

City of Columbia

701 East Broadway, Columbia, Missouri 65201



Agenda Item Number: B 139-15

Department Source: Public Works

To: City Council

From: City Manager & Staff

Council Meeting Date: 6/1/2015

Re: Bid Call for Storm Drainage Improvements at the Intersection of Hitt Street and Elm Street

Documents Included With This Agenda Item

Council memo, Resolution/Ordinance

Supporting documentation includes: Map and Plans

Executive Summary

Authorizing a bid call through the Purchasing Division for storm drainage improvements at the intersection of Hitt Street and Elm Street, to replace a failing corrugated metal pipe (CMP) with concrete pipe. The estimated construction cost for the project is \$195,000, and a public hearing was held July 16, 2012.

Discussion

The bottom of the existing CMP at the intersection of Hitt Street and Elm Street has rusted out allowing surrounding soil to be carried away by groundwater migrating to the pipe. This leads to the formation of depressions in the ground and the pavement above. The pipe drains a large area and there is a danger that it could collapse in the middle of a rain storm causing a hazardous condition around the Hitt and Elm intersection.

This project will consist of installing a concrete pipe on Elm Street, across the intersection of Hitt and Elm, to the east side of Hitt Street. The pipe must be approximately 11 feet deep in order to tie into the existing storm drainage system to the east. Due to the depth of the excavation involved, the intersection of Hitt and Elm must be closed to ensure the safety of the public as well as the contractor. The time of closure will be limited as much as possible while maintaining a safe work zone area. Adjacent sidewalks will be kept open to the maximum extent practicable.

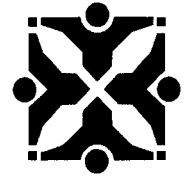
Fiscal Impact

Short-Term Impact: The estimated cost to construct this project is \$195,000 and will be paid from the annual stormwater project account.

Long-Term Impact: Routine maintenance costs will not change due to completion of this replacement project.

City of Columbia

701 East Broadway, Columbia, Missouri 65201



Vision, Strategic & Comprehensive Plan Impact

Vision Impact: Environment

Strategic Plan Impact: Infrastructure

Comprehensive Plan Impact: Environmental Management, Infrastructure

Suggested Council Action

Authorizing a bid call through the Purchasing Division for storm drainage improvements at the intersection of Hitt Street and Elm Street.

Legislative History

7/2/2012 (R104-12) Setting a Public Hearing for July 16, 2012 for storm drainage improvements at the intersection of Hitt Street and Elm Street.



Department Approved



City Manager Approved

Introduced by _____

First Reading _____

Second Reading _____

Ordinance No. _____

Council Bill No. B 139-15

AN ORDINANCE

determining it is in the public interest to construct storm drainage improvements at the intersection of Hitt Street and Elm Street; approving and adopting plans and specifications; determining that the work shall be done by contract; calling for bids through the Purchasing Division; providing for payment for the improvement; authorizing the City Manager to obtain, execute and record all documents necessary for the improvement; providing for compliance with the prevailing wage law and state-mandated construction safety training; and fixing the time when this ordinance shall become effective.

WHEREAS, the City Council adopted a resolution declaring the necessity of constructing storm drainage improvements at the intersection of Hitt Street and Elm Street; and

WHEREAS, the notice of a public hearing on this project was published in a daily newspaper of general circulation in the city; and

WHEREAS, the City Council has held a public hearing on construction of the improvement.

NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF COLUMBIA, MISSOURI, AS FOLLOWS:

SECTION 1. The Council finds that the replacement of a corrugated metal pipe with concrete pipe, construction of storm drain inlets, asphalt pavement replacement, concrete curb and gutter replacement and other miscellaneous work at the intersection of Hitt Street and Elm Street, in the City of Columbia, Missouri, is necessary for the welfare and improvement of the city and that it is in the public interest that such improvements be made.

SECTION 2. The plans and specifications for this improvement, as prepared by the Director of Public Works, are hereby approved and made a part of this ordinance by reference.

SECTION 3. The construction of the improvement shall be done by contract in accordance with the plans and specifications, the laws of the State of Missouri, and the Charter and Ordinances of the City of Columbia, Missouri.

SECTION 4. The Purchasing Agent is hereby authorized to call for bids and execute a contract for the improvement.

SECTION 5. Payment for this improvement shall be made from Stormwater Utility Funds and such other funds as may be lawfully appropriated.

SECTION 6. The City Manager is authorized to obtain, execute and have recorded all licenses, easements, deeds and any other conveyances or instruments necessary for the City to complete this improvement.

SECTION 7. The contract for the improvement shall provide that not less than the prevailing hourly rate of wages, as found by the Department of Labor and Industrial Relations of Missouri, shall be paid to all workers performing work under the contract. The contractor's bond shall guarantee the faithful performance of the prevailing hourly wage clause in the contract.

SECTION 8. The bid specifications and contract for the improvement shall provide that the contractor and any subcontractor shall provide a ten-hour Occupational Safety and Health Administration construction safety program (or a similar program approved by the Missouri Department of Labor and Industrial Relations) for all employees working on-site. All employees working on the site of the improvement are required to complete the safety program within 60 days of beginning work on the improvement project.

SECTION 9. This ordinance shall be in full force and effect from and after its passage.

PASSED this _____ day of _____, 2015.

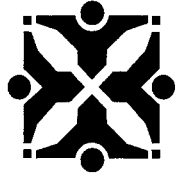
ATTEST:

City Clerk

Mayor and Presiding Officer

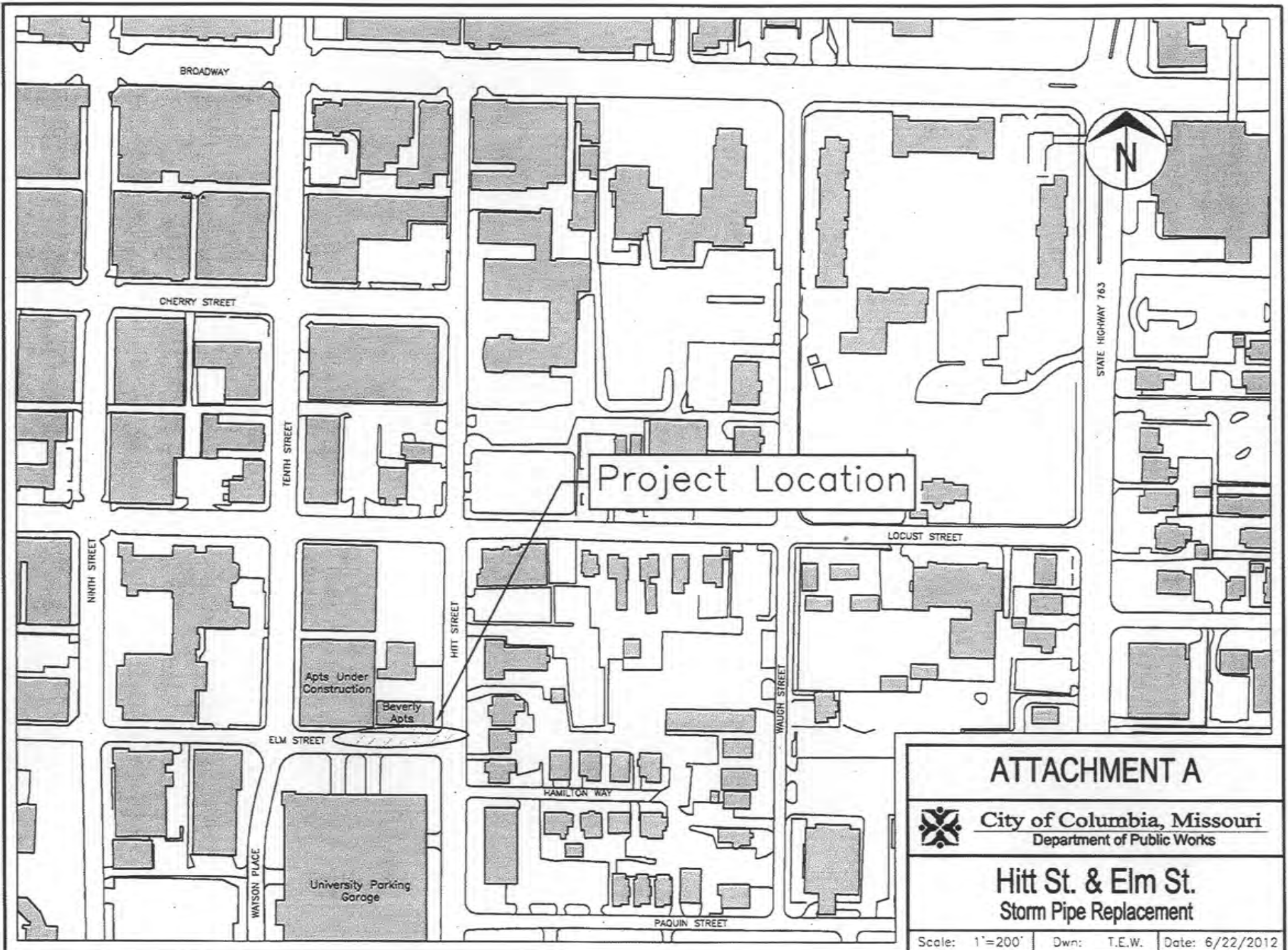
APPROVED AS TO FORM:

City Counselor



SUPPORTING DOCUMENTS INCLUDED WITH THIS AGENDA ITEM ARE AS FOLLOWS:

Map and Plans



ATTACHMENT A



City of Columbia, Missouri
Department of Public Works

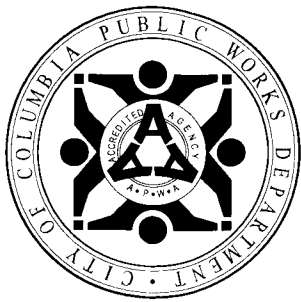
Hitt St. & Elm St.
Storm Pipe Replacement

Scale: 1"=200'

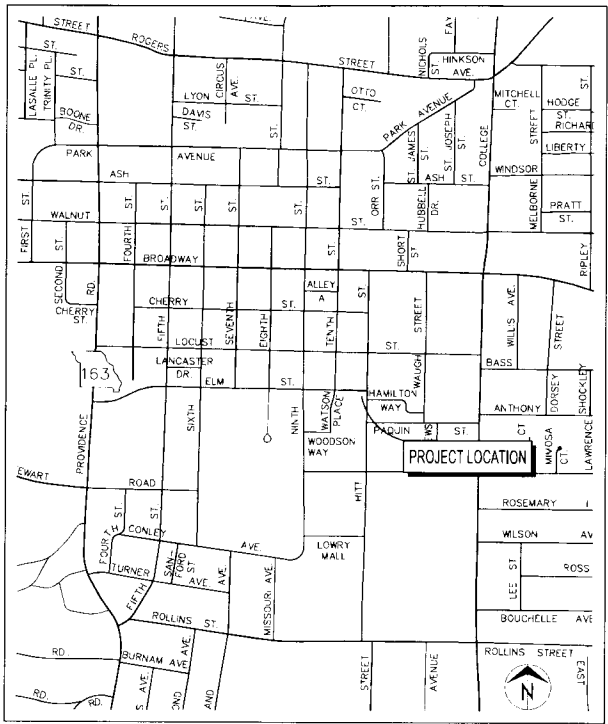
Dwn: T.E.W.

Date: 6/22/2012

City of Columbia, Missouri
Department of Public Works



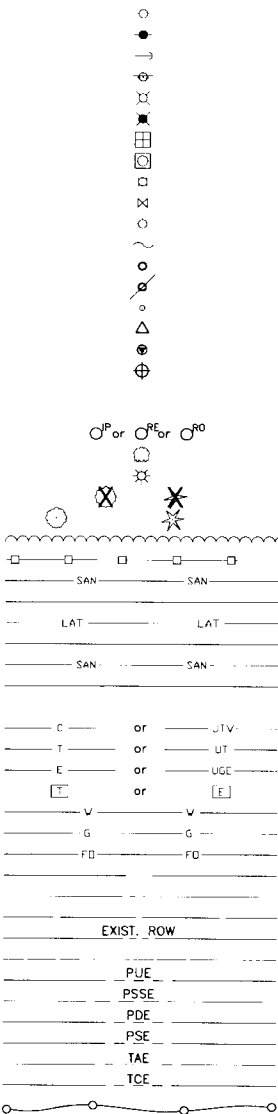
HITT & ELM
STORM DRAIN REPLACEMENT



LOCATION MAP

LEGEND OF SYMBOLS

- POWER POLE
- TELEPHONE POLE
- GUY ANCHOR
- GUY POLE
- STREET LIGHT POLE
- YARD LIGHT (SOLAR)
- WATER METER
- GAS METER
- GAS VALVE
- WATER VALVE
- FIRE HYDRANT
- PIPE BREAKLINE
- SANITARY MANHOLE
- SANITARY CLEANOUT
- SANITARY LATERAL CLEANOUT
- TRAVERSE POINT
- MoDOT ROW MARKER
- BENCHMARK
- SIGN
- MAIL BOX
- PROPERTY IRON
- BUSH
- STUMP
- TREE REMOVAL
- TREE
- TREE LINE
- SILT FENCE/TREE PROTECT
- EXISTING PUBLIC SANITARY SEWER
- PROPOSED PUBLIC SANITARY SEWER
- EXISTING SANITARY SEWER LATERAL
- PROPOSED PRIVATE SANITARY SEWER LATERAL
- EXISTING SANITARY SEWER TO BE ABANDONED
- PROPOSED SEWER MAIN AND LATERALS
- FENCE
- CABLE TELEVISION
- TELEPHONE
- ELECTRIC
- TELEPHONE OR ELECTRIC MANHOLE
- WATER MAIN
- GAS MAIN
- FIBER OPTIC
- FLOW LINE
- PROPERTY LINE
- LOT LINE
- EXISTING RIGHT OF WAY LINE
- EXISTING EASEMENT
- PERMANANT UTILITY EASEMENT
- PROPOSED SANITARY SEWER EASEMENT
- PROPOSED PERMANENT DRAINAGE EASEMENT
- PROPOSED RIGHT OF WAY
- TEMPORARY ACCESS EASEMENT
- TEMPORARY CONSTRUCTION EASEMENT
- GRADING LIMIT



GENERAL NOTES

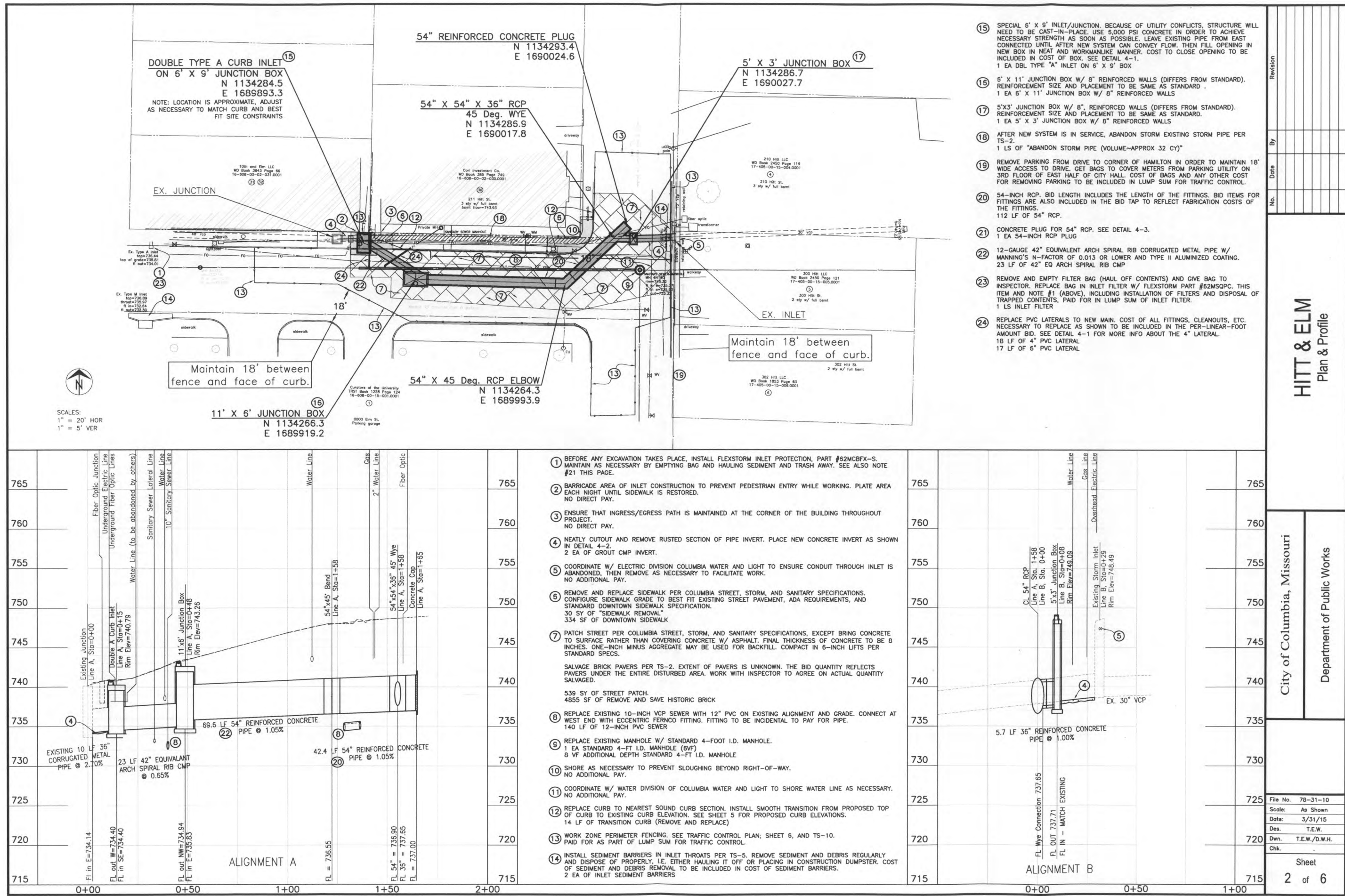
- All construction to be in accordance with "City of Columbia Street and Storm Sewer Specifications and Standards" and Sanitary Sewer Specifications and Standards (Current editions).
- All underground utilities are shown in their approximate locations.
- All removal of driveway pavements should be verified by field engineer.
- All excavation to be in accordance with Sections 319.010-319.050, Revised Statutes of the State of Missouri. Such compliance shall not, however, excuse any person making any excavation from doing so in a careful and prudent manner, nor shall it excuse such person from liability for any damage or injury to underground utilities resulting from the excavation.
- All RCP is Class III unless otherwise indicated.
- Remove all pavement surfaces, inlets, pipes and sidewalks within the construction limits as per TS-2, except those noted to remain.
- Backfill of reinforced concrete pipe shall be 1 inch clean rock or soil compacted to 90 percent of standard proctor density as per TS-4.

UTILITY COMPANIES:

TELEPHONE Centurytel 525 Cherry Street Columbia, MO 55205 Tim Dishman 573-805-3505	WATER City of Columbia P.O. Box 6015 Water & Light Department Columbia, MO 55205 573-874-7301
NATURAL GAS Ameren UE 2001 Maguire Blvd. Columbia, MO 55201 573-875-3053 (N of I-70)	ELECTRIC City of Columbia P.O. Box 6015 Water & Light Department Columbia, MO 55205 573-874-7301
CABLE TELEVISION Mediacom 501 N. College Avenue Columbia, MO 55201 573-443-1335 ext 354	SANITARY SEWER City of Columbia P.O. Box 6015 Public Works Department Columbia, MO 55205 573-874-7250
LOCATES Missouri One Call Inc. 1022 B Northeast Drive Jefferson City, MO 55109 1-800-344-7493	

INDEX OF SHEETS	
Description	Sheet No.
Cover Sheet	1
Plan / Profile	2
Detail Sheets	3-5
Traffic Control	5

City of Columbia, Missouri			
Department of Public Works			
No.	Date	By	Revision
File No. 78-31-10	Des. T.E.W.	Sheet	
Scale: None	Dwn. D.W.H./T.E.W.	1 of 6	
Date: 4/27/2015	Chk. -		
Hitt & Elm Storm Drain Replacement			
Approved By			
Director of Public Works			
Date			



SCALES:
1" = 20' HOR
1" = 5' VER

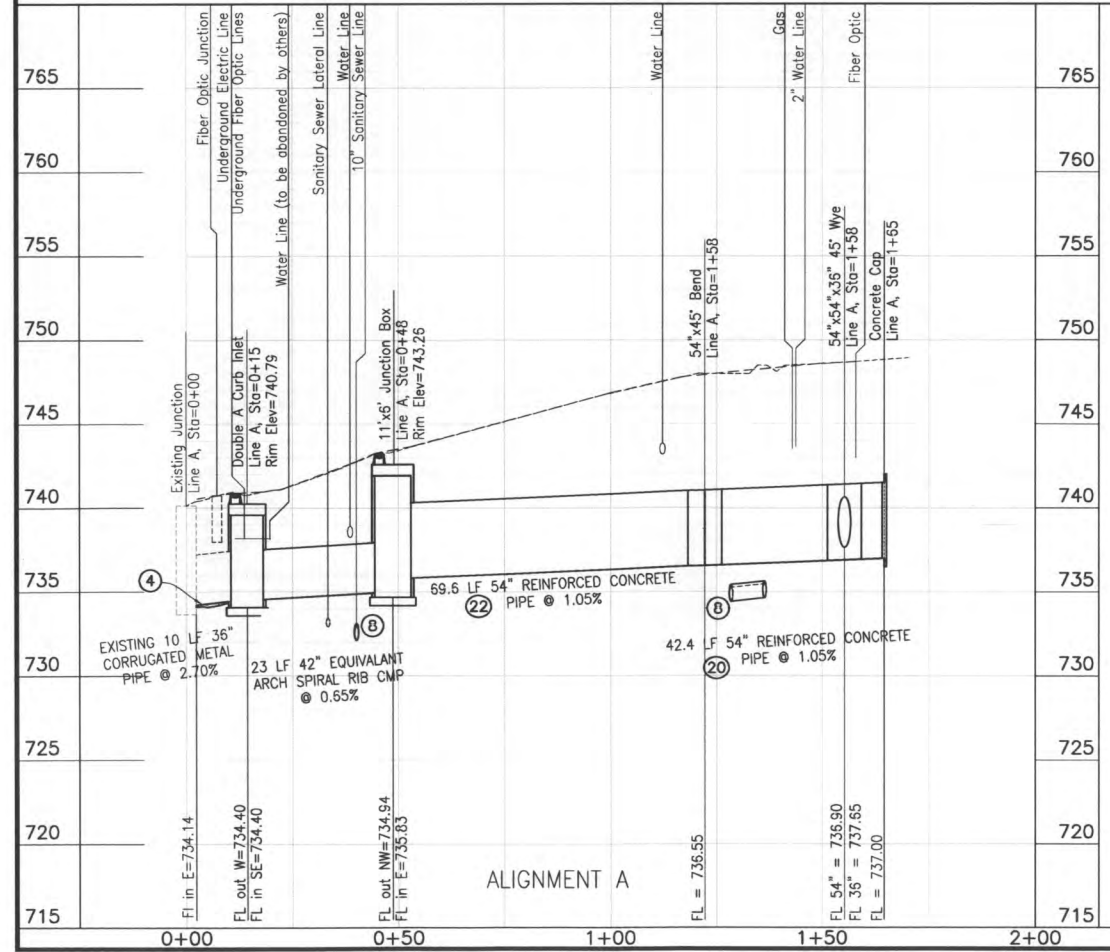
Maintain 18' between
fence and face of curb.

Maintain 18' between
fence and face of curb.

- 15 SPECIAL 6' X 6' INLET/JUNCTION, BECAUSE OF UTILITY CONFLICTS, STRUCTURE WILL NEED TO BE CAST-IN-PLACE, USE 5,000 PSI CONCRETE IN ORDER TO ACHIEVE NECESSARY STRENGTH AS SOON AS POSSIBLE. LEAVE EXISTING PIPE FROM EAST CONNECTED UNTIL AFTER NEW SYSTEM CAN CONVEY FLOW. THEN FILL OPENING IN NEW BOX IN NEAT AND WORKMANLIKE MANNER. COST TO CLOSE OPENING TO BE INCLUDED IN COST OF BOX. SEE DETAIL 4-1.
1 EA DBL TYPE "A" INLET ON 6' X 6' BOX
- 16 6' X 11' JUNCTION BOX W/ 8" REINFORCED WALLS (DIFFERS FROM STANDARD). REINFORCEMENT SIZE AND PLACEMENT TO BE SAME AS STANDARD.
1 EA 6' X 11' JUNCTION BOX W/ 8" REINFORCED WALLS
- 17 5'X3' JUNCTION BOX W/ 8", REINFORCED WALLS (DIFFERS FROM STANDARD). REINFORCEMENT SIZE AND PLACEMENT TO BE SAME AS STANDARD.
1 EA 5' X 3' JUNCTION BOX W/ 8" REINFORCED WALLS
- 18 AFTER NEW SYSTEM IS IN SERVICE, ABANDON STORM EXISTING STORM PIPE PER TS-2.
1 LS OF "ABANDON STORM PIPE (VOLUME~APPROX 32 CY)"
- 19 REMOVE PARKING FROM DRIVE TO CORNER OF HAMILTON IN ORDER TO MAINTAIN 18' WIDE ACCESS TO DRIVE. GET BAGS TO COVER METERS FROM PARKING UTILITY ON 3RD FLOOR OF EAST HALF OF CITY HALL. COST OF BAGS AND ANY OTHER COST FOR REMOVING PARKING TO BE INCLUDED IN LUMP SUM FOR TRAFFIC CONTROL.
- 20 54-INCH RCP. BID LENGTH INCLUDES THE LENGTH OF THE FITTINGS. BID ITEMS FOR FITTINGS ARE ALSO INCLUDED IN THE BID TAP TO REFLECT FABRICATION COSTS OF THE FITTINGS.
112 LF OF 54" RCP.
- 21 CONCRETE PLUG FOR 54" RCP. SEE DETAIL 4-3.
1 EA 54-INCH RCP PLUG
- 22 12-GAUGE 42" EQUIVALENT ARCH SPIRAL RIB CORRUGATED METAL PIPE W/ MANNING'S N-FACTOR OF 0.013 OR LOWER AND TYPE II ALUMINIZED COATING.
23 LF OF 42" EQ ARCH SPIRAL RIB CMP
- 23 REMOVE AND EMPTY FILTER BAG (HAUL OFF CONTENTS) AND GIVE BAG TO INSPECTOR. REPLACE BAG IN INLET FILTER W/ FLEXSTORM PART #52MSQPC. THIS ITEM AND NOTE #1 (ABOVE), INCLUDING INSTALLATION OF FILTERS AND DISPOSAL OF TRAPPED CONTENTS, PAID FOR IN LUMP SUM OF INLET FILTER.
- 24 REPLACE PVC LATERALS TO NEW MAIN. COST OF ALL FITTINGS, CLEANOUTS, ETC. NECESSARY TO REPLACE AS SHOWN TO BE INCLUDED IN THE PER-LINEAR-FOOT AMOUNT BID. SEE DETAIL 4-1 FOR MORE INFO ABOUT THE 4" LATERAL.
18 LF OF 4" PVC LATERAL
17 LF OF 6" PVC LATERAL

Revision	By	Date	No.

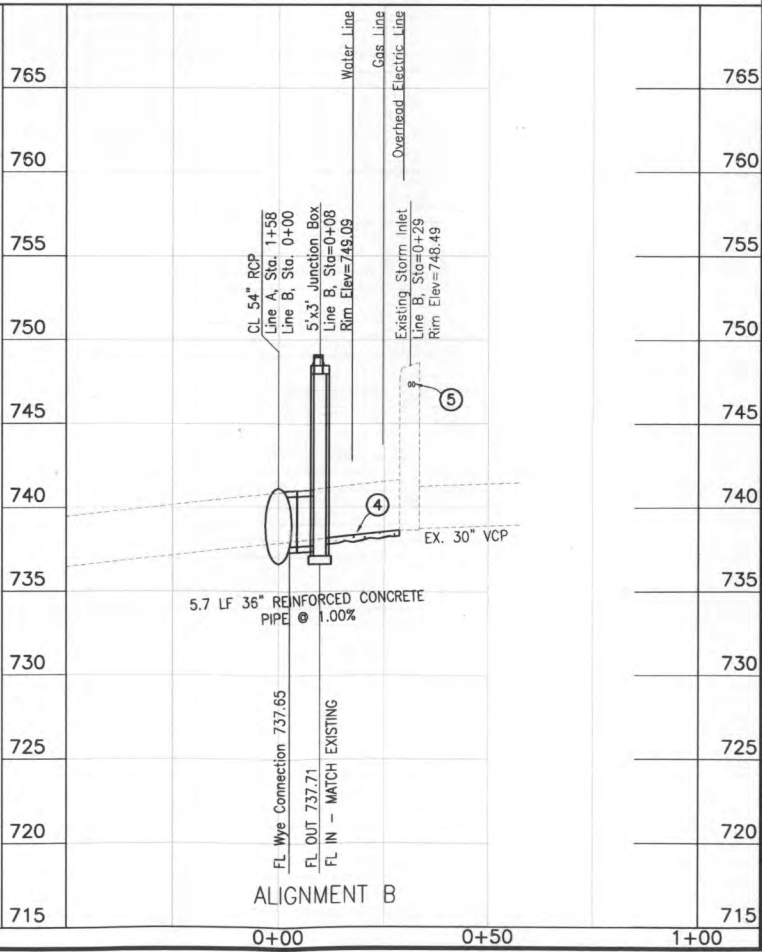
HITT & ELM
Plan & Profile



- 1 BEFORE ANY EXCAVATION TAKES PLACE, INSTALL FLEXSTORM INLET PROTECTION, PART #52MGBFX-S. MAINTAIN AS NECESSARY BY EMPTYING BAG AND HAULING SEDIMENT AND TRASH AWAY. SEE ALSO NOTE #21 THIS PAGE.
- 2 BARRICADE AREA OF INLET CONSTRUCTION TO PREVENT PEDESTRIAN ENTRY WHILE WORKING. PLATE AREA EACH NIGHT UNTIL SIDEWALK IS RESTORED. NO DIRECT PAY.
- 3 ENSURE THAT INGRESS/EGRESS PATH IS MAINTAINED AT THE CORNER OF THE BUILDING THROUGHOUT PROJECT. NO DIRECT PAY.
- 4 NEATLY CUTOUT AND REMOVE RUSTED SECTION OF PIPE INVERT. PLACE NEW CONCRETE INVERT AS SHOWN IN DETAIL 4-2.
2 EA OF GROUT CMP INVERT.
- 5 COORDINATE W/ ELECTRIC DIVISION COLUMBIA WATER AND LIGHT TO ENSURE CONDUIT THROUGH INLET IS NO ADDITIONAL PAY.
- 6 REMOVE AND REPLACE SIDEWALK PER COLUMBIA STREET, STORM, AND SANITARY SPECIFICATIONS. CONFIGURE SIDEWALK GRADE TO BEST FIT EXISTING STREET PAVEMENT, ADA REQUIREMENTS, AND STANDARD DOWNTOWN SIDEWALK SPECIFICATION.
30 SY OF "SIDEWALK REMOVAL"
334 SF OF DOWNTOWN SIDEWALK
- 7 PATCH STREET PER COLUMBIA STREET, STORM, AND SANITARY SPECIFICATIONS, EXCEPT BRING CONCRETE TO SURFACE RATHER THAN COVERING CONCRETE W/ ASPHALT. FINAL THICKNESS OF CONCRETE TO BE 8 INCHES. ONE-INCH MINUS AGGREGATE MAY BE USED FOR BACKFILL. COMPACT IN 6-INCH LIFTS PER STANDARD SPECS.

SALVAGE BRICK PAVERS PER TS-2. EXTENT OF PAVERS IS UNKNOWN. THE BID QUANTITY REFLECTS PAVERS UNDER THE ENTIRE DISTURBED AREA. WORK WITH INSPECTOR TO AGREE ON ACTUAL QUANTITY SALVAGED.

539 SY OF STREET PATCH.
4855 SF OF REMOVE AND SAVE HISTORIC BRICK
- 8 REPLACE EXISTING 10-INCH VCP SEWER WITH 12" PVC ON EXISTING ALIGNMENT AND GRADE. CONNECT AT WEST END WITH ECCENTRIC FERNCO FITTING. FITTING TO BE INCIDENTAL TO PAY FOR PIPE.
140 LF OF 12-INCH PVC SEWER
- 9 REPLACE EXISTING MANHOLE W/ STANDARD 4-FOOT I.D. MANHOLE.
1 EA STANDARD 4-FT I.D. MANHOLE (6VF)
8 VF ADDITIONAL DEPTH STANDARD 4-FT I.D. MANHOLE
- 10 SHORE AS NECESSARY TO PREVENT SLOUGHING BEYOND RIGHT-OF-WAY. NO ADDITIONAL PAY.
- 11 COORDINATE W/ WATER DIVISION OF COLUMBIA WATER AND LIGHT TO SHORE WATER LINE AS NECESSARY. NO ADDITIONAL PAY.
- 12 REPLACE CURB TO NEAREST SOUND CURB SECTION. INSTALL SMOOTH TRANSITION FROM PROPOSED TOP OF CURB TO EXISTING CURB ELEVATION. SEE SHEET 5 FOR PROPOSED CURB ELEVATIONS.
14 LF OF TRANSITION CURB (REMOVE AND REPLACE)
- 13 WORK ZONE PERIMETER FENCING. SEE TRAFFIC CONTROL PLAN; SHEET 6, AND TS-10.
PAID FOR AS PART OF LUMP SUM FOR TRAFFIC CONTROL.
- 14 INSTALL SEDIMENT BARRIERS IN INLET THROATS PER TS-5. REMOVE SEDIMENT AND DEBRIS REGULARLY AND DISPOSE OF PROPERLY, I.E. EITHER HAULING IT OFF OR PLACING IN CONSTRUCTION DUMPSTER. COST OF SEDIMENT AND DEBRIS REMOVAL TO BE INCLUDED IN COST OF SEDIMENT BARRIERS.
2 EA OF INLET SEDIMENT BARRIERS

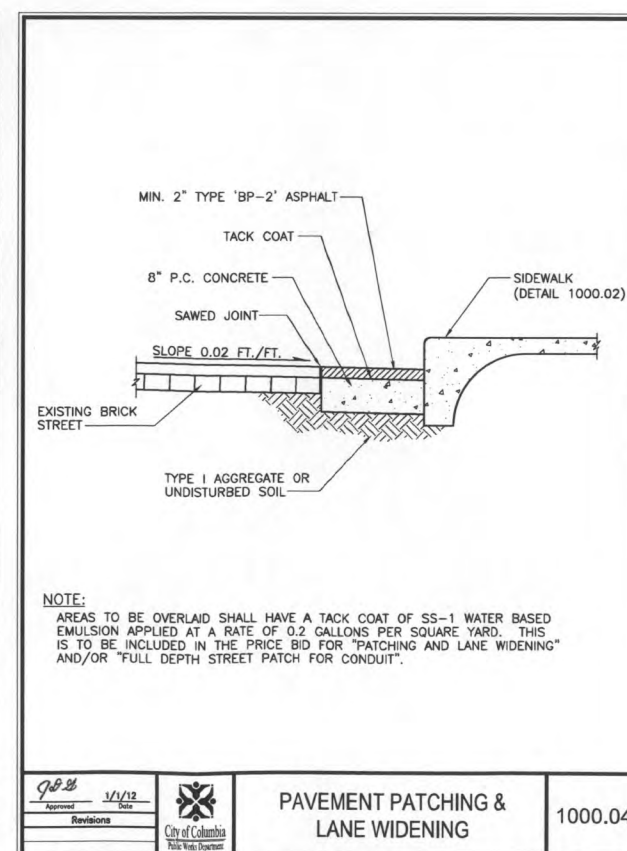
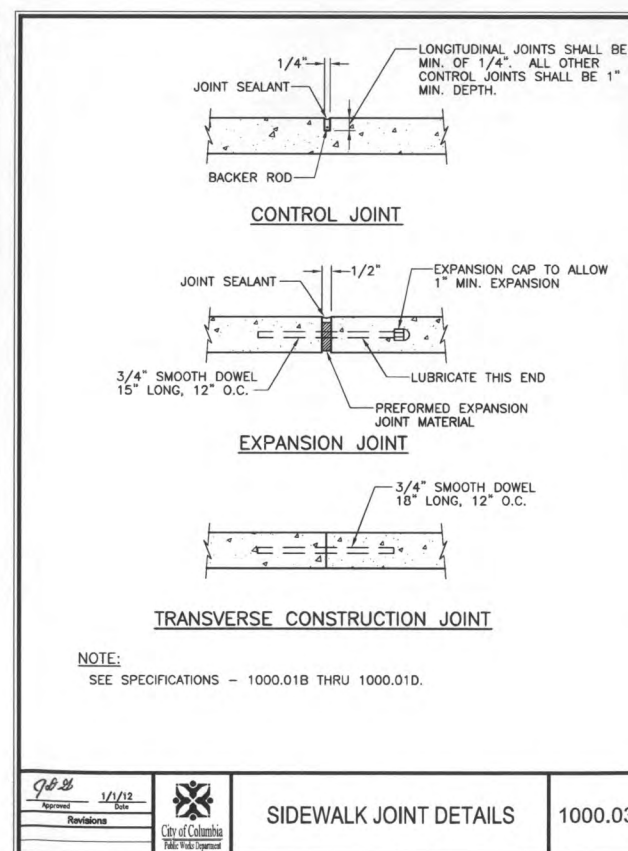
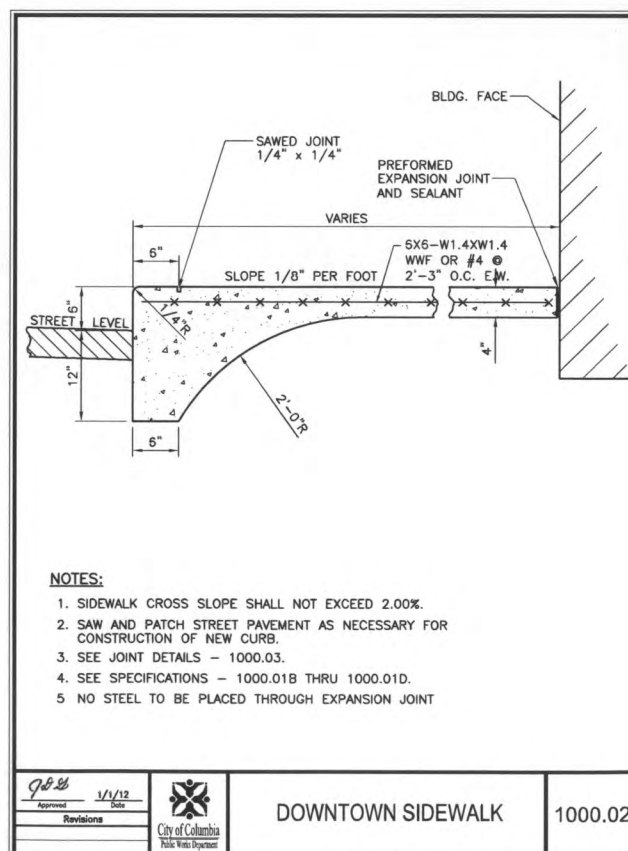
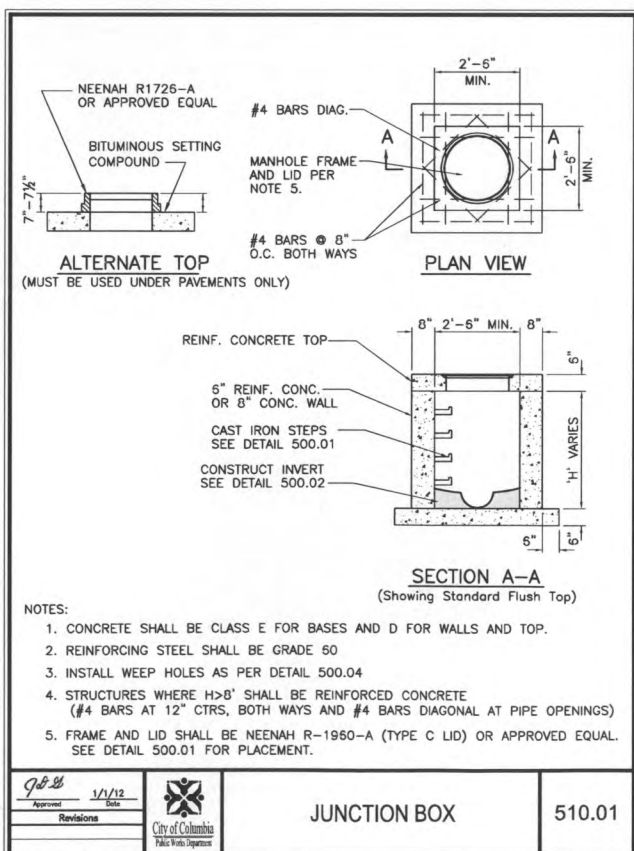
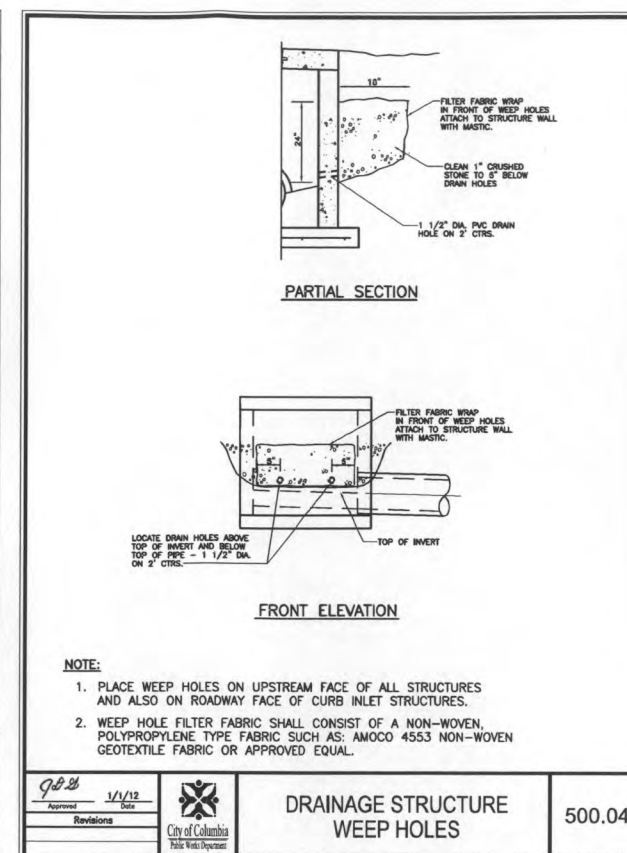
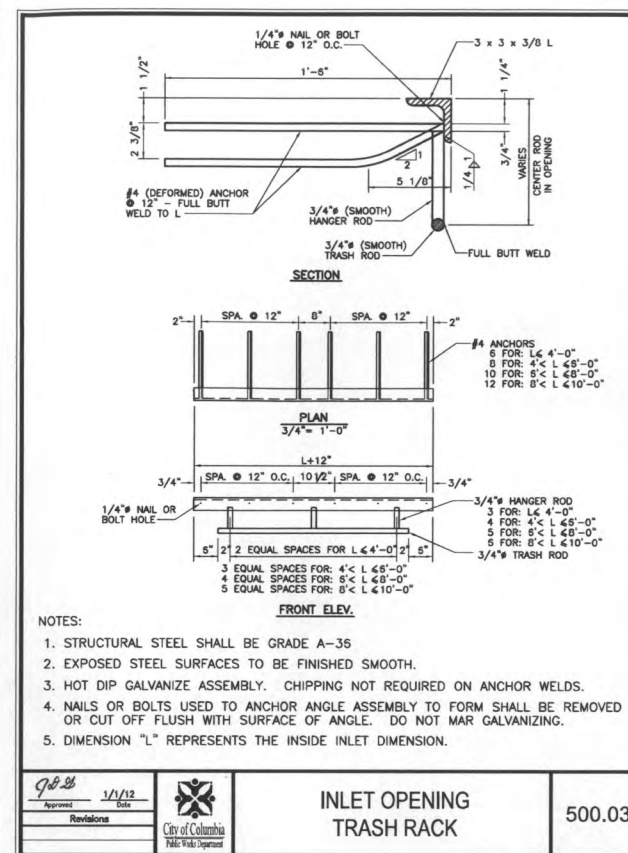
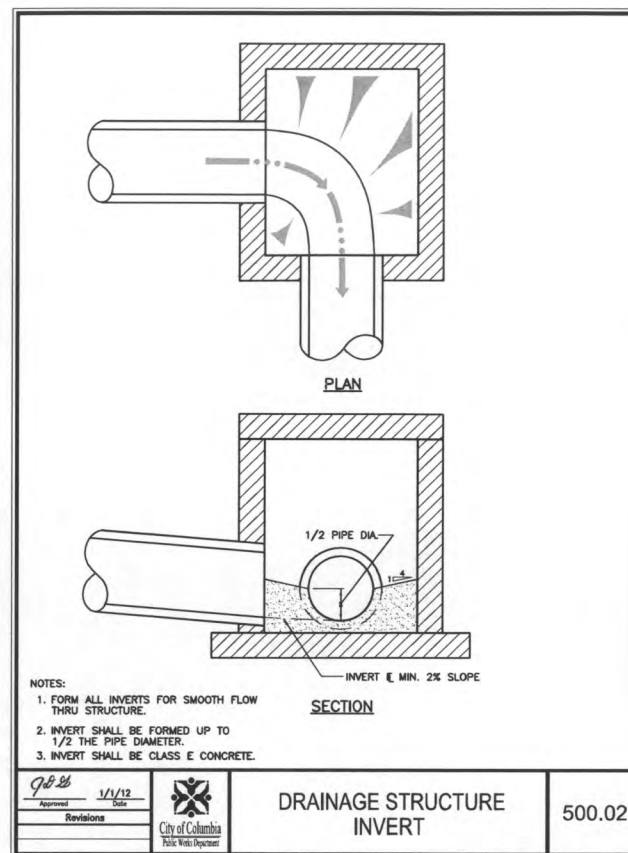
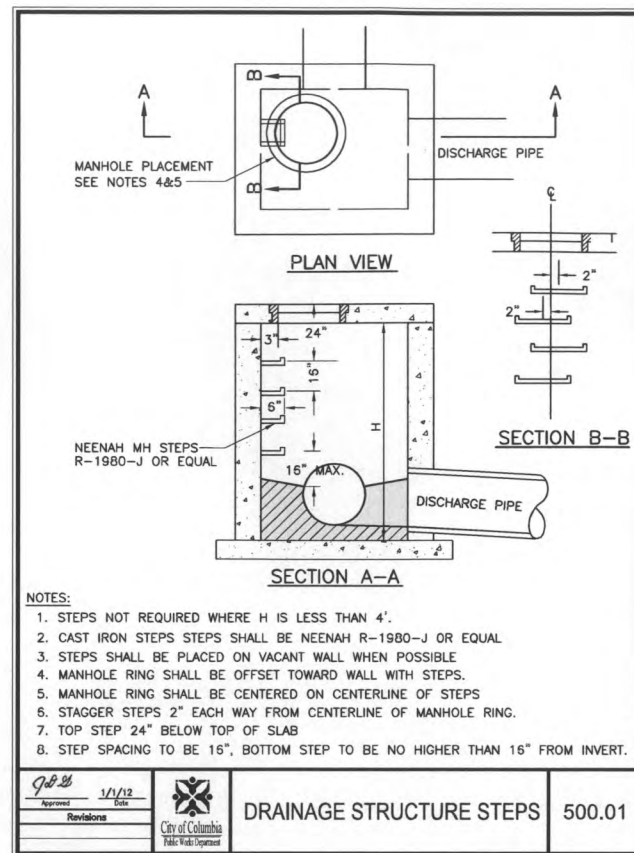


City of Columbia, Missouri

Department of Public Works

File No. 78-31-10
Scale: As Shown
Date: 3/31/15
Des. T.E.W.
Dwn. T.E.W./D.W.H.
Chk.

Sheet
2 of 6



HITT & ELM STORM DRAIN REPLACEMENT Details

City of Columbia, Missouri

DEPARTMENT OF PUBLIC WORKS

File No. 783110

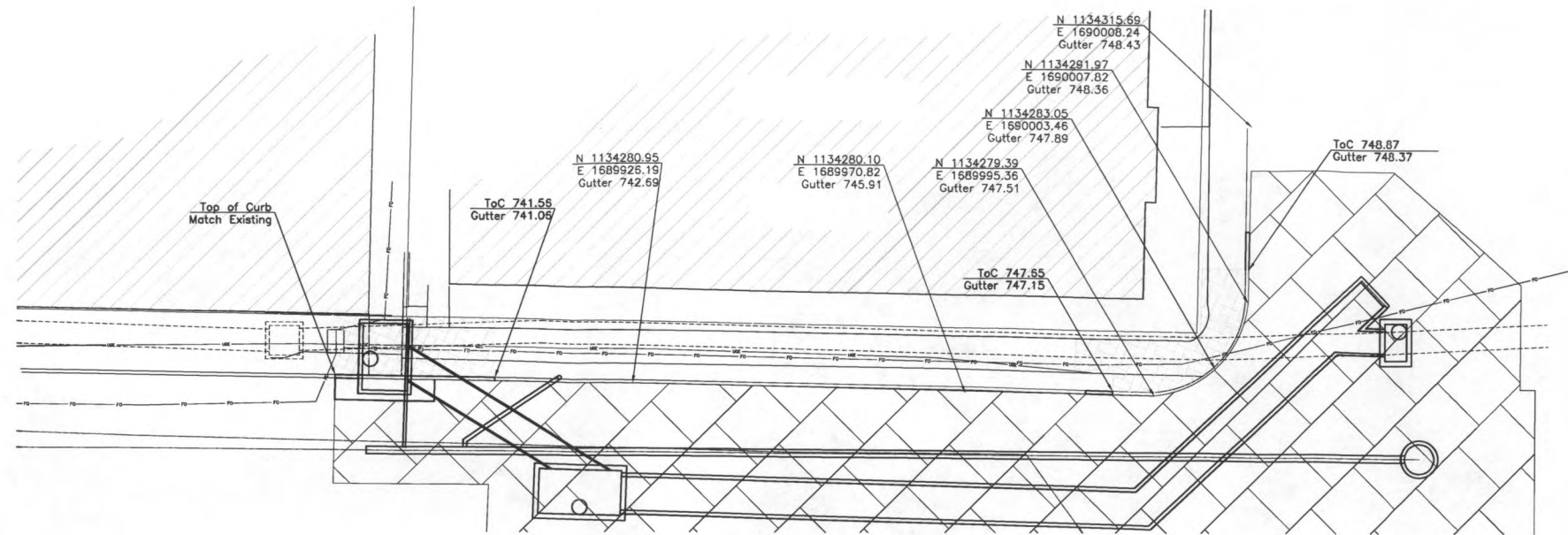
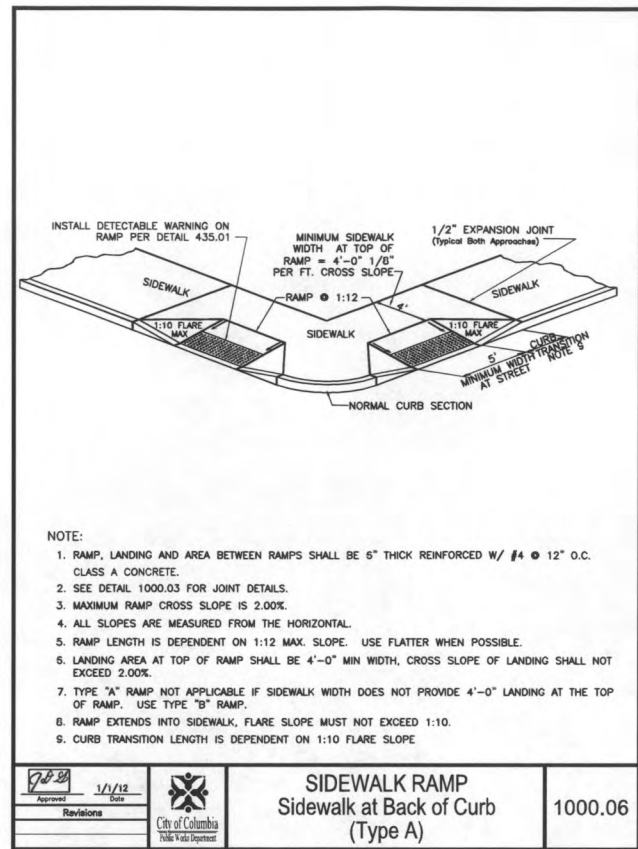
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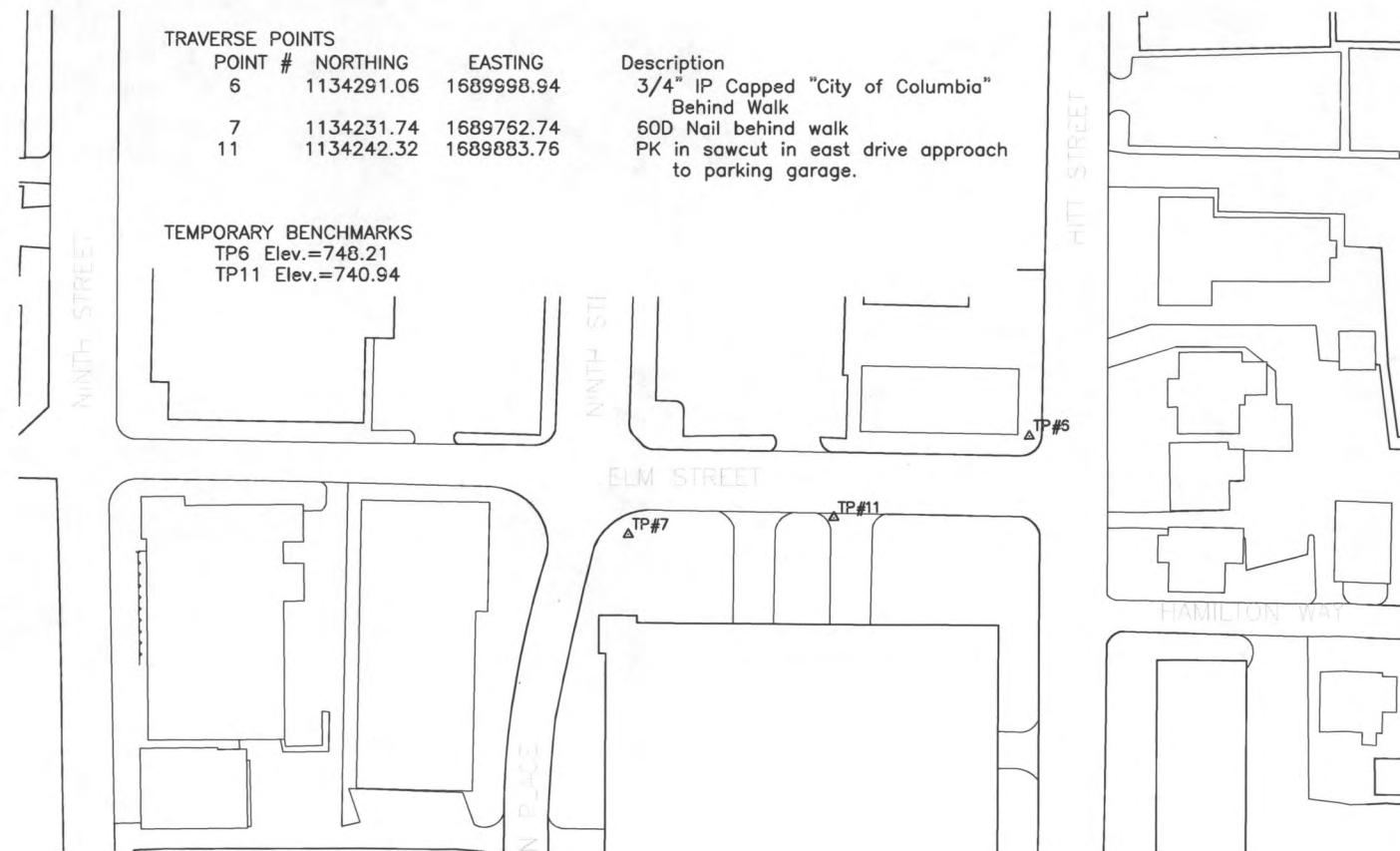
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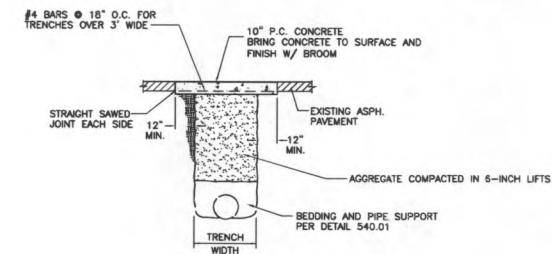
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Pavement Elevations
DETAIL 6-1



SURVEY CONTROL
DETAIL 6-2

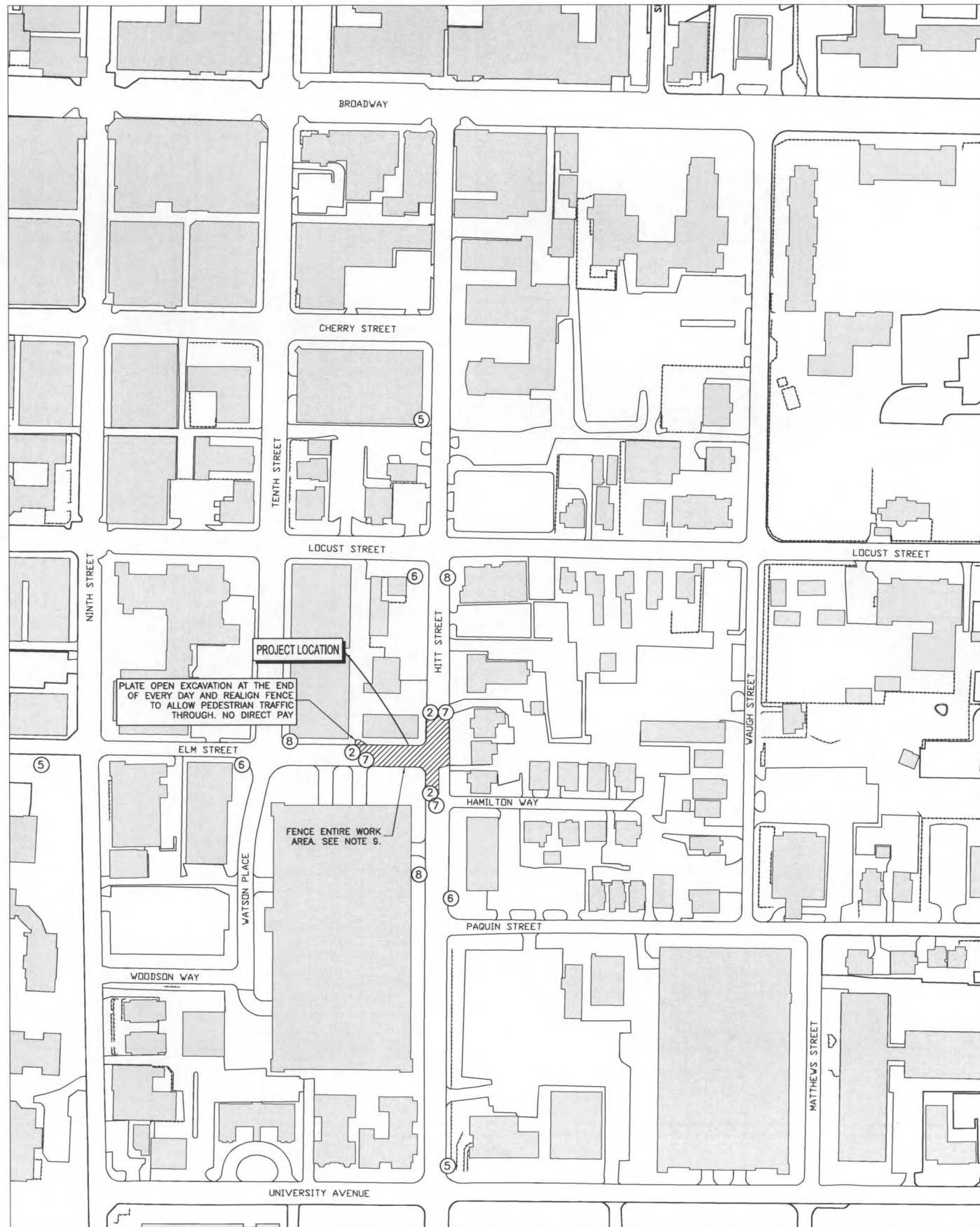


ASPHALT PAVEMENT PATCH
DETAIL 6-3

HITT & ELM STORM DRAIN REPLACEMENT
Details

City of Columbia, Missouri
DEPARTMENT OF PUBLIC WORKS

File No. 78-31-10
Scale: NTS
Date: 7/17/2013
Des. T.E.W.
Dwn. D.W.H.
Chk.

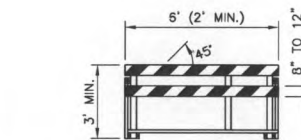
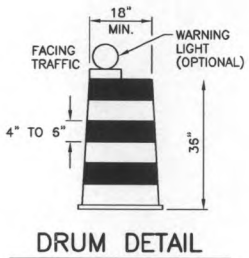
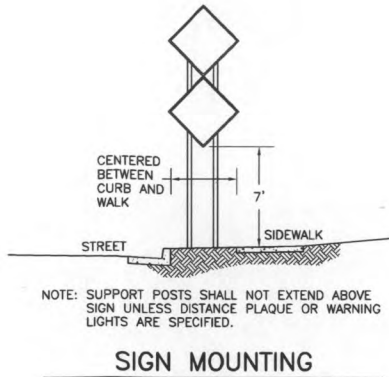


TRAFFIC CONTROL LAYOUT
SCALE: 1"=100'

TRAFFIC CONTROL NOTES:

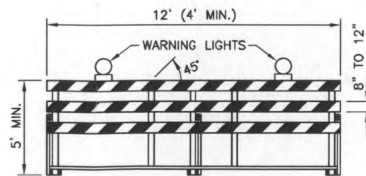
- 1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSURE THAT ALL BARRICADES, SIGNS, OTHER TRAFFIC CONTROL DEVICES AND PLACEMENT THEREOF SHALL CONFORM TO THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- 2. THE CONTRACTOR SHALL NOTIFY THE CITY JOINT COMMUNICATIONS OFFICE OF ALL ROAD CLOSURES OR LANE REDUCTIONS IN ADVANCE. JOINT COMMUNICATIONS PHONE NUMBER IS 674-7400.
- 3. TRAFFIC CONTROL DEVICES TO BE IN PLACE PRIOR TO BEGINNING CONSTRUCTION. ACTUAL QUANTITIES WILL DEPEND ON THE CONTRACTOR'S CONSTRUCTION SEQUENCE AND PROGRESS. NO MEASUREMENT WILL BE MADE OF ACTUAL QUANTITIES. QUANTITIES SHOWN ARE APPROXIMATE.
- 4. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PROPERTIES IN THE CONSTRUCTION ZONE TO THE MAXIMUM EXTENT PRACTICABLE.
- 5. WARNING LIGHTS SHALL FLASH WHEN PLACED ON CHANNELIZING DEVICES USED ALONE OR IN A CLUSTER TO WARN OF A CONDITION. THESE SHALL BE TYPE B.
- 6. WARNING LIGHTS PLACED ON CHANNELIZING DEVICES USED IN A SERIES TO CHANNELIZE ROAD USERS SHALL BE STEADY-BURN. THESE SHALL BE TYPE C.
- 7. CONTRACTOR SHALL INSTALL AND MAINTAIN PROJECT SIGN SUPPLIED BY THE CITY THROUGHOUT CONSTRUCTION CONTRACT. SIGN SHALL BE REMOVED BY CONTRACTOR AT PROJECT COMPLETION.
- 8. NO OPEN TRENCHES WILL BE ALLOWED OVERNIGHT OUTSIDE OF THE "ROAD CLOSED" AREA. ASPHALTIC "COLD MIX" SHALL BE USED AS A TEMPORARY PATCH OVERNIGHT. TEMPORARY PATCHING SHALL BE CONSIDERED INCIDENTAL TO THE WORK.
- 9. FENCE CONSTRUCTION AREA W/ FENCING AT FACE OF CURB SO THAT SIDEWALKS REMAIN OPEN AT ALL TIMES DURING CONSTRUCTION. SEE TS-12.
- 10. ALL OPEN TRENCHES ARE TO BE BARRICADED WITH CONSTRUCTION FENCING.
- 11. WHEN WORKING IN STREET RIGHT-OF-WAY, USE CHANNELIZATION DEVICES (CONES OR DRUMS) AS NECESSARY TO PROTECT WORKERS, WORK AND PEDESTRIANS. SPACE DEVICES AT 10' O.C. MAXIMUM. TAPER LENGTHS FOR MOVING TRAFFIC OUT OF ITS NORMAL PATH SHOULD BE AT LEAST 50'.
- 12. TRAFFIC CONTROL IS TO BE PAID FOR IN LUMP SUM AS "TRAFFIC CONTROL".
1 LS OF TRAFFIC CONTROL

TRAFFIC CONTROL		
MUTCD	LEGEND	SIZE
①	PROJECT SIGN	PROJECT SIGN PROVIDED BY CITY
②		(2) TYPE III BARRICADES, LIGHTED
③		(2) TYPE III BARRICADES, STAGGERED & LIGHTED
④		(2) TYPE II BARRICADES
⑤	W20-1	"ROAD CONSTRUCTION AHEAD"
⑥	W20-3	"ROAD CLOSED AHEAD"
⑦	R11-2	"ROAD CLOSED"
⑧	G20-2a	"END ROAD WORK"



- NOTES:
- 1. NOMINAL LUMBER DIMENSIONS ARE SATISFACTORY FOR BARRICADE RAIL WIDTH DIMENSIONS.
 - 2. RAIL STRIPE WIDTHS SHALL BE 6". EXCEPT THAT 4" WIDE STRIPES MAY BE USED IF RAIL LENGTHS ARE LESS THAN 36". THE SIDES OF BARRICADES FACING TRAFFIC SHALL HAVE RETROREFLECTIVE RAIL FACES.
 - 3. STRIPES ON BARRICADE RAILS SHALL BE ALTERNATING ORANGE AND WHITE RETROREFLECTIVE STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION ROAD USERS ARE TO PASS.

TYPE II BARRICADE



- NOTES:
- 1. NOMINAL LUMBER DIMENSIONS ARE SATISFACTORY FOR BARRICADE RAIL WIDTH DIMENSIONS.
 - 2. RAIL STRIPE WIDTHS SHALL BE 6". THE SIDES OF BARRICADES FACING TRAFFIC SHALL HAVE RETROREFLECTIVE RAIL FACES.
 - 3. ALL TYPE III BARRICADES SHALL HAVE TWO TYPE B WARNING LIGHTS.
 - 4. STRIPES ON BARRICADE RAILS SHALL BE ALTERNATING ORANGE AND WHITE RETROREFLECTIVE STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION ROAD USERS ARE TO PASS.

TYPE III BARRICADE

Revision	
By	
Date	
No.	
HITT AND ELM STORM DRAIN REPLACEMENT Traffic Control Plan	
City of Columbia, Missouri	Department of Public Works
File No. 78-31-10 Scale: As Shown Date: 4/21/2015 Des. T.E.W. Dwn. T.E.W. Chk. .	
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