.969	Course:	N 00° 37' 39.4748" W

Tangent Data

Description	PT Station	Northing	Easting
Start:	117+29.513	480848.265	2138143.971
End:	126+14.181	481732.852	2138132.051

Tangent Data

Parameter	Value	Parameter	Value
Length:	884.668	Course:	N 00° 46' 19.5014" W

SURVEY CONTROL POINTS

1 ARROW ON HYDRANT , NE QUADRANT OF E. 5th St & N. 2nd Ave
N- 480003.34
E- 2137598.60
Z- 753.45

3 CUT 'x' NW QUADRANT OF N. 4th Ave & E. 6th St
N- 480797.89
E- 2138172.08
Z- 758.13

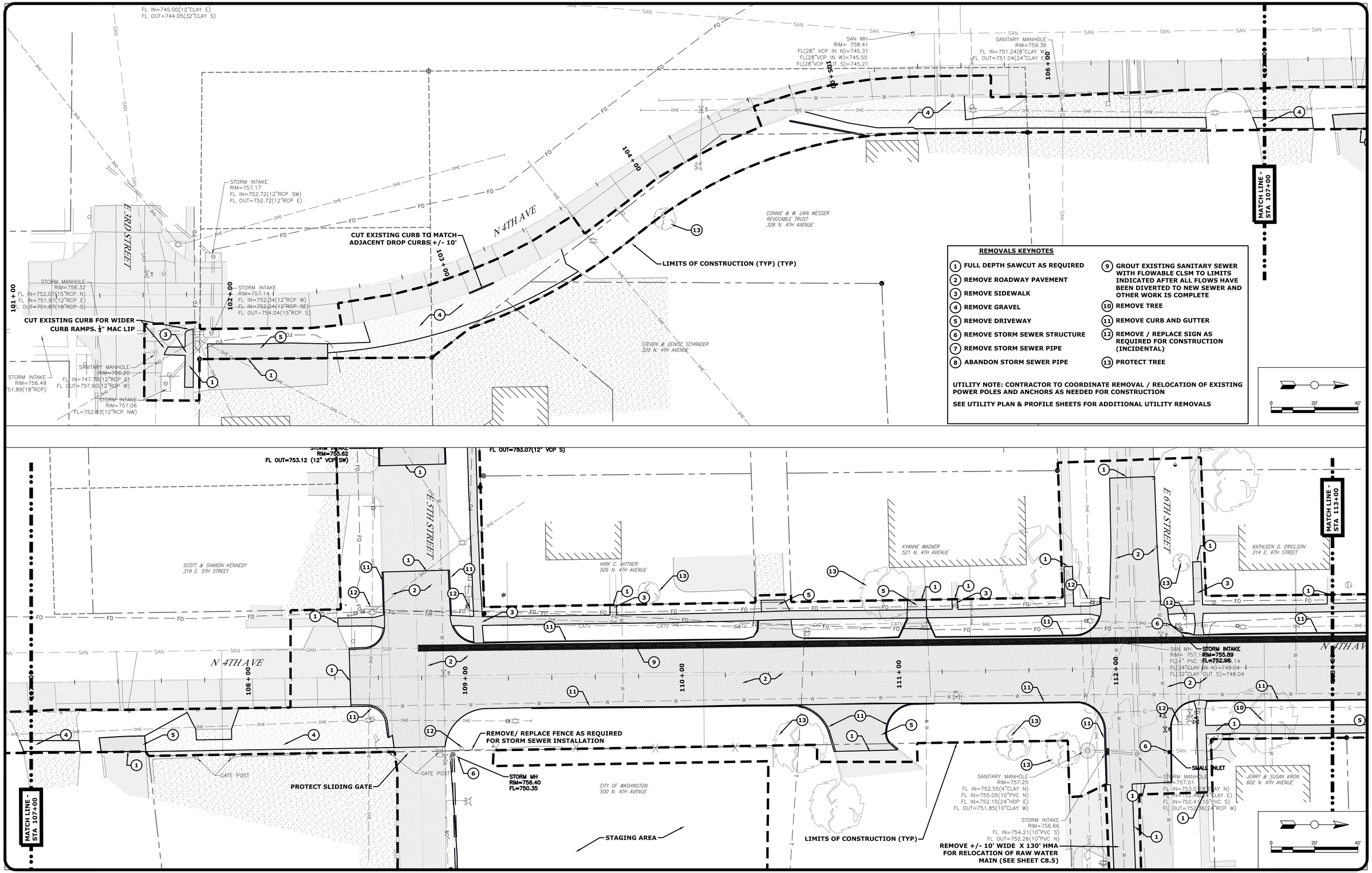
4 CUT 'x' NW QUADRANT OF N. 4th Ave & E. 5th St
N- 480024.89
E- 2138128.43
Z- 757.39

7 ARROW ON HYDRANT , EAST SIDE OF N 4th Ave +/- 450' SOUTH OF E. 5th St
N- 479558.63
E- 2138205.52
Z- 759.78

8 CUT 'x' NE QUADRANT OF N. 4th Ave & E. 7th St
N- 480797.89
E- 2138172.08
Z- 758.13

9 CUT 'x' WEST SIDE OF N. 4th Ave @ E. 9th St
N- 481284.70
E- 2138103.95
Z- 759.06

0 100' 200'



C1.1	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	EXISTING CONDITIONS & REMOVALS — N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C1.1

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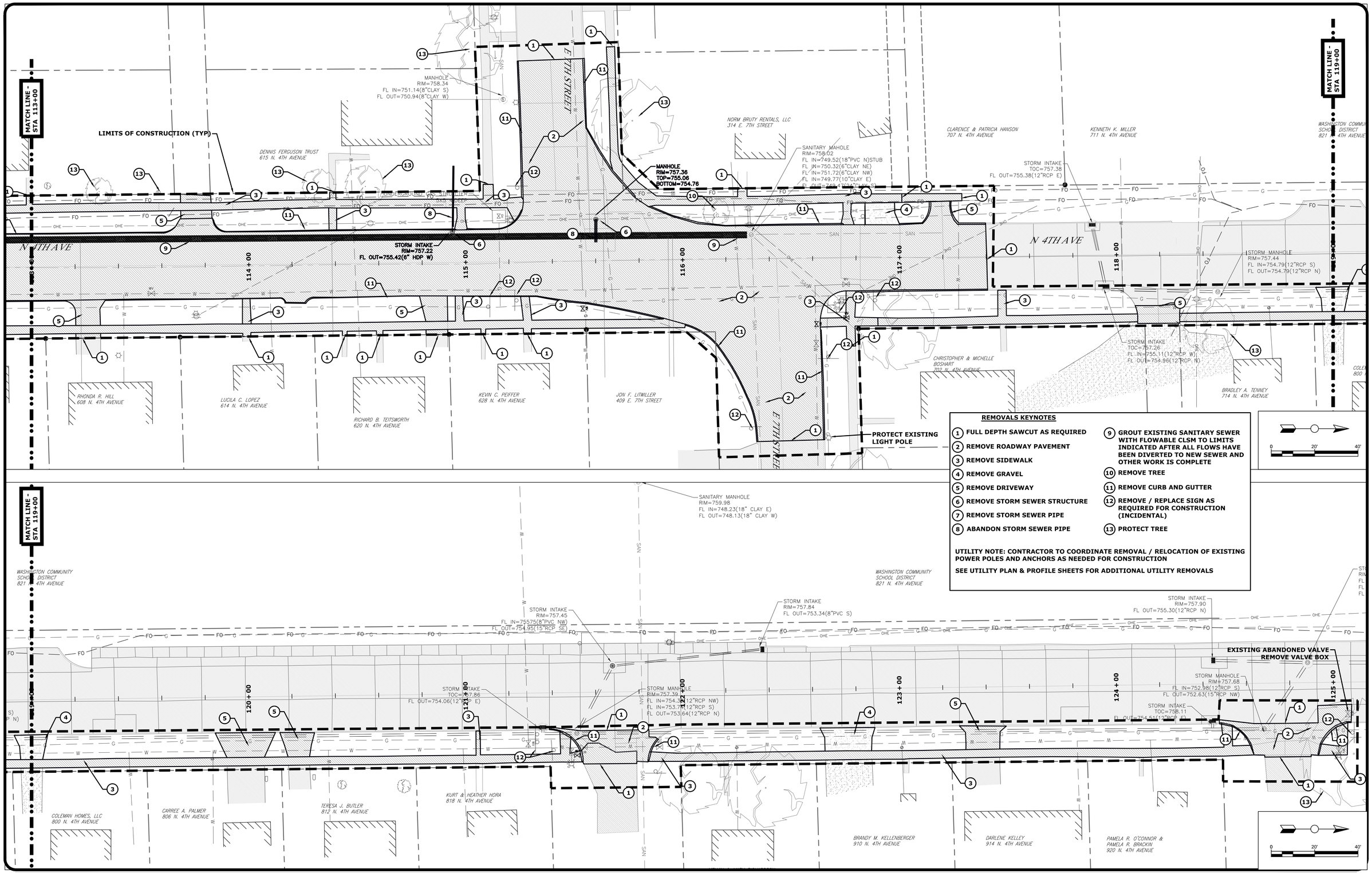

REMOVALS KEYNOTES

1. FULL DEPTH SAWCUT AS REQUIRED
2. REMOVE ROADWAY PAVEMENT
3. REMOVE SIDEWALK
4. REMOVE GRAVEL
5. REMOVE DRIVEWAY
6. REMOVE STORM SEWER STRUCTURE
7. REMOVE STORM SEWER PIPE
8. ABANDON STORM SEWER PIPE
9. GROUT EXISTING SANITARY SEWER WITH FLOWABLE CLSM TO LIMITS INDICATED AFTER ALL FLOWS HAVE BEEN DIVERTED TO NEW SEWER AND OTHER WORK IS COMPLETE
10. REMOVE TREE
11. REMOVE CURB AND GUTTER
12. REMOVE / REPLACE SIGN AS REQUIRED FOR CONSTRUCTION (INCIDENTAL)
13. PROTECT TREE

UTILITY NOTE: CONTRACTOR TO COORDINATE REMOVAL / RELOCATION OF EXISTING POWER POLES AND ANCHORS AS NEEDED FOR CONSTRUCTION

SEE UTILITY PLAN & PROFILE SHEETS FOR ADDITIONAL UTILITY REMOVALS

C1.2	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	EXISTING CONDITIONS & REMOVALS — N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C1.2

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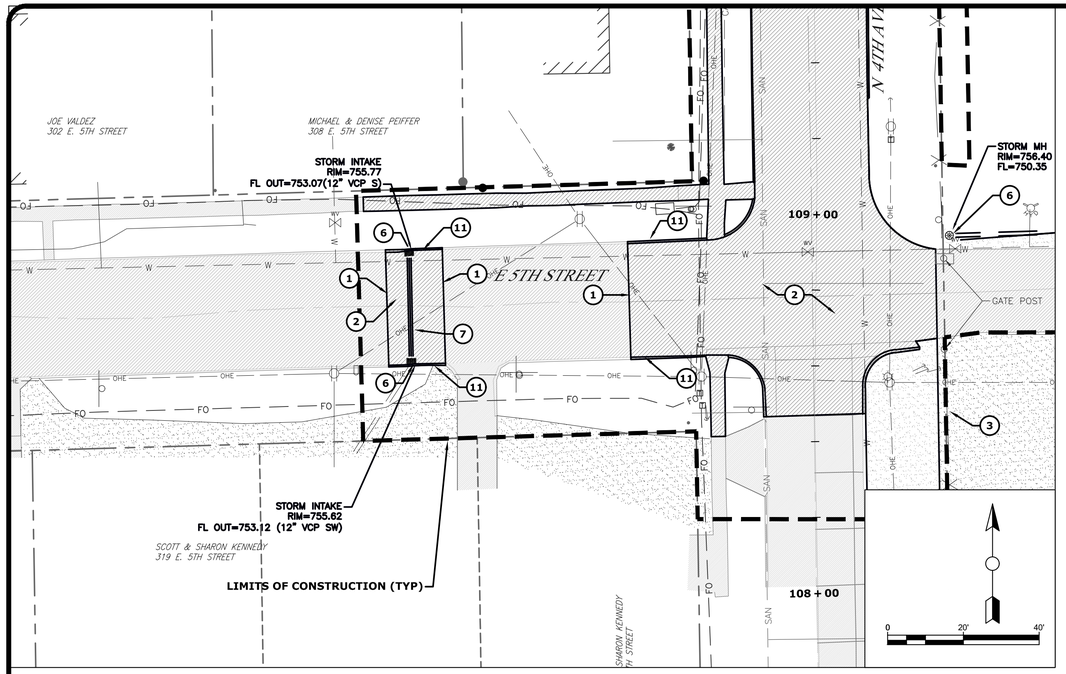

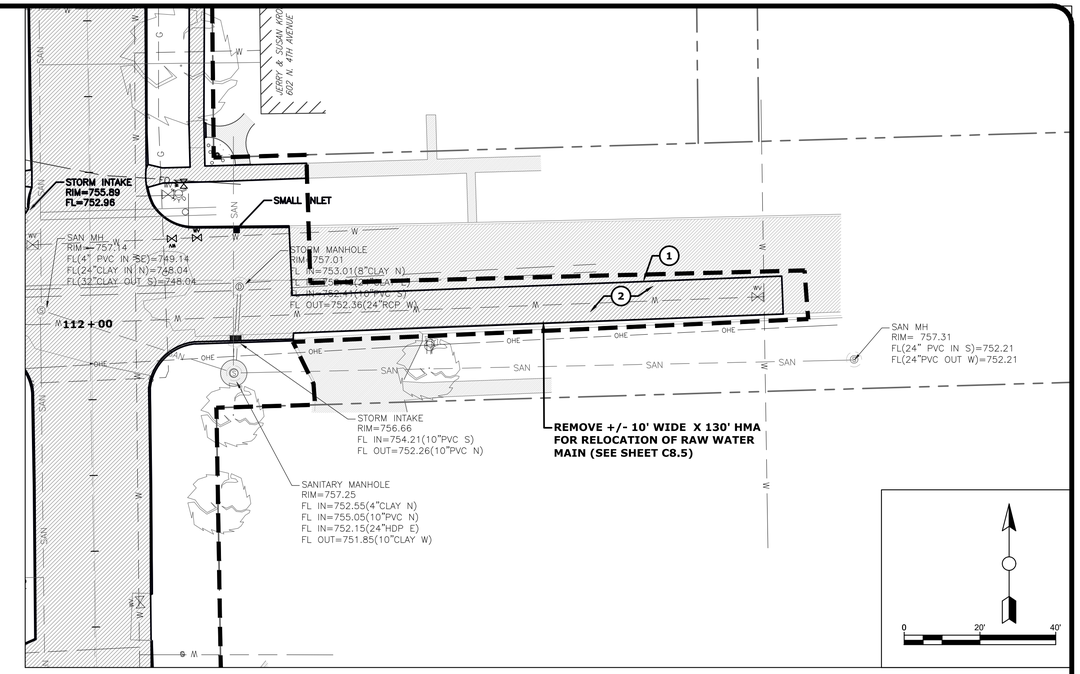

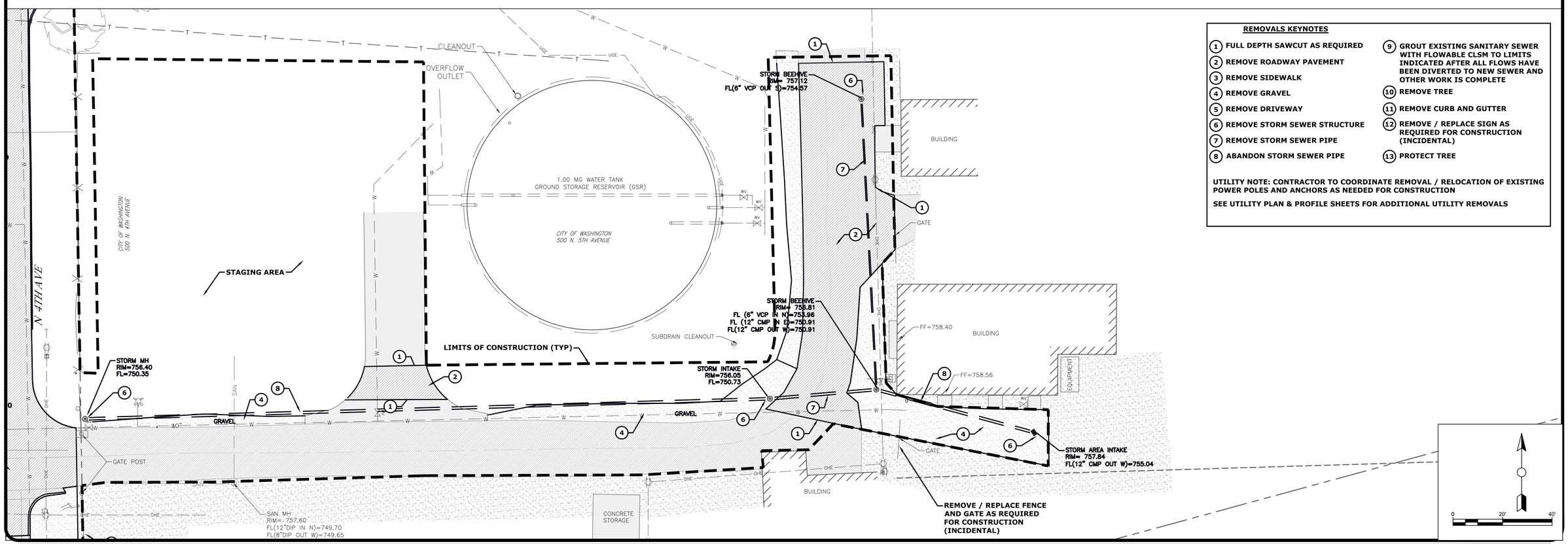

REMOVALS KEYNOTES

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C1.3	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	EXISTING CONDITIONS & REMOVALS — N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C1.3

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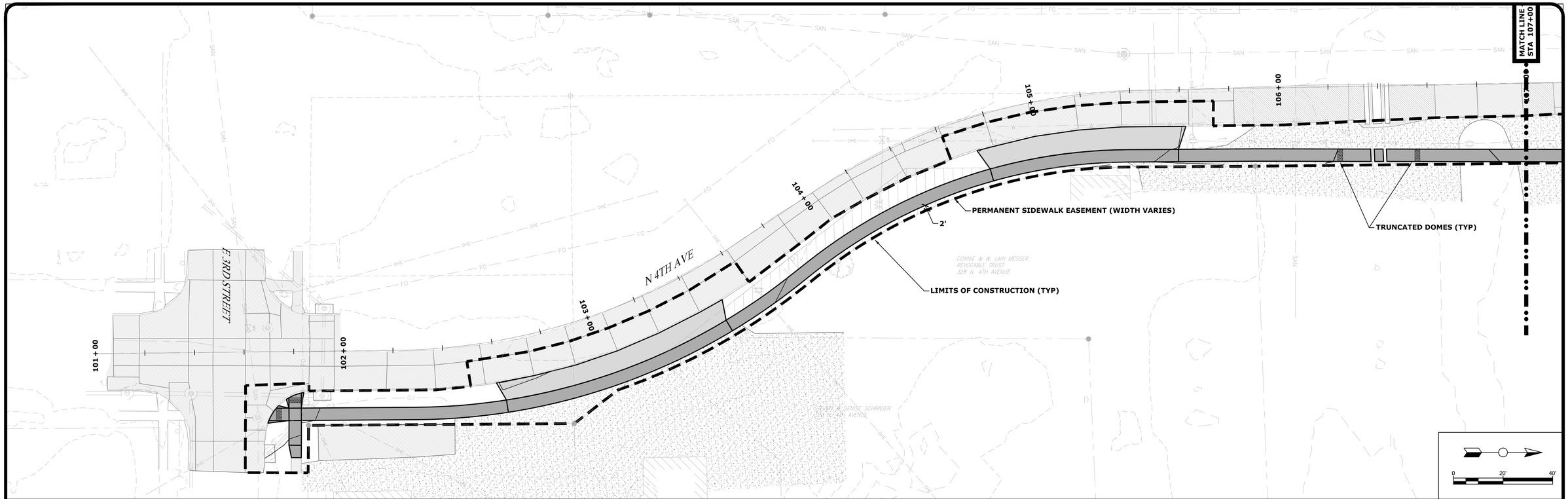

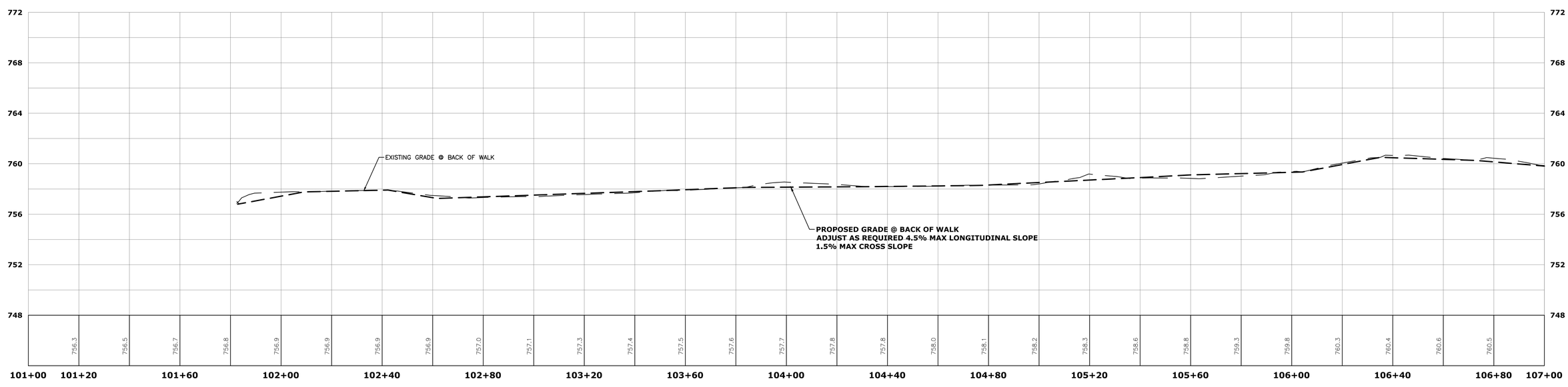

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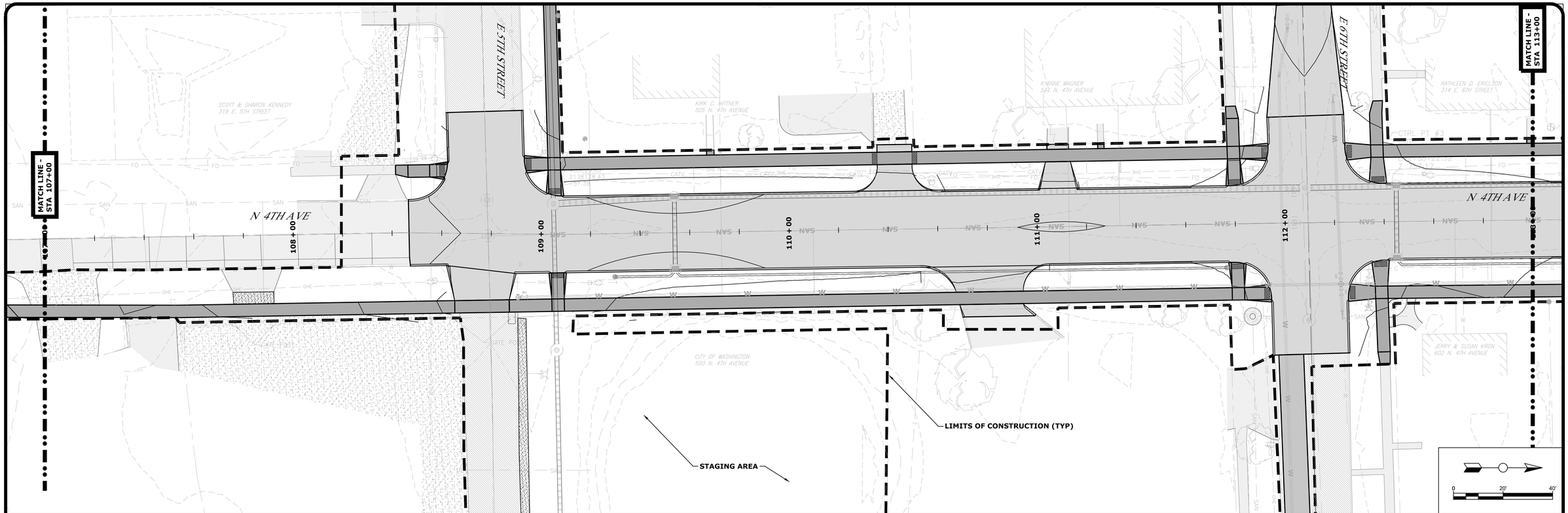

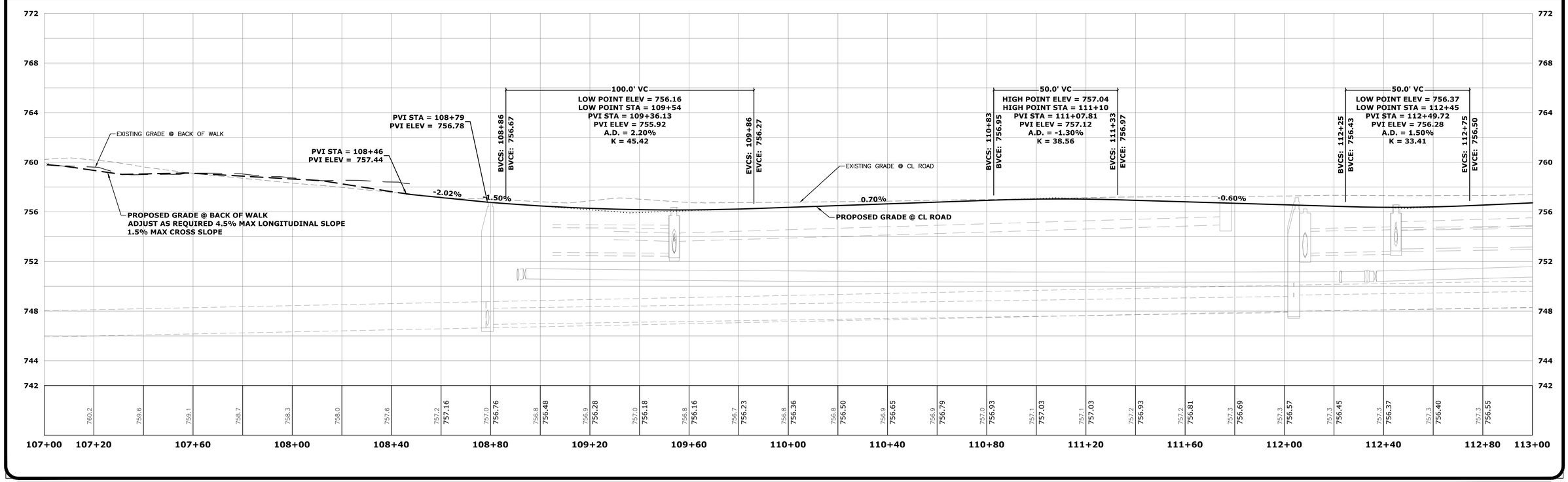

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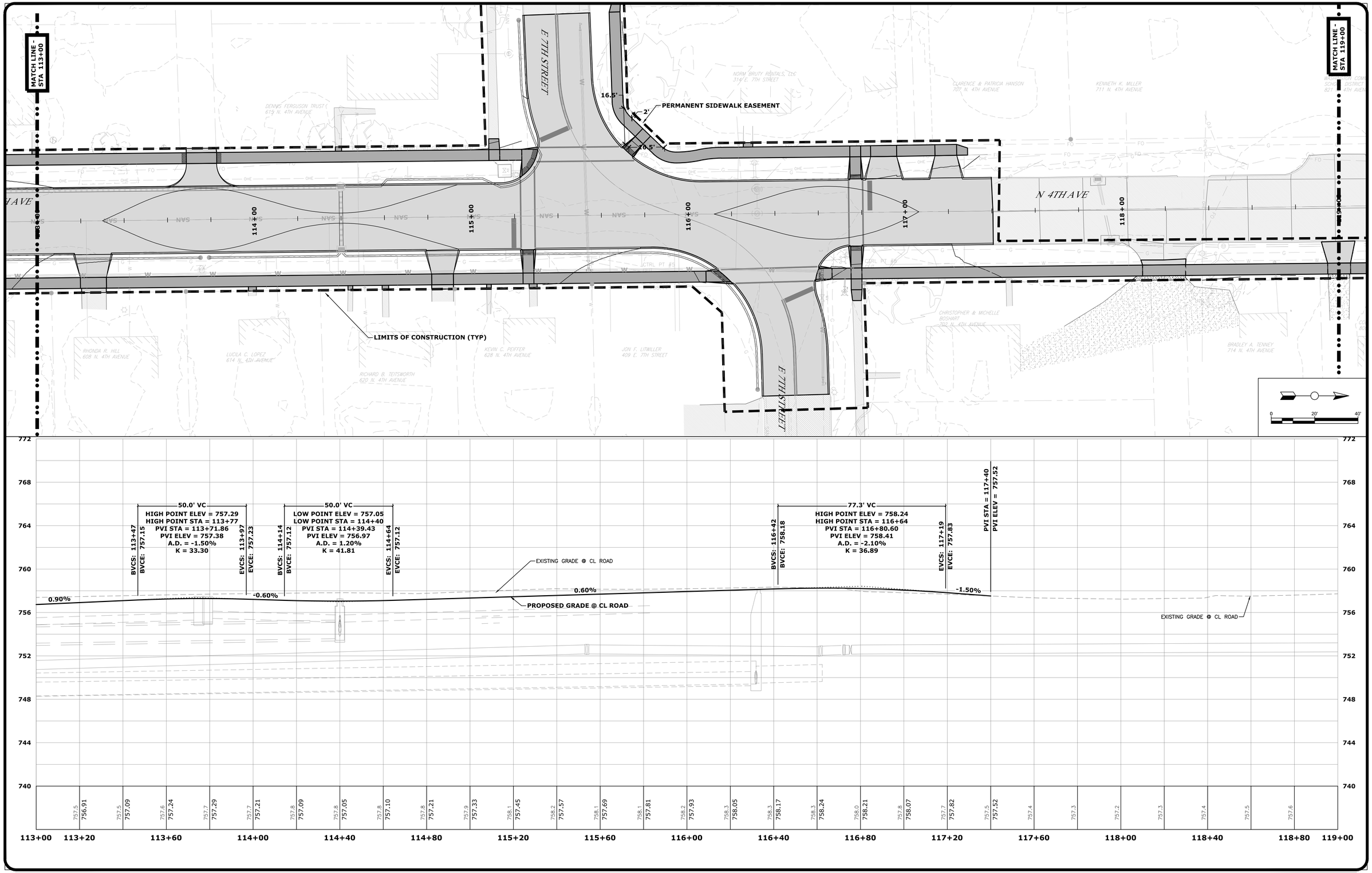

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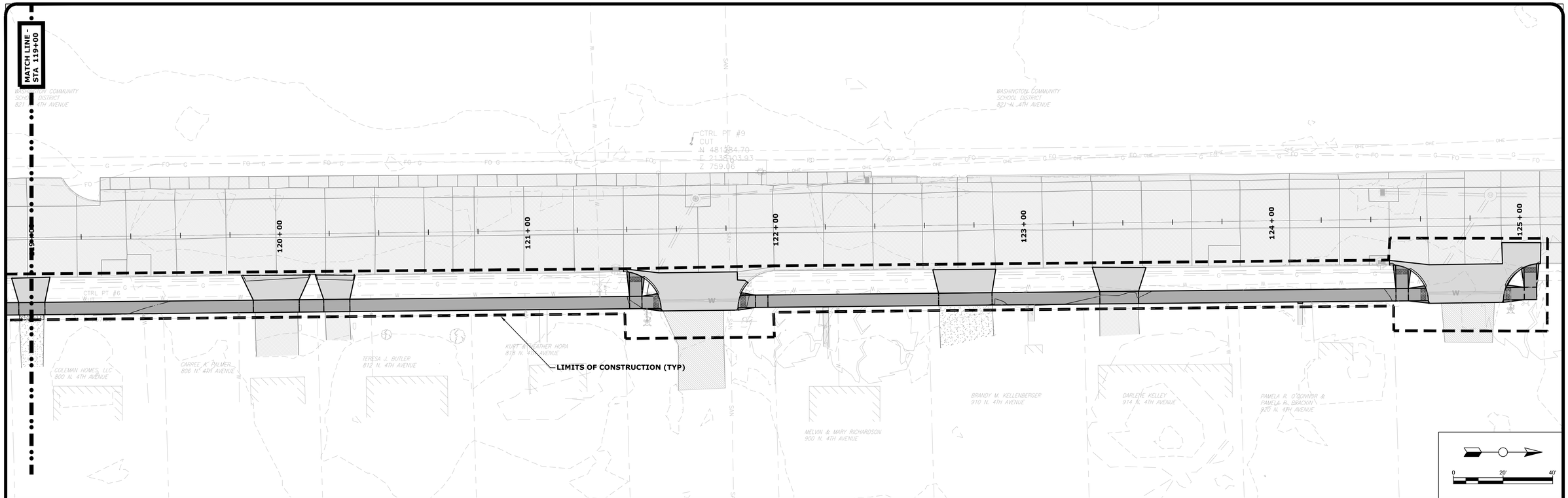

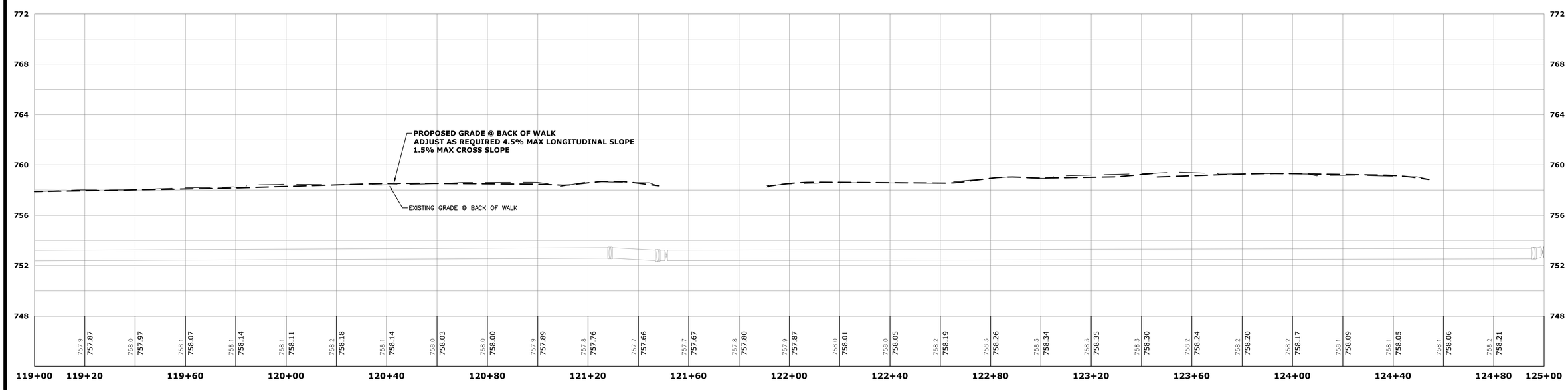

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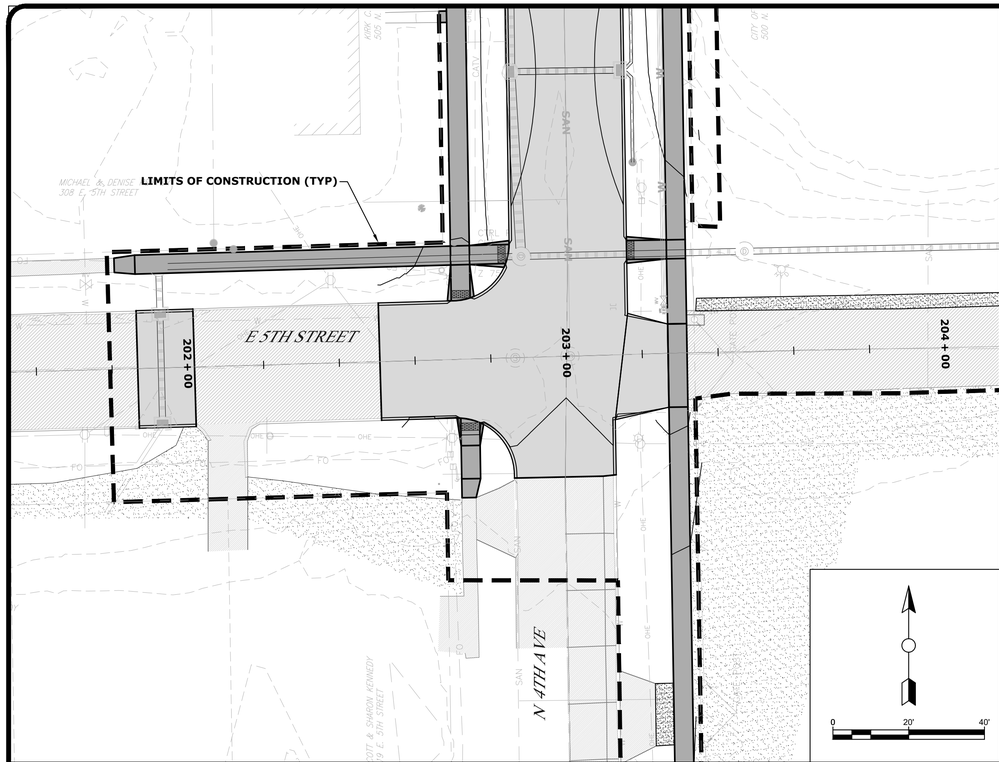
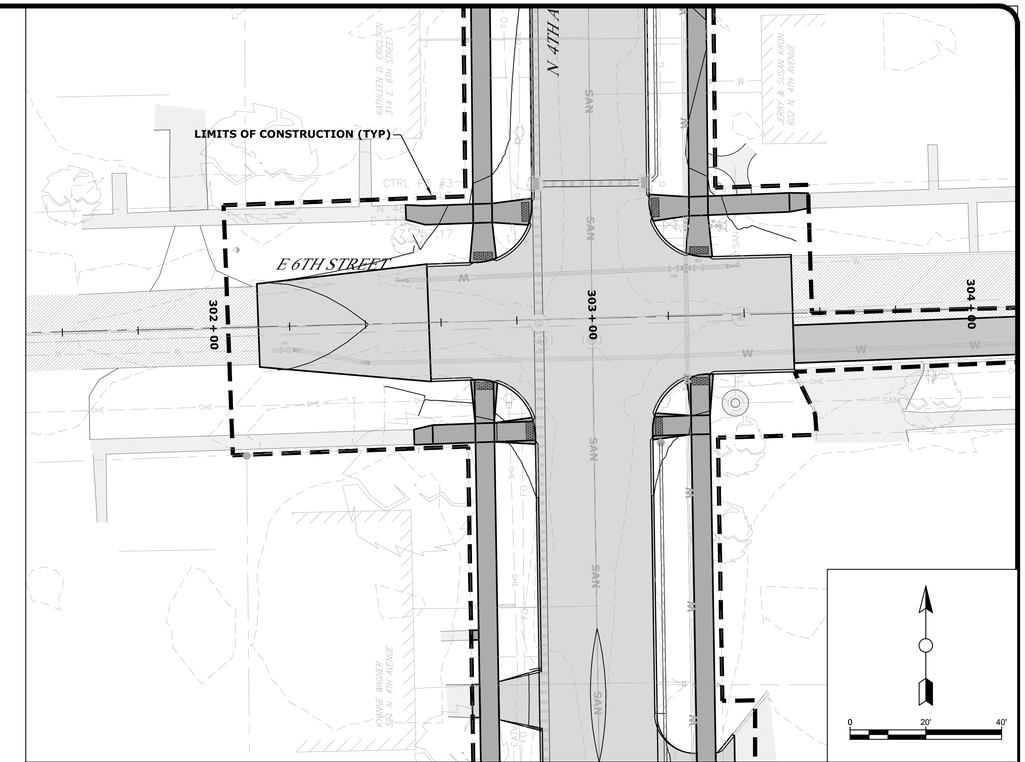
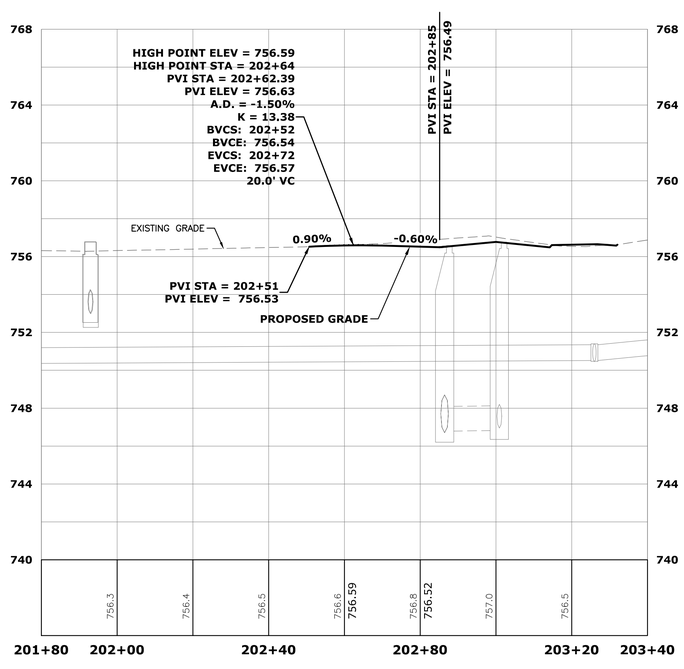
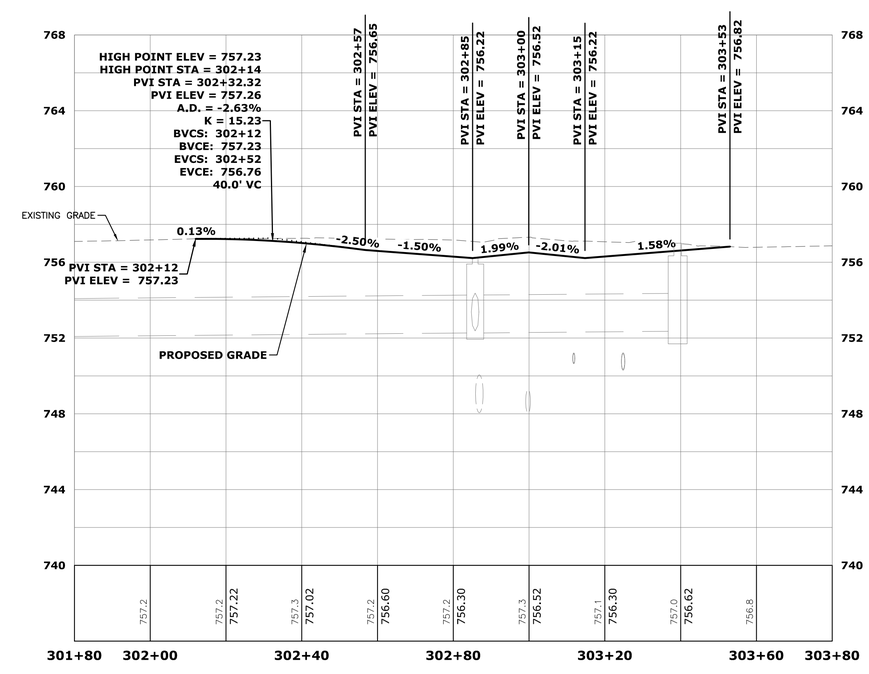


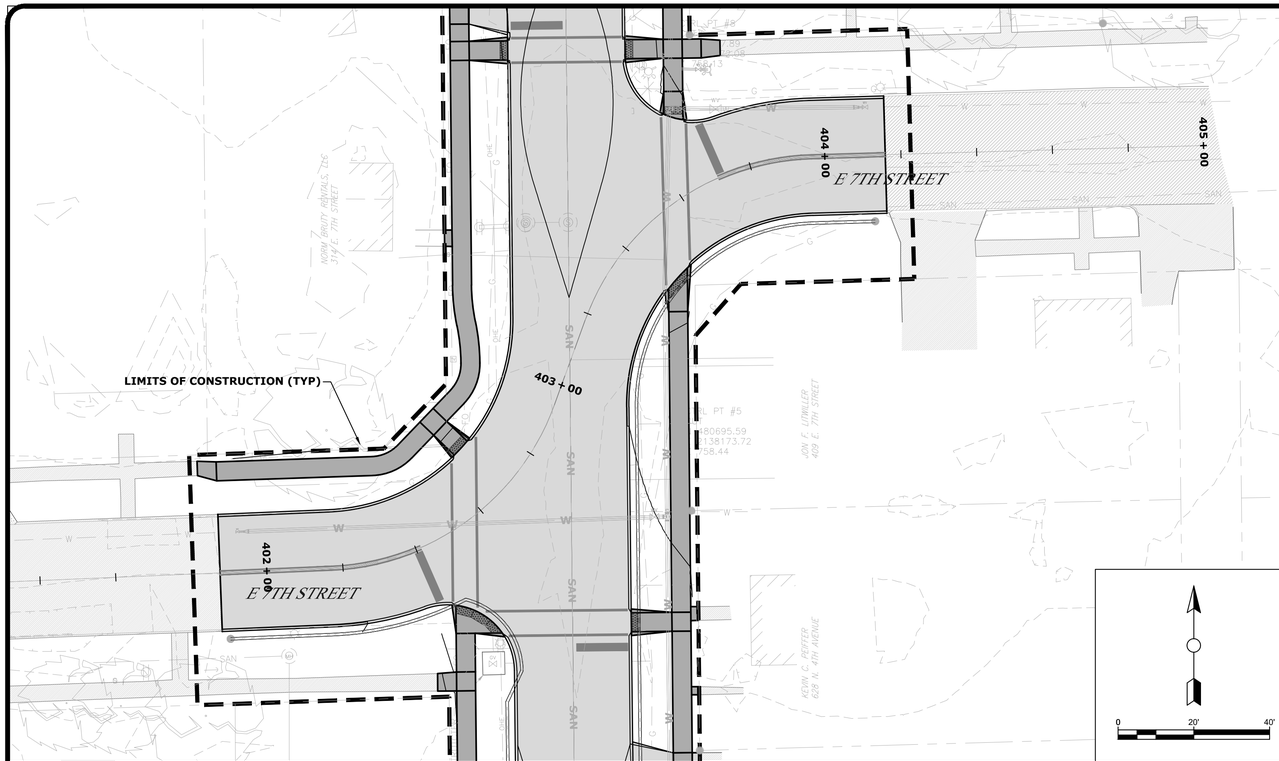


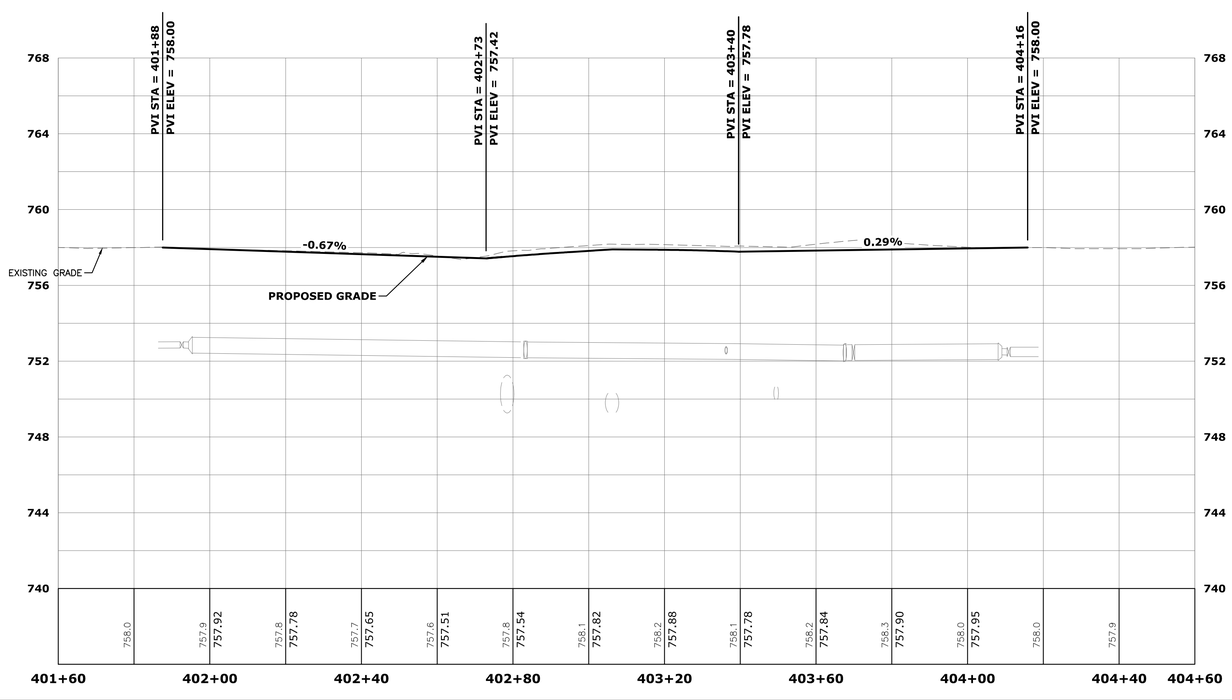




C2.5	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	ROADWAY PLAN & PROFILE N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C2.5

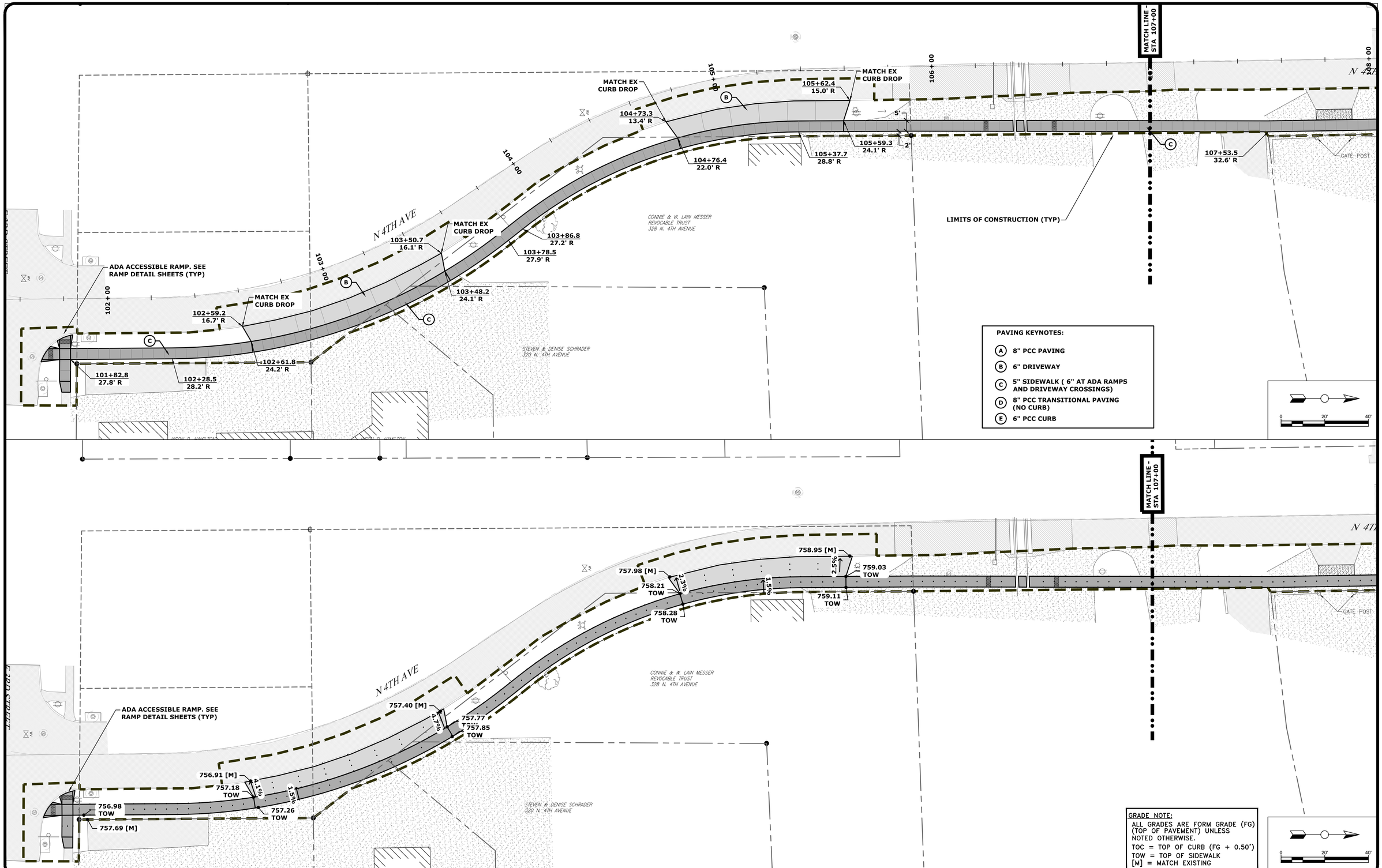
DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\Civil\Sheet Drawings\7114-19A_Plan & Profile.dwg : C2.5





C2.6	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	ROADWAY PLAN & PROFILE N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C2.6

DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\Civil\Sheet Drawings\7114-19A_Plan & Profile.dwg : C2.6

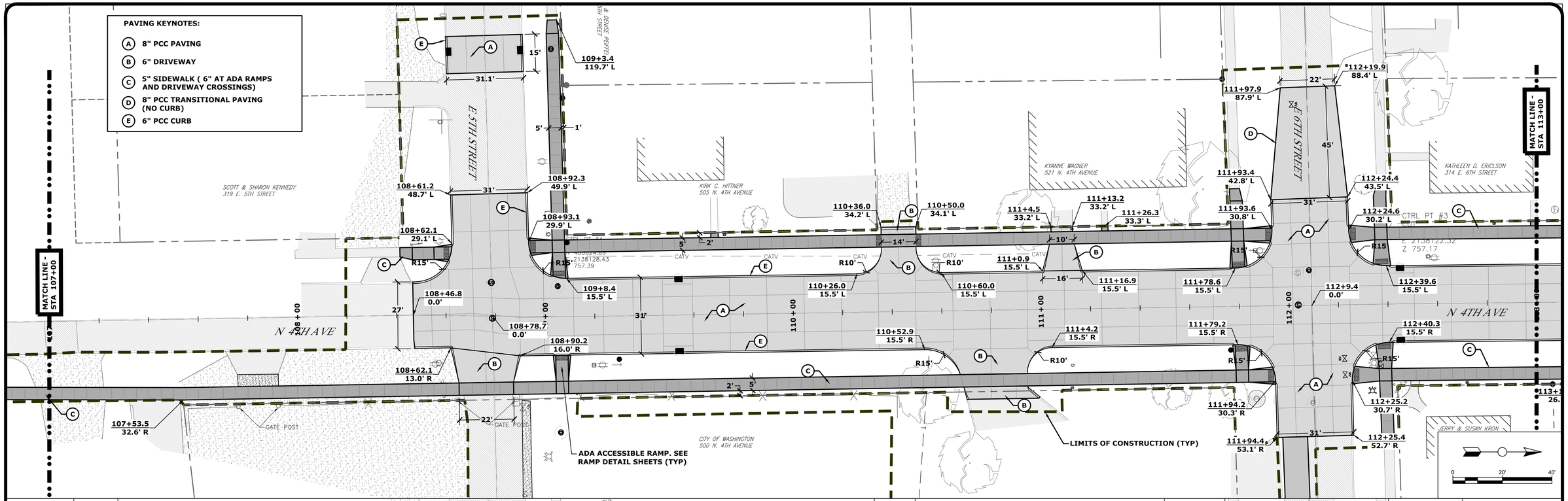


C3.1	LAST UPDATE: 02/04/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	GEOMETRIC LAYOUT & JOINTING PLAN — N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/04/20	C3.1

DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\Civil\Sheet Drawings\7114-19A_Geometry.dwg : C3.1

PAVING KEYNOTES:

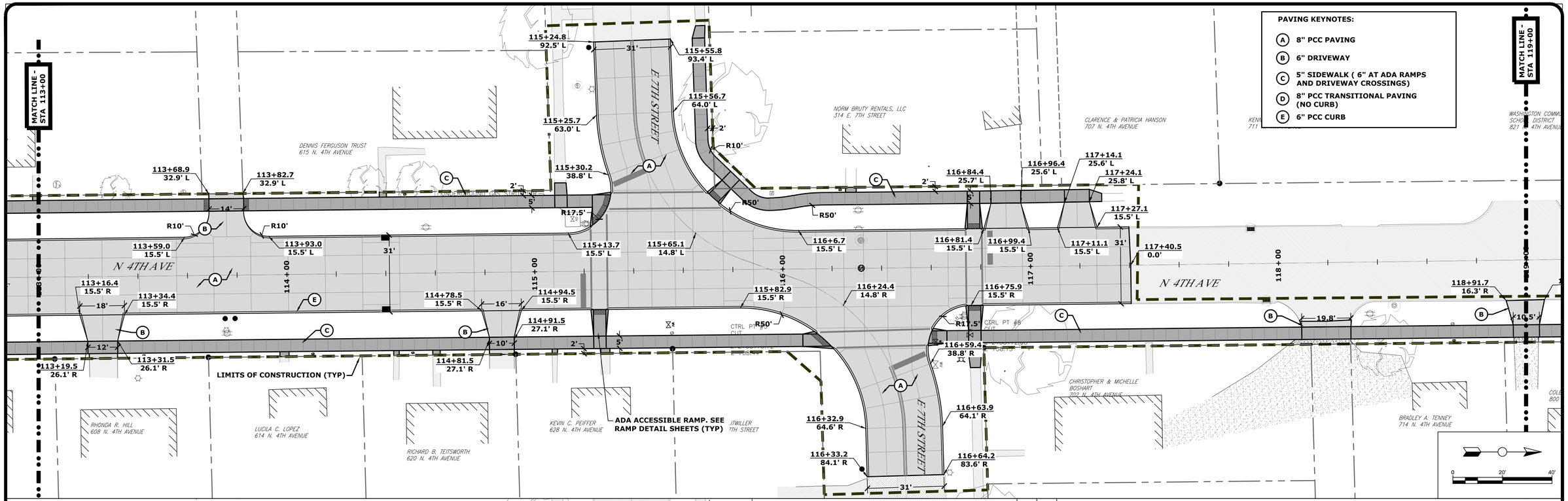
- (A) 8" PCC PAVING
- (B) 6" DRIVEWAY
- (C) 5" SIDEWALK (6" AT ADA RAMPS AND DRIVEWAY CROSSINGS)
- (D) 8" PCC TRANSITIONAL PAVING (NO CURB)
- (E) 6" PCC CURB



GRADE NOTE:
ALL GRADES ARE FORM GRADE (FG) (TOP OF PAVEMENT) UNLESS NOTED OTHERWISE.
TOC = TOP OF CURB (FG + 0.50')
TOW = TOP OF SIDEWALK
[M] = MATCH EXISTING

C3.2	LAST UPDATE: 02/04/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	GEOMETRIC LAYOUT & JOINTING PLAN — N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/04/20	C3.2

DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\Civil\Sheet Drawings\7114-19A_Geometry.dwg : C3.2



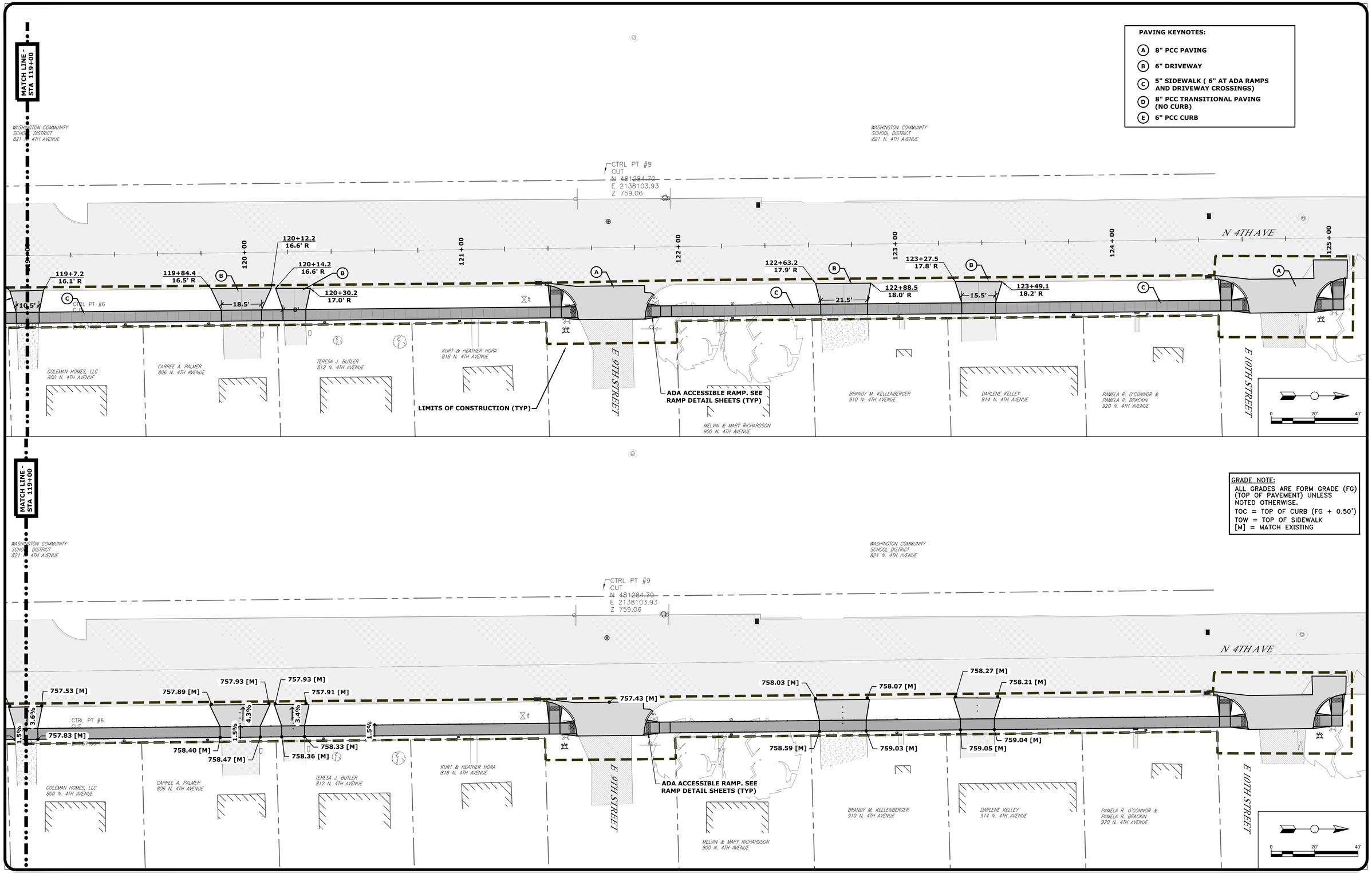
GRADE NOTE:
ALL GRADES ARE FORM GRADE (FG) (TOP OF PAVEMENT) UNLESS NOTED OTHERWISE.
TOC = TOP OF CURB (FG + 0.50')
TOW = TOP OF SIDEWALK
[M] = MATCH EXISTING

C3.3	LAST UPDATE: 02/04/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	GEOMETRIC LAYOUT & JOINTING PLAN N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/04/20	C3.3

DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\Civil\Sheet Drawings\7114-19A_Geometry.dwg : C3.3

PAVING KEYNOTES:

- (A) 8" PCC PAVING
- (B) 6" DRIVEWAY
- (C) 5" SIDEWALK (6" AT ADA RAMPS AND DRIVEWAY CROSSINGS)
- (D) 8" PCC TRANSITIONAL PAVING (NO CURB)
- (E) 6" PCC CURB



GRADE NOTE:

ALL GRADES ARE FORM GRADE (FG) (TOP OF PAVEMENT) UNLESS NOTED OTHERWISE.

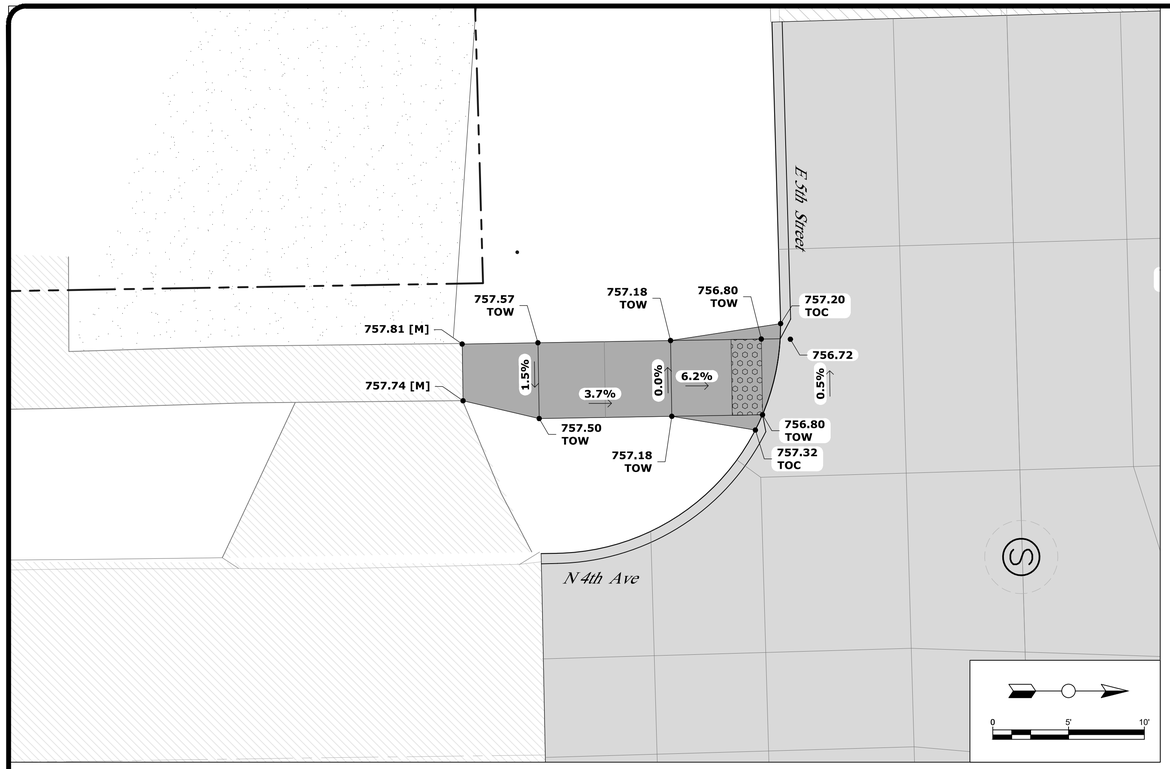
TOC = TOP OF CURB (FG + 0.50')

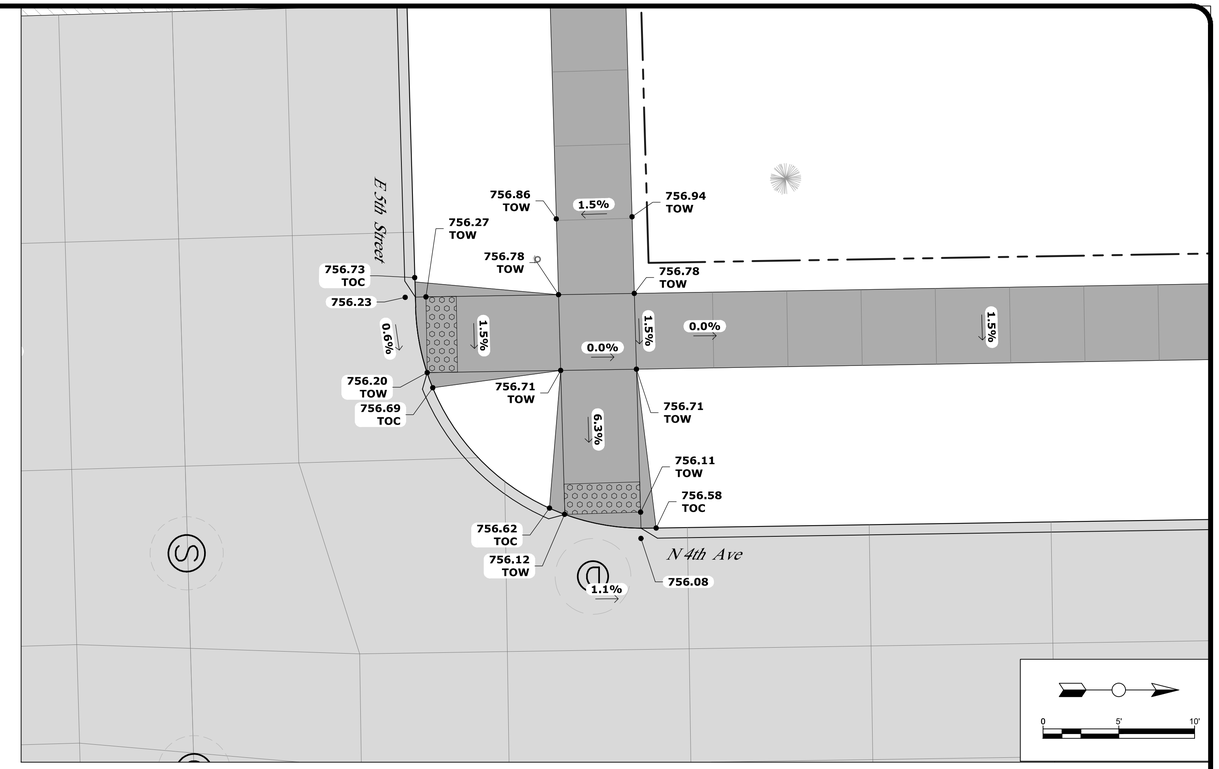
TOW = TOP OF SIDEWALK

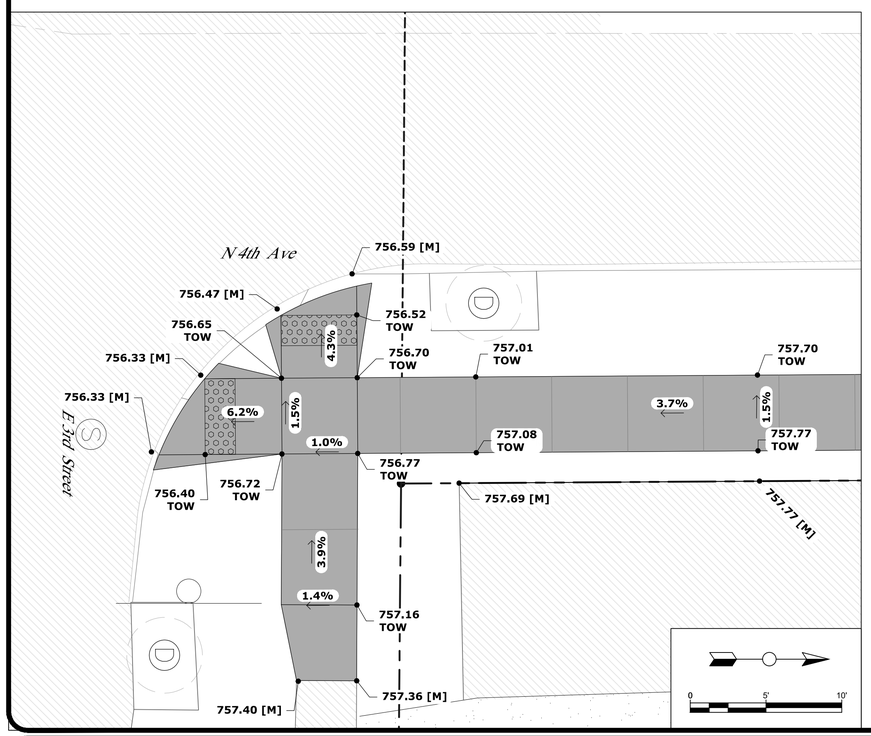
[M] = MATCH EXISTING

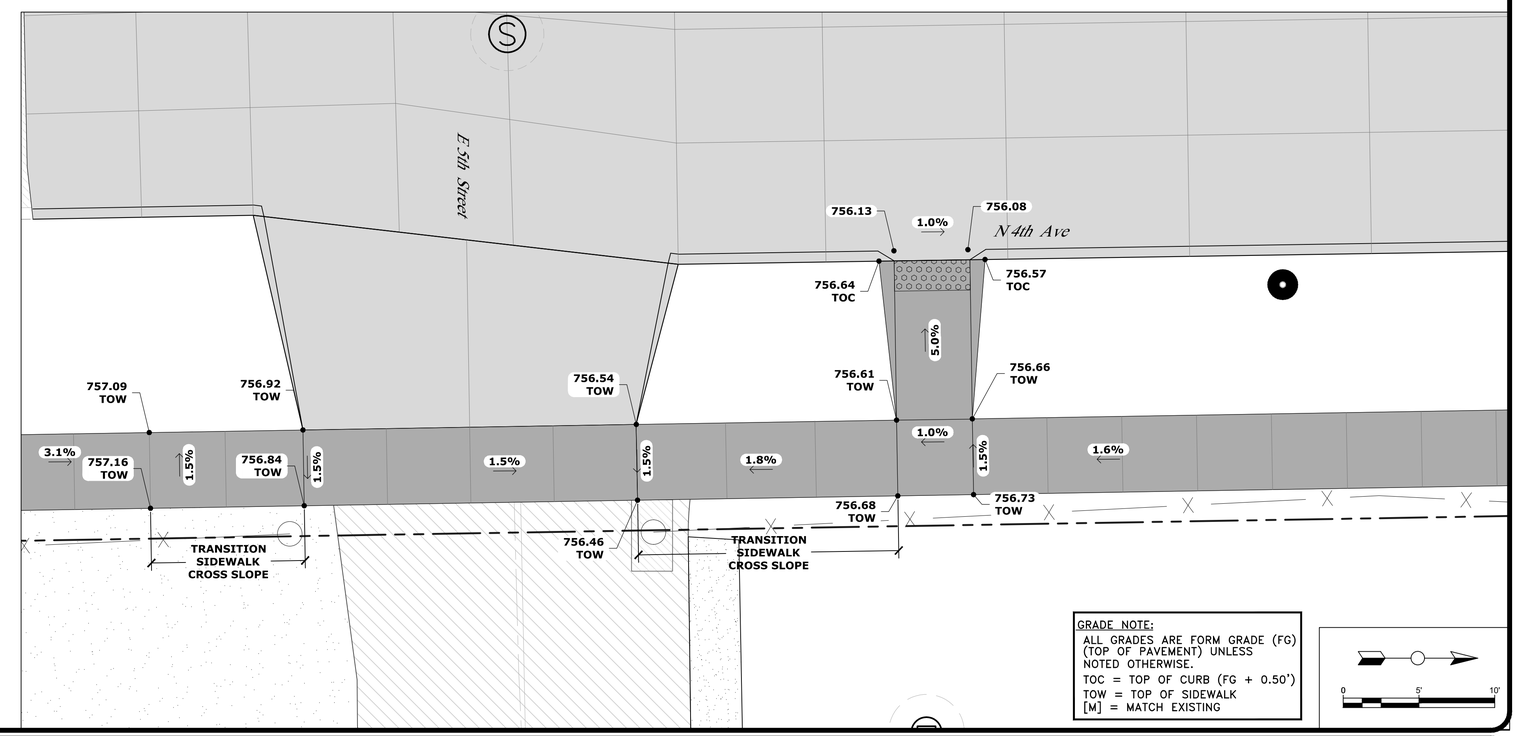
C3.4	LAST UPDATE: 02/04/20	PROJECT NO. 7114-19A	FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	GEOMETRIC LAYOUT & JOINTING PLAN N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/04/20	C3.4

DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\Civil\Sheet Drawings\7114-19A_Geometry.dwg : C3.4





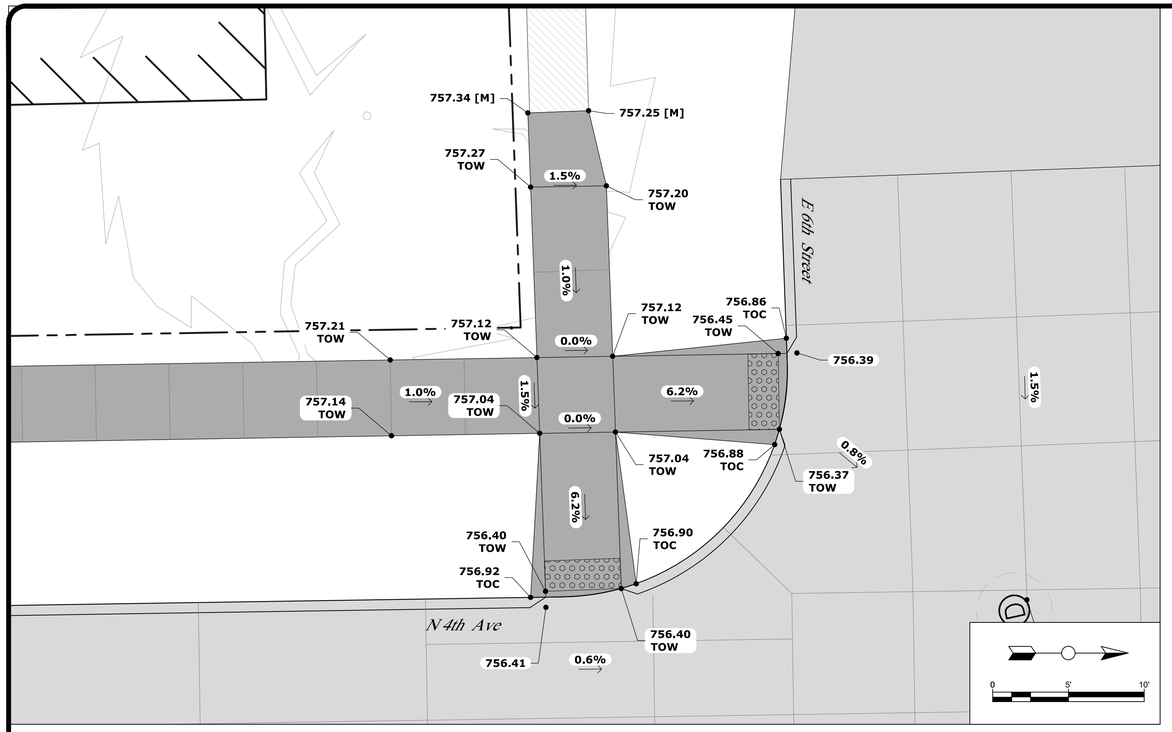


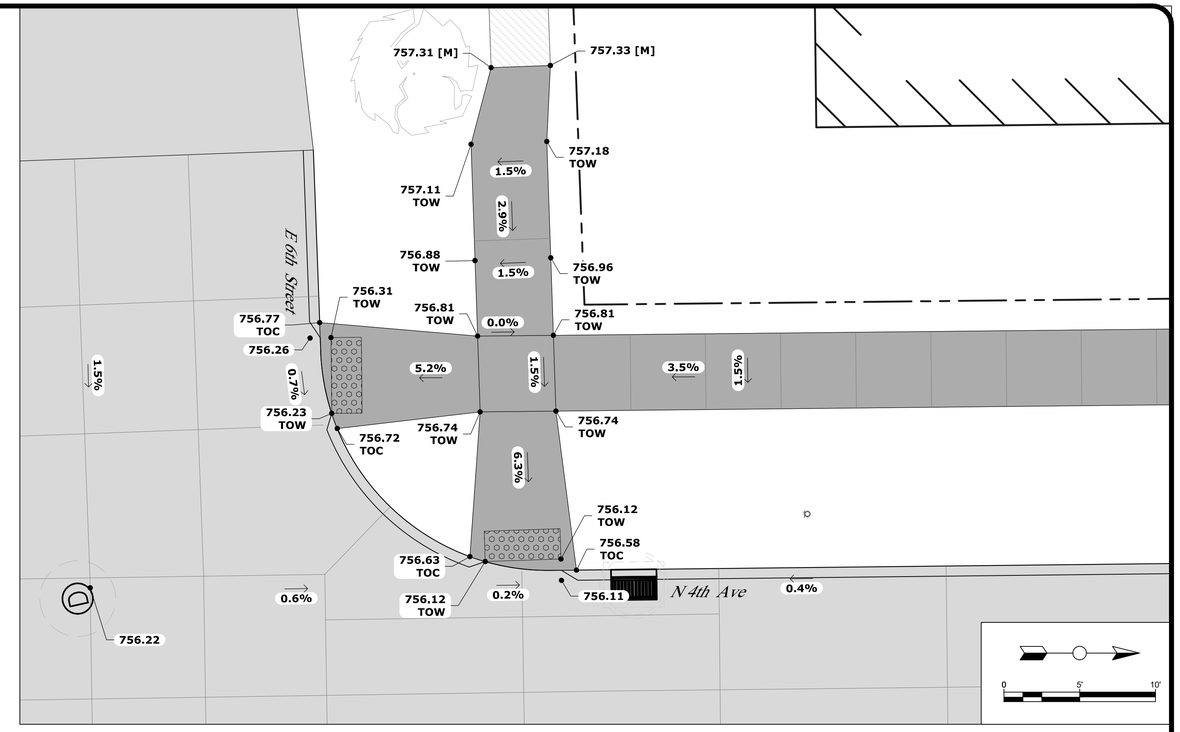


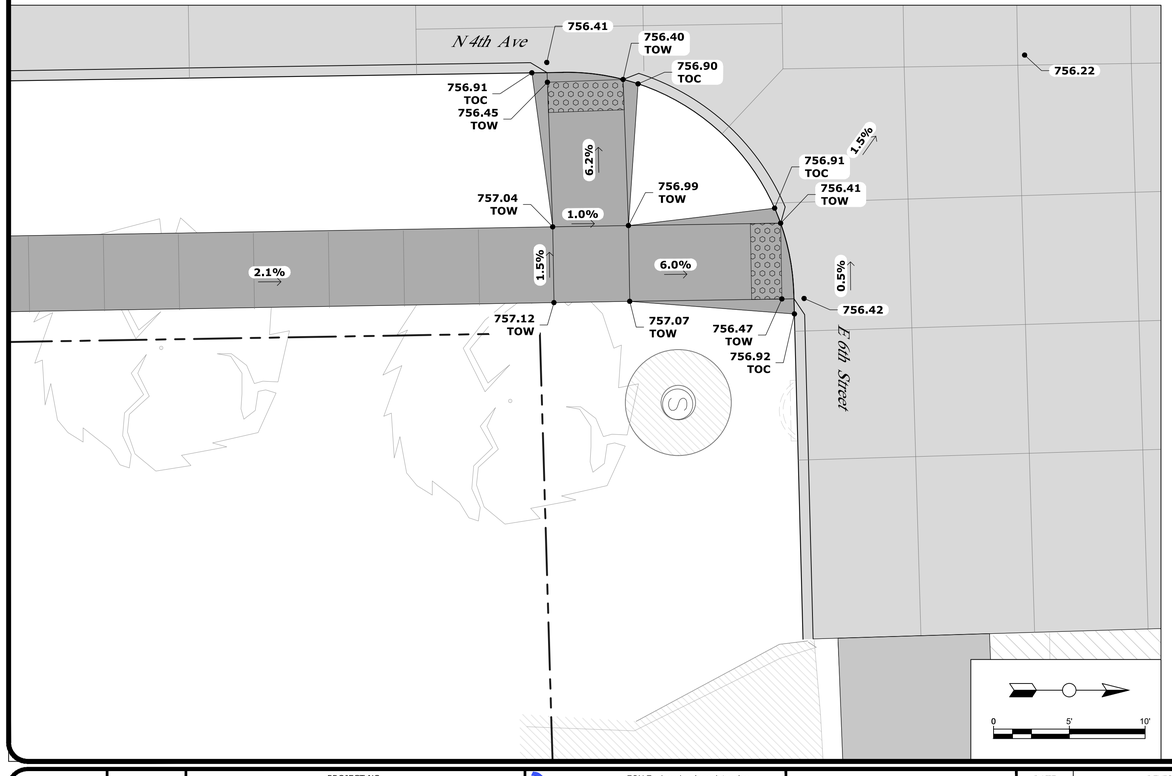
GRADE NOTE:
ALL GRADES ARE FORM GRADE (FG) (TOP OF PAVEMENT) UNLESS NOTED OTHERWISE.
TOC = TOP OF CURB (FG + 0.50')
TOW = TOP OF SIDEWALK
[M] = MATCH EXISTING

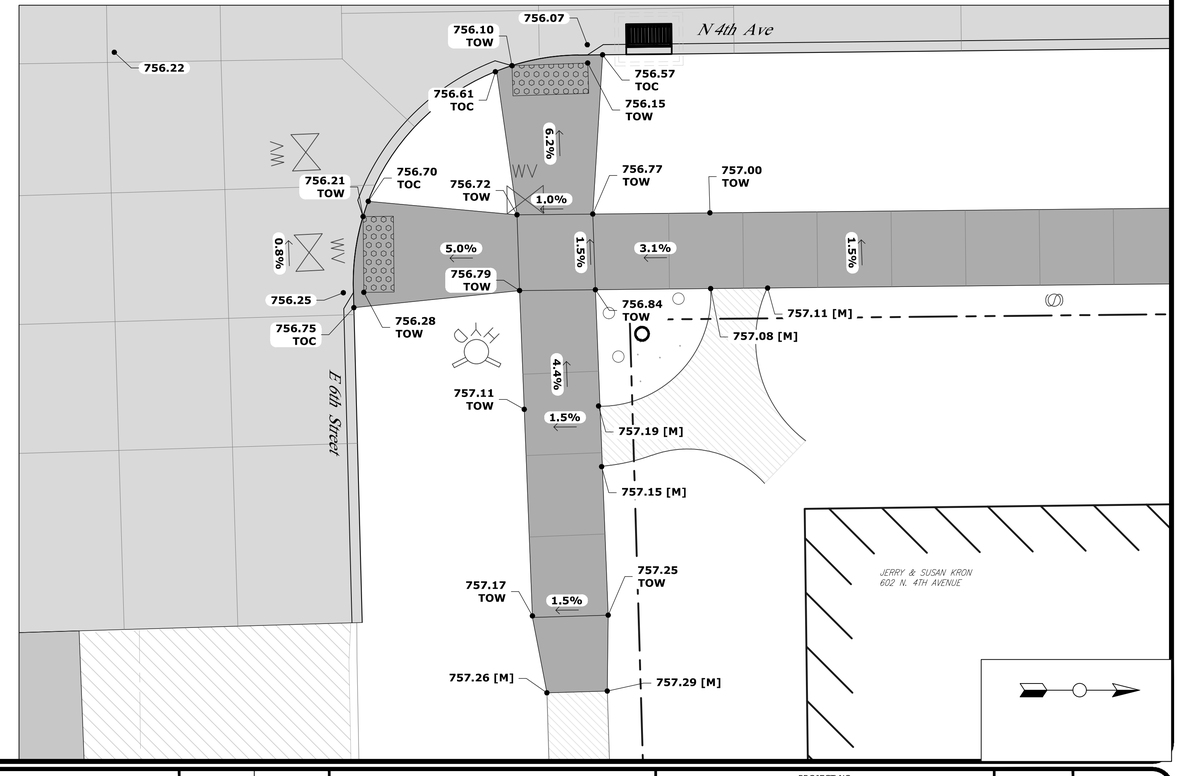
C4.1	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	SIDEWALK RAMP DETAILS N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C4.1

DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\Civil\Sheet Drawings\7114-19A_Ramps.dwg : C4.1









C4.2	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	SIDEWALK RAMP DETAILS — N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C4.2

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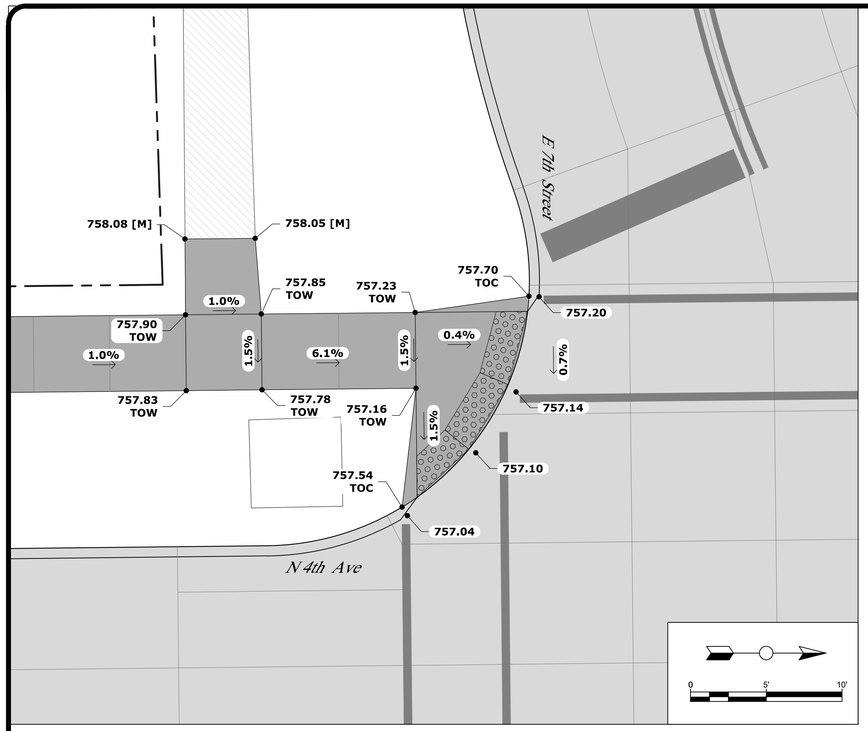
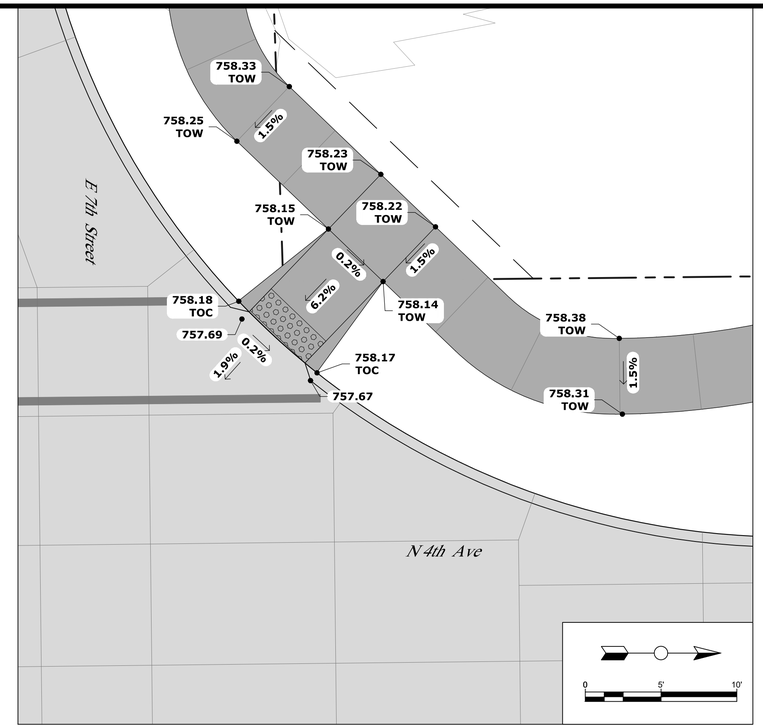
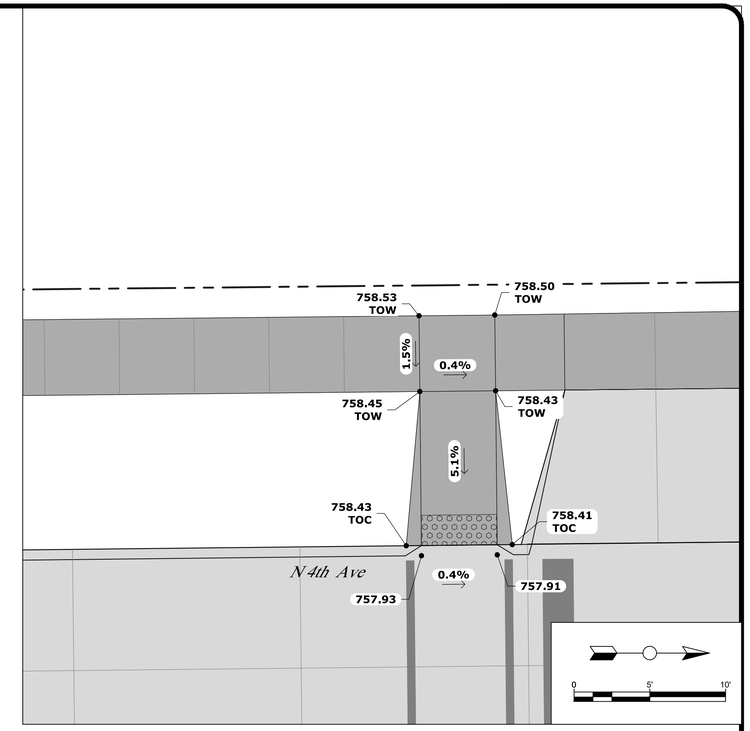
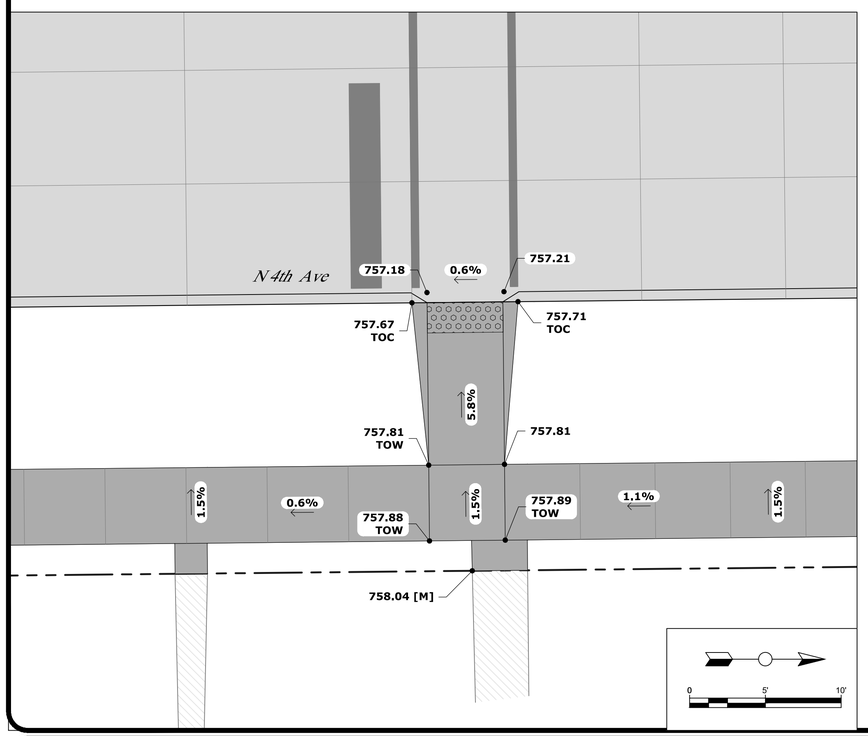
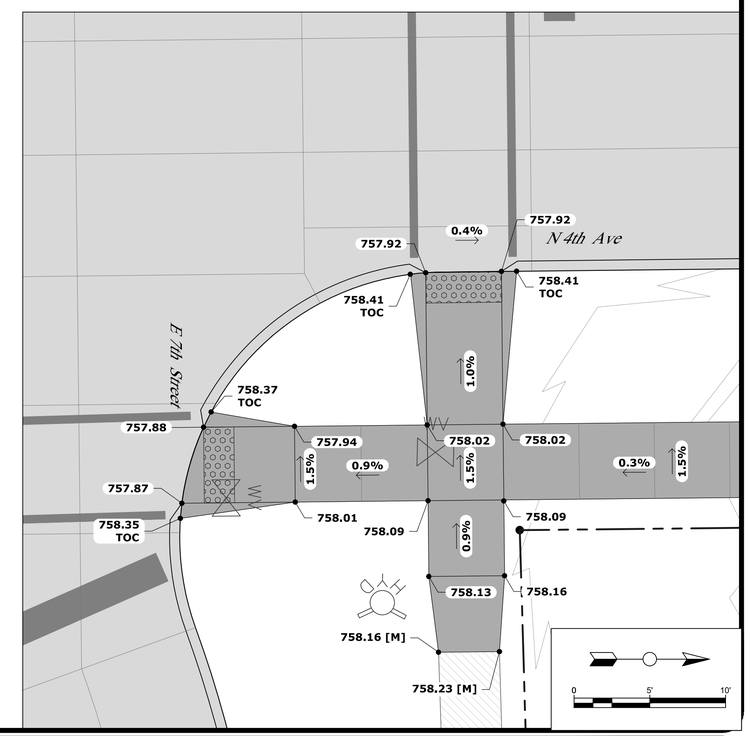




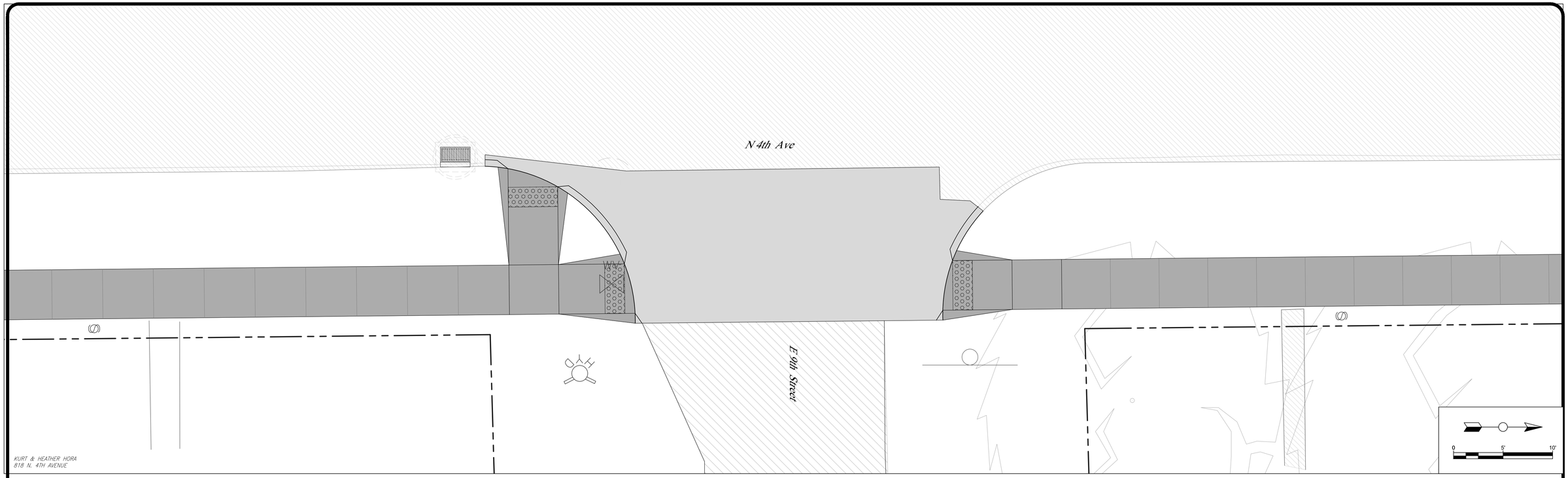


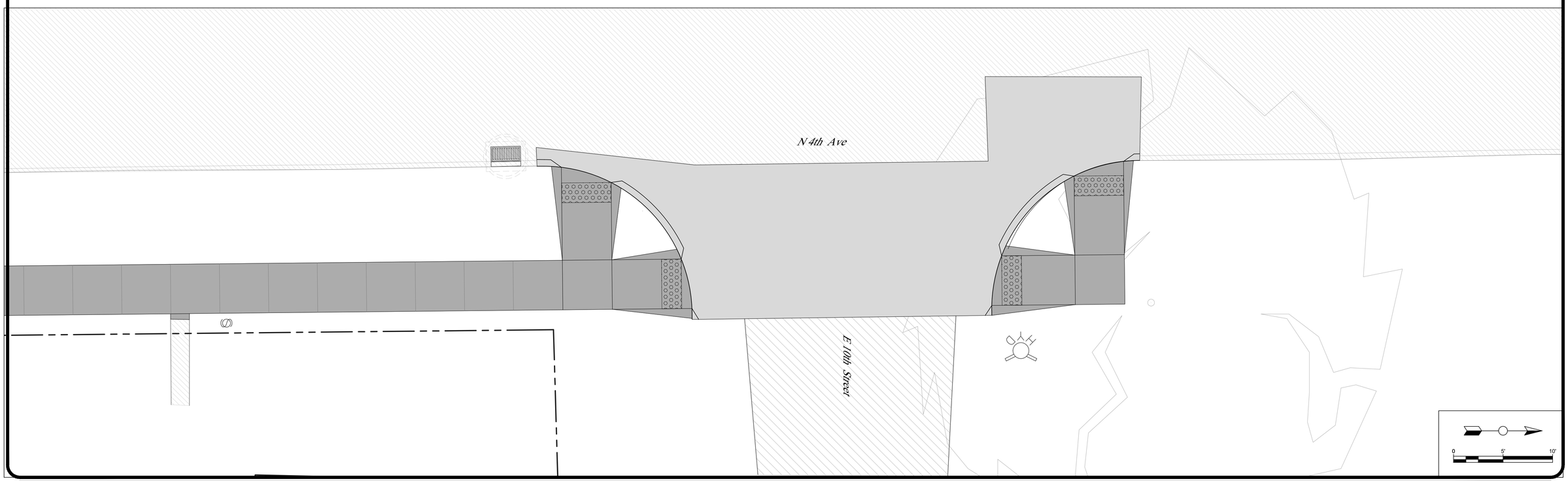




C4.3	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	SIDEWALK RAMP DETAILS — N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C4.3

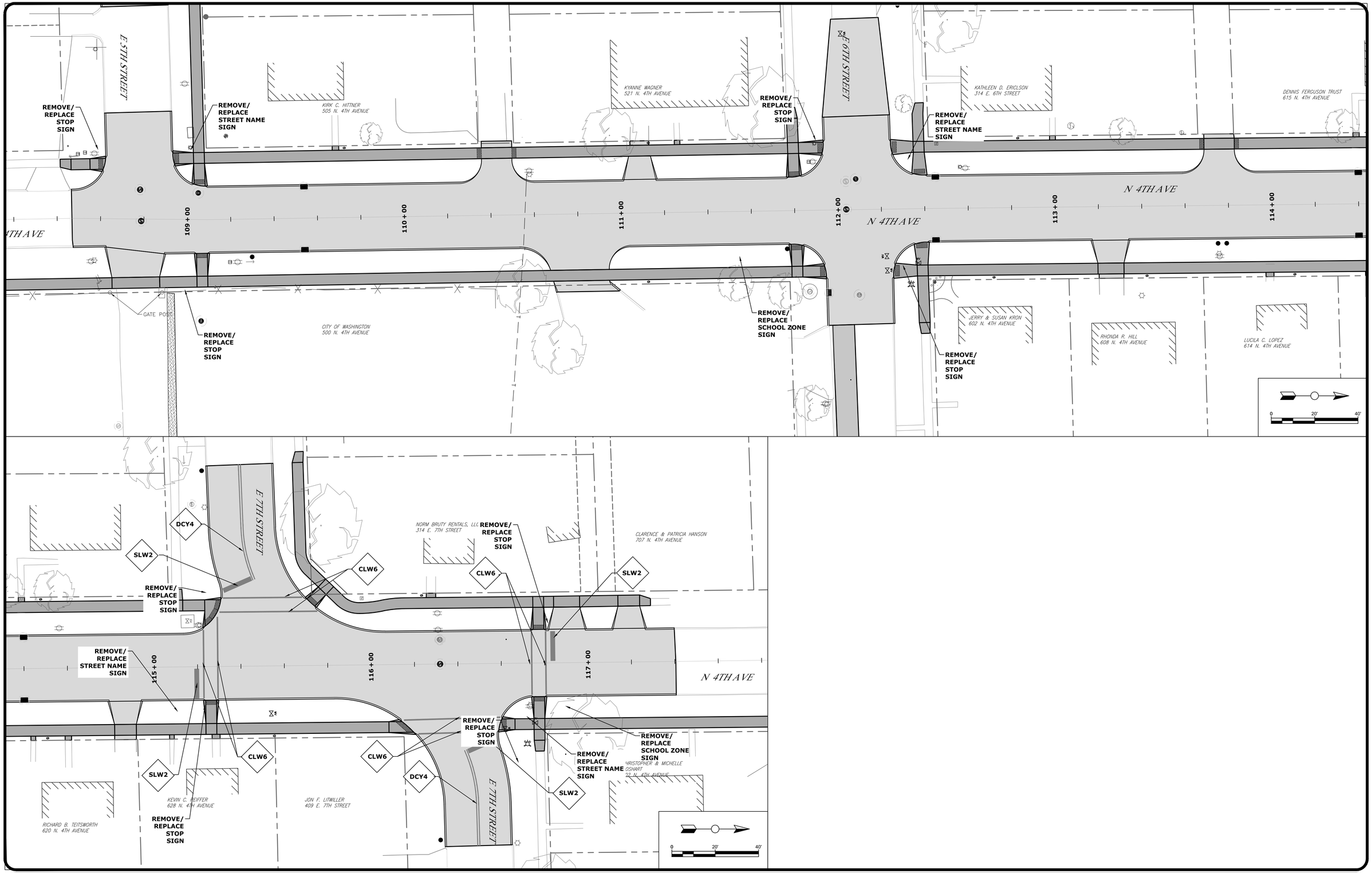
DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\Civil\Sheet Drawings\7114-19A_Ramps.dwg : C4.3





C4.4	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	SIDEWALK RAMP DETAILS N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C4.4

DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\Civil\Sheet Drawings\7114-19A_Ramps.dwg : C4.4



C5.1	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering	FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	STRIPING & SIGNAGE PLAN N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C5.1

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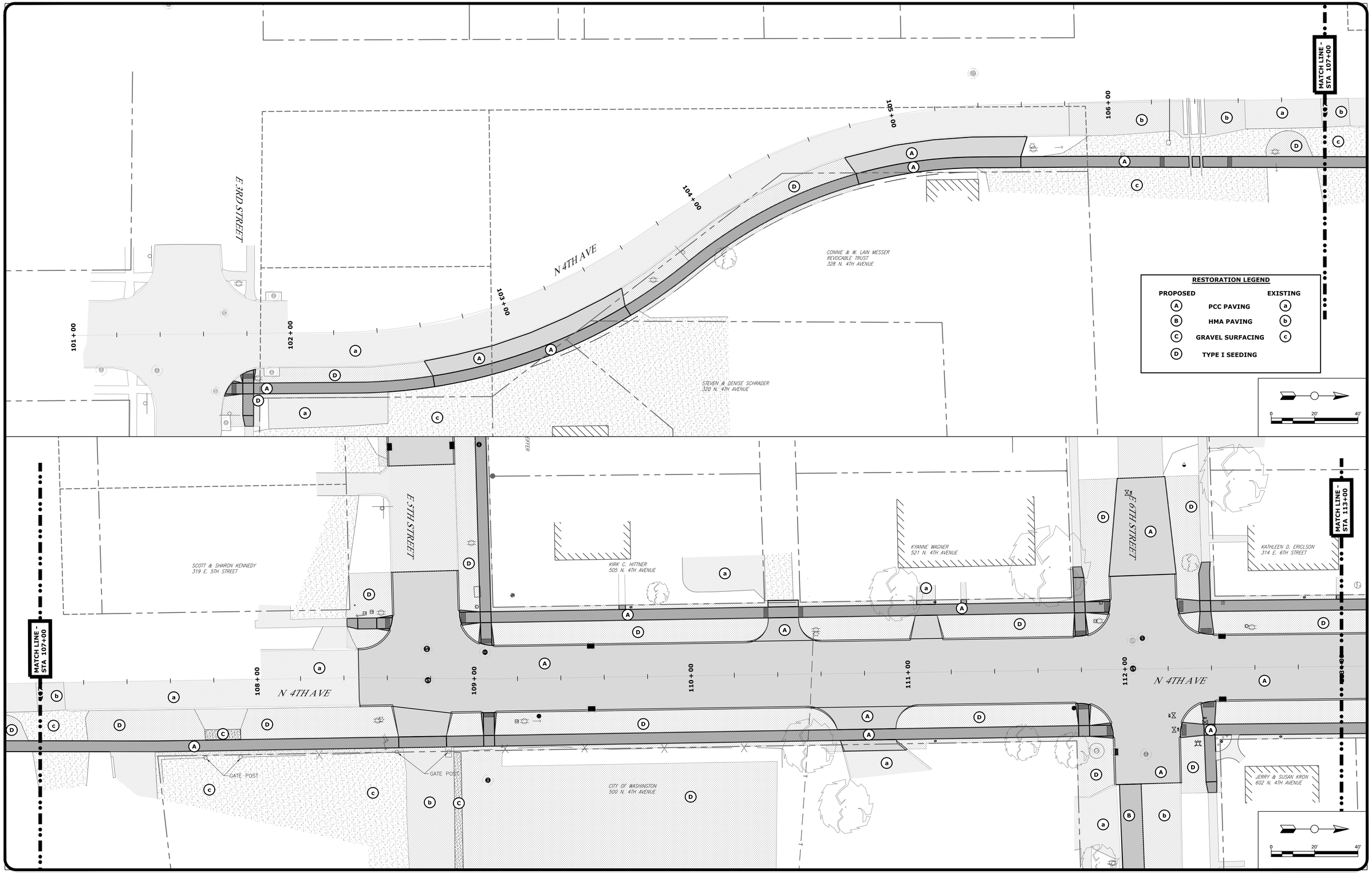

C6.1	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering	FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	RESTORATION PLAN N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C6.1

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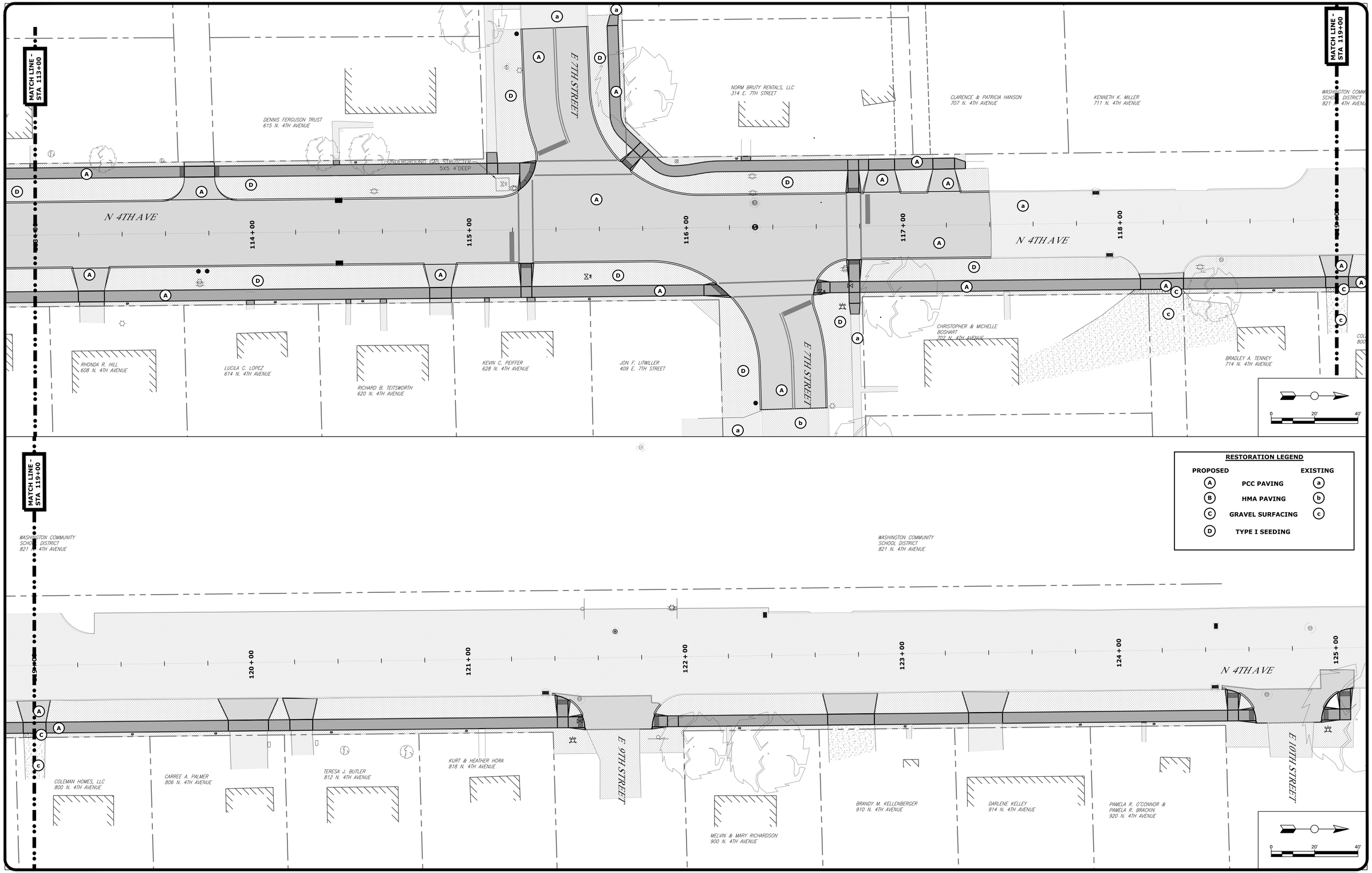
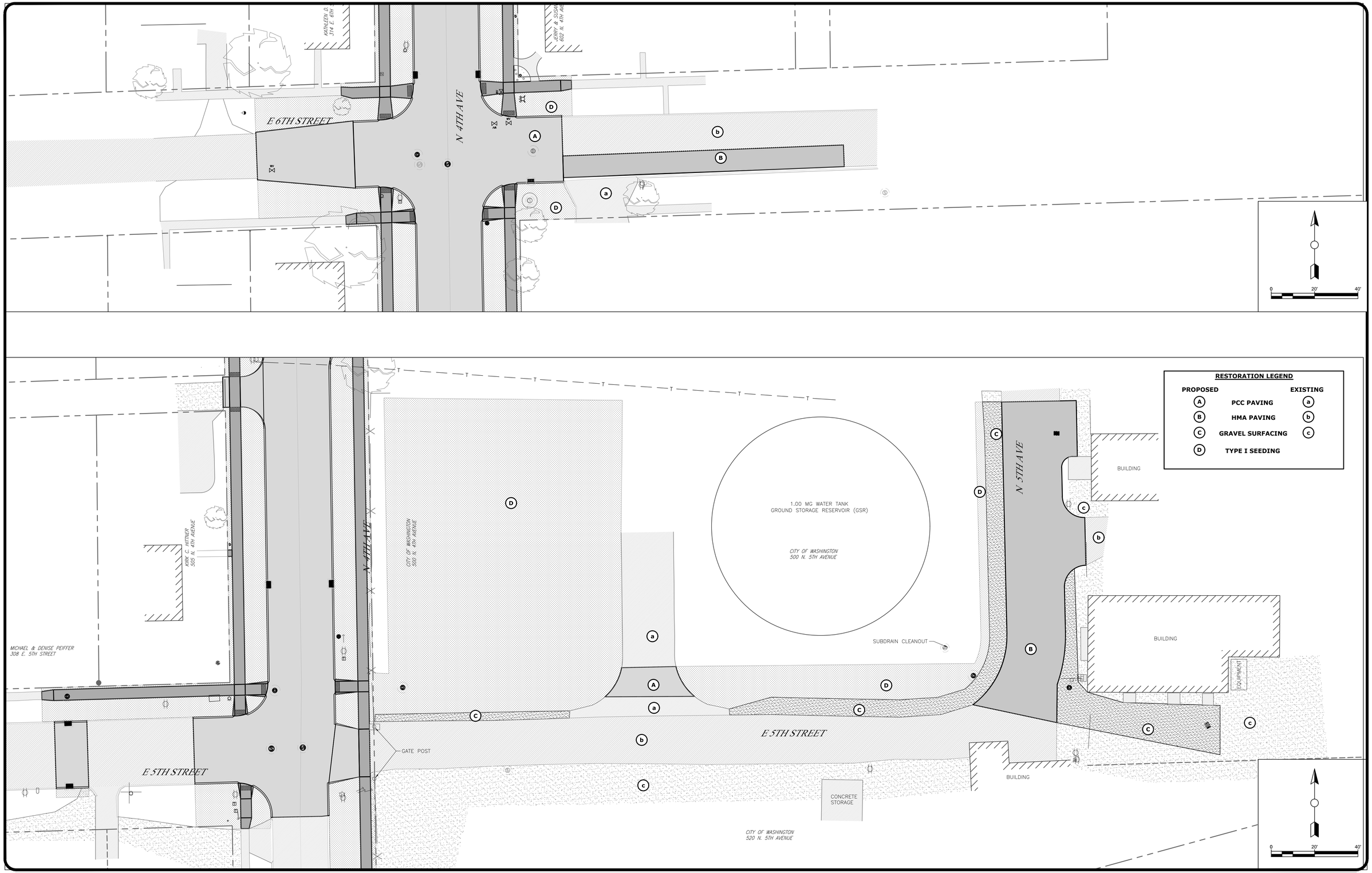


RESTORATION LEGEND

PROPOSED		EXISTING
A	PCC PAVING	a
B	HMA PAVING	b
C	GRAVEL SURFACING	c
D	TYPE I SEEDING	

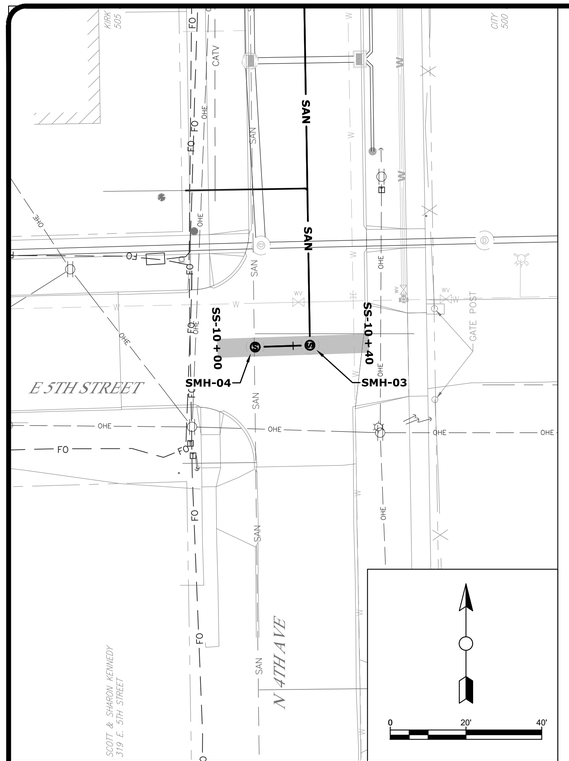
C6.2	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering	FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE	REVISION	CHECKED BY: DATE:	RESTORATION PLAN N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C6.2

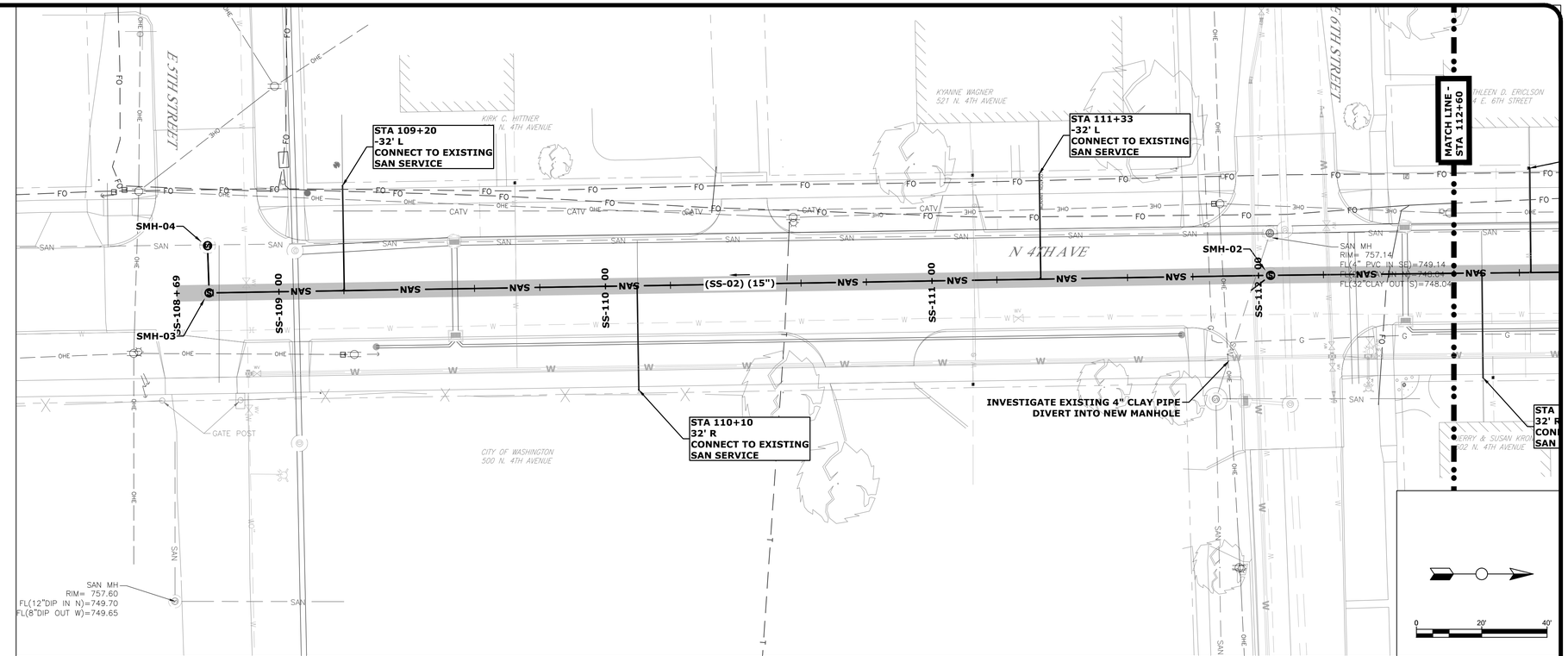
DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\Civil\Sheet Drawings\7114-19A_Restoration.dwg : C6.2

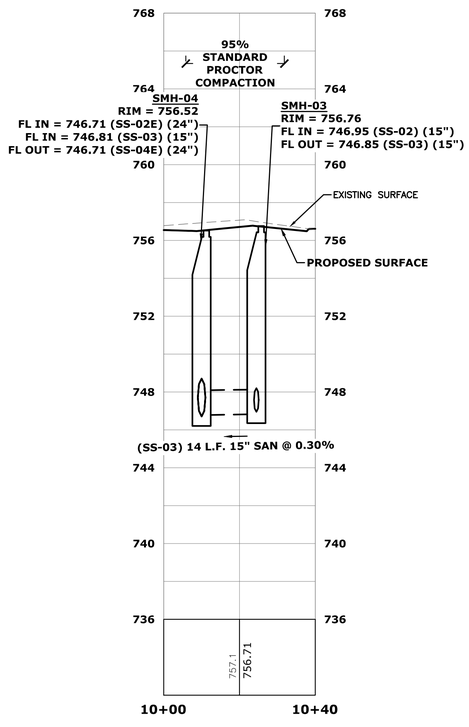


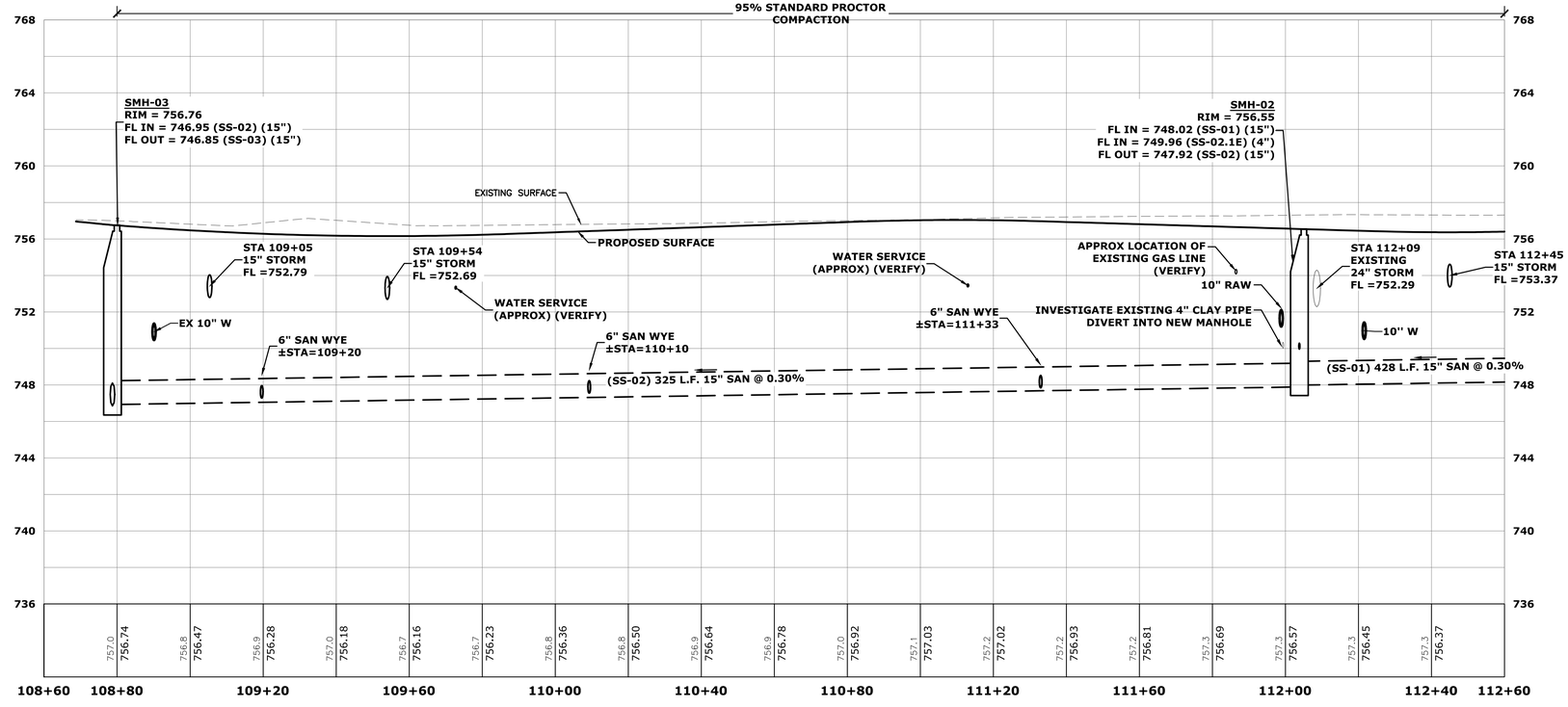
C6.3	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	RESTORATION PLAN N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C6.3

DRAWING FILENAME: K:\1proj\7000\7114-19A N 4th Avenue Improvements\Drawings\Civil\Sheet Drawings\7114-19A_Restoration.dwg : C6.3



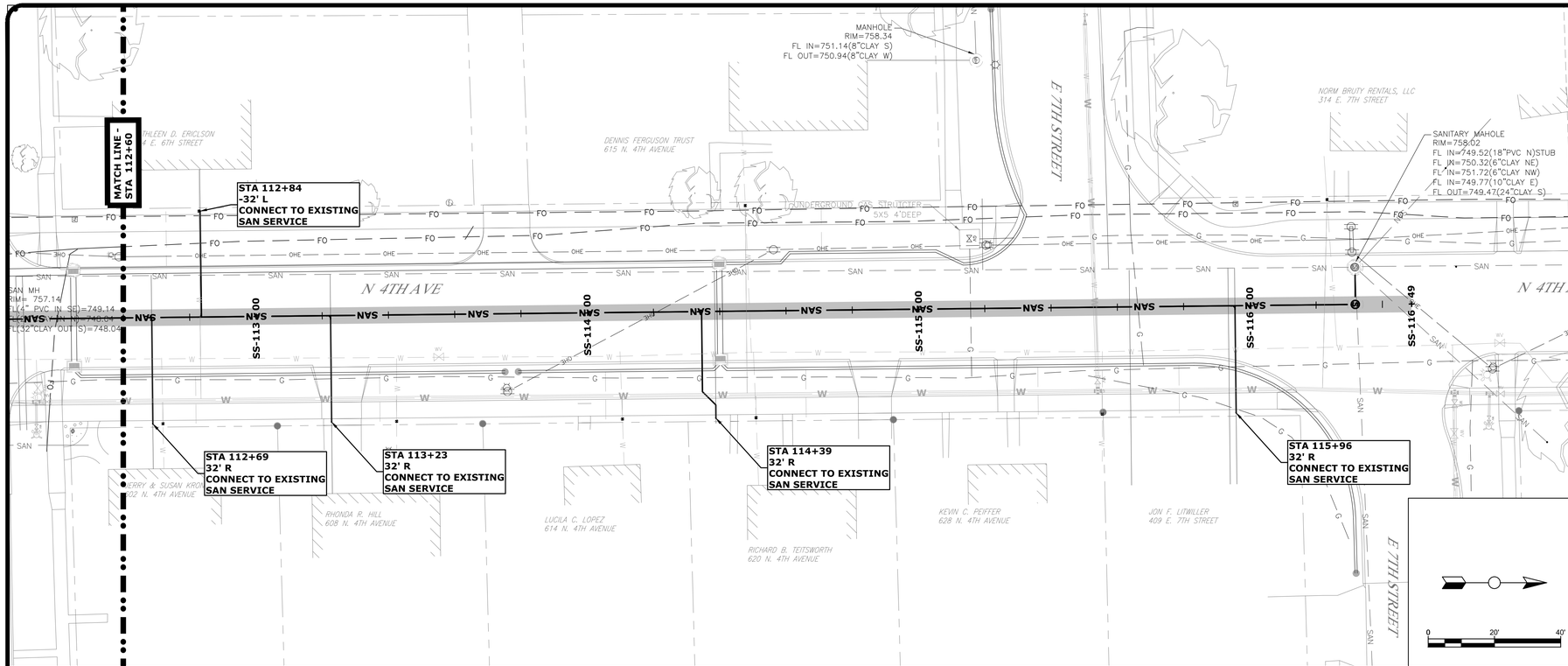


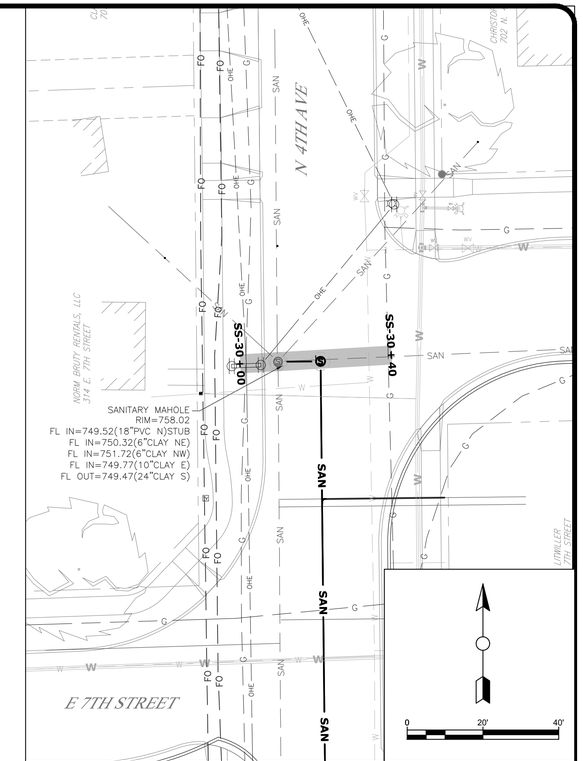


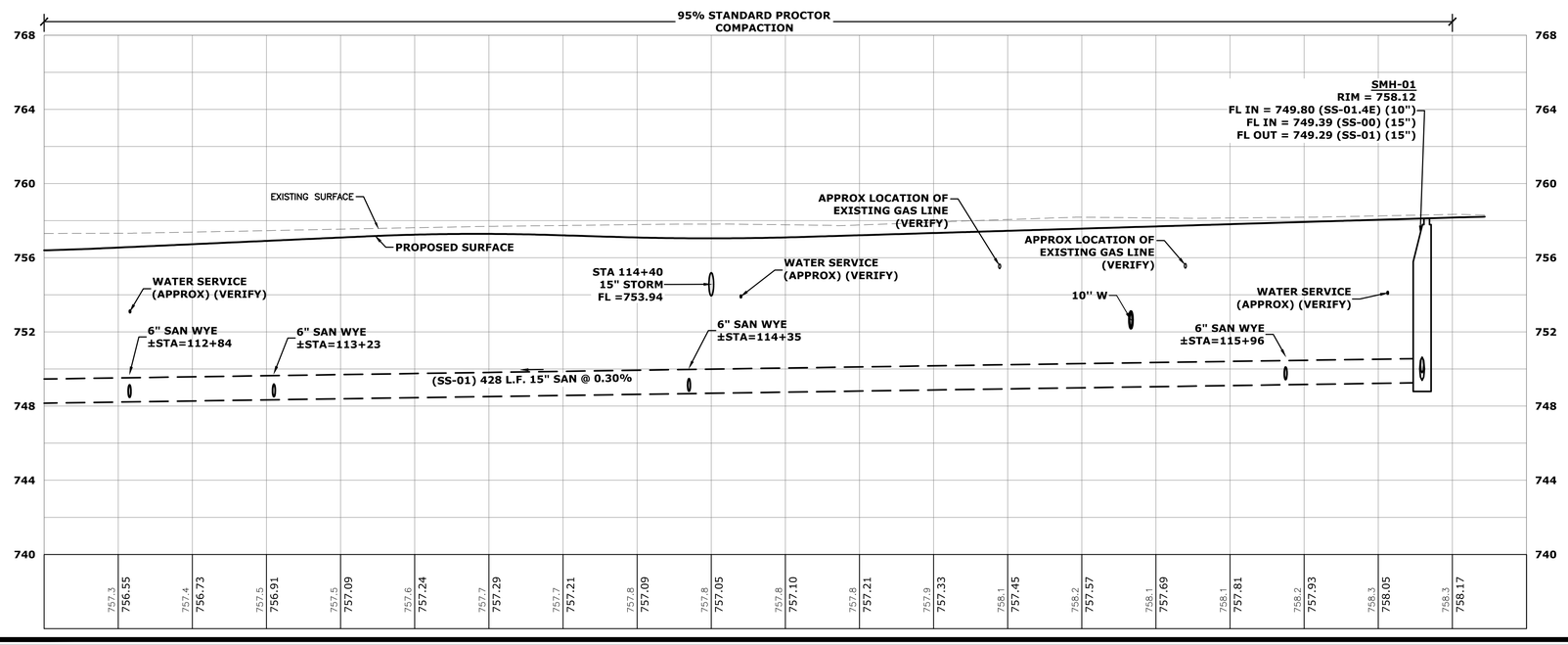


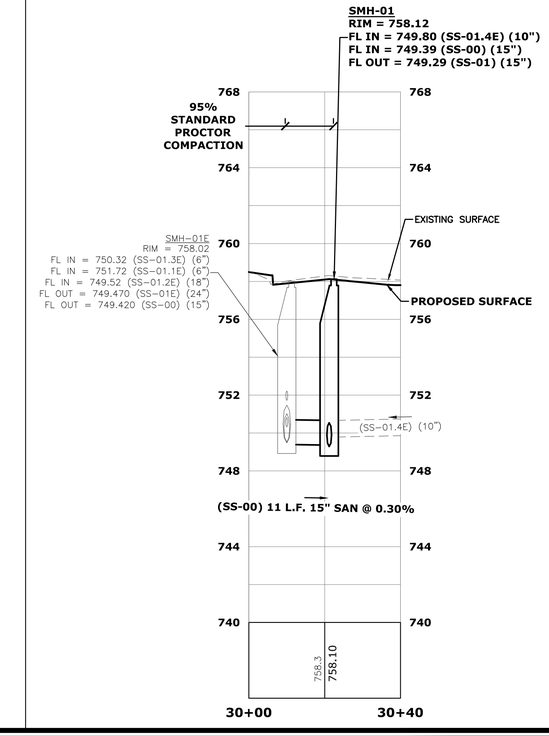
C7.1	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	SANITARY SEWER PLAN & PROFILE N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C7.1

DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\Civil\Sheet Drawings\7114-19A_Sanitary Sewer.dwg : C7.1



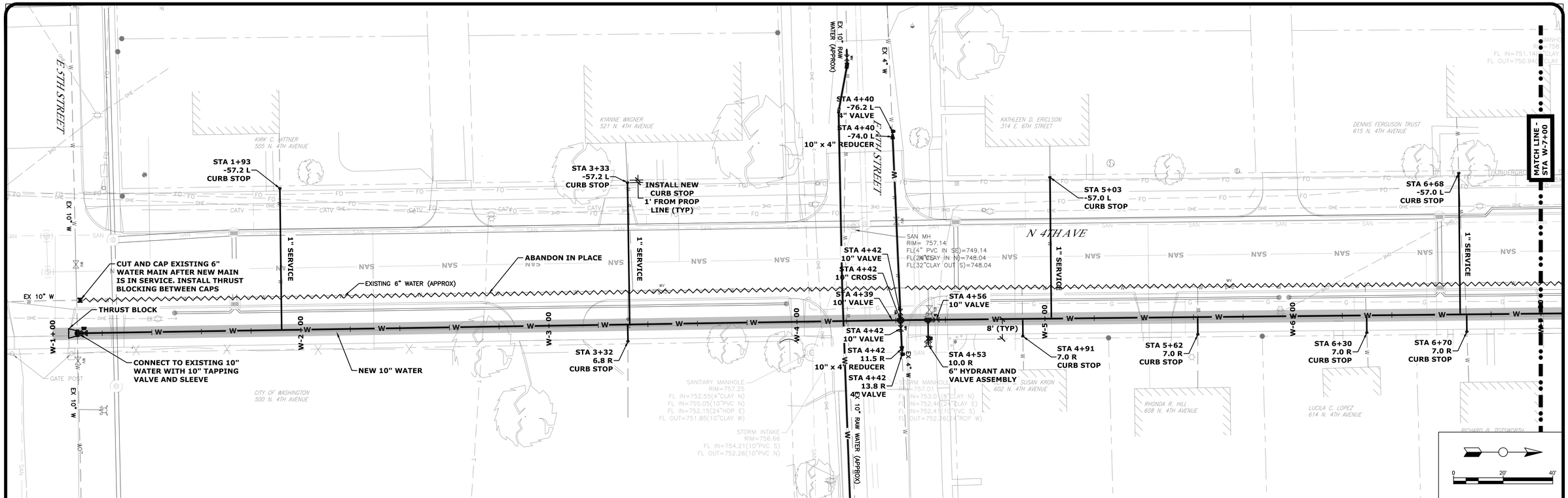


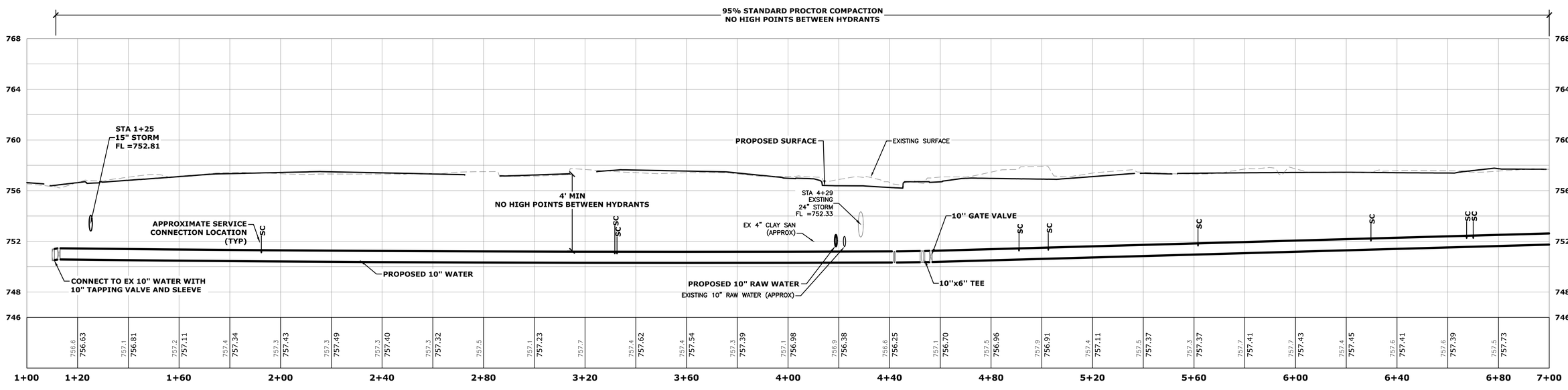




C7.2	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	SANITARY SEWER PLAN & PROFILE N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C7.2

DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\Civil\Sheet Drawings\7114-19A_Sanitary Sewer.dwg : C7.2





C8.1	LAST UPDATE: 03/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	WATER MAIN PLAN & PROFILE — N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 03/05/20	C8.1

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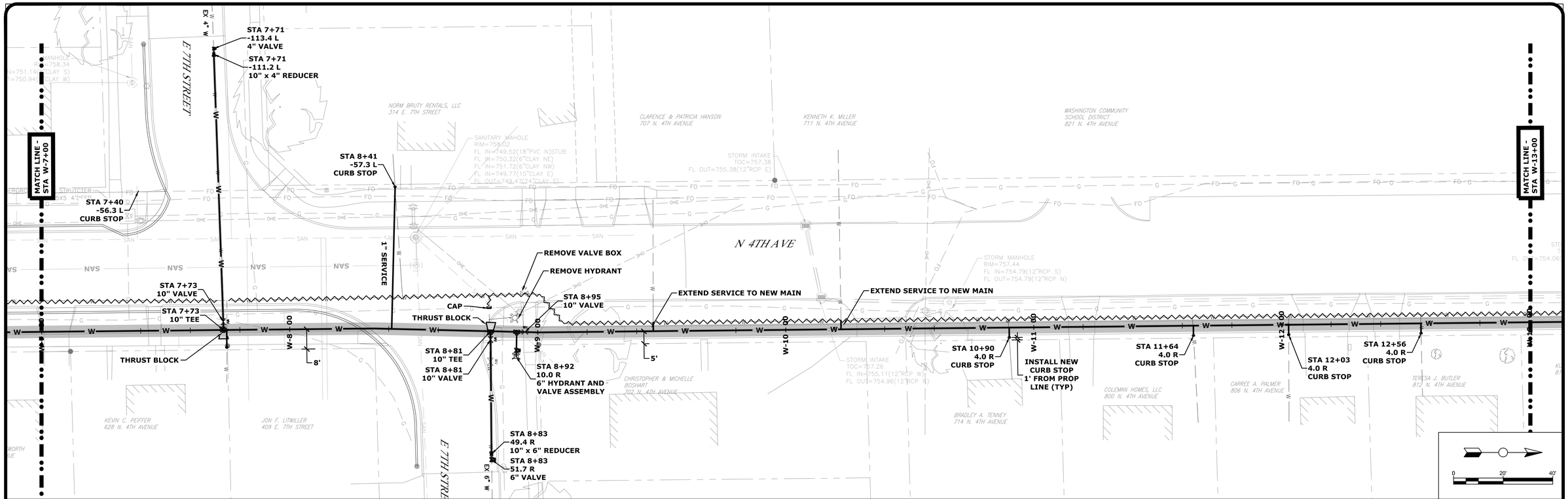

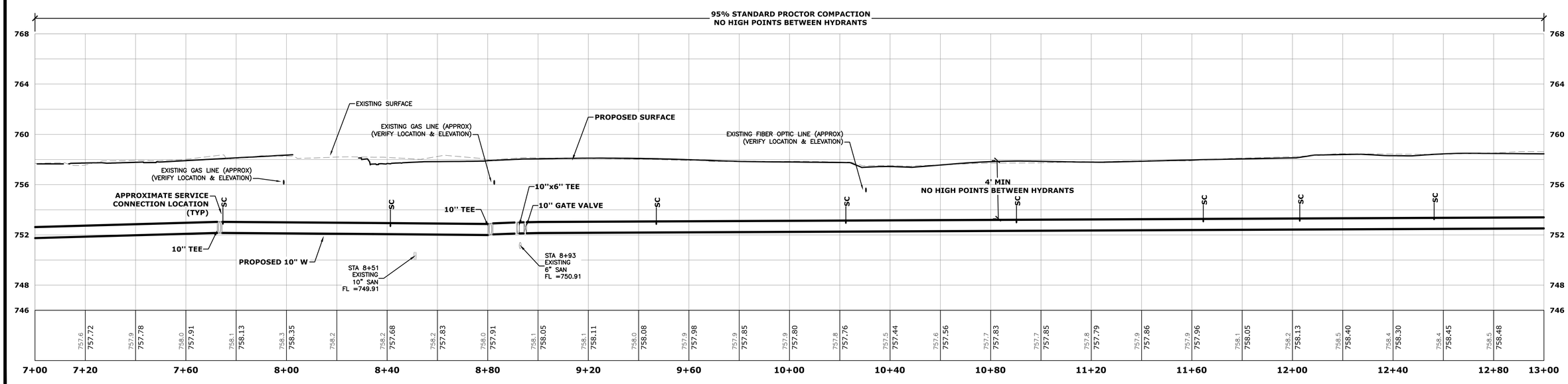

C8.2	LAST UPDATE: 03/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	WATER MAIN PLAN & PROFILE N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 03/05/20	C8.2

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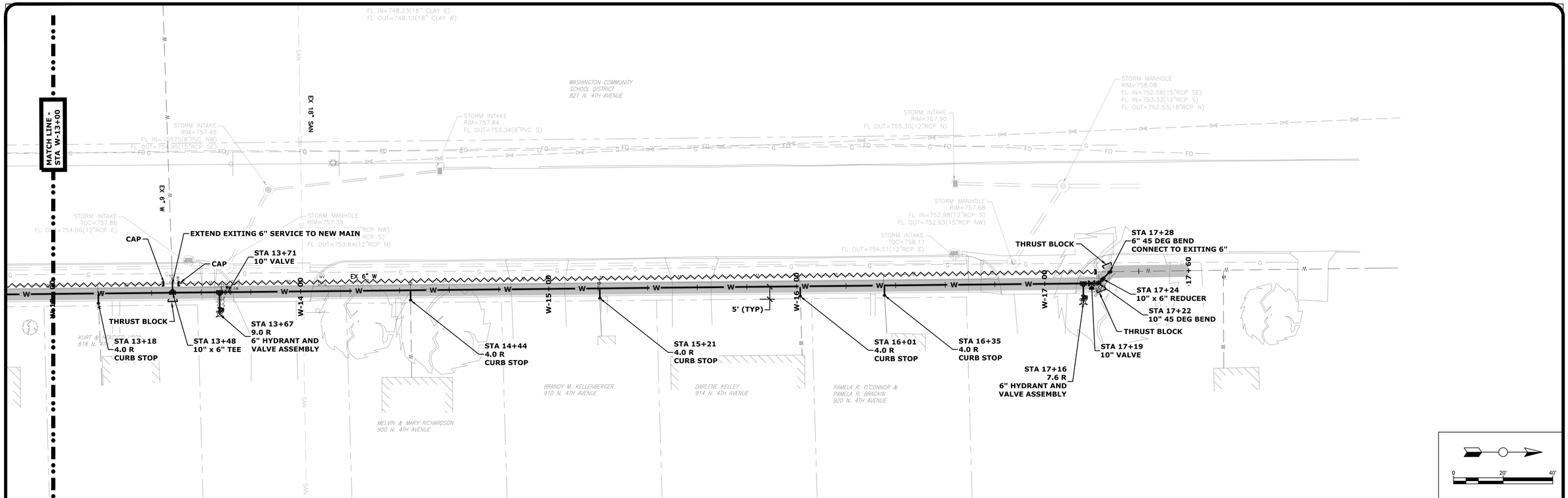

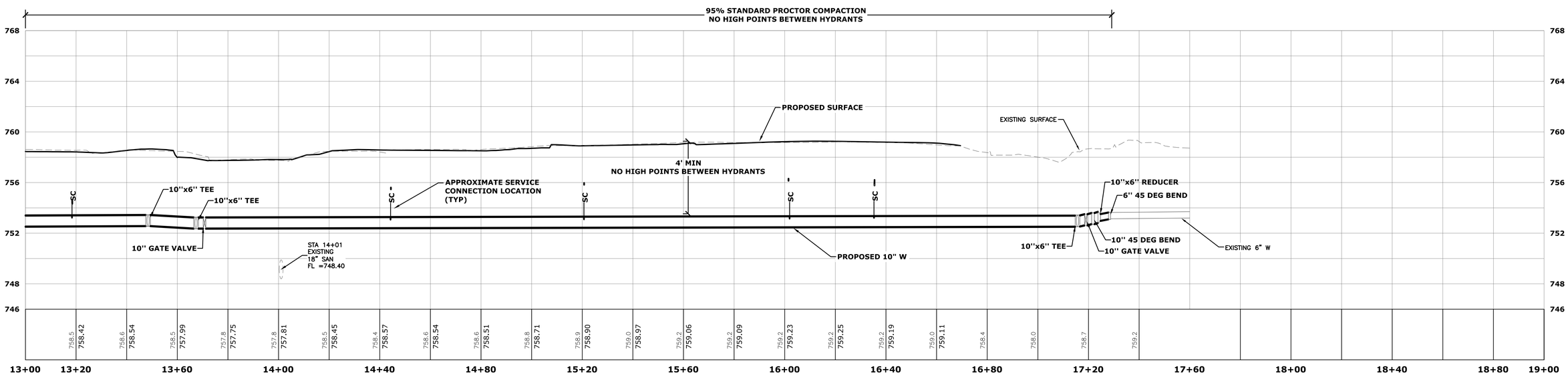

C8.3	LAST UPDATE: 03/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	WATER MAIN PLAN & PROFILE — N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 03/05/20	C8.3

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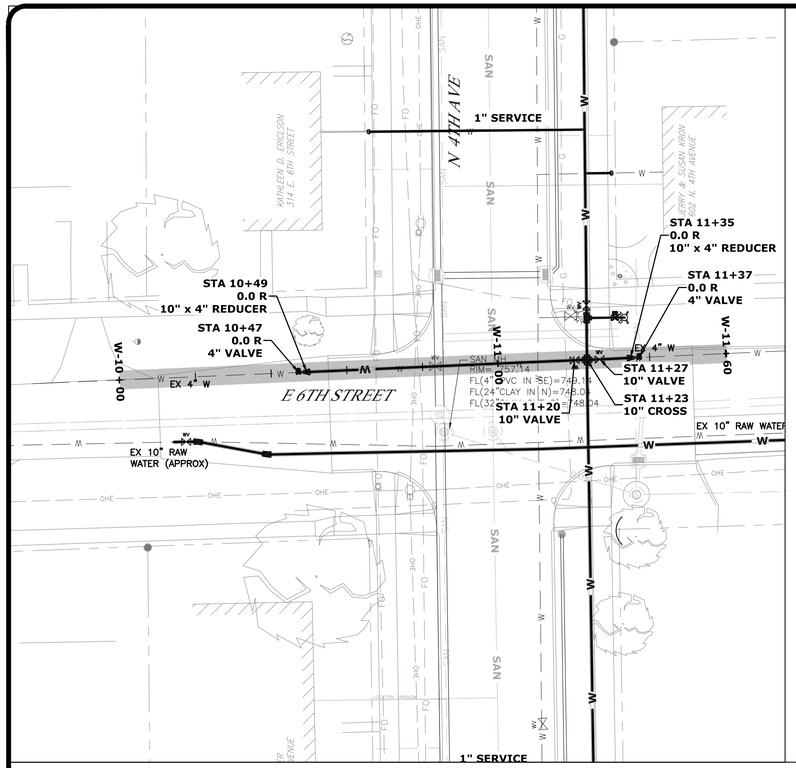

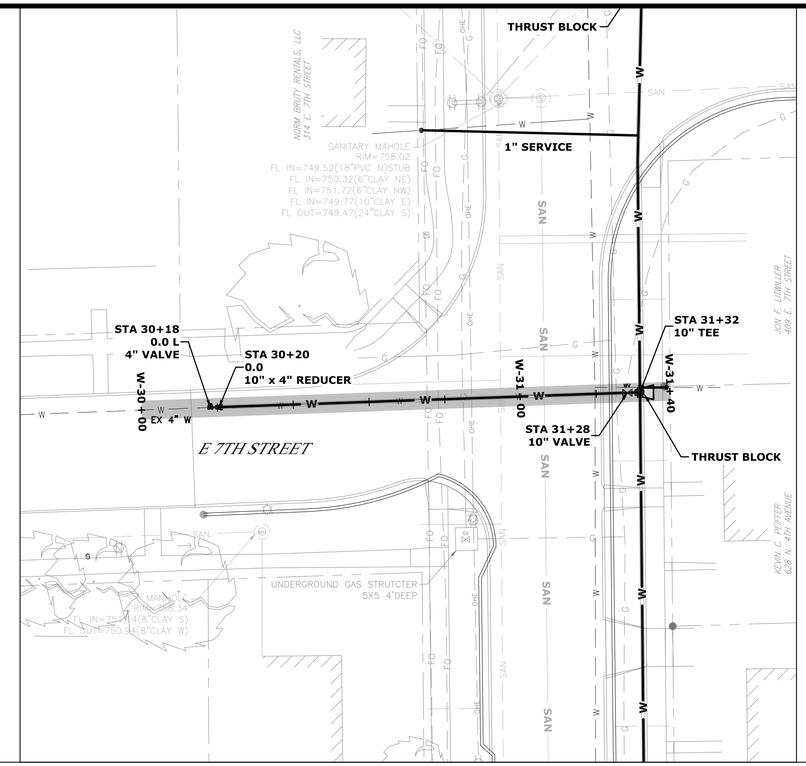

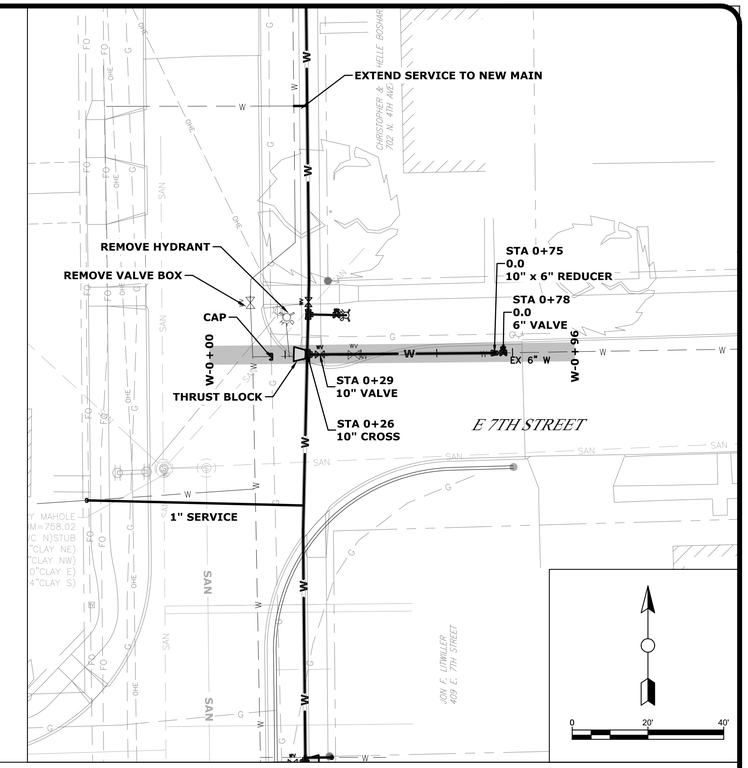

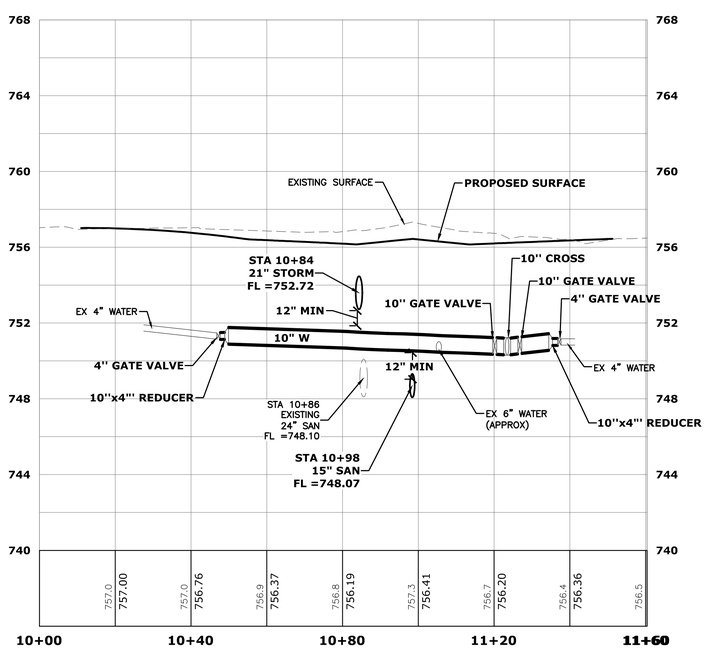

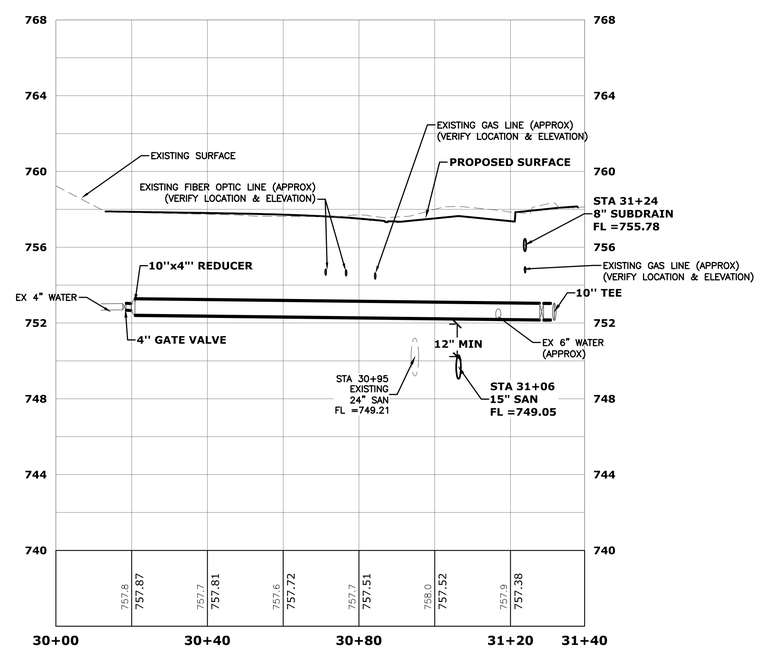

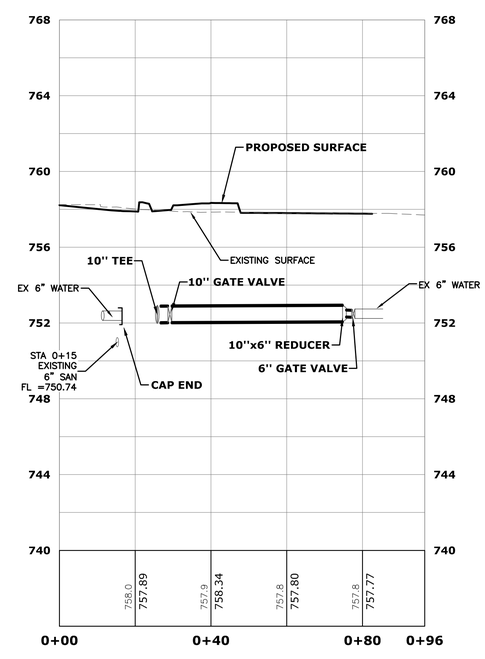

C8.4	LAST UPDATE: 03/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	WATER MAIN PLAN & PROFILE — N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 03/05/20	C8.4

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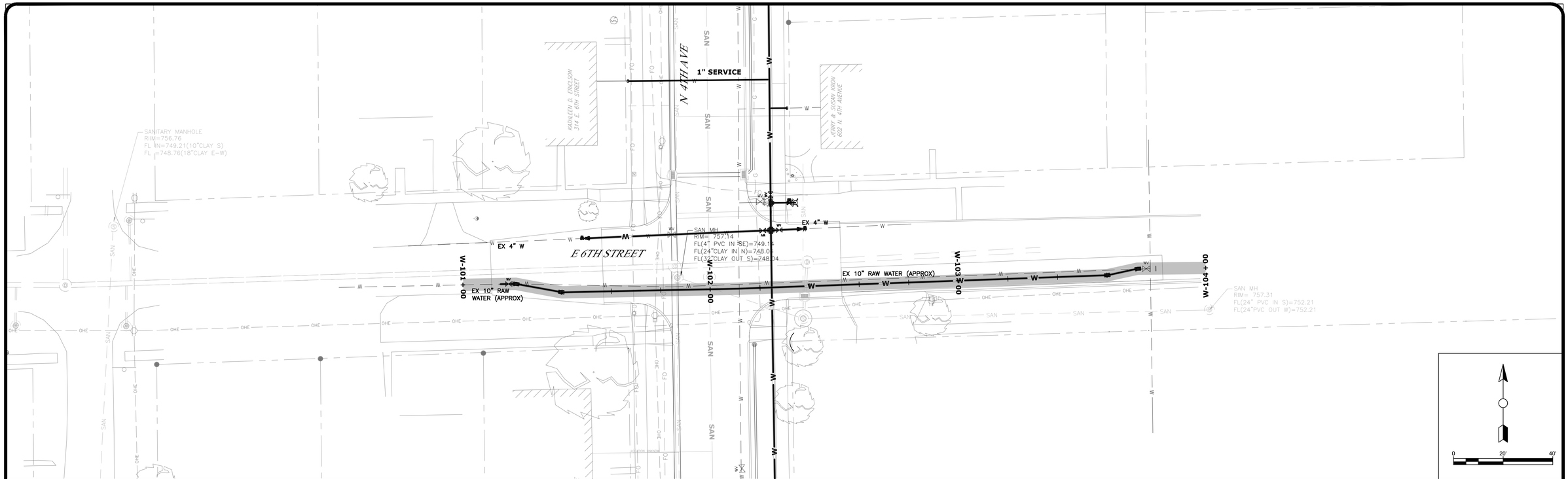

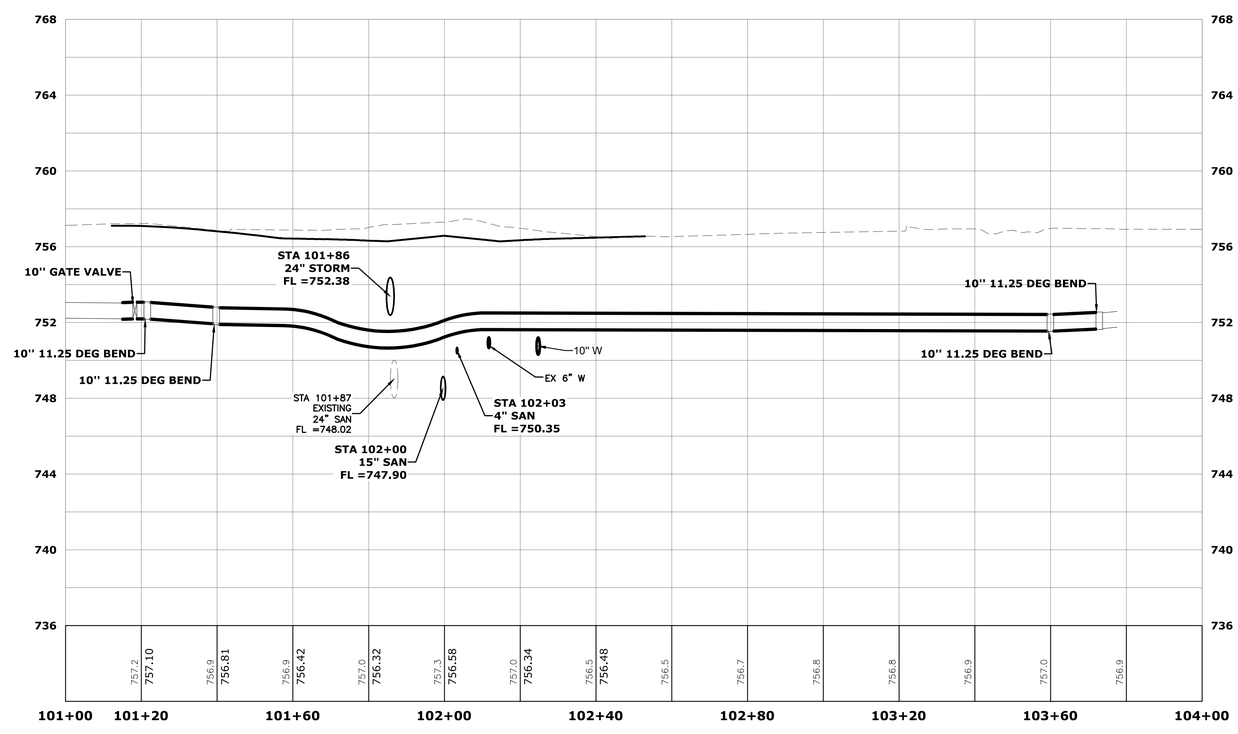

C8.5	LAST UPDATE: 03/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	RAW WATER MAIN PLAN & PROFILE — N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 03/05/20	C8.5

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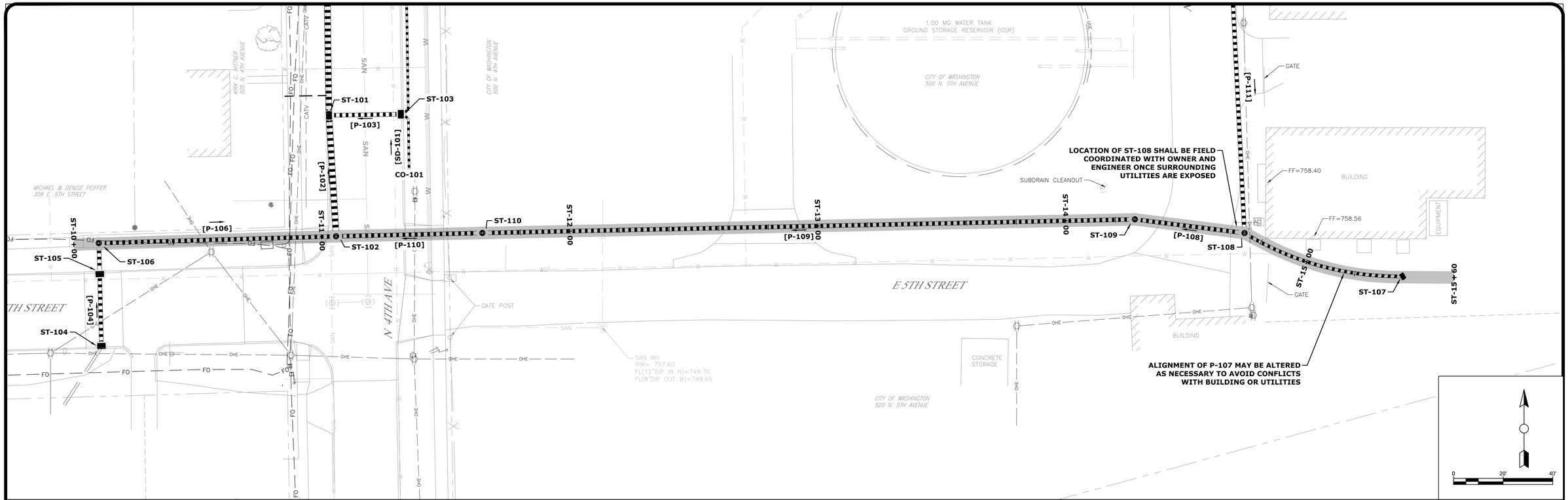
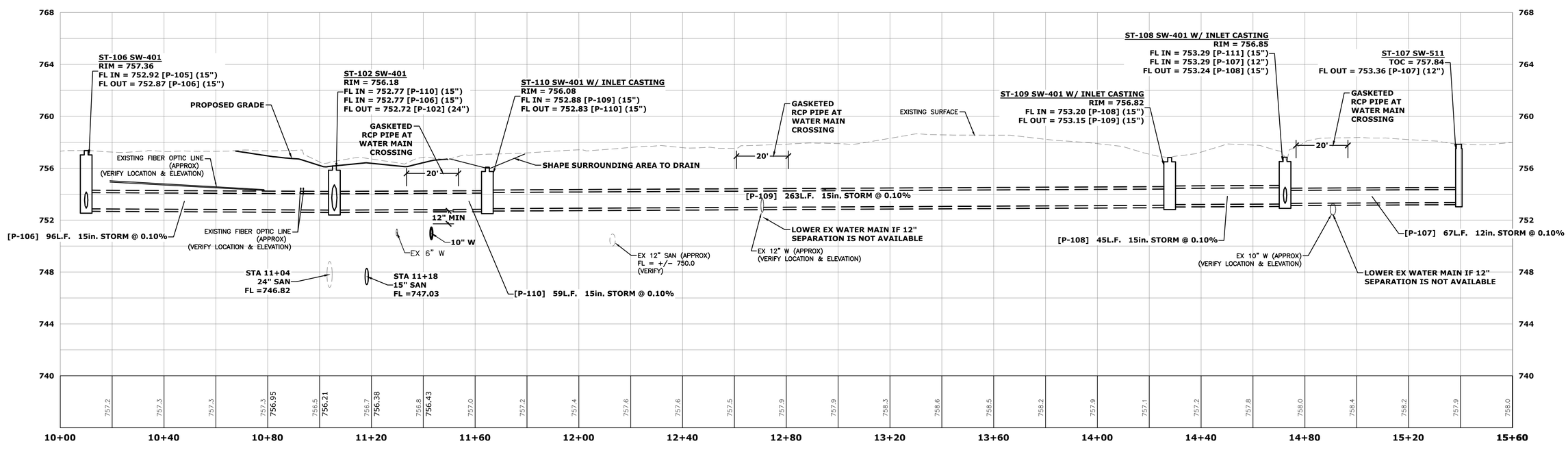
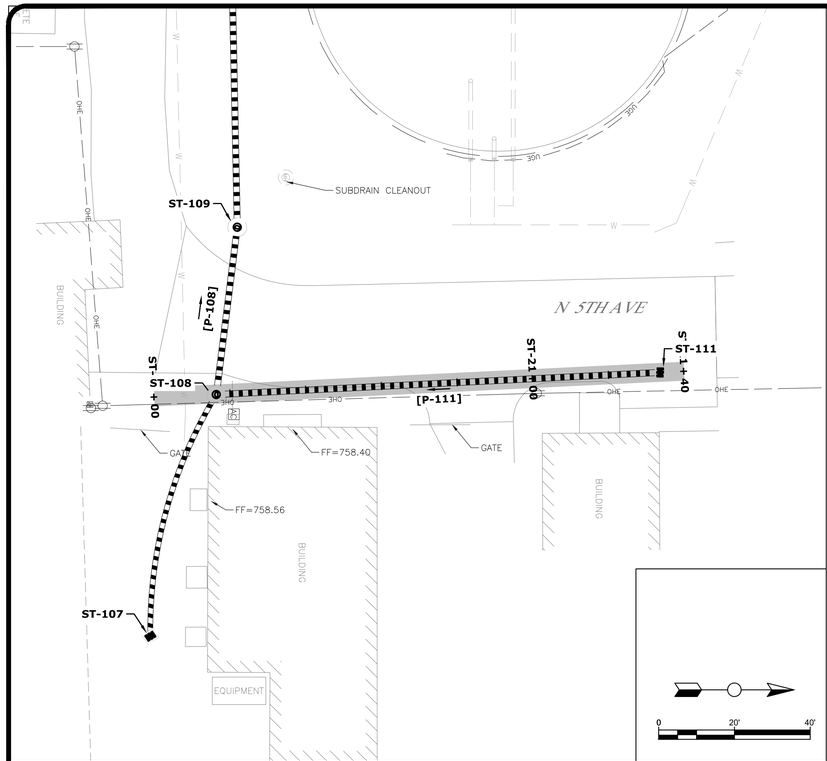
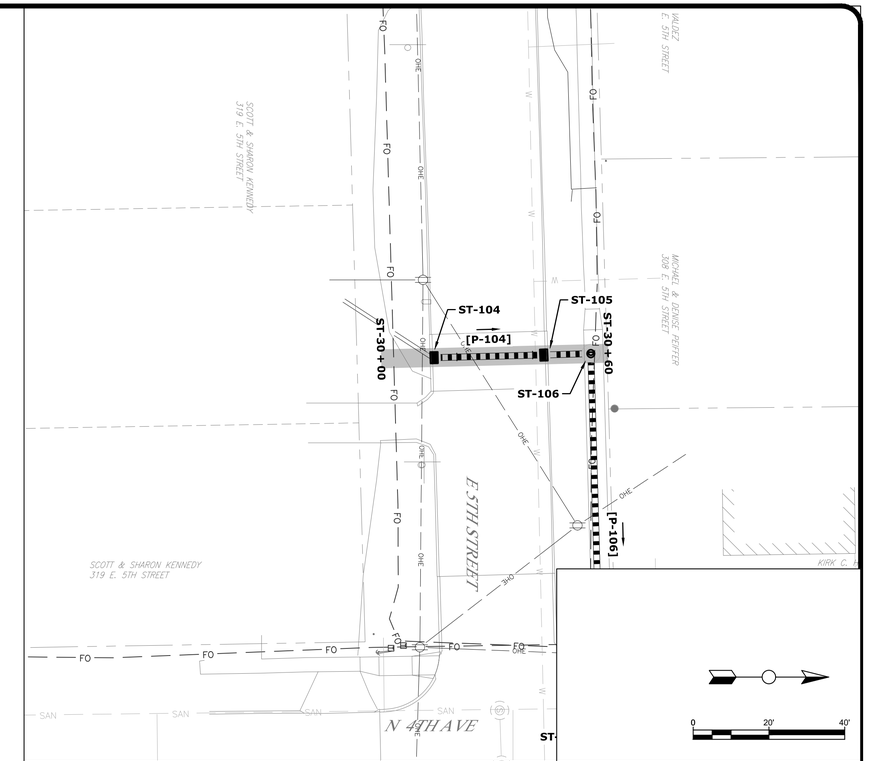


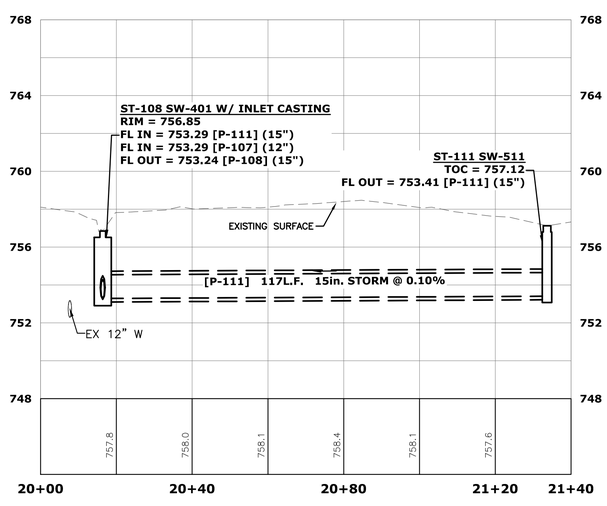


C9.1	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	STORM SEWER PLAN & PROFILE — N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C9.1

DRAWING FILENAME: K:\!proj\7000\7114-19A N 4th Avenue Improvements\Drawings\Civil\Sheet Drawings\7114-19A_Storm Sewer.dwg : C9.1







C9.2	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	STORM SEWER PLAN & PROFILE — N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C9.2

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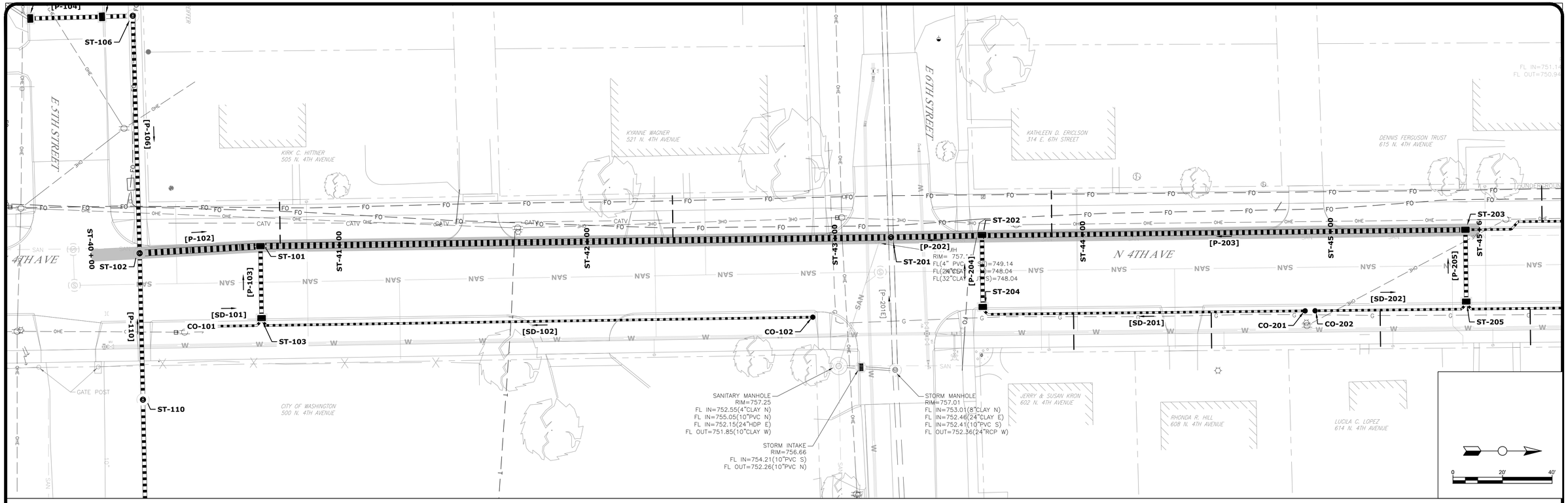

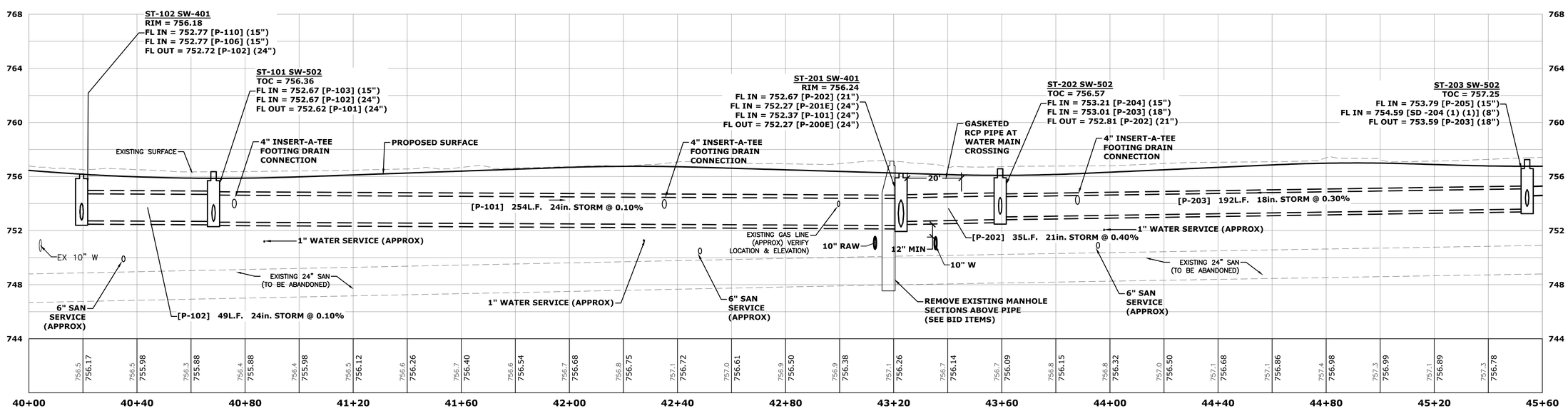

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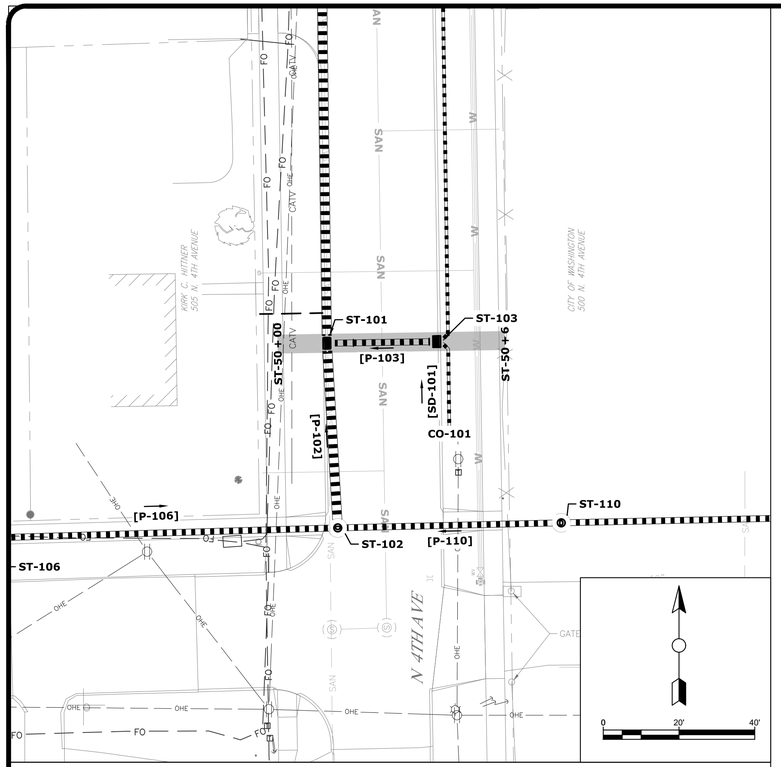

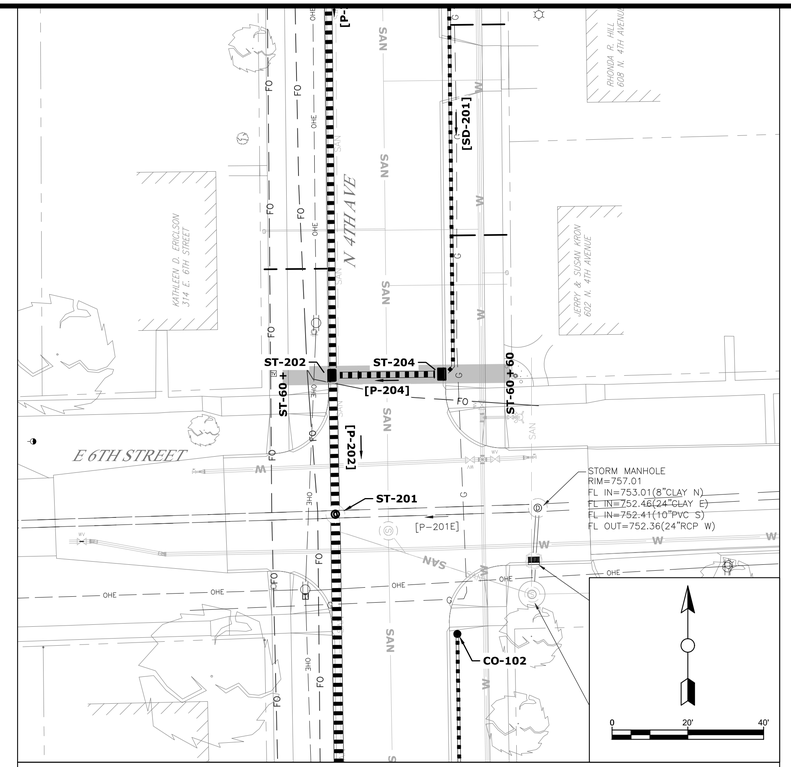

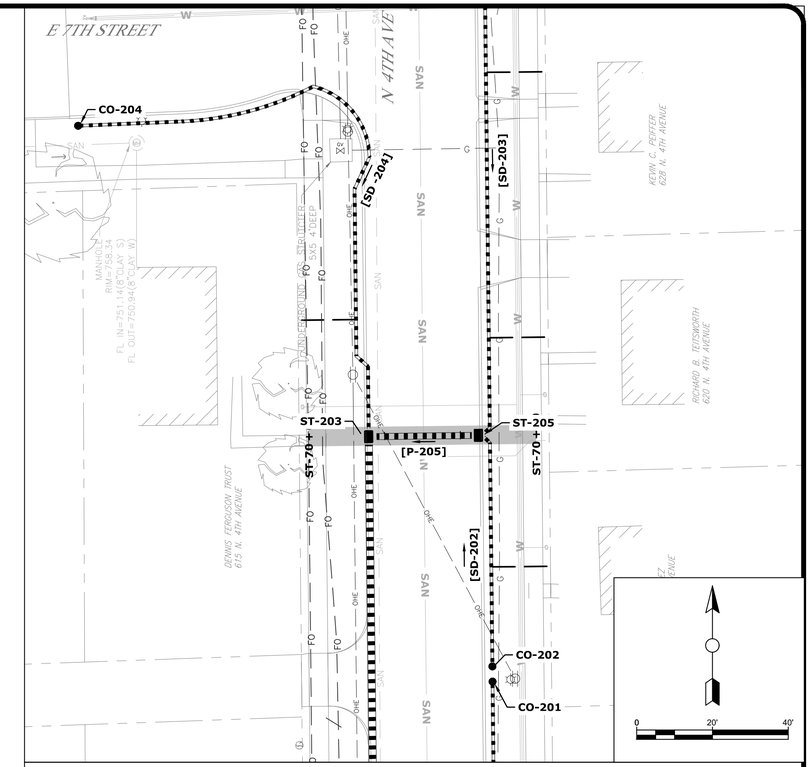

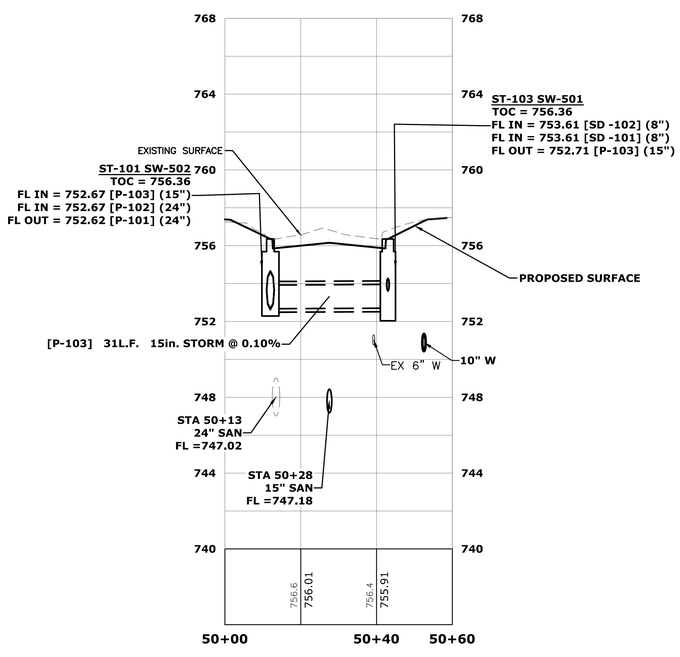

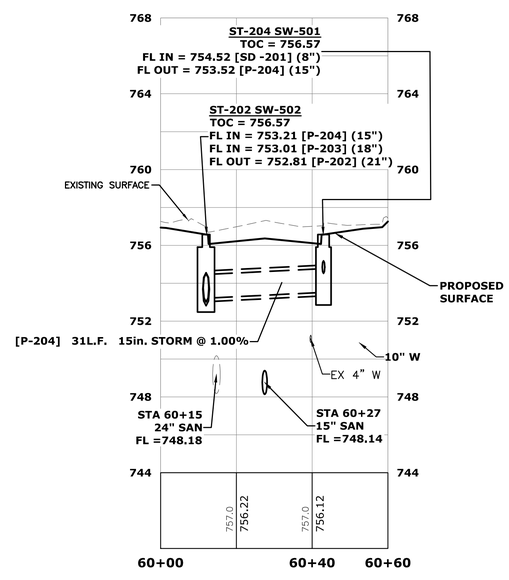

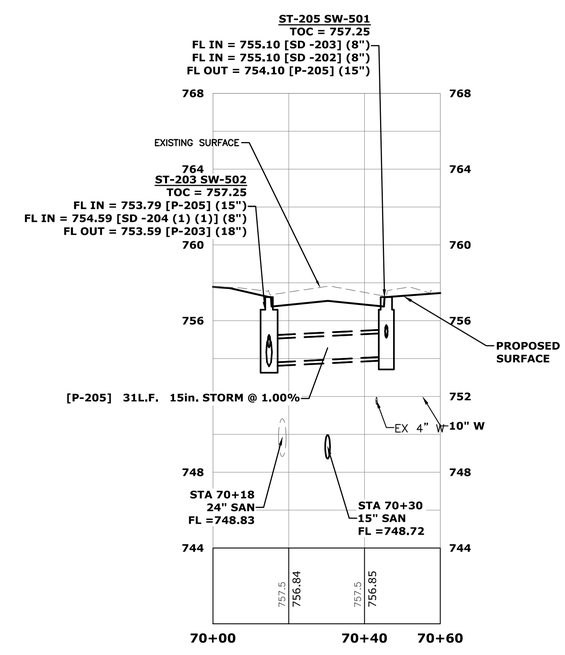

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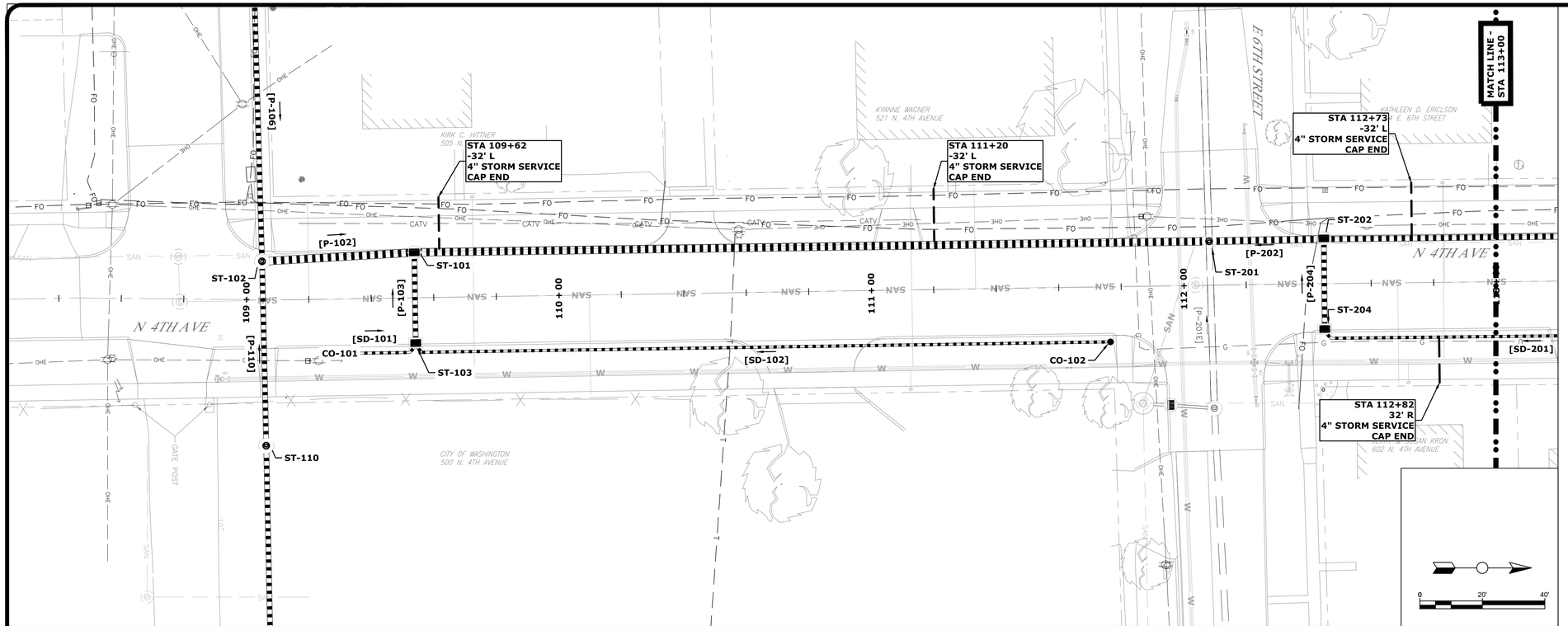

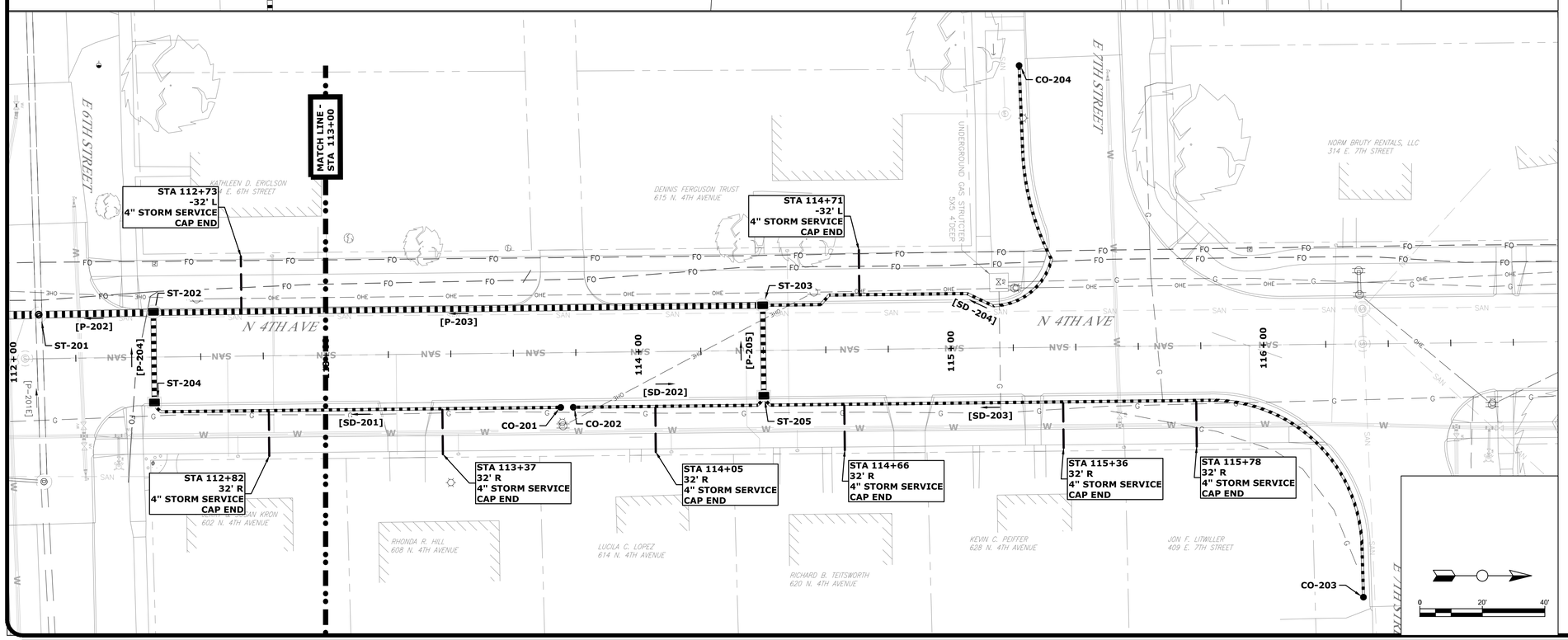

C9.5	LAST UPDATE: 02/05/20	PROJECT NO. 7114-19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	STORM SEWER SERVICE PLAN N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114-19A	LAST UPDATE: 02/05/20	C9.5

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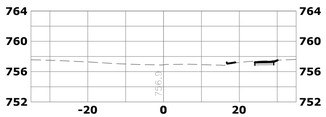

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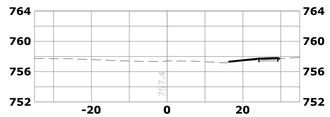

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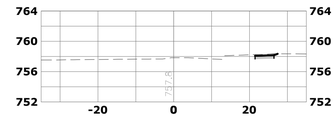

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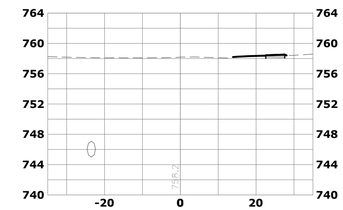

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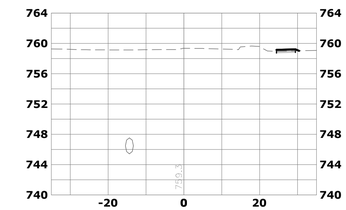

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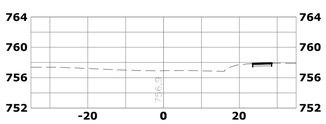

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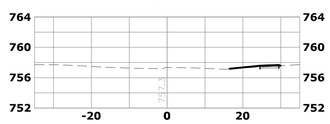

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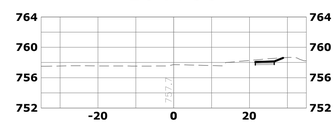

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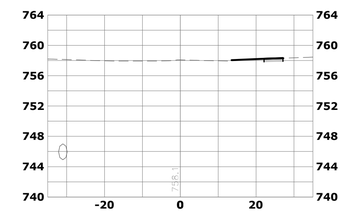

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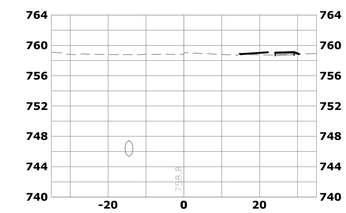

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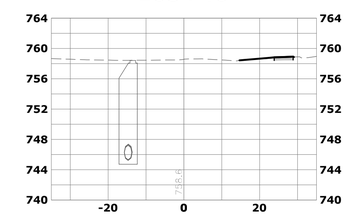

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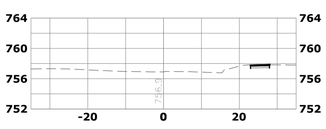

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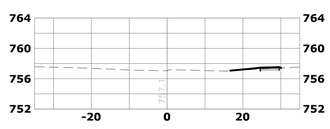

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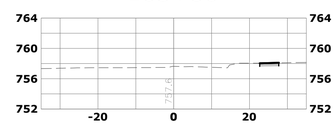

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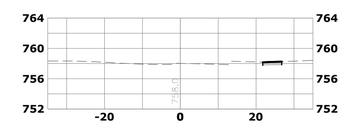

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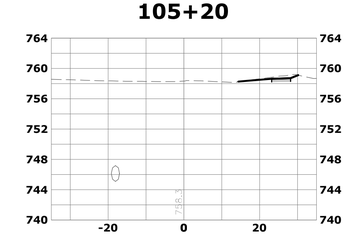

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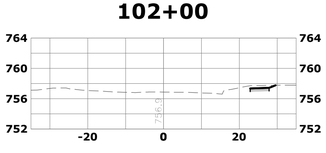

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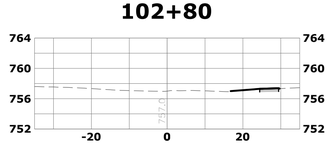

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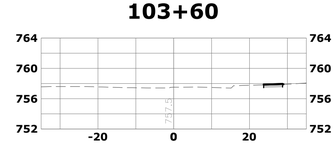

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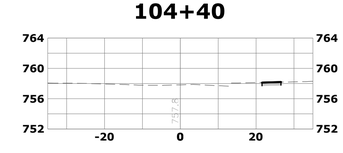

X1.1	LAST UPDATE: 02/05/20	PROJECT NO. 7114.19A	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	CROSS SECTIONS N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. 7114.19A	LAST UPDATE: 02/05/20	X1.1

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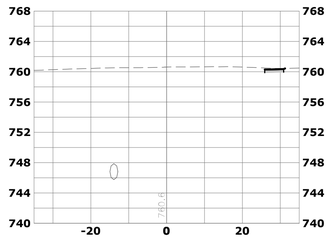

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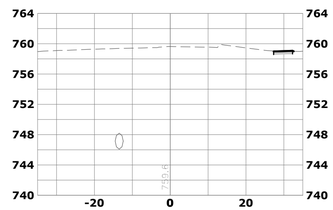

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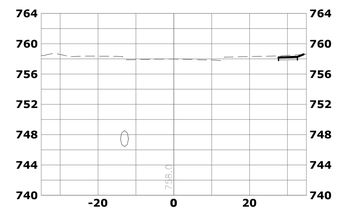

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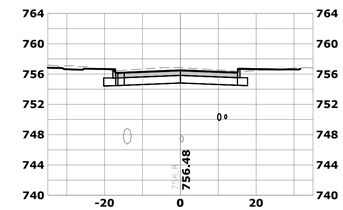

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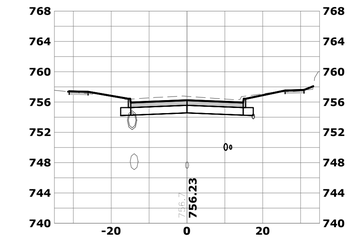

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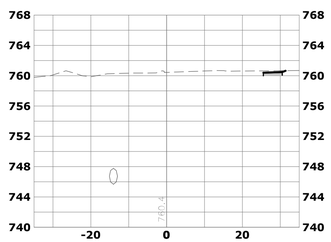

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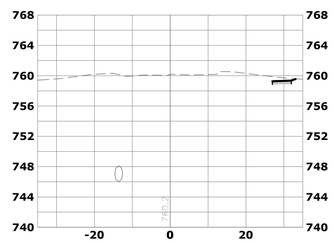

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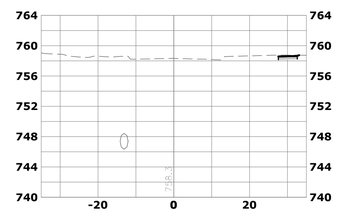

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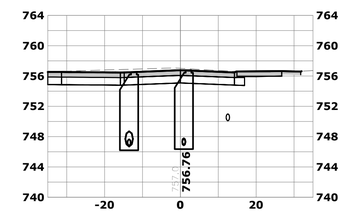

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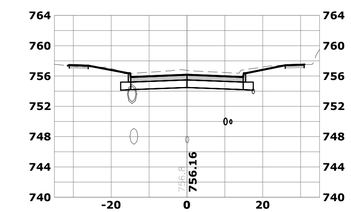

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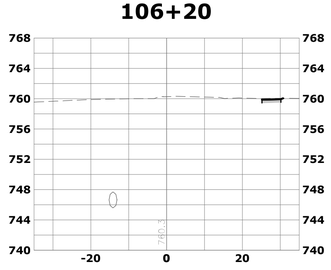

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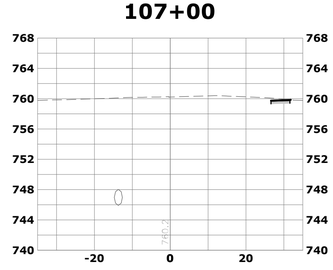

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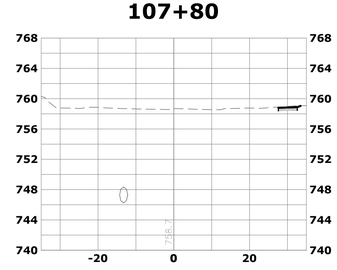

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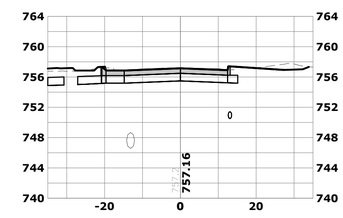

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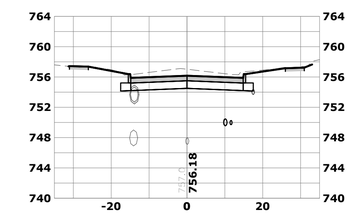

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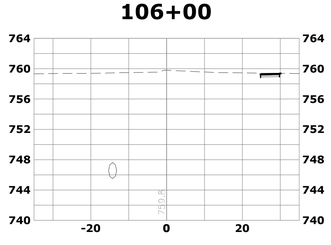

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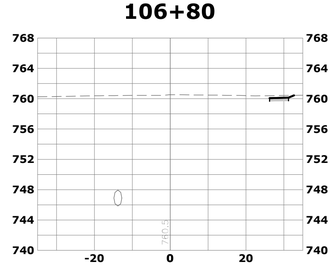

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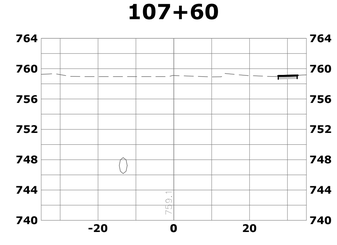

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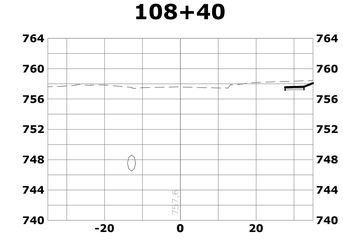

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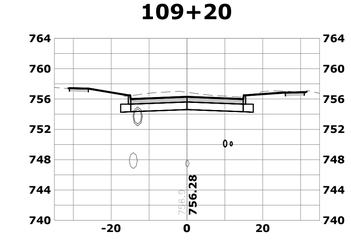

X1.2	LAST UPDATE: 02/05/20	PROJECT NO. *7114.19A*	FOX engineering — FOX Engineering Associates, Inc. 414 South 17th Street, Suite 107 Ames, Iowa 50010 Phone: (515) 233-0000 FAX: (515) 233-0103	WASHINGTON, IOWA	DATE / REVISION	CHECKED BY: / DATE:	CROSS SECTIONS N. 4TH AVENUE IMPROVEMENTS	PROJECT NO. *7114.19A*	LAST UPDATE: 02/05/20	X1.2

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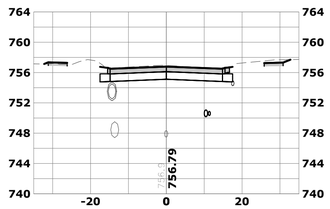

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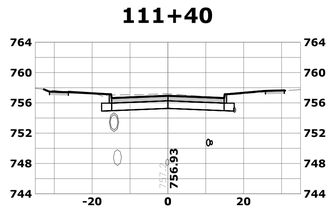

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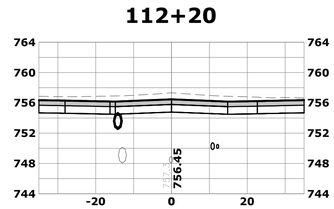

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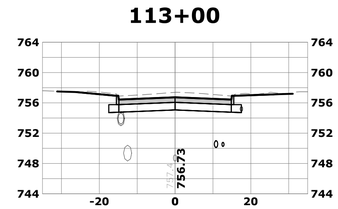

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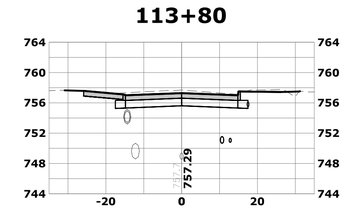

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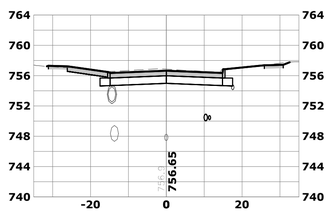

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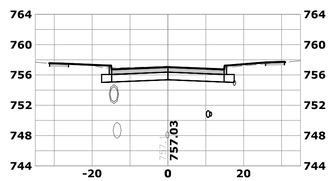

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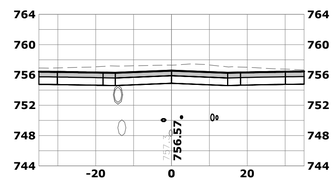

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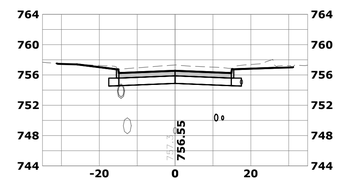

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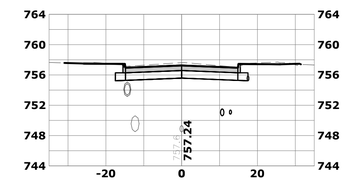

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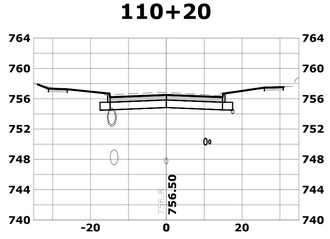

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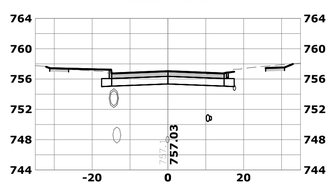

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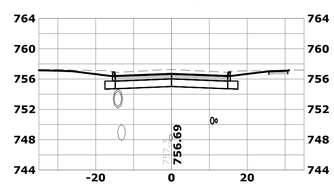

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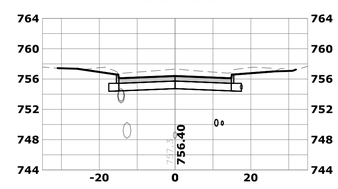

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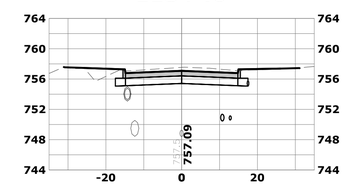

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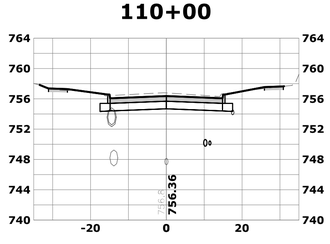

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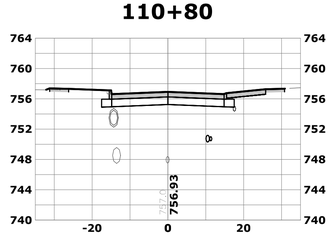

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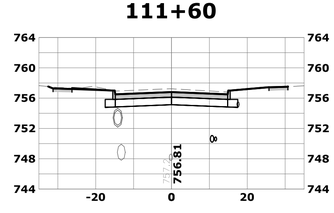

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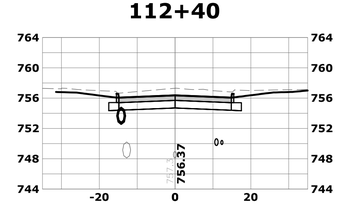

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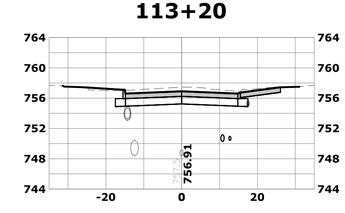

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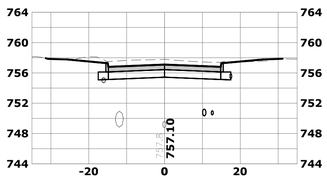

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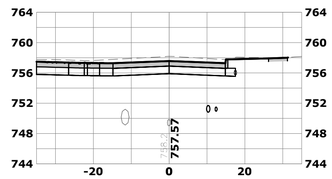

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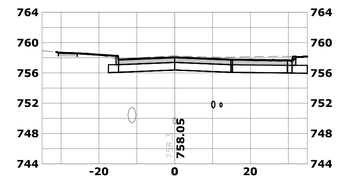

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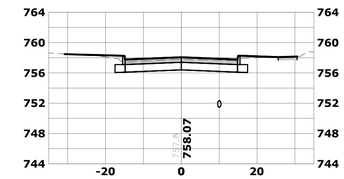

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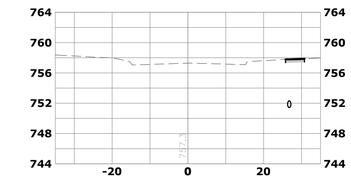

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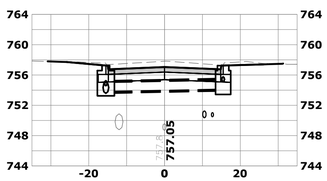

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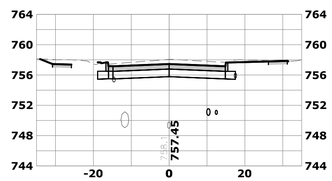

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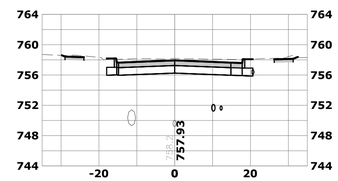

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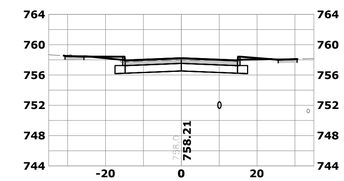

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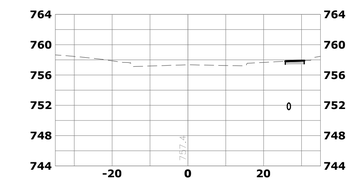

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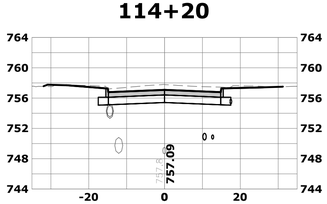

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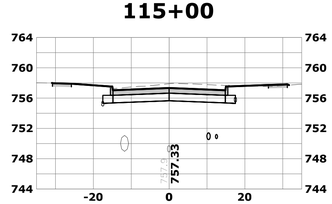

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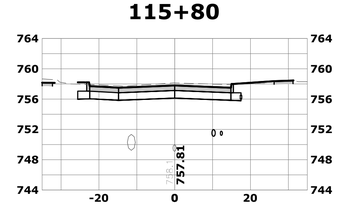

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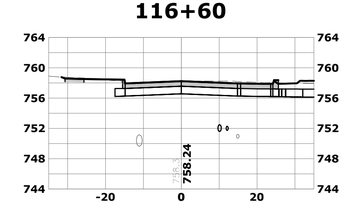

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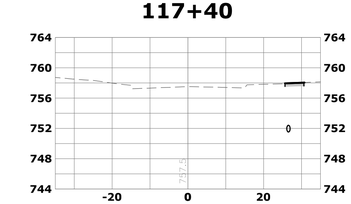

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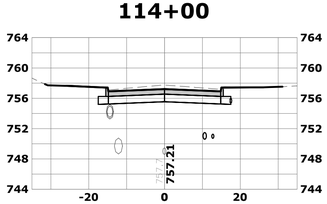

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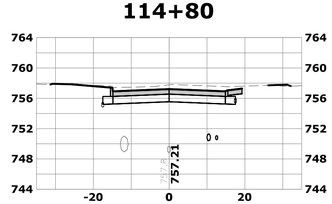

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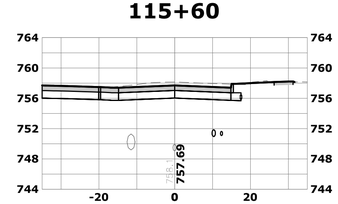

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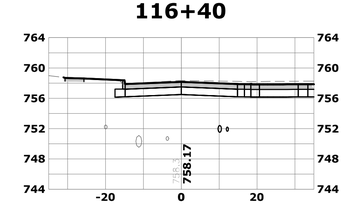

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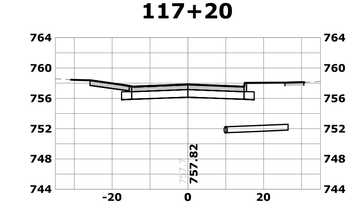

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PROJECT NO. 7114.19A

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X1.4

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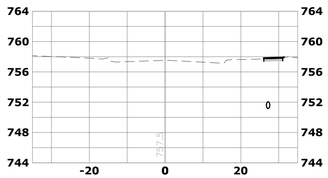

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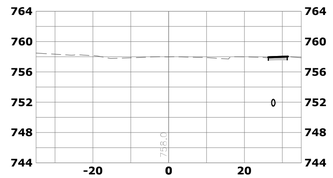

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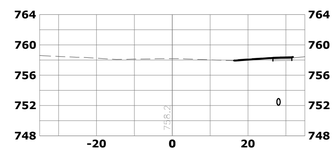

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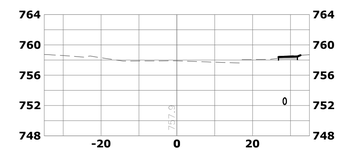

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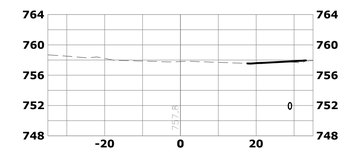

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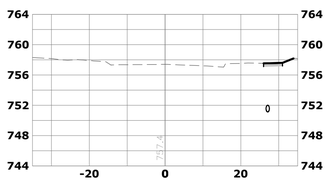

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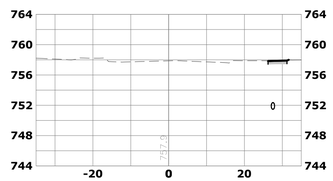

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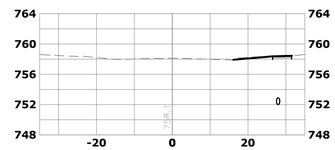

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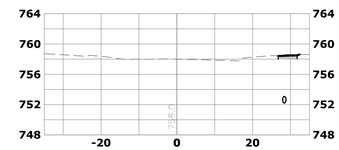

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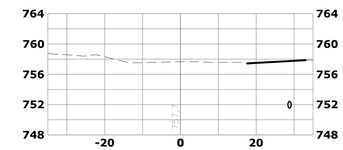

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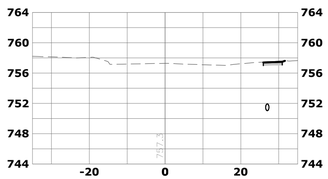

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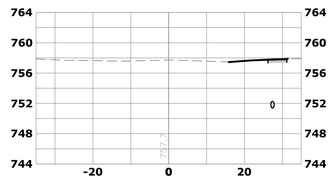

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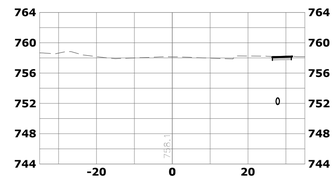

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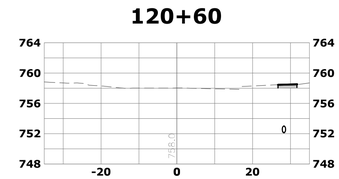

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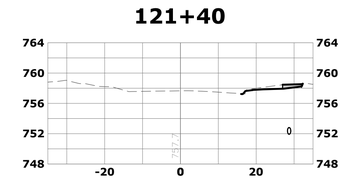

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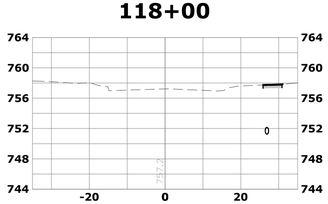

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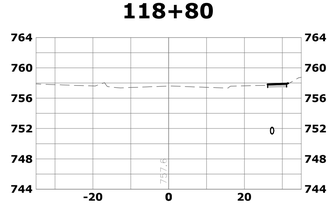

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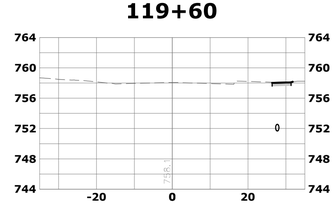

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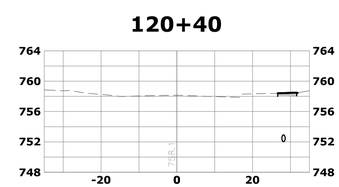

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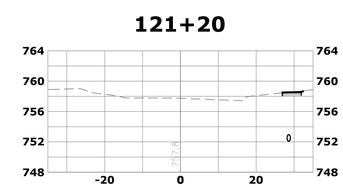

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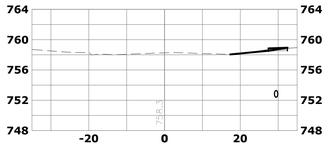

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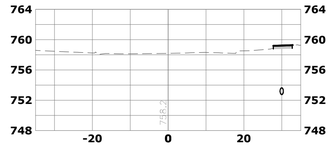

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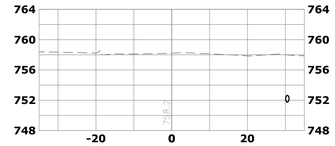

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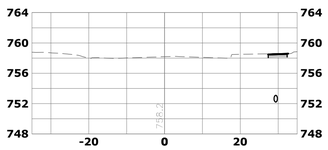

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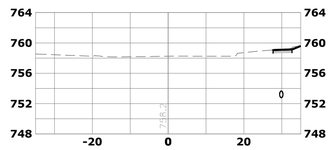

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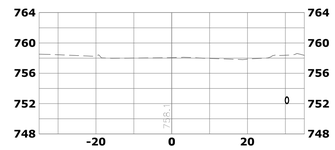

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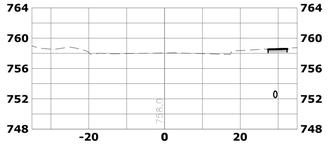

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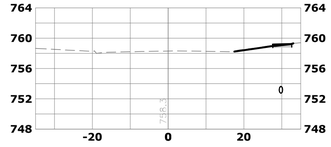

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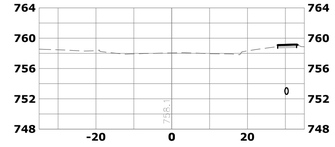

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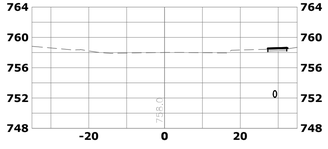

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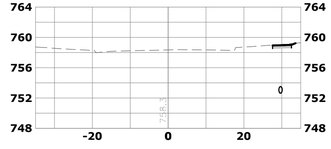

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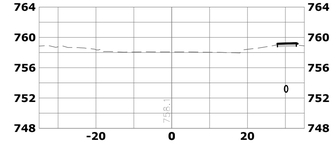

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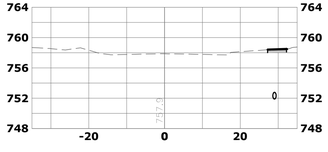

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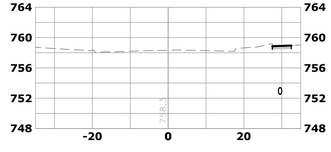

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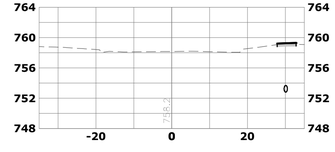

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