Request for Bid
Phase 1 Sewer Rehab Group 2 CIPP Addendum No. 1 to
RFB No. 197640.71.0390
November 12, 2021

The following information encompasses Addendum No. 1 for the above referenced RFB. Bidders shall fully consider and acknowledge this Addendum in the preparation and submittal of its formal Bid. Failure to do so may result in the rejection of the Bid.

Section 1 – Questions Received to Date, Mandatory Pre-Bid Meeting Attendance Sheet

Section 2 – Updates to 00170.11 Interpretations and Addenda

Section 3 – Updates to 00370 Commercial Bid Form

Section 4 – Updates to 00571.1 Notices and Correspondence

Section 5 – Updates to 00672.4 Equal Business Opportunity Program

Section 6 – Updates to Technical Specifications

All other conditions and requirements remain unchanged.

Section 1
Questions Received to Date, Mandatory Pre-Bid Meeting Attendance Sheet

Q1: If the low bidder does not meet the MWBE goal but the next lowest bidder meets the MWBE goal, is the low bidder considered non-compliant?

SARP10: No, if a contractor is not able to meet the MWBE goal, must have the proper paperwork for due diligence submitted.

Mandatory Pre-Bid Meeting
Attendee List

Program: SARP10	**Meeting Date: November 10, 2021**
Project: Phase 1 Sewer Rehab Group 2 CIPP	**Time: 9:00 AM**
Facilitator: Josh Grabowski	**Place/Room: Online via Microsoft Teams**

Name	Company	Phone	E-Mail
Mike Green	Granite Inliner	502-585-1241	mike.green@gcinc.com
James Chaisson	Suncoast Infrastructure	601-326-9163	jchaisson@suncoastinfrastructure.com
Max Phinney	SAK Construction LLC	636-385-1076	mphinney@sakcon.com
Ryan Miller	Insituform Technologies	615-967-8462	rmiller@aegion.com
Janie Rodriguez	Oscar Renda Contracting	817-4912703	bidding@southlandholdings.com
Justin Avent	Gresham Smith	901-849-6554	justin.avent@greshamsmith.com
Joe J Collins	Overland Contracting	731-616-8922	collinsjj@overlandcontracting.com
J. Borrero	Black & Veatch	813-482-6926	borreroj@bv.com
Josh Grabowski	Allworld Project Management	901-514-1719	jgrabowski@allworldmail.com
Thomas Kalonji	Allworld Project Management	901-376-2077	tkalonji@allworldmail.com
Scott McAmis	Gresham Smith	901-562-0111	scott.mcamis@greshamsmith.com
John Britt	Badger Daylighting	901-568-6891	jbritt@badgerinc.com
Terrell Richards	W&T Contracting Corp	901-331-1780	terrellrichards@wtcontractingcorp.com
Ross Cooke	Vortex Companies		rcooke@vortexcompanies.com
Wiley Richards	W&T Contracting Corp	901-497-1291	wileyrichards@wtcontractingcorp.com
Randy Hansbrough	SAK construction	901-268-5526	rhansbrough@sakcon.com
Denise Davis	Gulf Coast Underground, LLC	251-725-0200	ddavis@gulfcoastunderground.com
Nathan Stengel	W&T Contracting Corp	901-326-3558	nathanstengel@wtcontractingcorp.com
Jerry Caldwell	Black & Veatch	901-530-1805	caldwellj@bv.com
Ivan Tamayo	Black & Veatch	901-495-2637	tamayoip@bv.com
Nolan Mills	Black & Veatch	919-779-8004	millswn@bv.com
Michael Gates	Xylem Dewatering	901-481-1543	michael.gates@xylem.com
Trenton Moore	Cambridge Construction Management	770-652-1444	tmoore@ccminc.us

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Section 2
Updates to 00170.11 Interpretations and Addenda

- Study and carefully correlate the Respondent's observations and responses with the Bid Documents.
- Notify Purchaser of all conflicts, errors and discrepancies, if any; in the Bid Document submitted.
- Review the Loss Control Manual and State Revolving Fund (SRF) Documents.

Respondents by and through the submission of their Response, agree that they shall be held responsible for having therefore familiarized themselves with the nature and extent of the requirements in the Bid Documents.

00170.11 Interpretations and Addenda

If any prospective Firm is in doubt as to the true meaning of any part of the Requirements for Preparing and Submitting Bid Submittal for the requested services, they may submit a written request (verbal requests will not be accepted) for an interpretation before the Last Date for Bidder Questions; as stated in 00170.16. The person submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made only by addendum transmitted to each party receiving a set of such documents. Purchaser will not be responsible for any other explanations or interpretations of the proposed documents. Any requests not submitted within this time period will be deemed waived.

SUBMIT ALL QUESTIONS BY E-MAIL TO:

Attn: Josh Grabowski
jgrabowski@allworldmail.com
Cc: Ginny Dorsey
DorseyV@bv.com
Cc: Jerry Caldwell
~~CaldwellJ@bv.com~~ **CaldwellJ@bv.com**
(Reference: *SARP10 Program* ***Phase 1 Sewer Rehab Group 2 CIPP****, BID No.* ***197640.71.0390***)

All requests or questions should be clearly marked and must be received by Last Date for Bidder Questions, as stated in 00170.16. A response will be returned via addendum to all Firms along with the original question(s).

There shall be no communication between the Firm, their employees or subcontractors concerning this Bid to anyone within Black & Veatch, Overland Contracting, Allen & Hoshall, Allworld Project Management, Gresham Smith, Carter-Malone Group, or City of Memphis employee or any such person's spouse, child, parent, brother, sister, dependent or person assuming a relationship being the substantially equivalent of the above except through Bently Green – Program Director or Jerry Caldwell – Project Manager. **Failure to comply with this requirement will be grounds for disqualification.**

00170.12 Modification or Withdrawal of Bid Submittals

Responses may be modified or withdrawn by an appropriate document duly executed (in the same manner that a Response must be executed) and delivered to the place where Responses are to be submitted at any time prior to the submission deadline. A request for withdrawal or a modification must be in writing and signed by an authorized person. Evidence of such authority must accompany the request for withdrawal or modification. Withdrawal of a Response will not prejudice the rights of a Responder to submit a new Response prior to the Response deadline. After expiration of the period for receiving Responses, only Purchaser may request clarifications or additional information.

00170.13 Rejection of Responses

To the extent permitted by applicable local, state and federal laws and regulations, Purchaser reserves the right to reject any and all Responses, to waive any and all informalities not involving price, time, or changes in the Work with the successful Respondent, and the right to disregard all non-conforming, non-responsive, unbalanced or conditional Responses. Also, Purchaser reserves the right to reject a Response, in its sole discretion, if the City of Memphis believes that it would not be in its best interest to make an award to that Respondent.

Section 3
Updates to 00370 Commercial Bid Form

Table 00370.3.1 - Unit Price Bid Form

Bidder should refer to Section 00270, Instructions to Bidders, when completing this Bid Form. Bidder shall complete this form entirely and return it with Bidder's Bid.

Bid Submitted by: (Company Name)

00370.3 Bid Pricing Information

00370.3.1 Unit Pricing

Bidder proposes to complete the RFB Work based on firm, fixed, unit prices (US dollars), which prices multiplied by the final Work quantities would represent the full consideration to Bidder for its complete and satisfactory performance of the Work in compliance with all the terms and conditions of the RFB Documents. The Unit Prices in this Table include the cost of all the work which is required or implied by the RFB documents or which may be inferred therefrom, and which is customarily provided in furnishing a complete and finished work item of its kind. Further, any and all alterations, modifications, and adjustments to the work item, which is reasonably foreseeable or customarily encountered in providing and installing equipment, material, and services of the work item kind, will be performed without additional compensation.

In the event of a Purchaser-approved change in the scope of Work for which a unit price from this Table is not applicable, as determined by the Purchaser, the Subcontractor shall provide a new unit price for review and acceptance by the Purchaser. Subcontractor shall provide all information requested by the Purchaser to substantiate the value of the new unit price.

00370.3.1.1 Unit Prices Breakdown

				Bidder Response Columns	
Item Number	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Extension Price
71.0390 Phase 1 Sewer Rehab Group 2 CIPP					
02531-4.01.A	Manhole Replacement with Precast Manhole	Vertical Foot	48		$ -
02531-4.01.B	Precast Manhole Installation	Vertical Foot	90		$ -
02531-4.01.C	Pavement Backfill for Manholes	Cubic Yard	40		$ -
02531-4.01.D	Traffic Control per MH Installation/Replacement	Crew Day	16		$ -
Manhole Rehabilitation					
02533-4.01.A	Manhole Rehabilitation - Cementitious Coating	Vertical Foot	1,140		$ -
02533-4.01.B.1	Sewer Manhole Inside Drop Construction (<5')	Each	21		$ -
02533-4.01.B.2	Sewer Manhole Inside Drop Construction (5'-10')	Each	9		$ -
02533-4.01.C	Invert and Bench Replacement	Each	11		$ -
02533-4.01.E	Traffic Control for Manhole Rehabilitation	Crew Day	155		$ -
CIPP					
02535-4.01.A-1.0	6" Diameter CIPP (0-10 feet)	Linear Foot	81		$ -
02535-4.01.A-1.1	8" Diameter CIPP (0-10 feet)	Linear Foot	21,293		$ -
02535-4.01.A-1.2	8" Diameter CIPP (10-20 feet)	Linear Foot	8,979		$ -
02535-4.01.A-2.1	10" Diameter CIPP (0-10 feet)	Linear Foot	2,334		$ -
02535-4.01.A-2.2	10" Diameter CIPP (10-20 feet)	Linear Foot	1,506		$ -
02535-4.01.A-3.1	12" Diameter CIPP (0-10 feet)	Linear Foot	1,371		$ -
02535-4.01.A-3.2	12" Diameter CIPP (10-20 feet)	Linear Foot	265		$ -
02535-4.01.A-4.1	15" Diameter CIPP (0-10 feet)	Linear Foot	186		$ -
02535-4.01.A-4.2	15" Diameter CIPP (10-20 feet)	Linear Foot	82		$ -
02535-4.01.A-5.2	18" Diameter CIPP (10-20 feet)	Linear Foot	393		$ -
02535-4.01.A-6.1	21" Diameter CIPP (0-10 feet)	Linear Foot	95		$ -
02535-4.01.A-6.2	12" Diameter Double Barrel Siphon CIPP (0-10 feet)	Linear Foot	86		$ -
02535-4.01.B-1	Bypass Pumping (12" Diameter)	Each	6		$ -
02535-4.01.B-2	Bypass Pumping (15" Diameter)	Each	2		$ -
02535-4.01.B-3	Bypass Pumping (18" Diameter)	Each	1		$ -
02535-4.01.B-4	Bypass Pumping (21" Diameter)	Each	1		$ -
02535-4.01.C	Lateral Reinstatement	Each	827		$ -
02535-4.01.D	Locate and Expose Mainline Terminus	Each	10		$ -
02535-4.01.E	Traffic Control for CIPP	Crew Day	120		$ -
Mainline Point Repair					
02540-4.01.A-1.1	Sewer Point Repair, 6" Through 10" Pipe (<10' Deep)	Each	154		$ -
02540-4.01.A-1.2	Each Additional Linear Foot Beyond the 10 Feet Minimum, For Sewer Point Repair, 6" Through 10" Pipe (<10' Deep)	Linear Foot	105		$ -
02540-4.01.A-2.1	Sewer Point Repair, 6" Through 10" Pipe (10.1'-15' Deep)	Each	50		$ -
02540-4.01.A-2.2	Each Additional Linear Foot Beyond the 10 Feet Minimum, For Sewer Point Repair, 6" Through 10" Pipe (10.1'-15' Deep)	Linear Foot	55		$ -
02540-4.01.A-3.1	Sewer Point Repair, 6" Through 10" Pipe (15.1'-20' Deep)	Each	7		$ -
02540-4.01.A-3.2	Each Additional Linear Foot Beyond the 10 Feet Minimum, For Sewer Point Repair, 6" Through 10" Pipe (15.1'-20' Deep)	Linear Foot	10		$ -
02540-4.01.A-4.1	Sewer Point Repair, 12" Through 18" Pipe (10.1'-15' Deep)	Each	1		$ -
02540-4.01.A-4.2	Each Additional Linear Foot Beyond the 10 Feet Minimum, For Sewer Point Repair, 12" Through 18" Pipe (10.1'-15' Deep)	Linear Foot	10		$ -
02540-4.01.A-5.1	Sewer Point Repair, 12" Through 18" Pipe (15.1'-20' Deep)	Each	1		$ -

Item Number	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Extension Price
02540-4.01.A-5.2	Each Additional Linear Foot Beyond the 10 Feet Minimum, For Sewer Point Repair, 12" Through 18" Pipe (15.1'-20' Deep)	Linear Foot	10		$ -
02540-4.01.B	Each Service Connection and Associated Lateral Pipe Included In a Sewer Point Repair, All Depths, All Diameters	Each	36		$ -
02540-4.01.C	Traffic Control per Point Repair	Crew Day	213		$ -
02540-4.01.D	Pavement Backfill for Point Repair	Cubic Yard	3,760		$ -
02540-4.01.E	Hydroexcavation/Hand Digging	Each	213		$ -
Post-Rehabilitation PACP Inspection					
02541-4.01.A	Post Rehab CCTV Inspection For All Diameters (<24")	Linear Foot	65,900		$ -
02541-4.01.B	Heavy Cleaning All Diameters	Linear Foot	3,000		$ -
Post-Rehabilitation MACP Inspection					
02544-4.01.A	GPS Coordinates of Manhole Cover	Each	165		$ -
02544-4.01.C-1	Post Rehab MACP Level 2 Manhole Inspections	Each	165		$ -
Site Preparation and Restoration					
02630-4.01.A	Removal and Replacement of Vegetated/Turfed Areas	Square Yard	25		$ -
Pavement and Incidentals					
02920-5.01	Seeding (with Mulch)	per 1000 Sq Ft	25		$ -
02921-5.01	Sodding	Square Yard	200		$ -
02950-4.01.A-1	Asphaltic Concrete Pavement Removal and Replacement	Square Yard	2,325		$ -
02950-4.01.A-2	Concrete Pavement Removal and Replacement	Square Yard	61		$ -
02950-4.01.B	Concrete Sidewalk Removal and Replacement	Square Yard	1,000		$ -
02950-4.01.C	Concrete Curb and Gutter Removal and Replacement	Linear Foot	320		$ -
02950-4.01.D	Gravel Driveway and Gravel Area Removal and Replacement With Crushed Stone	Ton	2		$ -
Miscellaneous					
	SRF Signage	Each	2		$ -
71.0390 Phase 1 Sewer Rehab Group 2 CIPP - Total Estimated Unit Price Value					**$ -**

Section 4
Updates to 00571.1 Notices and Correspondence

00571 - Supplementary Terms and Conditions

00571.1 Notices and Correspondence

The parties agree to send all notices arising out of or related to this Subcontract by one of the following methods: (a) personal delivery; (b) certified mail with return receipt; (c) nationally recognized overnight mail or courier service, with delivery receipt requested; or (d) email. The parties may send routine correspondence by email or first-class mail, each without confirmation of receipt. The parties agree to address notices and correspondence as indicated in this article. Subcontractor agrees that delivery of a notice or of correspondence by Purchaser to Subcontractor's at the jobsite constitutes personal delivery.

Electronic Technical Correspondence

Addressed to Purchaser:	Addressed to Subcontractor:
To: Jerry Caldwell	To: [[name]]
~~CalldwellJ@bv.com~~ CaldwellJ@bv.com	[[email address]]
Cc: Joe Collins	Cc: [[name]]
CollinsJJ@overlandcontracting.com	[[email address]]

Non-Electronic Technical Correspondence

Addressed to Purchaser:	Addressed to Subcontractor:
Overland Contracting Inc.	[[subcontractor entity]]
845 Crossover Lane, Suite 120	[[street address]]
Memphis, TN 38117	[[city, state, zip code]]
Attention: Jerry Caldwell	Attention: [[name]]
197640.71.0390	197640.71.0390

Electronic Commercial Correspondence (excluding invoices)

Addressed to Purchaser:	Addressed to Subcontractor:
To: Ginny Dorsey	To: [[name]]
Dorsey@bv.com	[[email address]]
	Cc: [[name]]
	[[email address]]

Non-Electronic Commercial Correspondence (excluding invoices)

Addressed to Purchaser:	Addressed to Subcontractor:
Overland Contracting Inc.	[[subcontractor entity]]
8400 Ward Parkway	[[street address]]
Kansas City, MO 64114	[[city, state, zip code]]
Attention: Ginny Dorsey	Attention: [[name]]
197640.71.0390	197640.71.0390

Electronic Invoices

Subcontractor will submit invoices via the web-based project management platform, Prolog. Invoices will be reviewed, and either approved or returned to Subcontractor for correction. The OCI Project Manager will forward invoices to Black & Veatch Accounts Payable, once they are approved.

In accordance with section 00572.4 Invoicing and Payment, each invoice must clearly show the invoice number, the complete Subcontract project number, the Purchase Order number, the Work covered by the invoice, taxes, and the billing period (if applicable).

Section 5
Updates to 00672.4 Equal Business Opportunity Program

00672.4 Equal Business Opportunity Program

This form must be submitted with Bidder's bid. Failure to execute and submit this document with Bidder's bid may cause the Bid to be rejected as non-conforming. In addition, each Sub-Subcontractor must execute the form.

This Subcontract will be subject to the requirements of the City of Memphis Ordinance #5384 which establishes the Equal Business Opportunity ("EBO") Program. It is up to the Respondent to ensure that all requirements of this ordinance are met. The Ordinance may be accessed on the City's website at www.memphistn.gov under "Business – Contract Compliance". The intent of the EBO Program is to increase the participation of locally owned minority and women owned business enterprises ("M/WBE"). Toward achieving this objective, the overall M/WBE participation goal for this solicitation is 15%. The percentage of overall M/WBE participation is defined as the dollar value of subcontracts awarded to certified (as identified by the City of Memphis EBO list) minority and/or women business enterprises divided by the total proposed base bid amount.

Additionally, in accordance with federal executive Order 11625 and 12138, the local government must make a good faith effort to include participation from Disadvantage Business enterprises (DBE) in sub-agreement awards. The SRF Fair Share DBE goal for this project is a minimum of **2.6%** s WBE and minimum of **2.6%** MBE (as identified by the Tennessee Uniform Certification Program list, other State or Federal DBE lists, or the City of Memphis EBO list). **Please note Subcontractor must meet both percentages independently to satisfy the requirements.**

SRF Fair Share DBE Goals:
MBE goal – Construction **2.6%**
WBE goal – Construction **2.6%**
(Vendors from the TDOT TNUCP DBE list, other State or Federal DBE lists, or the City of Memphis EBO list)

SARP10 DBE Participation Goal:
MBEWBE minimum **15%**
(Vendors from the City of Memphis EBO list only)

Participation Plan
The Participation Plan must include: (1) level and dollar amount of participation your firm anticipates achieving in the performance of contract resulting from this RFB; (2) the type of work to be performed by the M/WBE participation; and (3) the names of the M/WBE and/or DBE firm(s) the Respondent plans to utilize in the performance of the contract resulting from this RFB.

Eligible M/WBE and/or DBE Firms
To qualify as a M/WBE firm, per the requirements of City of Memphis Ordinance #5384, a firm must be included on the City of Memphis EBO list of certified M/WBE firms. All contractors identified as an SRF Fair Share M/WBE firm must be on the Tennessee Uniform Certification Program (TNUCP) List, other State or Federal DBE lists, or the City of Memphis EBO list at the time of the bid opening.

A list of the City's eligible M/WBE firms may be requested from Purchaser as a guide only. If a Bidder desires to utilize an M/WBE firm not included on the list, it is the Bidder's responsibility to confirm that the desired firm is certified by the City of Memphis. Such confirmation must be obtained from the City's Contract Compliance Office, in writing, before the bid/response due date. Requests for verification must be submitted to the City's Contract Compliance Office listed below:

~~Joann Massey~~ **Ken Moody**
City of Memphis, Contract Compliance Office
125 North Main Street, Suite 546
Memphis, TN 38103
Phone: (901) 576-6210
Fax: (901) 576-6560
Email: ~~joann.massey@memphistn.gov~~ **ken.moody@memphistn.gov**

Section 6
Updates to Technical Specifications

Group 2 CIPP Project - Pipe Bid Schedule

Pipe ID	Sheet	US MH [Approx. Depth (ft)]	DS MH [Approx. Depth (ft)]	Diameter (in.)	Material	Approx. Repair Length (ft)	Approx. Repair Depth (ft)	Approx. # of Taps	Repair Method	Notes
FS045118S	F19	FS045118 [15.8]	FS045117 [10.2]	18	Vitrified Clay Pipe	392.9	13.0	6	CIPP	
FS045121S	G19	FS045121 [7.4]	FS045120 [5.5]	15	Vitrified Clay Pipe	185.7	6.5	1	CIPP	
FS045181S	E21	FS045181 [5.6]	FS045180 [7.1]	10	Vitrified Clay Pipe	211.8	6.4	1	CIPP	
FS045187S	E21	FS045187 [9.6]	FS045186 [7.3]	10	Vitrified Clay Pipe	See Notes	8.5	15	Point Repair Only	Point Repair @ 416.3' DS from 5187 for 10' for HSV.
FS045188.01S	E21	FS045188.01 [7.6]	FS045188 [9.8]	10	Vitrified Clay Pipe	701.4	8.7	5	CIPP	
FS045197S	H21	FS045197 [11.8]	FS045196.02 [8.2]	10	Vitrified Clay Pipe	206.7	10.0	1	CIPP	Point Repair @ 98.8' DS from 5197 for 10' for B.
FS045198S	H21	FS045198 [13.6]	FS045197 [11.8]	10	Vitrified Clay Pipe	153.6	12.7	1	CIPP	
FS045231S	G20	FS045231 [7.2]	FS045230 [8]	12	Vitrified Clay Pipe	338.3	7.6	7	CIPP	
FS045236S	I20	FS045236 [4.7]	FS045235 [6.2]	6	Vitrified Clay Pipe	See Notes	5.5	9	Point Repair Only	Point Repair @ 118.1' DS from 5236 for 10' for B, Point Repair @ 150.7' DS from 5236 for 10' for HSV.
FS045244S	H19	FS045244 [3.4]	FS045243 [4]	12	Vitrified Clay Pipe	433.0	3.7	14	CIPP	
FS045246S	H19	FS045246 [4.1]	FS045245 [3.3]	12	Vitrified Clay Pipe	319.1	3.7	8	CIPP	
FS045249S	I18	FS045249 [5.7]	FS045248.01 [6.7]	12	Vitrified Clay Pipe	59.1	6.2	0	CIPP	
FS045250S	I18	FS045250 [8.6]	FS045249 [5.7]	12	Not Specified	221.0	7.2	5	CIPP	
FS045271S	F19	FS045271 [12.1]	FS045270 [9.4]	10	Vitrified Clay Pipe	See Notes	10.8	6	Point Repair Only	Point Repair @ 224.9' DS from 5271 for 10' for BSV.
FS045273S	E19	FS045273 [7.3]	FS045272 [6.8]	8	Vitrified Clay Pipe	See Notes	7.1	3	Point Repair Only	Point Repair @ 78'-98' DS from 5272 for MWLS.
FS045275S	E19	FS045275 [7.1]	FS045274 [8.1]	8	Vitrified Clay Pipe	150.2	7.6	0	CIPP	Point Repair @ 87.9' US from 5274 for 10' for JOM.
FS045286.04S	D19	FS045286.04 [9.2]	FS045286.01 [6.3]	8	Not Specified	171.7	7.8	5	CIPP	
FS045295S	E19	FS045295 [9.8]	FS045291 [8.6]	8	Vitrified Clay Pipe	432.8	9.2	3	CIPP	Point Repair @ 66.2' US from 5291 for 10' for H, Point Repair @ 278.2' DS from 5295 for 10' for HSV, Point Repair @ 294.3' DS from 5295 for 10' for OBI.
FS045301S	F19	FS045301 [7.8]	FS045300.02 [4.2]	8	Vitrified Clay Pipe	See Notes	6.0	18	Point Repair Only	Point Repair @ 31.5' DS from 5301 for 10' for B.
FS045307S	C18	FS045307 [12.5]	FS045289 [12.2]	8	Vitrified Clay Pipe	427.3	12.4	11	CIPP	Point Repair @ 145.8' US from 5289 for 20' for BSV.
FS045319S	C19	FS045319 [Dead End]	FS045288 [5.9]	6	Vitrified Clay Pipe	See Notes	5.9	14	Point Repair Only	Point Repair @ 406' US from 5288 for 10' for BSV.
FS045331S	J17	FS045331 [10.8]	FS045330 [-.-]	8	Vitrified Clay Pipe	See Notes	10.8	3	Point Repair Only	Point Repair @ 120.8' US from 5330 for 10' for HSV.

Group 2 CIPP Project - Pipe Bid Schedule

Pipe ID	Sheet	US MH [Approx. Depth (ft)]	DS MH [Approx. Depth (ft)]	Diameter (in.)	Material	Approx. Repair Length (ft)	Approx. Repair Depth (ft)	Approx. # of Taps	Repair Method	Notes
FS045332S	J17	FS045332 [8.8]	FS045331 [10.8]	8	Vitrified Clay Pipe	848.7	9.8	46	CIPP	Point Repair @ 218.1' DS from 5332 for 10' for HSV, Point Repair @ 252.9' DS from 5332 for 10' for HSV, Point Repair @ 535.8' DS from 5332 for 10' for JOM.
FS045337S	C20	FS045337 [5.4]	FS045150 [8.3]	8	Vitrified Clay Pipe	See Notes	6.9	5	Point Repair Only	Point Repair @ 246.3' DS from 5337 for 10' for B.
FS045375S	F20	FS045375 [0]	FS045374 [6]	8	Vitrified Clay Pipe	356.9	3.0	2	CIPP	
FS045376S	B18	FS045376 [Dead End]	FS045314 [9.3]	6	Vitrified Clay Pipe	See Notes	9.3	5	Point Repair Only	Point Repair @ 306.2' US from 5314 for 20' for B.
FS045377S	C18	FS045377 [13.8]	FS045307 [12.5]	8	Polyvinyl Chloride	See Notes	13.2	5	Point Repair Only	Point Repair @ 25.8' DS from 5377 for 10' for BSV.
FS045389S	H19	FS045389 [3.1]	FS045244 [3.4]	8	Concrete Pipe (non-reinforced)	222.5	3.3	2	CIPP	Point Repair @ 50.9' DS from 5389 for 10' for JOL.
FS045390S	H18	FS045390 [7.4]	FS045389 [3.1]	8	Vitrified Clay Pipe	683.5	5.3	8	CIPP	
FS045391S	G18	FS045391 [9.5]	FS045390 [7.4]	8	Vitrified Clay Pipe	310.0	8.5	5	CIPP	
FS045409S	E20	FS045409 [3.8]	FS045408 [7.3]	8	Vitrified Clay Pipe	398.3	5.6	14	CIPP	
FS045415S	D20	FS045415 [Dead End]	FS045414 [6.7]	6	Vitrified Clay Pipe	See Notes	6.7	7	Point Repair Only	Point Repair @ 180.7' US from 5414 for 15' for JSL
FS045420S	E20	FS045420 [Dead End]	FS045114 [13.5]	6	Not Specified	See Notes	13.5	1	Point Repair Only	Point Repair @ 47.7' US from 5114 for 20' for OBP.
FS045427S	F20	FS045427 [13.6]	FS045581 [6.6]	6	Vitrified Clay Pipe	See Notes	10.1	0	Point Repair Only	Point Repair @ 10' US from 5581 for 20' for B.
FS045433S	H17	FS045433 [10.2]	FS045432 [6.9]	6	Vitrified Clay Pipe	See Notes	8.6	2	Point Repair Only	Point Repair @ 120'-140' US from 5432 for BSV.
FS045434S	I18	FS045434 [8.6]	FS045250 [8.6]	8	Vitrified Clay Pipe	245.0	8.6	7	CIPP	
FS045435S	I18	FS045435 [11.2]	FS045434 [8.6]	8	Vitrified Clay Pipe	846.6	9.9	24	CIPP	
FS045460S	D19	FS045460 [11.8]	FS045107 [7.6]	8	Vitrified Clay Pipe	See Notes	9.7	5	Point Repair Only	Point Repair @ 118.2' DS from 5460 for 10' for OBI.
FS045471S	F22	FS045471 [8.3]	FS045470 [9.1]	8	Concrete Pipe (non-reinforced)	372.0	8.7	8	CIPP	
FS045486S	H22	FS045486 [2.8]	FS045485 [-.-]	8	Concrete Pipe (non-reinforced)	See Notes	2.8	4	Point Repair Only	Point Repair @ 213.6' DS from 5486 for 10' for JOL.
FS045487S	H22	FS045487 [2.8]	FS045486 [2.8]	8	Vitrified Clay Pipe	44.0	2.8	0	CIPP	
FS045493S	G22	FS045493 [5.1]	FS045492 [6.3]	8	Concrete Pipe (non-reinforced)	See Notes	5.7	1	Point Repair Only	Tap Replacement @ 66.8' US from 5492 for 15' for TFD.
FS045495S	G22	FS045495 [Dead End]	FS045494 [7.7]	8	Concrete Pipe (non-reinforced)	238.0	7.7	3	CIPP	

Group 2 CIPP Project - Pipe Bid Schedule

Pipe ID	Sheet	US MH [Approx. Depth (ft)]	DS MH [Approx. Depth (ft)]	Diameter (in.)	Material	Approx. Repair Length (ft)	Approx. Repair Depth (ft)	Approx. # of Taps	Repair Method	Notes
FS045496.01S	G21	FS045496.01 [6.8]	FS045496 [8.1]	6	Vitrified Clay Pipe	See Notes	7.5	9	Point Repair Only	Point Repair @ 68.3' DS from 5496.01 for 10' for BSV.
FS045496S	G21	FS045496 [8.1]	FS045426.04 [7.6]	8	Vitrified Clay Pipe	278.1	7.9	6	CIPP	Point Repair @ 218.1' DS from 5496 for 10' for B.
FS045497.01S	G21	FS045497.01 [3.9]	FS045497 [5.6]	8	Vitrified Clay Pipe	See Notes	4.8	10	Point Repair Only	Point Repair @ 6' US from 5497 for 20' for BSV, Point Repair @ 359.3' US from 5497 for 10' for BSV, Point Repair @ 545.7' US from 5497 for 10' for BSV.
FS045518S	H22	FS045518 [12.7]	FS045517 [15]	8	Vitrified Clay Pipe	See Notes	13.9	6	Point Repair Only	Tap Replacement @ 56.7' DS from 5518 for 15' for TFD, Tap Replacement @ 263.7' DS from 5518 for 15' for TFD, Tap Replacement @ 272.8' DS from 5518 for 15' for TFD
FS045533S	F21	FS045533 [Dead End]	FS045191 [8.4]	6	Polyvinyl Chloride	See Notes	8.4	6	Point Repair Only	Tap Replacement @ 96.9' US from 5191 for 15' for TFD, Point Repair @ 161.2' US from 5191 for 10' for JOL.
FS045561S	B22	FS045561 [10.6]	FS045559 [10.8]	8	Vitrified Clay Pipe	377.4	10.7	3	CIPP	
FS045575S	E20	FS045575 [6.3]	FS045115 [7.6]	6	Polyvinyl Chloride	See Notes	7.0	7	Point Repair Only	Point Repair @ 242.9' DS from 5575 for 15' for B.
FS045577S-1	G21	FS045577 [2.6]	FS045497 [5.6]	6	Vitrified Clay Pipe	See Notes	4.1	0	Point Repair Only	Point Repair @ 53' DS from 5577 for 20' for BSV.
FS045592S	H17	FS045592 [Dead End]	FS045432 [6.9]	8	Not Specified	See Notes	6.9	1	Point Repair Only	Point Repair @ 79.3' US from 5432 for 10' for HSV.
NN010108S	Z2	NN010108 [7]	NN010107.02 [6.4]	21	Not Specified	94.6	6.7	0	CIPP	
NN010116S	AA2	NN010116 [13.7]	NN010137 [13.1]	8	Not Specified	486.3	13.4	0	CIPP	
NN010145.02S	X2	NN010145.02 [9.7]	NN010145 [11.2]	8	Concrete Pipe (non-reinforced)	See Notes	10.5	5	Point Repair Only	Point Repair @ 139.7' US from 0145 for 10' for B.
NN010150.01S	V2	NN010150.01 [10.4]	NN010150 [12]	8	Vitrified Clay Pipe	See Notes	11.2	20	Point Repair Only	Point Repair @ 105' DS from 0150.01 for 10' for OBI.
NN010154.01S	U2	NN010154.01 [0]	NN010154 [11.4]	8	Vitrified Clay Pipe	See Notes	5.7	32	Point Repair Only	Point Repair @ 18'-28' US from 0154 for HSV, Point Repair @ 504.2' US from 0154 for BVV for 10'.
NN010163S	W2	NN010163 [10]	NN010147 [12.1]	8	Vitrified Clay Pipe	See Notes	11.1	7	Point Repair Only	Point Repair @ 111.5' DS from 0163 for 10' for HVV.
NN010171S	V3	NN010171 [Dead End]	NN010170 [9.2]	8	Vitrified Clay Pipe	See Notes	9.2	5	Point Repair Only	Point Repair @ 10.5' US from 0170 for 10' for JSM.
NN010220S	Z3	NN010220 [7.1]	NN010109 [6.5]	8	Not Specified	See Notes	6.8	11	Point Repair Only	Point Repair @ 21.9' US from 0109 for 10' for B, Point Repair @ 70.4' US from 0109 for 10' for HSV, Point Repair @ 115' US from 0109 for 10' for B, Point Repair @ 195.4' US from 0109 for 10' for B.
NN010221S	Z3	NN010221 [Dead End]	NN010220 [7.1]	8	Not Specified	See Notes	7.1	3	Point Repair Only	Point Repair @ 13' - 28' US from 0220 for JSL.
NN010229.01S	AA1	NN010229.01 [3.6]	NN010229 [10.5]	8	Not Specified	349.0	7.1	1	CIPP	

Group 2 CIPP Project - Pipe Bid Schedule

Pipe ID	Sheet	US MH [Approx. Depth (ft)]	DS MH [Approx. Depth (ft)]	Diameter (in.)	Material	Approx. Repair Length (ft)	Approx. Repair Depth (ft)	Approx. # of Taps	Repair Method	Notes
NN010236S	W2	NN010236 [9.5]	NN010148 [12.2]	8	Vitrified Clay Pipe	581.4	10.9	18	CIPP	Point Repair @ 449.6' for 10' for JOL.
NN010238.01S	W1	NN010238.01 [Dead End]	NN010238 [16.2]	8	Concrete Pipe (non-reinforced)	355.3	16.2	13	CIPP	Tap Replacement @ 16.4' US from 0238 for 15' for TFD, Point Repair @ 352.9' US from 0238 for 10' for JOL.
NN010249.01S	T2	NN010249.01 [7.2]	NN010249 [7.6]	8	Not Specified	309.6	7.4	8	CIPP	Point Repair @ 88.1' DS from 0249.01 for 10' for JOL, Tap Replacement @ 183.5' DS from 0249.01 for 15' for TFD.
NN010249S	T2	NN010249 [7.6]	NN010248 [10.7]	8	Not Specified	237.7	9.2	10	CIPP	
NN010254S	R2	NN010254 [7.3]	NN010253 [7.3]	8	Concrete Pipe (non-reinforced)	287.5	7.3	0	CIPP	
NN010256S	AA3	NN010256 [6.6]	NN010107 [11.3]	8	Not Specified	See Notes	9.0	14	Point Repair Only	Point Repair @ 217.2' DS from 0256 for 10' for JOL, Point Repair @ 345.4' DS from 0256 for 10' for BSV.
NN010295S	W3	NN010295 [7]	NN010294 [6.2]	8	Concrete Pipe (non-reinforced)	See Notes	6.6	12	Point Repair Only	Point Repair @ 185.1' US from 0294 for 10' for OBC.
NN010314S	U3	NN010314 [0]	NN010313 [12.4]	8	Vitrified Clay Pipe	557.9	6.2	12	CIPP	Point Repair @ 184.1' US from 0313 for 10 for BSV.
NN010338S	Y1	NN010338 [12]	NN010337 [6.5]	8	Concrete Pipe (non-reinforced)	See Notes	9.3	5	Point Repair Only	Tap Replacement @ 186.4' DS from 0338 for 15' for TFD.
NN010346S	V1	NN010346 [Dead End]	NN010278 [9]	8	Not Specified	See Notes	9.0	3	Point Repair Only	Point Repair @ 137.6' US from 0278 for 10' for H.
NN010356S	Y2	NN010356 [Dead End]	NN010355 [9.7]	8	Not Specified	See Notes	9.7	17	Point Repair Only	Point Repair @ 201.9' IS from 0369 for 10' for BSV.
NN010361S	T1	NN010361 [8.9]	NN010349 [15.6]	8	Not Specified	See Notes	12.3	3	Point Repair Only	Point Repair @ 208.6' DS from 0361 for 10' for B.
NN010362S	U1	NN010362 [7.1]	NN010361 [8.9]	8	Not Specified	See Notes	8.0	2	Point Repair Only	Point Repair @ 256.1' US from 0361 for 10' for OBZ.
NN010365S	U2	NN010365 [7.1]	NN010366 [10.5]	8	Not Specified	252.2	8.8	2	CIPP	
NN010370S	U1	NN010370 [Dead End]	NN010369 [11]	8	Not Specified	See Notes	11.0	4	Point Repair Only	Point Repair @ 201.9' US from 0369 for 10' for BSV."
NN010374.01S	R3	NN010374.01 [10.4]	NN010374 [8.2]	8	Not Specified	401.6	9.3	21	CIPP	
NN010385S	S2	NN010385 [10.4]	NN010384 [8.7]	8	Vitrified Clay Pipe	429.3	9.6	15	CIPP	Point Repair @ 172.6' DS from 0385 for 10' for JOL.
NN010386S	R2	NN010386 [11.1]	NN010385 [10.4]	8	Vitrified Clay Pipe	305.5	10.8	0	CIPP	
NN010397S	R2	NN010397 [Dead End]	NN010387 [7.1]	8	Vitrified Clay Pipe	551.1	7.1	16	CIPP	
NN010402S	S2	NN010402 [Dead End]	NN010385 [10.4]	8	Not Specified	270.9	10.4	12	CIPP	
NN010406S	R2	NN010406 [Dead End]	NN010386 [11.1]	8	Vitrified Clay Pipe	270.6	11.1	11	CIPP	

Group 2 CIPP Project - Pipe Bid Schedule

Pipe ID	Sheet	US MH [Approx. Depth (ft)]	DS MH [Approx. Depth (ft)]	Diameter (in.)	Material	Approx. Repair Length (ft)	Approx. Repair Depth (ft)	Approx. # of Taps	Repair Method	Notes
NN010411S	S2	NN010411 [0]	NN010252 [7.9]	8	Concrete Pipe (non-reinforced)	See Notes	4.0	9	Point Repair Only	Point Repair @ 116.6' DS from 0411 for 10' for OBP.
NN010422S	U2	NN010422 [Dead End]	NN010153 [10.1]	8	Vitrified Clay Pipe	540.5	10.1	27	CIPP	
NN010425S	U1	NN010425 [Dead End]	NN010424 [8.9]	8	Not Specified	393.0	8.9	17	CIPP	
NN010438S	V2	NN010438 [7.7]	NN010151 [15.2]	8	Vitrified Clay Pipe	398.8	11.5	18	CIPP	Tap Replacement @ 46.3' US from 0151 for 15' for TF, Point Repair @ 15.6' DS from 0438 for 10' for JOM, Point Repair @ 186' for 20', Point Repair @ 257.5' DS from 0438 for 10' for B.
NN010442.01S	V2	NN010442.01 [7.9]	NN010442 [9.7]	8	Not Specified	239.0	8.8	2	CIPP	
NN010451S	V1	NN010451 [Dead End]	NN010450 [7.9]	8	Not Specified	See Notes	7.9	8	Point Repair Only	Point Repair @ 147.2' US from 0450 for 10' for JSM, Tap Replacement @ 149.8' US from 0450 for 10' for TFD.
NN010459S	X1	NN010459 [7]	NN010477 [8.1]	8	Not Specified	See Notes	7.6	7	Point Repair Only	Tap Replacement @ 143.3' DS from 0459 for 15' for TFD.
NN010460S	W1	NN010460 [8.3]	NN010275 [17.7]	8	Concrete Pipe (non-reinforced)	553.0	13.0	22	CIPP	Tap Repalcement @ 137.4' DS for 0460 for 15' for TF, Point Repair @ 381.2' DS for 0460 for 10' for JOL.
NN010539S	U4	NN010539 [11.3]	NN010538 [11]	10	Not Specified	472.0	11.2	5	CIPP	
NN010569S	S6	NN010569 [8]	NN010568 [7.9]	8	Not Specified	213.2	8.0	6	CIPP	
NN010570S	S6	NN010570 [8.4]	NN010569 [8]	8	Not Specified	213.9	8.2	11	CIPP	Point Repair @ 106.9' DS from NN010570 for 20' for JOL.
NN010577S	T5	NN010577 [6.9]	NN010552 [8.6]	8	Not Specified	402.1	7.8	18	CIPP	Point Repair @ 150.2' US from 0552 for 10' for JOM.
NN010578S	T5	NN010578 [8.1]	NN010577 [6.9]	8	Not Specified	554.0	7.5	21	CIPP	
NN010579S	S5	NN010579 [6.9]	NN010578 [8.1]	8	Not Specified	559.3	7.5	25	CIPP	
NN010581S	T5	NN010581 [6.1]	NN010554 [16.5]	8	Not Specified	307.8	11.3	11	CIPP	Tap Replacement @ 9.5' DS for 0581 for 15' for TF, Tap Replacement @ 79.3' DS for 0581 for 15' for TBI, Tap Replacement @ 163' DS for 0581 for 15' for TFD.
NN010583S	S5	NN010583 [9.8]	NN010582 [8.9]	8	Not Specified	See Notes	9.4	18	Point Repair Only	Point Repair @ 258.9' DS from 0583 for 10' for HSV.
NN010590S	U7	NN010590 [7.6]	NN010589 [7.7]	8	Not Specified	295.9	7.7	10	CIPP	Point Repair @ 101.7' DS from 0590 for 10' for JOL.
NN010594S	S6	NN010594 [18]	NN010593 [9.4]	8	Not Specified	351.4	13.7	1	CIPP	
NN010605S	T6	NN010605 [Dead End]	NN010604 [8.9]	8	Not Specified	See Notes	8.9	17	Point Repair Only	Tap Replacement @ 126.4' US from 0604 for 15' for TFD, Spot Repair @ 342.6' US from 0604 for 20' for ID.
NN010606S	S6	NN010606 [7.8]	NN010593 [9.4]	8	Not Specified	148.5	8.6	6	CIPP	Point Repair @ 105.6' US from 0593 for 10' for BVV.

Group 2 CIPP Project - Pipe Bid Schedule

Pipe ID	Sheet	US MH [Approx. Depth (ft)]	DS MH [Approx. Depth (ft)]	Diameter (in.)	Material	Approx. Repair Length (ft)	Approx. Repair Depth (ft)	Approx. # of Taps	Repair Method	Notes
NN010621S	U5	NN010621 [5.6]	NN010553.01 [21.7]	8	Not Specified	245.9	13.7	5	CIPP	Point Repair @ 1' DS from 0621 for 10' for B, Tap Replacement @ 77.7' DS from 0621 for 15' for TB.
NN010624S	U5	NN010624 [15]	NN010553 [21.5]	8	Not Specified	See Notes	18.3	2	Point Repair Only	Point Repair @ 103.3' US from 0553 for 10' for FM, Point Repair @ 299.6' US from 0553 for 10' for OBZ, Point Repair @ 94.5' DS from 0624 for 10' for B.
NN010636S	T5	NN010636 [5.9]	NN010551 [10.2]	8	Not Specified	611.5	8.1	27	CIPP	Point Repair @ 266.3' for 10' for JOL, Point Repair @ 291.9' for 10' for JOL, Point Repair @ 331 for 10' for B, Tap Replacement @ 446.1' for 15' for TBI, Point Repair @ 544.7' for 10' for JOL.
NN010819S	AD2	NN010819 [18.0]	NN010818 [-.-]	8	Not Specified	241.9	18.0	0	CIPP	Point Repair @ 3' DS from 0819 for 10' for B, Point Repair @ 227.3' DS from 0819 for 10' for HVV.
NN010822S	AC2	NN010822 [14]	NN010821 [16]	8	Not Specified	See Notes	15.0	0	Point Repair Only	Point Repair @ 292.5' DS from 0822 for 20' for D.
NN021818S	Y22	NN021818 [8.8]	NN021817 [10.9]	10	Not Specified	See Notes	9.9	11	Point Repair Only	Point Repair @ 288.9' US from 1817 for 10' for HVV.
NN021821S	Z23	NN021821 [8.2]	NN021820 [8.1]	10	Not Specified	354.0	8.2	14	CIPP	Point Repair @ 169.8' DS from 1821 for 10' for HSV.
NN021827.05S	Y24	NN021827.05 [6.2]	NN021827.03 [6.2]	8	Not Specified	237.3	6.2	2	CIPP	Point Repair @ 163.9' US from 1827.03 for 15' for JSL, Point Repair @ 231.6' US from 1827.03 for 10' for JSL.
NN021868S	W22	NN021868 [Dead End]	NN021867 [10.2]	8	Not Specified	See Notes	10.2	16	Point Repair Only	Point Repair @ 300.2' US from 1867 for 10' for BSV, Tap Replacement @ 359.5' US from 1867 for 10' for TFD.
NN021884S	Y22	NN021884 [Dead End]	NN021861 [7]	8	Not Specified	See Notes	7.0	12	Point Repair Only	Point Repair @ 64.3' US from 1861 for 10' for HSV, Point Repair @ 356.3' US from 1861 for 10' for JOL.
NN021904S	W23	NN021904 [Dead End]	NN021903 [10]	8	Not Specified	139.7	10.0	1	CIPP	
NN021917S	Y23	NN021917 [10.6]	NN021862 [7.9]	8	Not Specified	See Notes	9.3	16	Point Repair Only	Point Repair @ 17.2' DS from 1917 for 10' for HVV, Tap Replacement @ 30.1' DS from 1917 for 15' for TFD.
NN021918S	Y23	NN021918 [7.6]	NN021917 [10.6]	8	Not Specified	See Notes	9.1	19	Point Repair Only	Point Repair @ 232.8' DS from 1918 for 10' for HVV.
NN021919S	X23	NN021919 [8.8]	NN021918 [7.6]	8	Not Specified	359.3	8.2	3	CIPP	Point Repair @ 12.8' DS from 1919 for 10' for JOL.
NN021922S	X23	NN021922 [9]	NN021921 [10]	8	Not Specified	See Notes	9.5	7	Point Repair Only	Point Repair @ 83.3' US from 1921 for 10' for HSV, Point Repair @ 229.3' US from 1921 for 10' for JOL, Tap Replacement @ 111' DS from 1922 for 15' for TFD.
NN021924S	X22	NN021924 [9.7]	NN021863 [7.9]	8	Not Specified	See Notes	8.8	15	Point Repair Only	Point Repair @ 396.5' US from 1863 for 10' for H.
NN021937S	X24	NN021937 [6.7]	NN021936 [5.9]	8	Not Specified	238.2	6.3	0	CIPP	
NN021945S	Y22	NN021945 [7.3]	NN021862 [7.9]	8	Not Specified	See Notes	7.6	0	Point Repair Only	Point Repair @ 130.5' US from 1862 for 10' for JSM.

Group 2 CIPP Project - Pipe Bid Schedule

Pipe ID	Sheet	US MH [Approx. Depth (ft)]	DS MH [Approx. Depth (ft)]	Diameter (in.)	Material	Approx. Repair Length (ft)	Approx. Repair Depth (ft)	Approx. # of Taps	Repair Method	Notes
NN021947S	V24	NN021947 [7.7]	NN021833 [11.8]	8	Not Specified	See Notes	9.8	9	Point Repair Only	Point Repair @ 326.3' DS from 1947 for 10' for BVV.
NN021949S	U24	NN021949 [Dead End]	NN021948 [7.9]	8	Not Specified	146.4	7.9	7	CIPP	
NN022017S	V22	NN022017 [10.1]	NN021893 [11.5]	8	Not Specified	450.8	10.8	4	CIPP	Point Repair @ 156.4' DS from 2017 for 10' for HSV
NN022027S	W23	NN022027 [9.7]	NN022026 [10.4]	8	Not Specified	413.8	10.1	3	CIPP	
NN022036S	X23	NN022036 [Dead End]	NN021863 [7.9]	8	Not Specified	See Notes	7.9	13	Point Repair Only	Point Repair @ 216.2' US from 1863 for 10' for HSV.
NN022175S	AG10	NN022175 [10.9]	NN022174 [9.3]	8	Not Specified	425.5	10.1	10	CIPP	Point Repair @ 178.9' DS from 2175 for 10' for HSV.
NN022189S	N13	NN022189 [0]	NN022793 [6]	6	Vitrified Clay Pipe	See Notes	3.0	14	Point Repair Only	Point Repair @ 187.4' US from 2793 for 10' for HSV, Tap Replacement @ 253.1' US from 2793 for 15' for TFD.
NN022219S	P11	NN022219 [12.4]	NN022220 [-.-]	8	Concrete Pipe (non-reinforced)	220.6	12.4	0	CIPP	
NN022324S	R14	NN022324 [17.4]	NN022323 [17]	15	Vitrified Clay Pipe	81.9	17.2	0	CIPP	Point Repair @ 2.5' DS from 2324 for 10' for B.
NN022329S	Q14	NN022329 [6.6]	NN022328.01 [9.4]	8	Vitrified Clay Pipe	183.9	8.0	7	CIPP	Tap Replacement @ 38.8' US from 2328 for 15' for TFD, Point Repair @ 87.2' US from 2328 for 10' for JOL, Point Repair @ 172.9' US from 2328 for 10' for HSV.
NN022340S	R14	NN022340 [12.3]	NN022322 [15.6]	10	Vitrified Clay Pipe	674.1	14.0	0	CIPP	Point Repair @ 8.1' DS from 2340 for 10' for HVV, Point Repair @ 82.6' DS from 2340 for 10' for RPPD.
NN022350S	P15	NN022350 [10]	NN022349.02 [6.8]	8	Vitrified Clay Pipe	360.5	8.4	4	CIPP	
NN022351S	P15	NN022351 [8.2]	NN022350 [10]	8	Vitrified Clay Pipe	429.0	9.1	3	CIPP	Point Repair @ 1.5' US from 2350 for 10' for JSL, Point Repair @ 35.1' DS from 2351 for 10' for HVV.
NN022356S	S15	NN022356 [5.2]	NN022316 [7.5]	8	Vitrified Clay Pipe	287.0	6.4	11	CIPP	
NN022366S	R15	NN022366 [9.4]	NN022341.01 [10.4]	8	Vitrified Clay Pipe	295.5	9.9	4	CIPP	Point Repair @ 12.9' DS from 2366 for 10' for HSV.
NN022381S	O13	NN022381 [19.6]	NN022380 [-.-]	12	Vitrified Clay Pipe	264.6	19.6	0	CIPP	
NN022395S	S13	NN022395 [7.3]	NN022394 [15.8]	8	Concrete Pipe (non-reinforced)	See Notes	11.6	18	Point Repair Only	Point Repair @ 272.4' DS from 2395 for 10' for HVV.
NN022416S	R16	NN022416 [10.9]	NN022415 [7.1]	8	Vitrified Clay Pipe	244.6	9.0	2	CIPP	
NN022467S	P14	NN022467 [12.8]	NN022466 [13.1]	12	Vitrified Clay Pipe	See Notes	13.0	0	Point Repair Only	Point Repair @ 245.6' US from 2466 for 10' for JOL.
NN022484S	Q14	NN022484 [8.5]	NN022324.01 [11.2]	10	Vitrified Clay Pipe	233.4	9.9	4	CIPP	

Group 2 CIPP Project - Pipe Bid Schedule

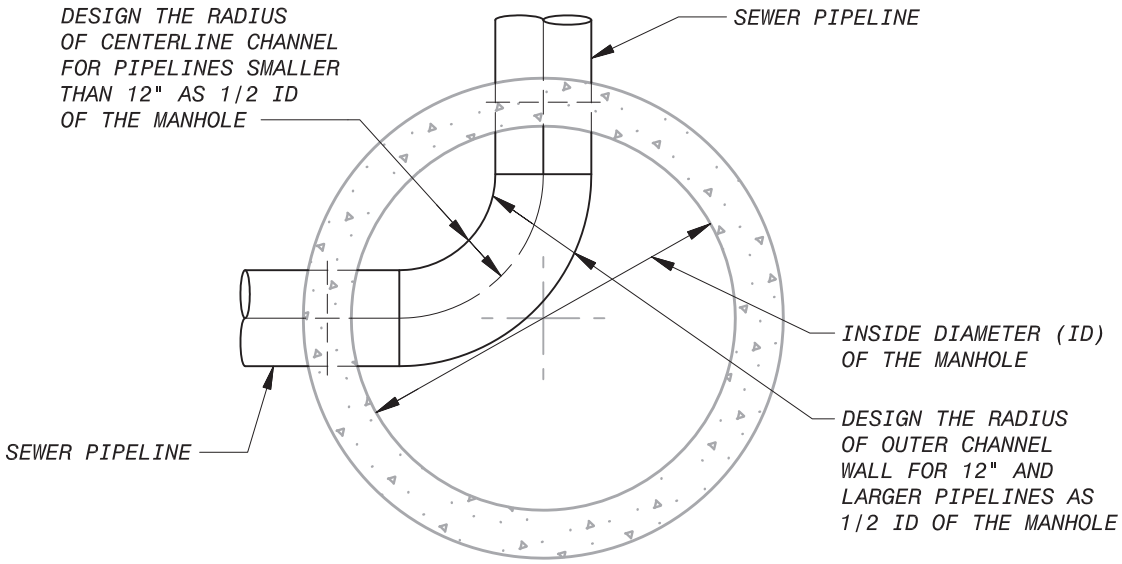
Pipe ID	Sheet	US MH [Approx. Depth (ft)]	DS MH [Approx. Depth (ft)]	Diameter (in.)	Material	Approx. Repair Length (ft)	Approx. Repair Depth (ft)	Approx. # of Taps	Repair Method	Notes
NN022503S	O13	NN022503 [7.1]	NN022384 [-.-]	8	Vitrified Clay Pipe	See Notes	7.1	7	Point Repair Only	Point Repair @ 234.4' DS from 2503 for 10' for HSV, Point Repair @ 24.5' US from 2384 for 10' for HSV, Point Repair @ 91.5' US from 2384 for 10' for TBI.
NN022512S	S14	NN022512 [8.7]	NN022511 [7.8]	8	Concrete Pipe (non-reinforced)	257.3	8.3	6	CIPP	Point Repair @ 0' US from 2511 for 10' for HVV, Point Repair @ 221.7' US from 2511 for 15' for DSGV.
NN022529S	O14	NN022529 [2.8]	NN022528 [-.-]	8	Vitrified Clay Pipe	395.7	2.8	7	CIPP	
NN022530S	O14	NN022530 [8.2]	NN022529 [2.8]	8	Vitrified Clay Pipe	338.2	5.5	4	CIPP	
NN022537S	N15	NN022537 [4.3]	NN022536 [6.4]	8	Vitrified Clay Pipe	539.4	5.4	18	CIPP	Point Repair @ 11.9' DS from 2537 for 10' for HSV, Point Repair @ 25.9' DS from 2537 for 10' for MMC, Point Repair @ 82.2' DS from 2537 for 10' for HSV, Point Repair @ 210.6' DS from 2537 for 10' for HVV, Point Repair @ 478.6' DS from 2537 for 10' for B, Point Repair @ 536.7' DS from 2537 for 10' for HSV.
NN022552S	R15	NN022552 [Dead End]	NN022551 [6.4]	6	Vitrified Clay Pipe	See Notes	6.4	3	Point Repair Only	Point Repair @ 7.3' US from 2551 for 10' for HVV.
NN022560S-1	N14	NN022560 [0]	NN022793 [6]	8	Vitrified Clay Pipe	270.3	3.0	2	CIPP	Point Repair @ 275.2' US from 2793 for 10' for JOL.
NN022561S	O13	NN022561 [4.6]	NN022333 [12.2]	8	Vitrified Clay Pipe	See Notes	8.4	35	Point Repair Only	Point Repair @ 10.8' US from 2333 for 15' for IG, Tap Replacement @ 142.5' US from 2333 for 15' for TFD.
NN022628S	Q16	NN022628 [8.2]	NN022521 [5.4]	8	Vitrified Clay Pipe	See Notes	6.8	5	Point Repair Only	Point Repair @ 75.7' US from 2521 for 10' for OBI.
NN022672S	N13	NN022672 [9.6]	NN022385 [6.6]	6	Vitrified Clay Pipe	See Notes	8.1	8	Point Repair Only	Point Repair @ 78.7' DS from 2672 for 10' for IG.
NN022675S	P15	NN022675 [Dead End]	NN022350 [10]	8	Vitrified Clay Pipe	See Notes	10.0	4	Point Repair Only	Point Repair @ 121' US from 2350 for 10' for OBI.
NN022686S	S14	NN022686 [10.1]	NN022578 [9.3]	8	Concrete Pipe (non-reinforced)	264.8	9.7	3	CIPP	Point Repair @ 180' US from 2578 for 10' for HSV.
NN022766S	P16	NN022766 [Dead End]	NN022522 [5.5]	6	Vitrified Clay Pipe	See Notes	5.5	0	Point Repair Only	Point Repair @ 19.9' US from 2522 for 10' for BSV.
NN022792S	N13	NN022792 [5.5]	NN022580 [5.2]	8	Vitrified Clay Pipe	See Notes	5.4	0	Point Repair Only	Point Repair @ 15.8' US from 2580 for 10' for HSV, Point Repair @ 101.6' US from 2580 for 10' for HSV.
NN022793S	N14	NN022793 [6]	NN022792 [5.5]	8	Vitrified Clay Pipe	349.0	5.8	3	CIPP	Point Repair @ 254.8' DS from 2793 for 10' for HSV.
NN022801S	P16	NN022801 [Dead End]	NN022771 [4.9]	6	Vitrified Clay Pipe	See Notes	4.9	0	Point Repair Only	Point Repair @ 51.2' US from 2771 for 10' for HVV.
NN022804S	N14	NN022804 [6.9]	NN022533 [2.7]	8	Vitrified Clay Pipe	257.2	4.8	4	CIPP	Tap Replacement @ 8.2' DS from 2804 for 15' for TFD.
NN022830S	O15	NN022830 [10.1]	NN022445 [8.6]	8	Vitrified Clay Pipe	339.9	9.4	2	CIPP	
NN022936S	R12	NN022936 [6.7]	NN022935 [8.8]	8	Not Specified	270.4	7.8	14	CIPP	Tap Replacement @ 26' DS from 2936 for 10' for TBI.

Group 2 CIPP Project - Pipe Bid Schedule

Pipe ID	Sheet	US MH [Approx. Depth (ft)]	DS MH [Approx. Depth (ft)]	Diameter (in.)	Material	Approx. Repair Length (ft)	Approx. Repair Depth (ft)	Approx. # of Taps	Repair Method	Notes
NN022946S	R11	NN022946 [Dead End]	NN022941 [7.8]	8	Not Specified	See Notes	7.8	6	Point Repair Only	Point Repair @ 10'-25' US from 2941 for Sag and HSV.
NN022949S	R11	NN022949 [7.3]	NN022948 [8.2]	8	Not Specified	129.5	7.8	0	CIPP	
NN022955S	Q12	NN022955 [10.3]	NN022953 [9.8]	8	Vitrified Clay Pipe	489.5	10.1	2	CIPP	Point Repair @ 121.3' DS from 2955 for 15' for B, Point Repair @ 147.3 DS from 2955 for 10' for B.
NN022961S	R12	NN022961 [10.1]	NN022960 [13.7]	8	Not Specified	See Notes	11.9	4	Point Repair Only	Point Repair @ 26.5' DS from 2961 for 10' for D.
NN022981S	P11	NN022981 [7.6]	NN022980 [7.6]	8	Vitrified Clay Pipe	245.6	7.6	3	CIPP	
NN022991S	Q12	NN022991 [9.5]	NN022990 [9.7]	6	Vitrified Clay Pipe	See Notes	9.6	19	Point Repair Only	Point Repair @ 176.9' US from 2990 for 10' for HVV.
NN022993S	R12	NN022993 [6]	NN022992 [13.1]	8	Not Specified	See Notes	9.6	23	Point Repair Only	Point Repair @ 222.6' DS from 2293 for 10' for D.
NN023000S	R12	NN023000 [7.1]	NN022934 [7.2]	8	Not Specified	See Notes	7.2	10	Point Repair Only	Point Repair @ 71.9' US from 2934 for 10' for ISGT.
NN023019S	P11	NN023019 [9.2]	NN022979 [8.6]	8	Vitrified Clay Pipe	427.2	8.9	16	CIPP	Point Repair @ 232.9' DS from 3019 for 10' for BSV.
NN023170S	R9	NN023170 [13.5]	NN023169 [10.5]	8	Vitrified Clay Pipe	315.7	12.0	13	CIPP	Tap Replacement @ 63.2' US from 3169 for 15' for TFD, Tap Replacement @ 86.9' US from 3169 for 15' for TF, Tap Replacement @ 115' US from 3169 for 15' for TFD.
NN023173S	R8	NN023173 [9.8]	NN023172 [10.7]	8	Not Specified	See Notes	10.3	4	Point Repair Only	Point Repair @ 76.4' DS from 3173 for 10' for B, Point Repair @ 325.5' DS from 3173 for 10' for JOL.
NN023214S	T8	NN023214 [8.9]	NN023162 [18.1]	8	Vitrified Clay Pipe	472.6	13.5	20	CIPP	Point Repair @ 45.8' US from 3162 for 10' for JOL, Tap Replacement @ 55.4' US from 3162 for 15' for TFA, Point Repair @ 96.8' US from 3162 for 10' for HVV, Tap Replacement @ 154.1' US from 3162 for 15' for TBI, Point Repair @ 182.9' US from 3162 for 10' for OBJ.
NN023232S	U7	NN023232 [6.5]	NN023231 [14]	8	Vitrified Clay Pipe	476.7	10.3	19	CIPP	Point Repair @ 34.8' DS from 3232 for 10' for OBJ.
NN023233S	T7	NN023233 [8.8]	NN023232 [6.5]	8	Vitrified Clay Pipe	241.3	7.7	7	CIPP	
NN023234S	T7	NN023234 [Dead End]	NN023233 [8.8]	8	Not Specified	514.8	8.8	15	CIPP	
NN023239S	T9	NN023239 [6.8]	NN023238 [6.5]	8	Not Specified	444.3	6.7	11	CIPP	Point Repair @ 44.2' DS from 3239 for 10' for B, Point Repair @ 70.1' DS from 3239 for 10' for B, Point Repair @ 127.6' DS from 3239 for 10' for B, Point Repair @ 184.2' DS from 3239 for 10' for OBJ, Tap Replacement @ 150.4' US from 3238 for 15' for OBB.
NN023270S	T9	NN023270 [8.9]	NN023269 [5.1]	8	Not Specified	See Notes	7.0	11	Point Repair Only	Point Repair @ 101.9' US from 3269 for 10' for B, Point Repair @ 155' US from 3269 for 10' for B, Point Repair @ 421.3' US from 3269 for 20' for JSL, Point Repair @ 1' DS from 3270 for 20' for B.

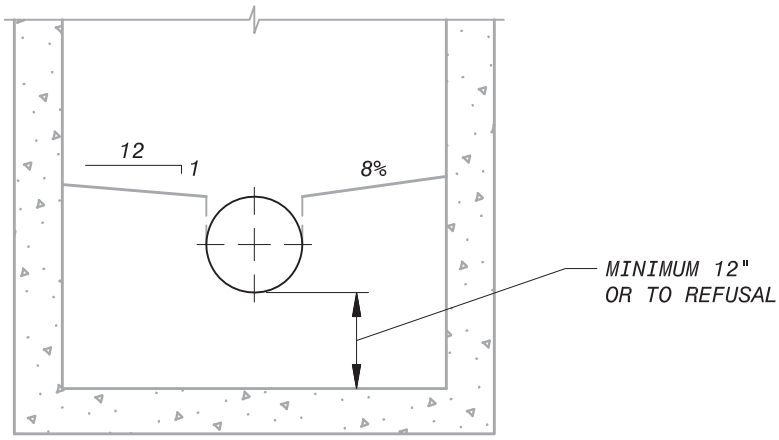
Group 2 CIPP Project - Pipe Bid Schedule

Pipe ID	Sheet	US MH [Approx. Depth (ft)]	DS MH [Approx. Depth (ft)]	Diameter (in.)	Material	Approx. Repair Length (ft)	Approx. Repair Depth (ft)	Approx. # of Taps	Repair Method	Notes
NN023297S	T8	NN023297 [8.1]	NN023369 [7.5]	8	Not Specified	See Notes	7.8	18	Point Repair Only	Point Repair @ 138.9' US from 3369 for 10' for HVV, Point Repair @ 323.1' US from 3369 for 10' for RPD.
NN023365S	T10	NN023365 [8.5]	NN023261 [9.2]	10	Not Specified	626.3	8.9	23	CIPP	Point Repair @ 493' US from 3261 for 10' for JOL.
NN023375S	S9	NN023375 [Dead End]	NN023222 [10.4]	8	Not Specified	See Notes	10.4	5	Point Repair Only	Point Repair @ 106.5' US from 3222 for 10' for JOL.
NN023544S	Z7	NN023544 [7.3]	NN023550 [-.-]	10	Not Specified	See Notes	7.3	0	Point Repair Only	Point Repair @ 123'-143' DS from 3544 for BSV.
NN023546S	Z7	NN023546 [5.5]	NN023545 [6.8]	8	Not Specified	See Notes	6.2	4	Point Repair Only	Point Repair @ 187.8' DS from 3546 for 10' for JSL, Point Repair @ 265' DS from 3546 for 10' for HSV.
NN023592S	W7	NN023592 [7.5]	NN023591 [6.8]	8	Not Specified	See Notes	7.2	0	Point Repair Only	Point Repair @ 18.4' DS from 3592 for 10' for OBP.
NN023596S	X7	NN023596 [Dead End]	NN023595 [7.5]	8	Not Specified	See Notes	7.5	3	Point Repair Only	Point Repair @ 62.2' US from 3595 for 10' for HSV.
NN023617S	Y6	NN023617 [7.9]	NN023616 [9.4]	8	Not Specified	See Notes	8.7	5	Point Repair Only	Point Repair @ 23.4' US from 3616 for 10' for HSV.
NN023693S	AA7	NN023693 [4.6]	NN023692 [6.1]	6	Not Specified	See Notes	5.4	14	Point Repair Only	Point Repair @ 284.2' US from 3692 for 10' for HSV.
NN023701.01S	V7	NN023701.01 [7.6]	NN023701 [7]	8	Not Specified	See Notes	7.3	6	Point Repair Only	Tap Replacement @ 17.9' DS from 3701.01 for 15' for TFD, Tap Replacement @ 140.8' DS from 3701.01 for 15' for TFD, Point Repair @ 234.8' DS from 3701.01 for 10' for H.
NN023718S	V6	NN023718 [9.1]	NN023717 [9.4]	8	Not Specified	See Notes	9.3	7	Point Repair Only	Point Repair @ 61.7' DS from 3718 for 10' for B, Point Repair @ 82.3' DS from 3718 for 10' for B, Point Repair @ 241.8' DS from 3718 for 10' for H.
NN023745S	X4	NN023745 [0]	NN023744 [5.8]	10	Not Specified	See Notes	2.9	2	Point Repair Only	Point Repair @ 263.4' US from 3744 for 10' for JOL.
NN023766.01S	W7	NN023766.01 [8.6]	NN023766 [8.1]	8	Not Specified	See Notes	8.4	10	Point Repair Only	Tap Replacement @ 124.4' DS from 3766.01 for 15' for TFD.
NN023771S	V7	NN023771 [7.1]	NN023770 [7.2]	8	Not Specified	482.3	7.2	16	CIPP	Point Repair @ 36' DS from 3771 for 10' for HSV, Point Repair @ 122.7' DS from 3771 for 10' for H.
NN023966S	AC10	NN023966 [7.5]	NN023965 [9.2]	8	Not Specified	See Notes	8.4	11	Point Repair Only	Point Repair @ 206.8' DS from 3966 for 15' for TFD.
NN024002S	W9	NN024002 [9.3]	NN024001 [17.8]	8	Not Specified	See Notes	13.6	9	Point Repair Only	Point Repair @ 60.8' US from 4001 for 10' for BSV.
FS045178S	D20	FS045178 [7.4]	FS045177 [9.6]	10	Vitrified Clay Pipe	406.0	8.5	2	CIPP	Point Repair @ 150.5' DS from 5178 for 10' for DV.
NN023658S	Exhibit A	NN023658 [8]	NN023657 [8.3]	6	Vitrified Clay Pipe	80.0	8.0	0	CIPP	
NN020586S-1	Exhibit B	NN020586 [6.9]	NN020585.02 [7.2]	12	Concrete Pipe (non-reinforced)	43.0	7.0	0	CIPP	Double Barrel Siphon
NN020586S-2	Exhibit B	NN020586 [6.9]	NN020585.02 [7.2]	12	Concrete Pipe (non-reinforced)	43.0	7.0	0	CIPP	Double Barrel Siphon



MINIMUM RADIUS OF MANHOLE CHANNEL

EXAMPLE: FOR A 48-INCH DIAMETER MANHOLE FOR 8-INCH SEWERS,
MINIMUM CENTERLINE CHANNEL RADIUS EQUALS TWO (2) FEET



NOTES:

1. CHANNEL SHALL BE POURED WITH 3,000 PSI CONCRETE.
2. INSTALL HYDROPHILIC NEOPRENE GASKET AROUND PERIMETER OF MANHOLE, 2 INCHES TO 4 INCHES BELOW FINAL CONCRETE ELEVATION (E.G. LMK INSIGNIA END SEAL SLEEVE).
3. INVERT OF NEW MANHOLE CHANNEL SHALL BE FINISHED WITH CONSISTENT SLOPING GRADE FROM INCOMING PIPELINE INVERT TO OUTGOING PIPELINE INVERT, IF APPLICABLE WITH EXISTING INVERT ELEVATIONS.
4. RADIUS OF CHANNEL:
   - A. FOR SEWER PIPELINES SMALLER THAN 12-INCH DIAMETER, PROVIDED A MINIMUM RADIUS OF THE CENTERLINE OF THE CHANNEL OF ONE-HALF (1/2) THE INSIDE DIAMETER (ID) OF THE MANHOLE.
   - B. FOR SEWER PIPELINES 12-INCH AND LARGER, PROVIDE A MINIMUM RADIUS OF THE OUTER CHANNEL WALL OF ONE-HALF (1/2) THE INSIDE DIAMETER (ID) OF THE MANHOLE.
   - C. DESIGN THE CHANNELS TO HAVE A UNIFORM CURVE, WITH NO REVERSE CURVES WITHIN THE MANHOLE.
5. WIDTH OF CHANNEL:
   - A. THE CHANNEL WIDTH FOR SEWER PIPELINES HAVING THE SAME DIAMETER ENTER AND EXIT A MANHOLE IS THE SAME AS THE PIPE INSIDE DIAMETER.
   - B. THE CHANNEL WIDTH FOR SEWER PIPELINES HAVING DIFFERENT DIAMETER, IS TAPERED FROM ONE PIPE SIZE TO THE OTHER.
6. TOP OF BENCH ELEVATION:
   - A. WHEN BOTH THE INCOMING AND OUTGOING PIPES ARE THE SAME DIAMETER, SET THE TOP OF THE BENCH AT THE SAME ELEVATION AS THE TOP OF THE PIPE.
   - B. WHEN THE INCOMING AND OUTGOING OF THE PIPES HAVE DIFFERENT DIAMETERS, SET THE TOP OF PIPE ELEVATION OF THE HIGHEST PIPE WITHIN THE MANHOLE, EXCEPT WHEN A MANHOLE DROP CONNECTION IS DESIGNED. WHEN A SEWER HOUSE CONNECTION (SHC) ENTERING THE MANHOLE IS SIGNIFICANTLY HIGHER THAN THE MAINLINE SEWER, THE BENCH ON THE SIDE WHERE THE SHC ENTERS MAY BE ELEVATED, AND THE BENCH ON THE OPPOSITE SIDE MAY MATCH THE TOP OF THE MAINLINE SEWER FOR MORE CONVENIENT ACCESS.
7. WIDTH AND SLOPE OF THE TOP OF THE BENCH:
   - A. THE BENCH SHOULD PROVIDE GOOD FOOTING FOR A WORKER AND A PLACE WHERE TOOLS AND EQUIPMENT CAN BE LAID AND MUST BE PROVIDED WITH ADEQUATE SLOPE TO DRAIN.
     1. INSTALL THE TOP OF BENCH WITH AN EIGHT (8%) PERCENT OR 1-INCH PER FOOT SLOPE FROM THE WALL TO THE CHANNEL'S EDGE.
     2. INSTALL THE WIDTH OF THE BENCH TO HAVE A MINIMUM OF 12-INCH ON EACH SIDE OF THE CHANNEL, IF POSSIBLE.

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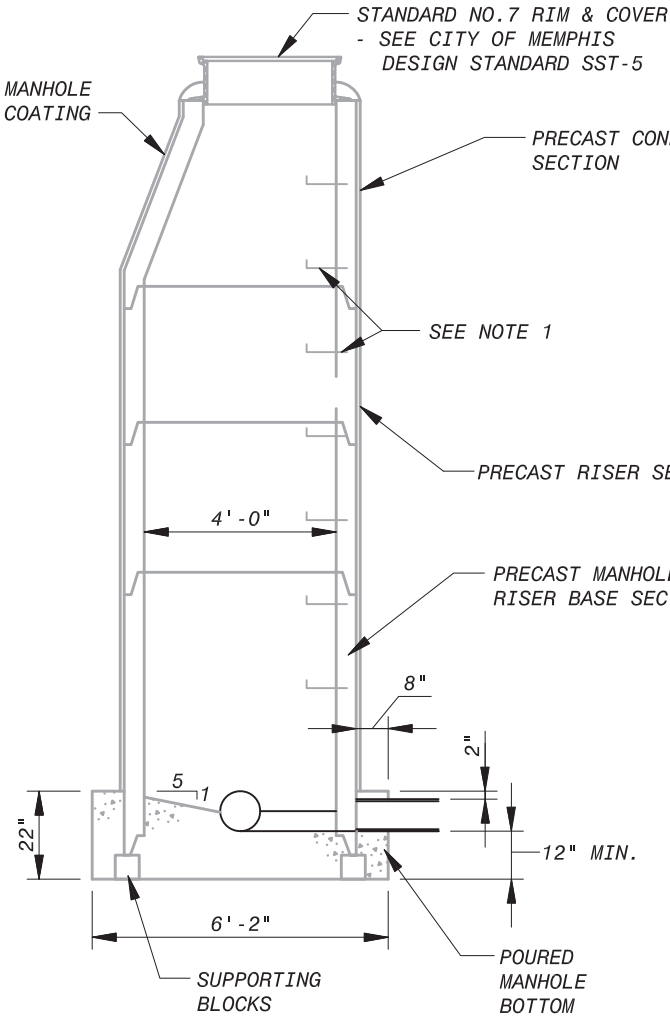
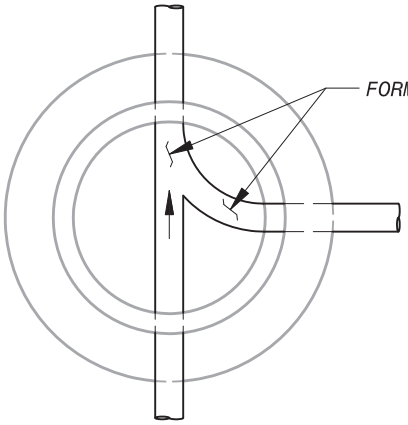
BENCH & CHANNEL REPLACEMENT DETAIL

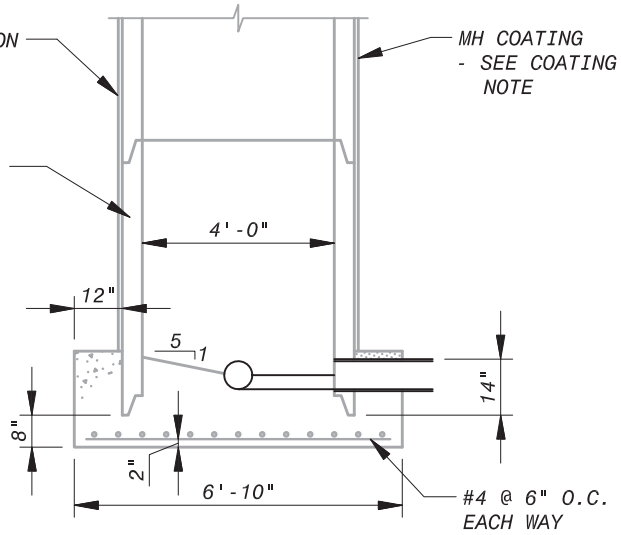
SCALE: NOT TO SCALE

REV 0.0

DATE: 06/17/15







NOTES:
1. CAST IRON STEPS STAGGERED LATERALLY 12" C-C & UNIFORMLY SPACED VERTICALLY AT 16" O.C. MAXIMUM - SEE "MANHOLE STEPS" NOTE BELOW

MANHOLE COATING NOTE:
OUTSIDE COATING OF MANHOLE SHALL BE WITH ASPHALTIC BLACK, AS AVAILABLE AT UNITED PAINT COMPANY.

METHOD OF APPLICATION SHALL BE PERFORMED BY BRUSH OR BY LOW PRESSURE SPAYER.

TYPICAL PRECAST MANHOLE

ALTERNATE

(MANHOLES IN EXCESS OF 20' DEEP)

JOINT SEALANT: CONCRETE MORTAR SHALL BE USED TO SEAL JOINTS AFTER THE INSTALLATION OF AN APPROVED GASKET MATERIAL BETWEEN ALL PRECAST MANHOLE SECTIONS.

BASE SECTIONS: MANHOLE BOTTOM SHALL NOT BE POURED UNTIL PRECAST BASE SECTION OF MANHOLE AND PIPE STUBS OUT & IN ARE IN PLACE. PIPE STUBS OUTSIDE OF MANHOLE SHALL HAVE A MINIMUM LENGTH OF 12" AND A MAXIMUM LENGTH OF 15" FROM OUTSIDE OF MANHOLE TO THE FIRST JOINT OF PIPE. CONCRETE USED TO FORM BASES AND INVERTS SHALL BE 3,000 p.s.i.

SUBSTITUTES: POURED-IN-PLACE MANHOLES MAY BE SUBSTITUTED FOR PRECAST MANHOLES, PROVIDED A FORMAL, WRITTEN REQUEST HAS BEEN SUBMITTED TO & APPROVED BY THE ENGINEER OF DESIGN. ALL POURED-IN-PLACE MANHOLES SHALL CONFORM TO CITY OF MEMPHIS STANDARD DRAWINGS NO. SST-6 AND SST-7.

MANHOLE STEPS: THE FOLLOWING MANHOLE STEPS HAVE BEEN APPROVED FOR USE:
1. TOWER GROVE MH STEP NO. B-1096 BY TOWER GROVE FOUNDRY CO.
2. M.A. MANHOLE STEPS BY M.A. INDUSTRIES, INC., EAST POINT, GA.
3. WEDGE-LOK SAFETY STEP BY DELTA PIPE PRODUCTS, INC., ATLANTA, GA.

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PRECAST SANITARY MANHOLE SST-1

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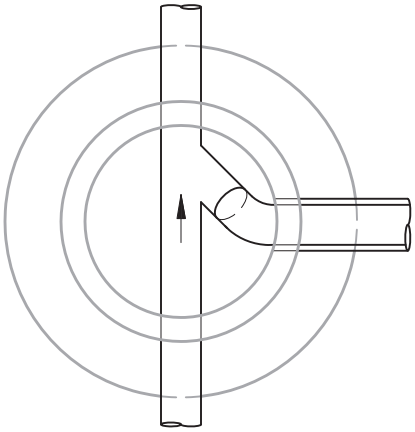
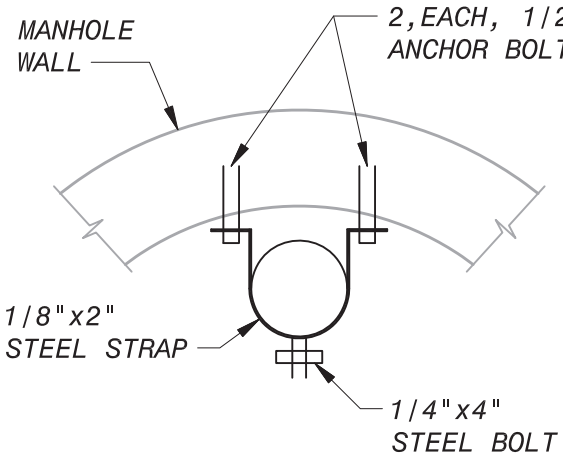
REV 0.0

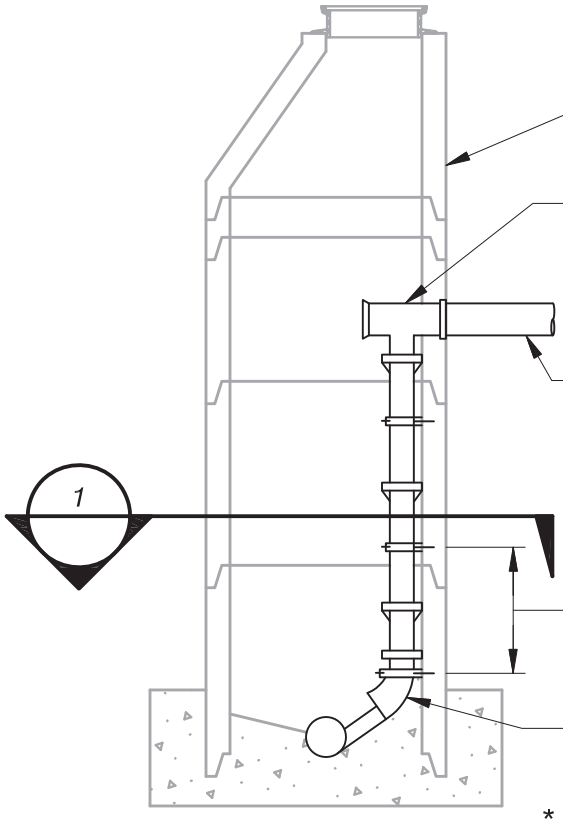
DATE: 06/04/15





1 SECTION

NTS (ENLARGED)



* OPENING IN MH WALL TO BE GROUTED WITH HIGH STRENGTH, QUICK SETTING, NON-SHRINKING CEMENT GROUT.

INSIDE DROP

(SEE NOTE 2)

NOTES:

1. TO BE USED, WHERE REQUIRED, ON NEW MANHOLES.
2. TO BE USED ON ALL EXISTING MH'S, WHERE REQUIRED.

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SANITARY MANHOLE DROP CONSTRUCTION SST-2

SCALE: NOT TO SCALE

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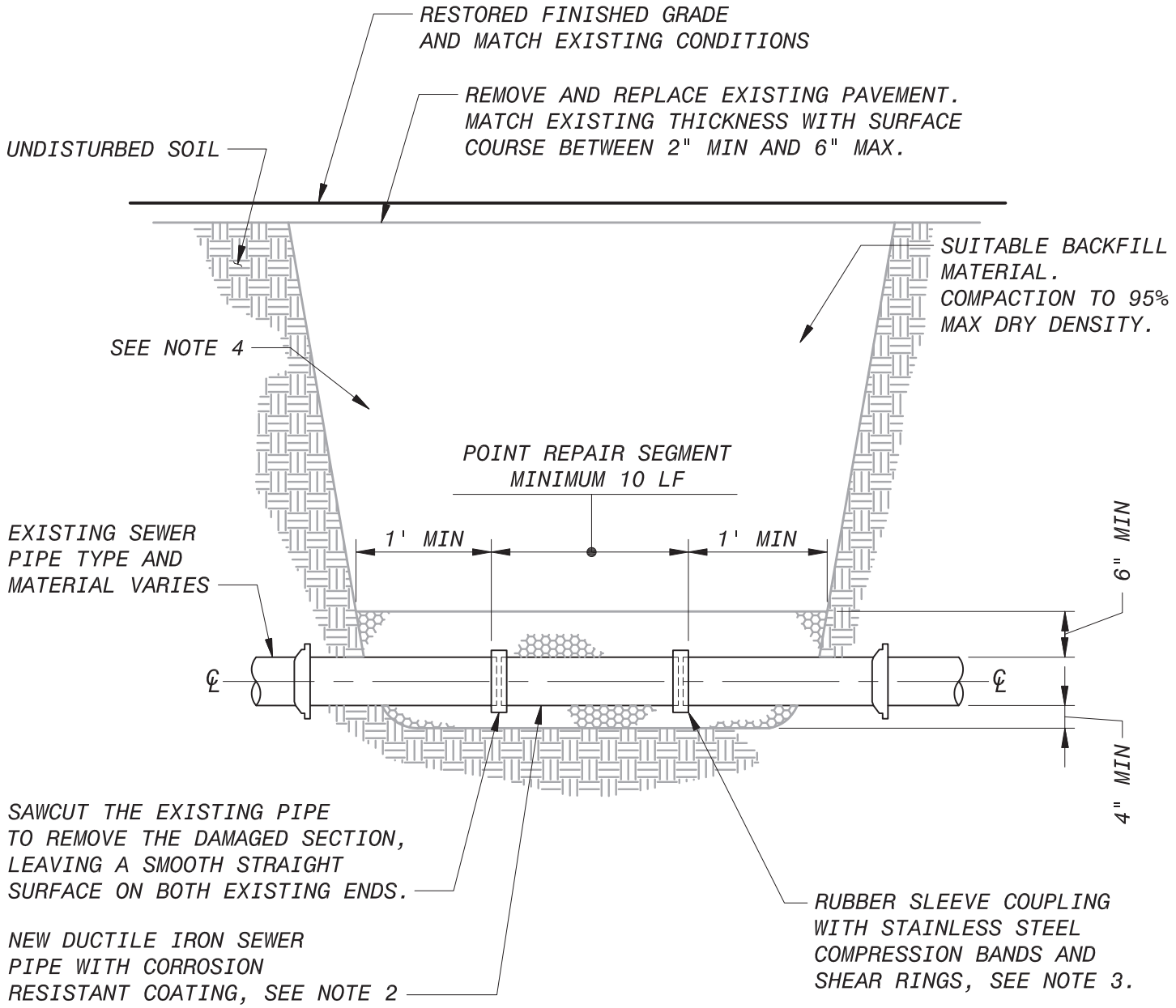
DATE: 06/04/15



NOTES

1. CONSULT WITH SARP10 CONSTRUCTION MANAGER BEFORE MAKING REPAIRS REQUIRING MORE THAN 10 LF.
2. INSTALL NEW DUCTILE IRON SEWER PIPE, IN ACCORDANCE WITH CITY OF MEMPHIS STANDARD CONSTRUCTION SPECIFICATION SECTION 02530-SEWER PIPE INSTALLATION.
3. INSTALL FERNCO SERIES 5000RC SHIELDED COUPLINGS WITH NUT AND BOLT CLAMP, MISSION "FLEX-SEAL" ADJUSTABLE SHIELDED REPAIR COUPLINGS, OR APPROVED EQUAL.
4. REMOVE EXCAVATED MATERIAL UNDER PAVED SURFACES AND BACKFILL WITH CRUSHED LIMESTONE OR RECYCLED CRUSHED CONCRETE PER CITY OF MEMPHIS STANDARD SPECIFICATIONS.

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SARP10

SANITARY SEWER POINT REPAIR

SCALE: NOT TO SCALE

REV 3.0

DATE: 1/5/15

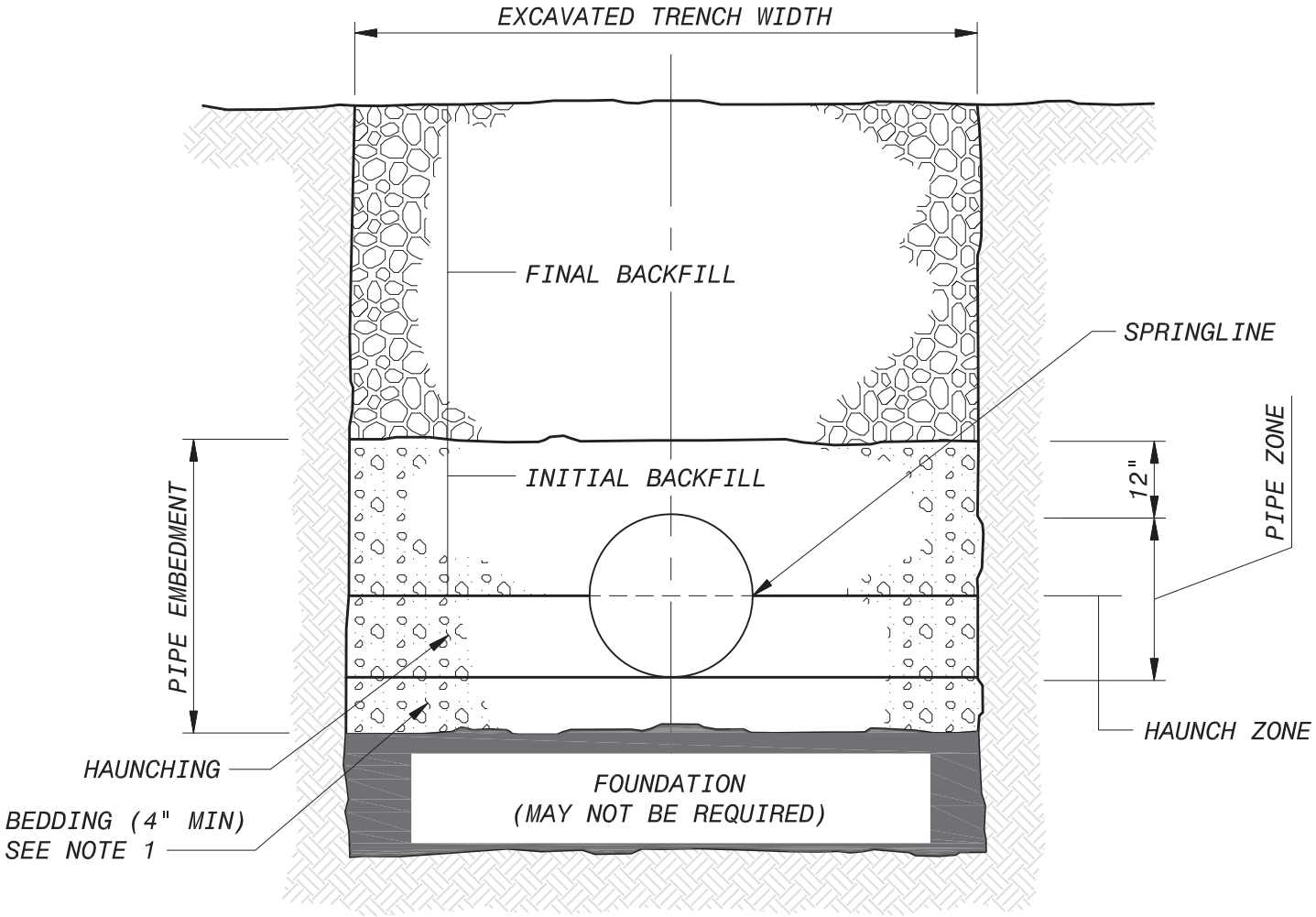


FIGURE 1

TRENCH CROSS SECTION SHOWING TERMINOLOGY - PIPE REPLACEMENT

NOTES

1. INSTALL CRUSHED LIMESTONE ASTM D-448-54 TABLE 1, #67 FOR BEDDING AND HAUNCHING MATERIAL. THE QUANTITY OF CRUSHED LIMESTONE FOR BEDDING AND HAUNCHING IS PART OF THE "SEWER POINT REPAIR" LINE ITEM AND NO SEPARATE PAYMENT WILL BE MADE.
2. INSTALL EITHER CRUSHED LIMESTONE OR RECYCLED CRUSHED CONCRETE FOR INITIAL BACKFILL AND FINAL BACKFILL PER CITY OF MEMPHIS SPECIFICATIONS.

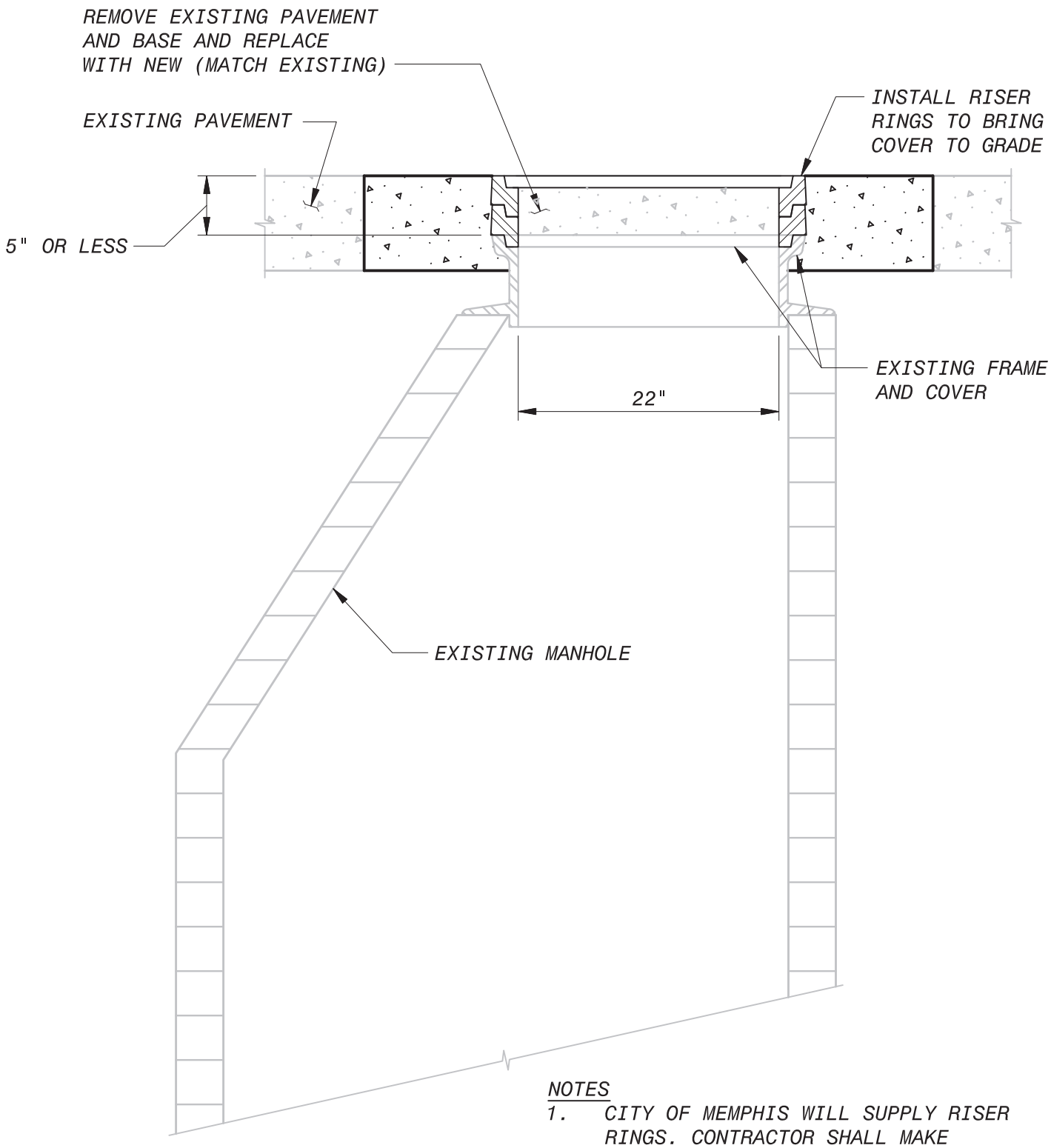
SARP10

TRENCH CROSS SECTION SHOWING TERMINOLOGY - PIPE REPLACEMENT

SCALE: NOT TO SCALE

REV 0.0

DATE: 1/5/15



NOTES

1. CITY OF MEMPHIS WILL SUPPLY RISER RINGS. CONTRACTOR SHALL MAKE ARRANGEMENTS FOR PICK UP.

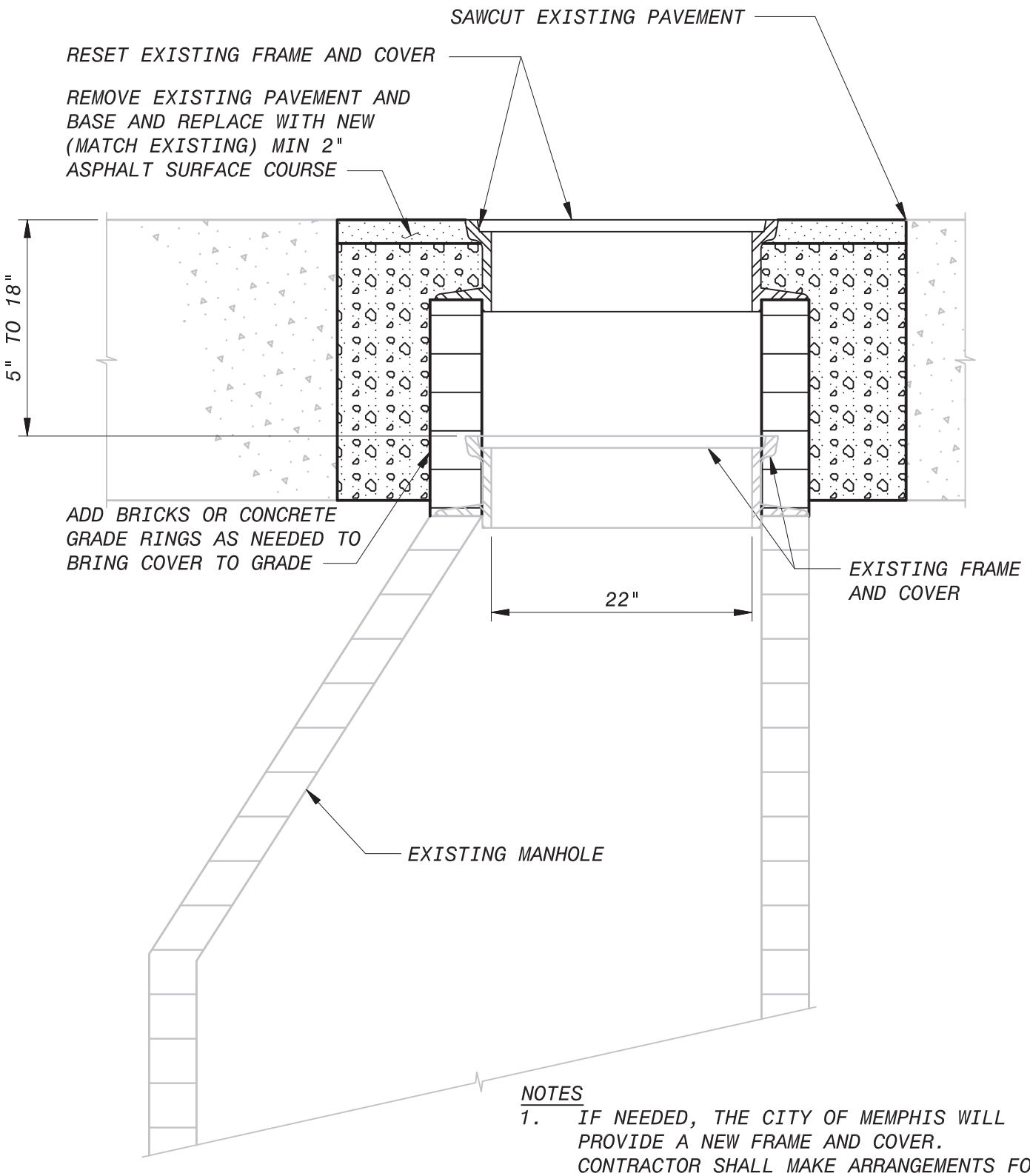
SARP10

ADJUSTING MANHOLE FRAME AND COVER UP TO 5 INCHES SECTION / PROFILE

SCALE: NOT TO SCALE

REV 0.0

DATE: 04/07/14



NOTES

1. IF NEEDED, THE CITY OF MEMPHIS WILL PROVIDE A NEW FRAME AND COVER. CONTRACTOR SHALL MAKE ARRANGEMENTS FOR PICK UP.

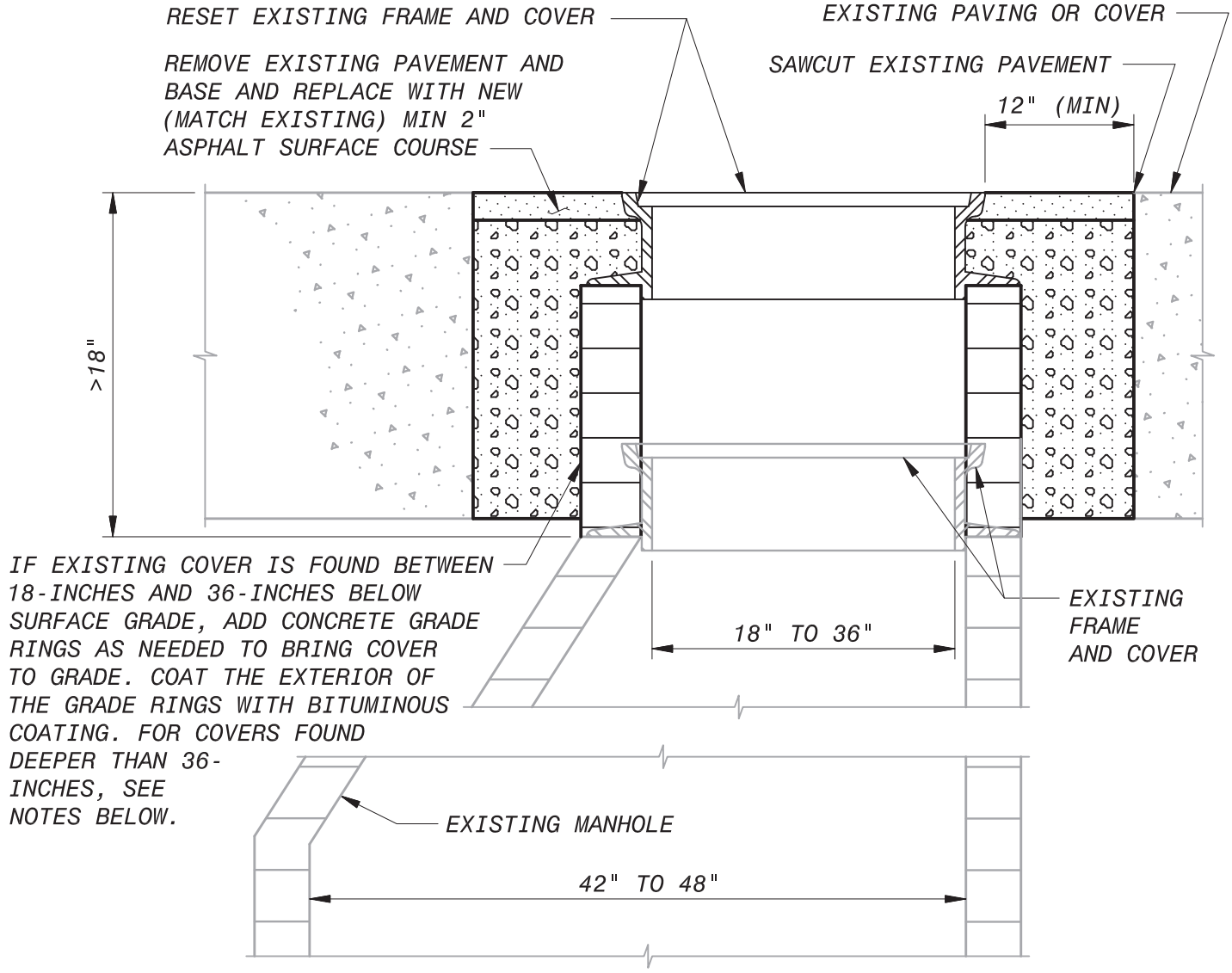
SARP10

ADJUSTING MANHOLE FRAME AND COVER 5 TO 18 INCHES SECTION / PROFILE

SCALE: NOT TO SCALE

REV 0.0

DATE: 04/07/14



NOTES:

1. REMOVE EXISTING COVER OR PAVEMENT AND EXCAVATE TO LOCATE ACTUAL DEPTH OF EXISTING MH FRAME AND COVER.
2. DETERMINE REQUIRED ADJUSTMENT TO BRING COVER TO SURFACE GRADE.
   A. IF LESS THAN 36-INCHES, RAISE THE FRAME AND COVER IN ACCORDANCE WITH SARP10 DETAIL "ADJUSTING MANHOLE FRAME & COVER 5 TO 18 INCHES"
   B. IF GREATER THAN 36-INCHES, PROCEED WITH THE FOLLOWING NOTES.
3. DETERMINE FULL DIAMETER OF THE MANHOLE. IF BETWEEN 42 AND 48 INCHES NOMINALLY, REMOVE SUFFICIENT DEPTH OF EXISTING BRICK CORBEL (SLOPING WALLS) UNTIL MANHOLE WALLS ARE STRAIGHT AND ARE ABLE TO SUPPORT A PRECAST MANHOLE CORBEL 4 FEET HIGH, 48 INCHES IN DIAMETER.
4. PREPARE BED OF CONCRETE TO RECEIVE AND SUPPORT THE PRECAST CORBEL AND SEAT THE NEW CORBEL TO THE EXISTING BRICK WALLS.
5. INSTALL THE NEW FRAME TO THE PRECAST CONCRETE CORBEL AND ADJUST TO MEET SURFACE GRADE. IF ASPHALT ROAD, REPLACE WITH NEW (MATCH EXISTING) MINIMUM 2" ASPHALT SURFACE COURSE.
6. IF EXISTING MANHOLE DIAMETER IS LESS THAN 42 INCHES, REPLACE THE ENTIRE MANHOLE IN ACCORDANCE WITH CITY OF MEMPHIS SD #13.
7. IF NEEDED, THE CITY OF MEMPHIS WILL PROVIDE A NEW FRAME AND COVER. CONTRACTOR SHALL MAKE ARRANGEMENTS FOR PICK UP.

SCALE: NOT TO SCALE

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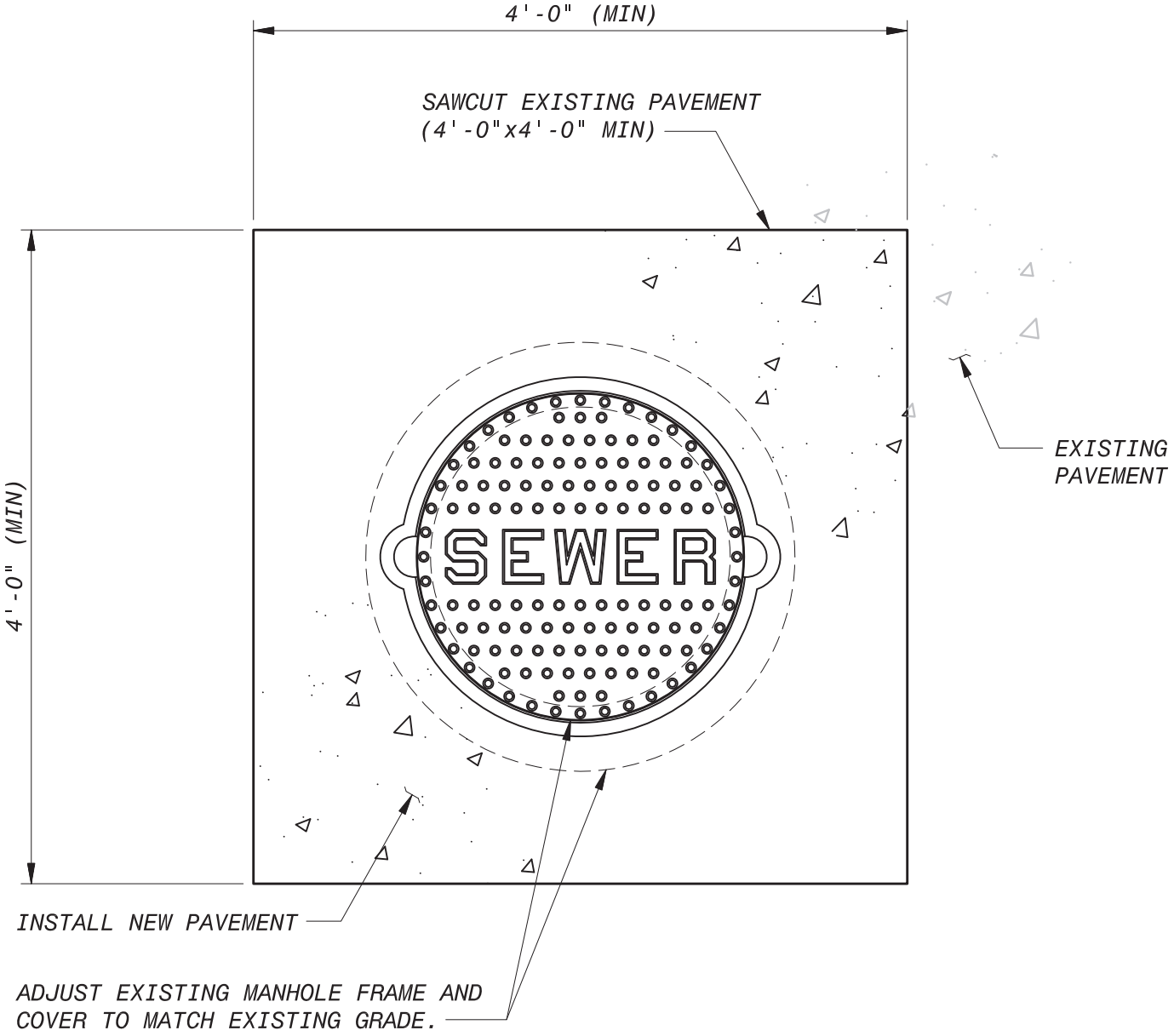
Building a world of difference.

SARP10

ADJUST MANHOLE >18 INCHES DEEP SECTION / PROFILE

REV 0.0

DATE: 09/04/15



NOTES

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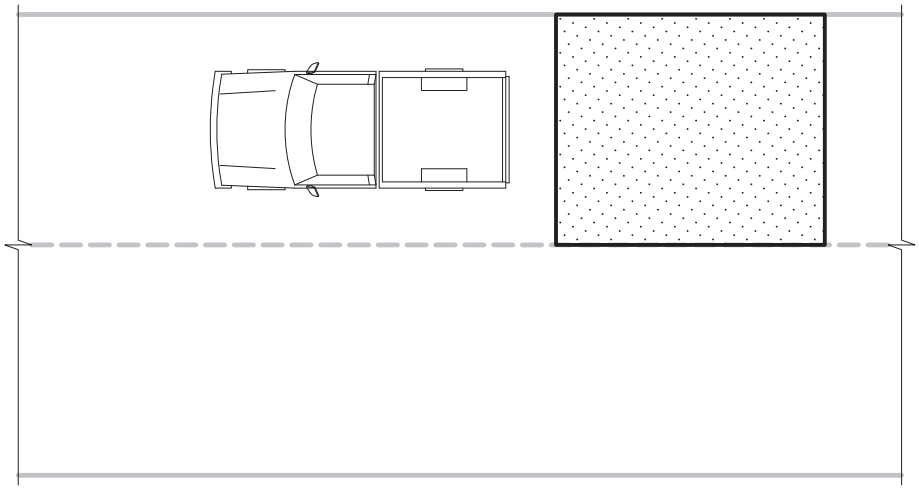
SARP10

ADJUSTING MANHOLE FRAME AND COVER PAVING PLAN

SCALE: NOT TO SCALE

REV 0.0

DATE: 04/01/14



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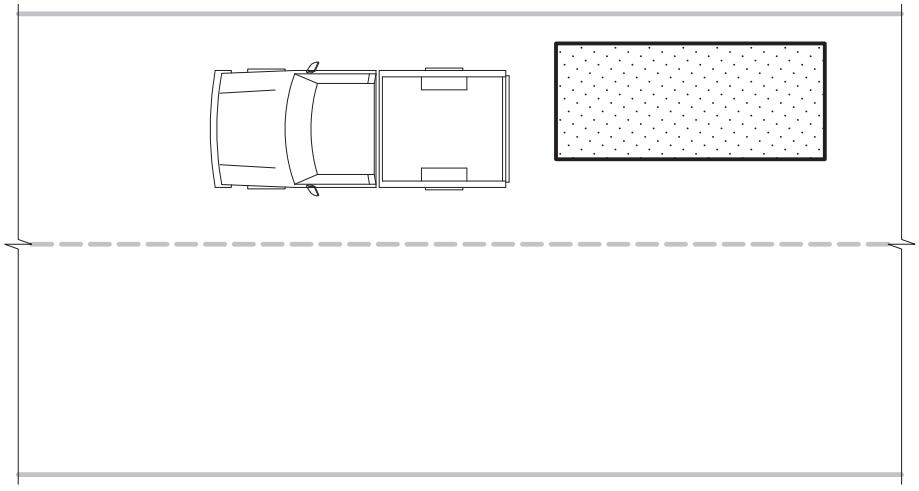

NOT ACCEPTABLE

NOTES

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3. ALL REPAIRS SHALL BE FULL LANE WIDTH.
4. FOR PATCHES IN ASPHALT, A TACK COAT SHALL BE APPLIED TO ALL EDGES OF THE EXISTING ASPHALT BEFORE PLACING THE NEW PAVEMENT.
5. AFTER PLACING THE NEW ASPHALT, ALL SEAMS (JOINTS) BETWEEN THE NEW AND EXISTING PAVEMENTS SHALL BE SEALED WITH AN ASPHALT TACK COAT OR RUBBERIZED CRACK SEAL MATERIAL.

MEMPHIS SEWER ASSESSMENT & REHABILITATION PROGRAM
SARP 10

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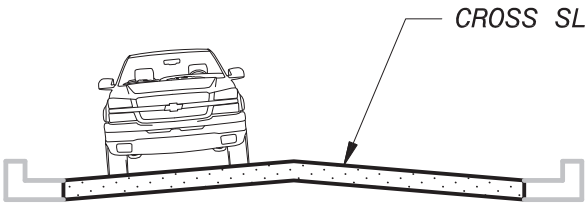
SARP10

PAVEMENT REPAIR SINGLE LANE DETAILS

SCALE: NOT TO SCALE

REV 0.0

DATE: 04/04/14



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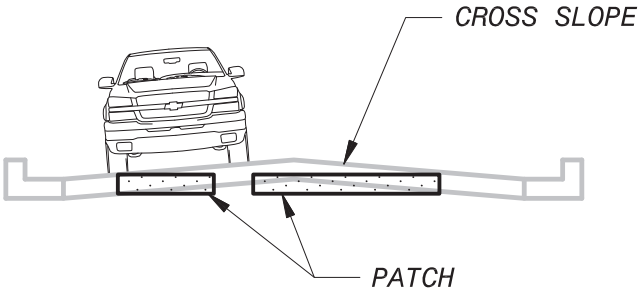

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6. PATCHES SHALL HAVE A SMOOTH LONGITUDINAL GRADE CONSISTENT WITH THE EXISTING ROADWAY.
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MEMPHIS SEWER ASSESSMENT & REHABILITATION PROGRAM
SARP 10

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Building a world of difference.

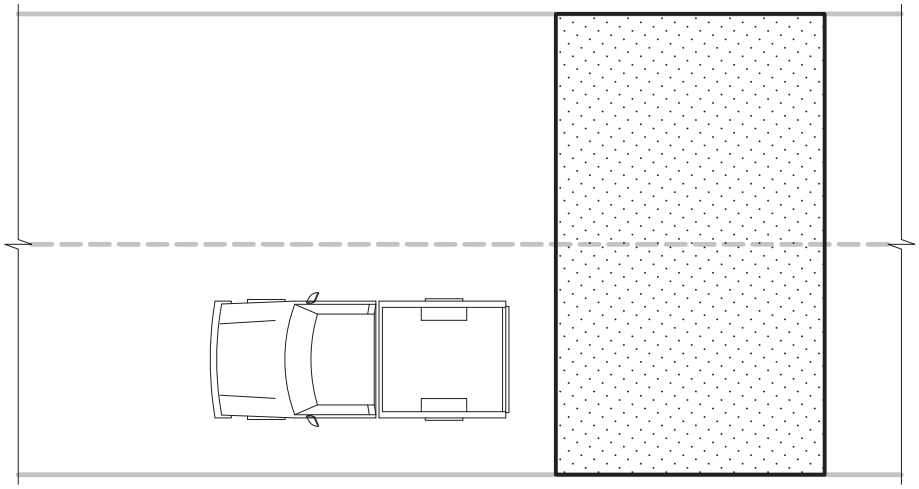
SARP10

PAVEMENT REPAIR CROSS SLOPE DETAILS

SCALE: NOT TO SCALE

REV 0.0

DATE: 04/04/14



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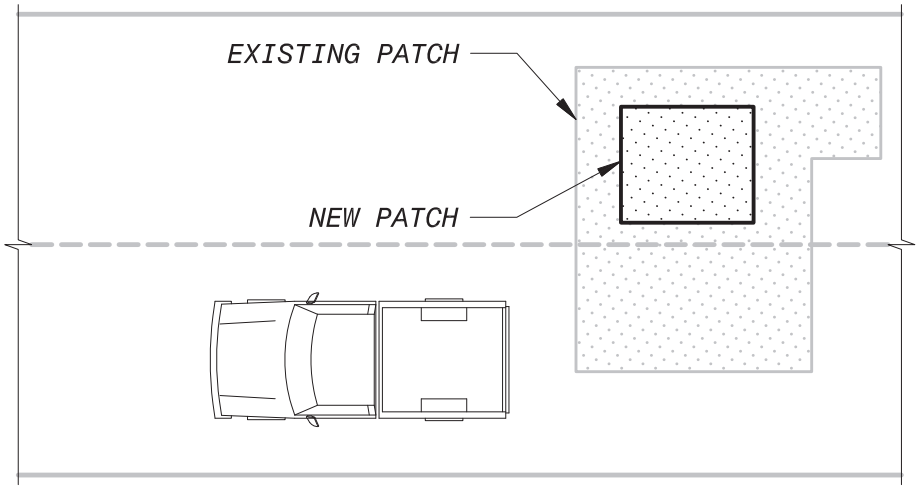

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6. AVOID PATCHES WITHIN PATCHES. IF THIS CANNOT BE AVOIDED, MAKE THE BOUNDARIES OF THE PATCHES COINCIDE.

MEMPHIS SEWER ASSESSMENT & REHABILITATION PROGRAM SARP 10

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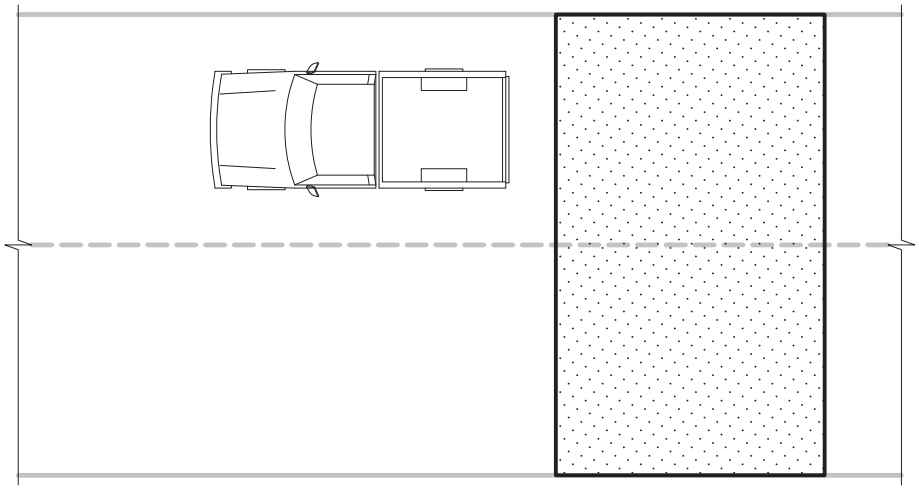
SARP10

PAVEMENT REPAIR PATCH INSIDE A PATCH DETAILS

SCALE: NOT TO SCALE

REV 0.0

DATE: 04/04/14



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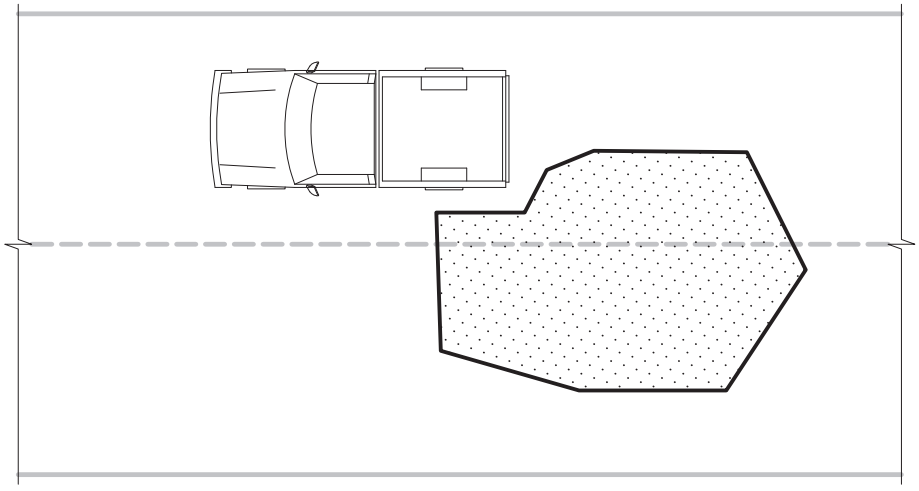

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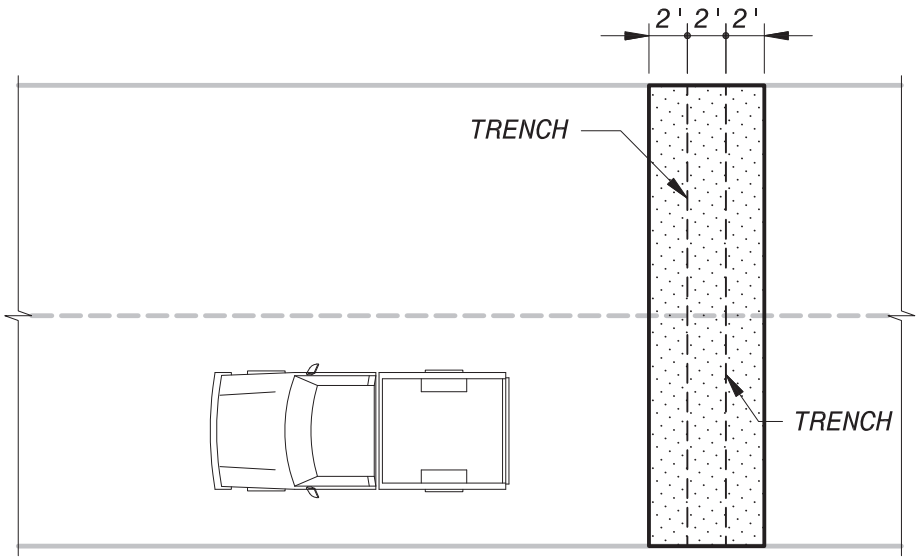
SARP10

PAVEMENT REPAIR MULTI-LANE DETAILS

SCALE: NOT TO SCALE

REV 0.0

DATE: 04/04/14



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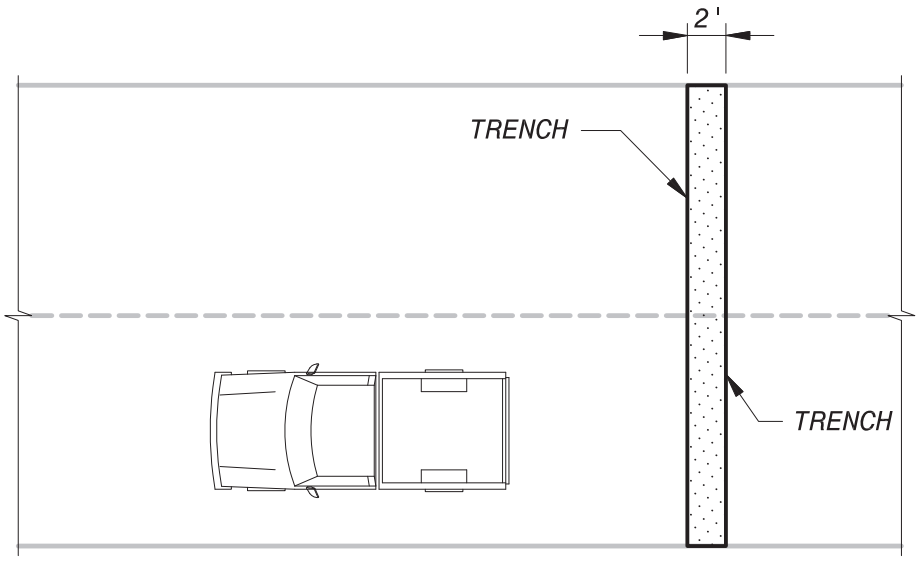

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6. TRAVERSE PATCHES SHALL BE OVERLAID ACROSS THE ENTIRE STREET WIDTH FOR A DISTANCE OF TWO (2) FEET MINIMUM ON ALL SIDES OF THE TRENCH.

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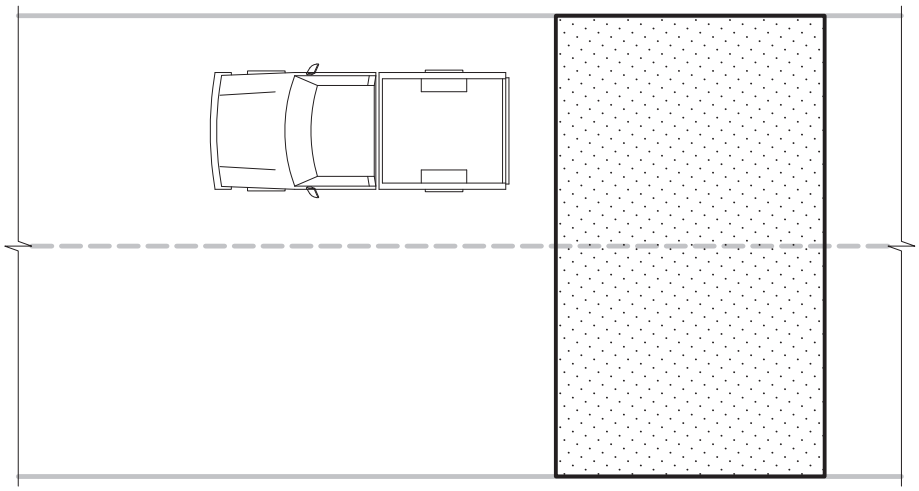
PAVEMENT REPAIR TRAVERSE PATCHES DETAILS

SCALE: NOT TO SCALE

REV 0.0

DATE: 04/04/14



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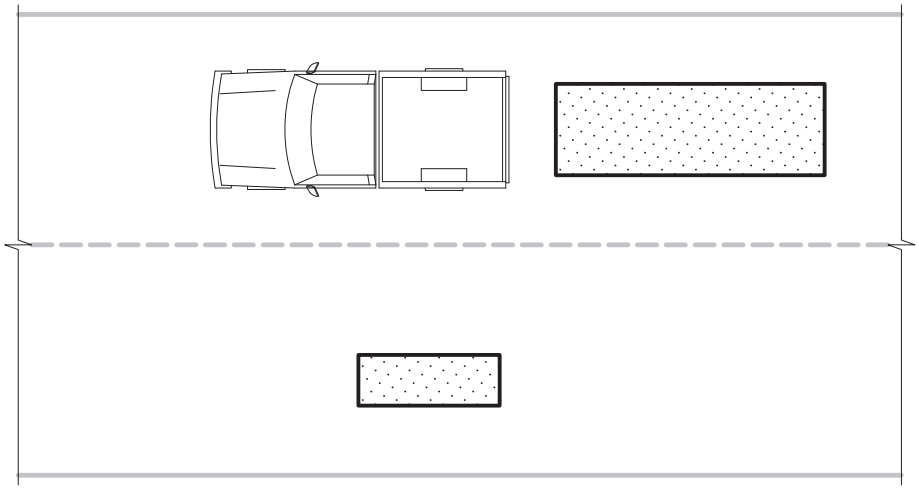

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6. TRAVERSE PATCHES SHALL BE OVERLAID ACROSS THE ENTIRE STREET WIDTH FOR A DISTANCE OF TWO (2) FEET MINIMUM ON ALL SIDES OF THE TRENCH.
7. DO NOT ALLOW THE EDGES OF PATCHES TO FALL IN EXISTING WHEEL PATHS.
8. THE EDGES OF PATCHES PARALLEL TO THE DIRECTION OF TRAFFIC SHALL BE LIMITED TO THE BOUNDARIES OF LANES OR TO THE CENTERLINE OF TRAVEL LANES.

MEMPHIS SEWER ASSESSMENT & REHABILITATION PROGRAM
SARP 10

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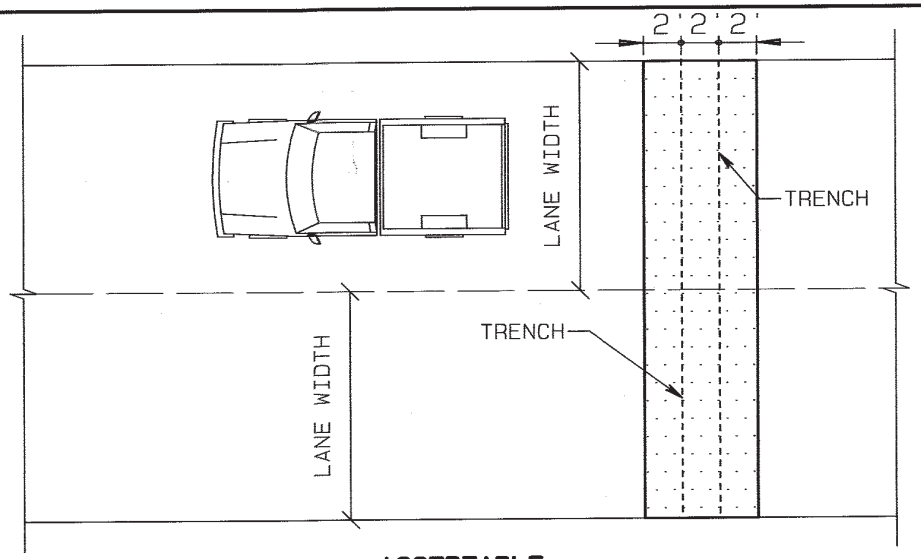
SARP10

PAVEMENT REPAIR WHEEL PATH DETAILS

SCALE: NOT TO SCALE

REV 0.0

DATE: 04/04/14



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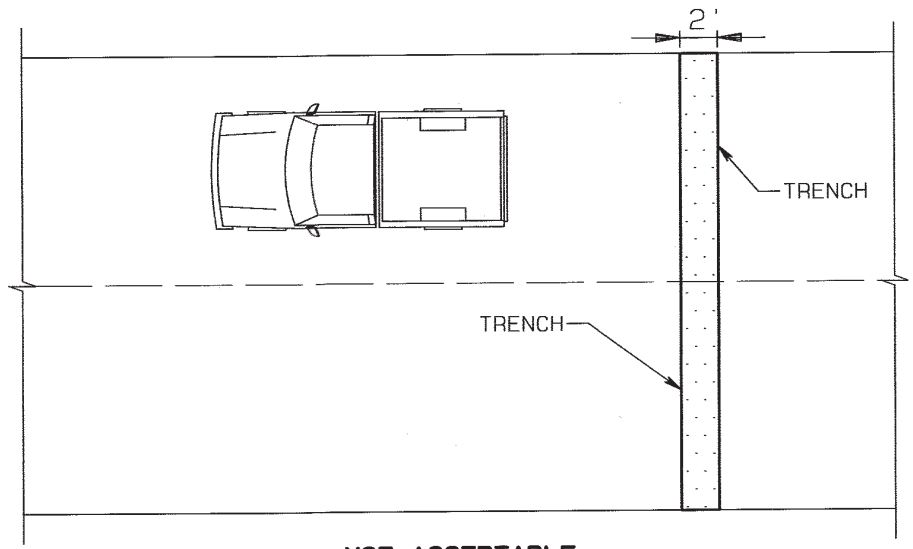

NOT ACCEPTABLE

NOT TO SCALE

REVISIONS			
NO.	DATE	BY	REMARKS

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CITY OF MEMPHIS
DIVISION OF ENGINEERING

DESIGN STANDARD

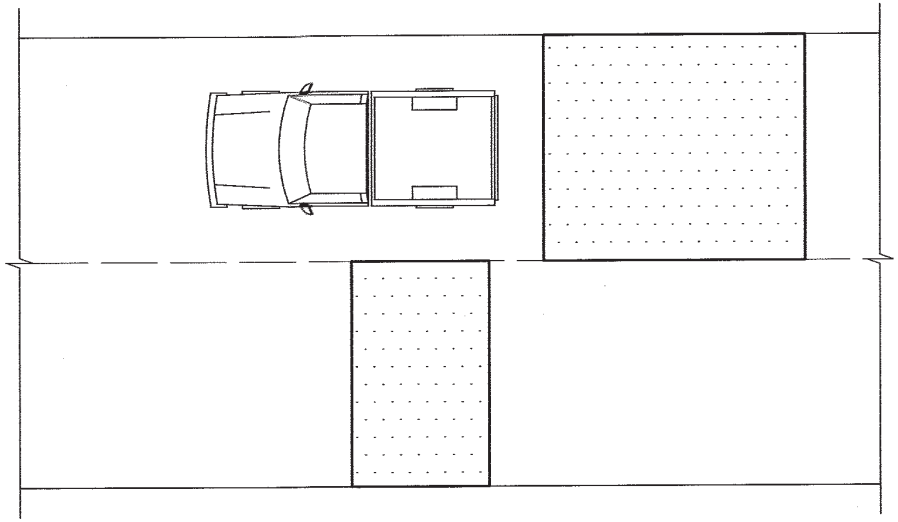
FOR

PAVEMENT REPAIR TRAVERSE PATCHES DETAILS

Chee Chew — CIVIL DESIGN ENGINEER — 12-11-19 — DATE

CITY ENGINEER — 12/4/19 — DATE

DWG. NO. 53 A



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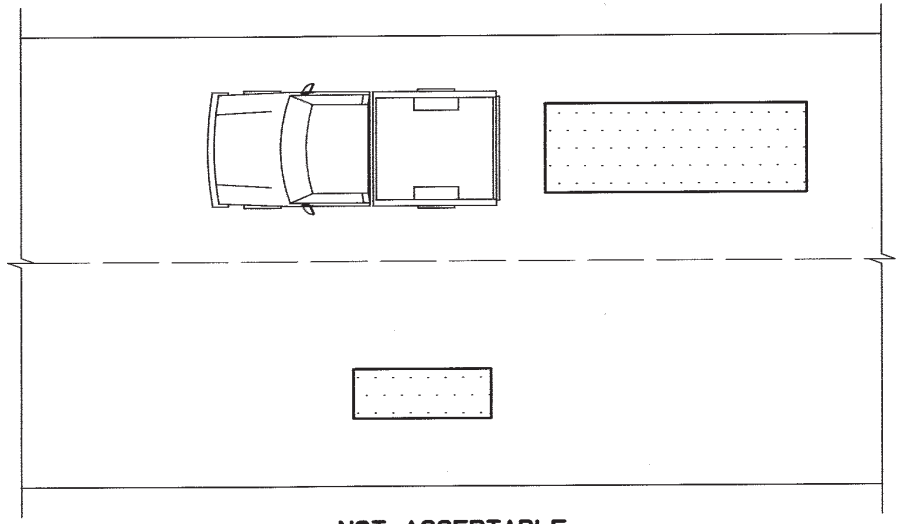

NOT ACCEPTABLE

NOT TO SCALE

REVISIONS			
NO.	DATE	BY	REMARKS

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CITY OF MEMPHIS
DIVISION OF ENGINEERING

DESIGN STANDARD

FOR

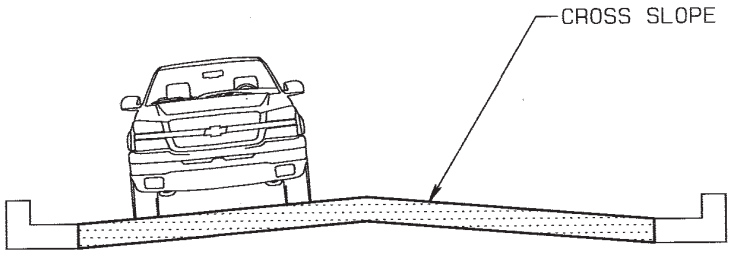
PAVEMENT REPAIR WHEEL PATH DETAILS

Chia Chen — 12.11.19
CIVIL DESIGN ENGINEER — DATE

JW 12/4/19
CITY ENGINEER — DATE

DWG. NO. 53 B

REVISIONS			
NO.	DATE	BY	REMARKS



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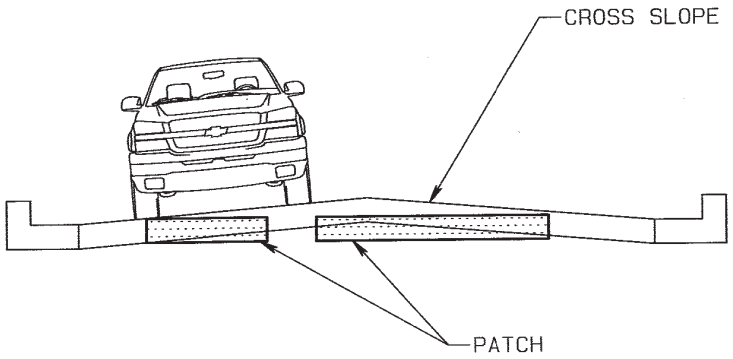


NOT ACCEPTABLE

NOT TO SCALE

CITY OF MEMPHIS
DIVISION OF ENGINEERING

DESIGN STANDARD

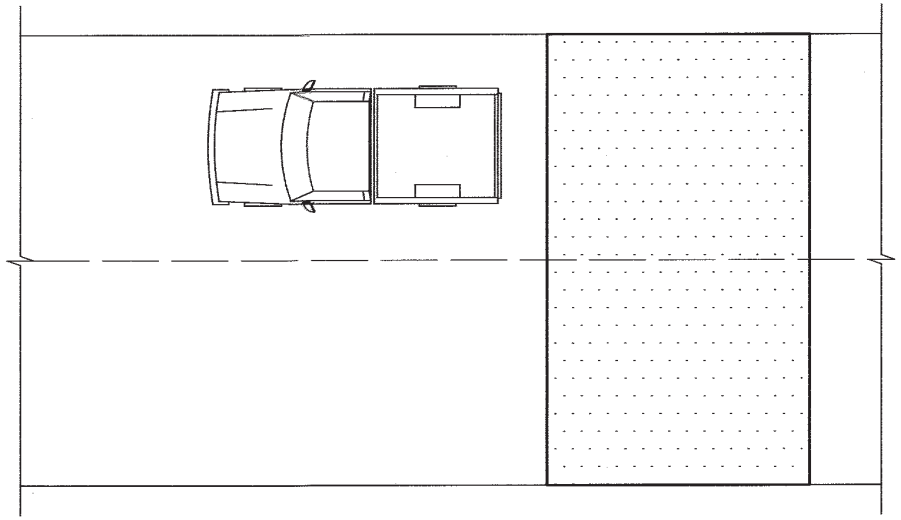
FOR

PAVEMENT REPAIR CROSS SLOPE DETAILS

Chee Chew — 12.11.19
CIVIL DESIGN ENGINEER — DATE

12/11/19
CITY ENGINEER — DATE

DWG. NO. 53 C



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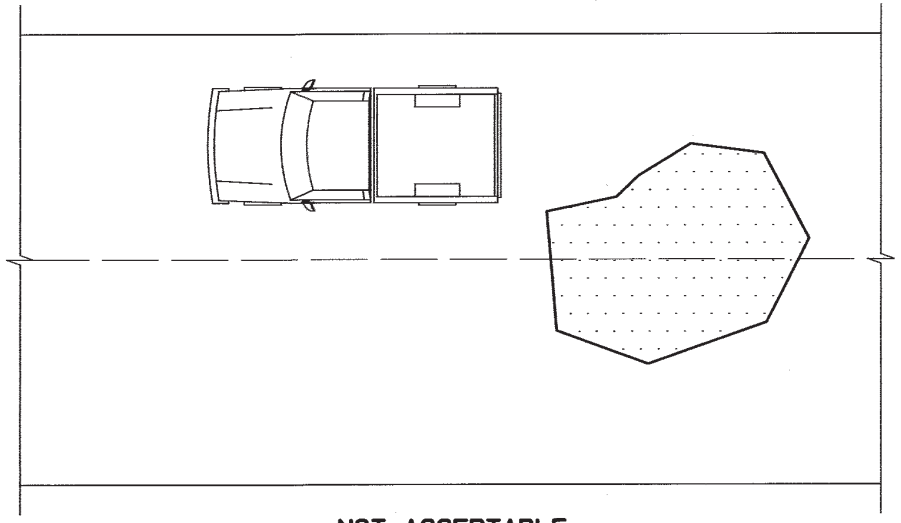

NOT ACCEPTABLE

NOT TO SCALE

REVISIONS			
NO.	DATE	BY	REMARKS

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CITY OF MEMPHIS
DIVISION OF ENGINEERING

DESIGN STANDARD

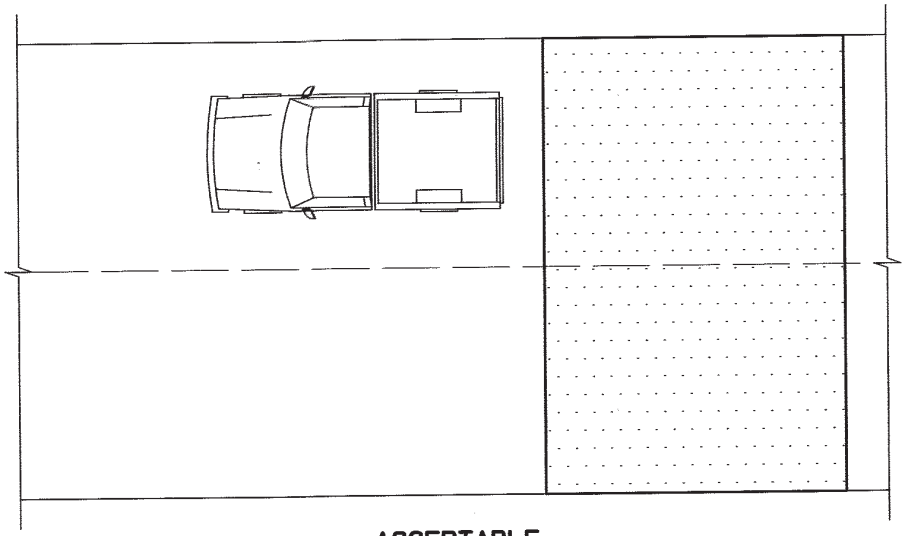
FOR

PAVEMENT REPAIR MULTI-LANE DETAILS

Chee Chew — CIVIL DESIGN ENGINEER — 12.11.19 — DATE

JW 12/11/19 — CITY ENGINEER — DATE

DWG. NO. 53 D



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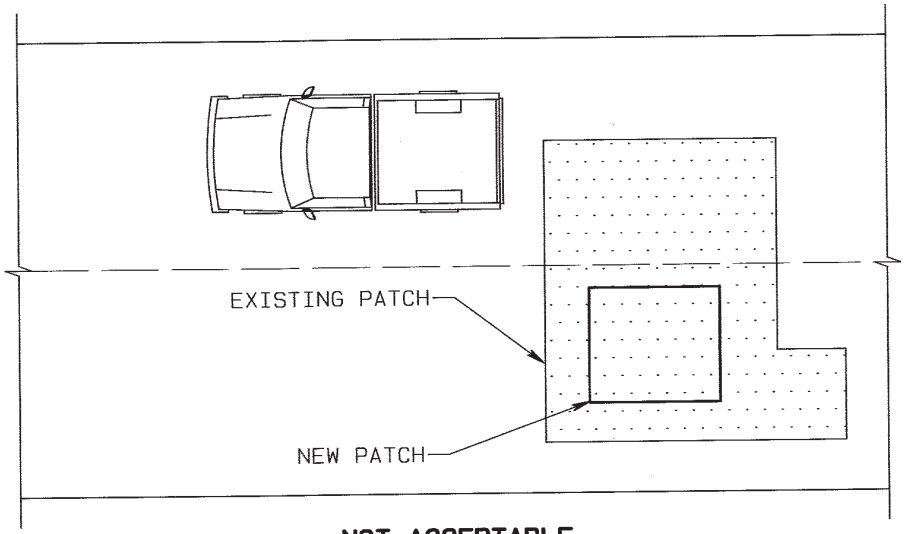

NOT ACCEPTABLE

NOT TO SCALE

REVISIONS			
NO.	DATE	BY	REMARKS

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6. AVOID PATCHES WITHIN PATCHES. IF THIS CANNOT BE AVOIDED, MAKE THE BOUNDARIES OF THE PATCHES COINCIDE.

CITY OF MEMPHIS
DIVISION OF ENGINEERING

DESIGN STANDARD

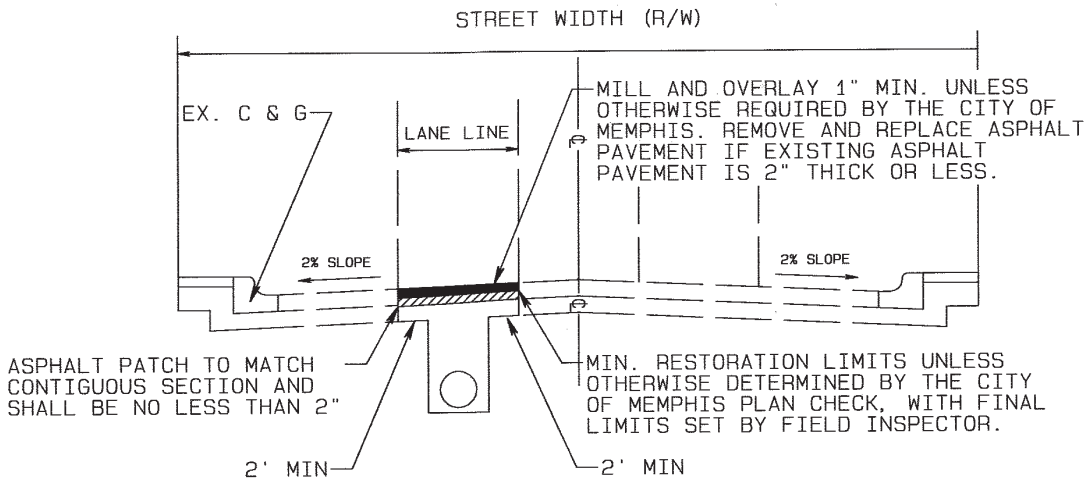
FOR

PAVEMENT REPAIR PATCH INSIDE A PATCH DETAILS

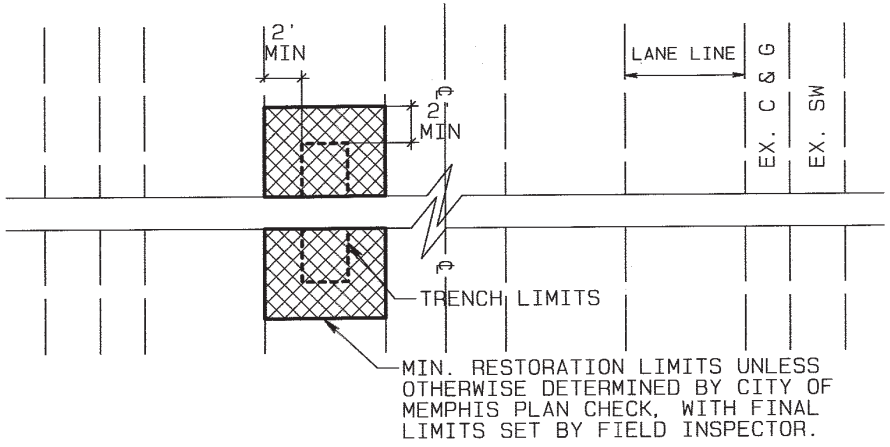
Chee Chew — CIVIL DESIGN ENGINEER — 12.11.19 — DATE

JWE 12/11/19 — CITY ENGINEER — DATE

DWG. NO. 53 E



CUT RESTORATION



PLAN VIEW

NOT TO SCALE

REVISIONS

NO.	DATE	BY	REMARKS

NOTES

1. IF CUT IS WITHIN A LANE, PAVEMENT RESTORATION MUST EXTEND TO THE NEXT LANE LINE.
2. THE ENTITY'S REQUIREMENTS TAKE PRECEDENCE OVER ANY MINIMUM REQUIREMENTS SHOWN HEREON.

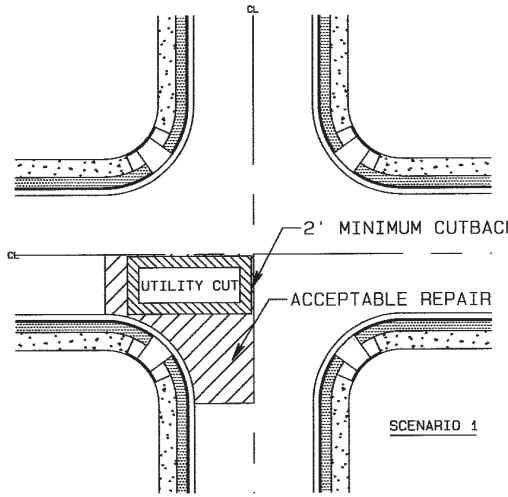
CITY OF MEMPHIS
DIVISION OF ENGINEERING

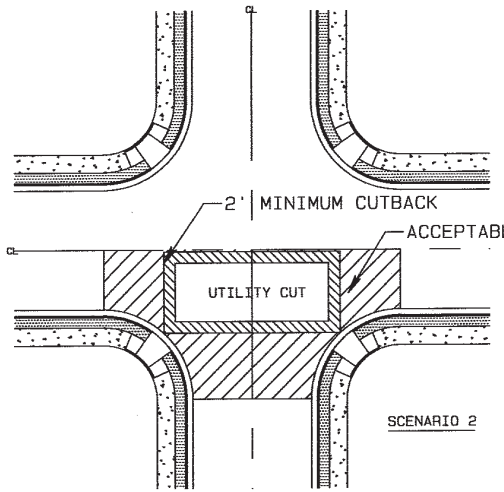
DESIGN STANDARD
FOR
PAVEMENT REPAIR CUT RESTORATION DETAIL

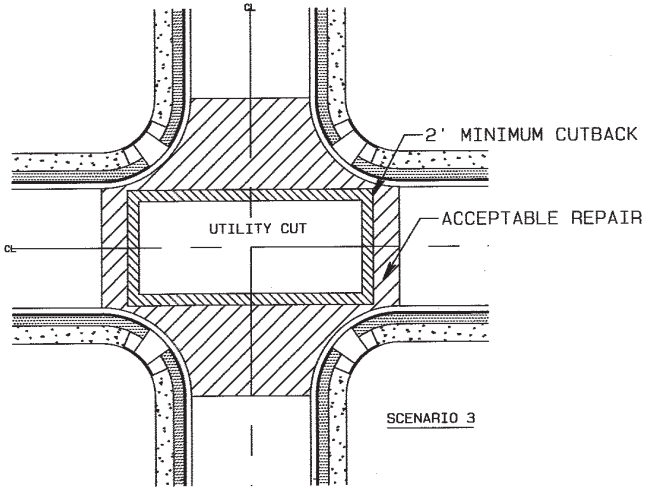
Chee Chew — CIVIL DESIGN ENGINEER — 12.11.19 — DATE

JWB 12/11/19 — CITY ENGINEER — DATE

DWG. NO. 53 F







NOT TO SCALE

REVISIONS			
NO.	DATE	BY	REMARKS

NOTES

1. SEE "DESIGN STANDARD FOR TYPICAL REPAIR OF UTILITY CUTS IN PAVEMENT", CITY STANDARD DRAWING NO. 32.

CITY OF MEMPHIS
DIVISION OF ENGINEERING

DESIGN STANDARD

FOR

UTILITY CUT LOCATIONS AT INTERSECTIONS

Chee Chew — 12.11.19
CIVIL DESIGN ENGINEER — DATE

WW 12/11/19
CITY ENGINEER — DATE

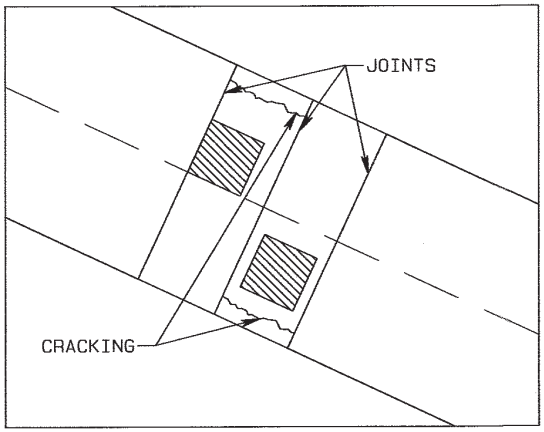
DWG. NO. 53 G

REVISIONS			
NO.	DATE	BY	REMARKS

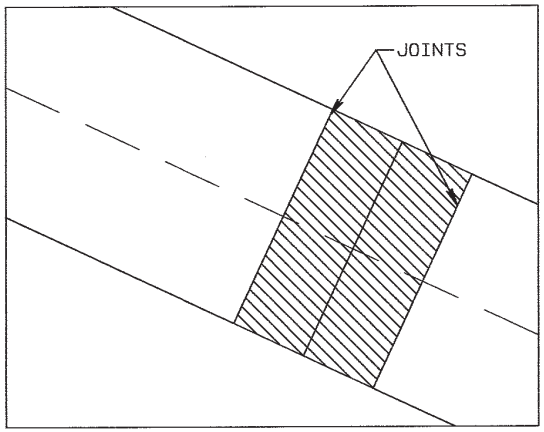
NOTES

1. IN CONCRETE PAVEMENTS, REMOVE SECTIONS TO EXISTING JOINTS, OR NEW SAW CUT JOINTS AT MID-SLAB, THAT ARE IN GOOD REPAIR. IN DAMAGED CONCRETE, THE LIMITS OF REMOVAL SHOULD BE DETERMINED IN THE FIELD BY CITY INSPECTIONS.

NOT ACCEPTABLE



ACCEPTABLE



NOT TO SCALE

CITY OF MEMPHIS
DIVISION OF ENGINEERING

DESIGN STANDARD

FOR

CONCRETE PAVEMENT REPAIR

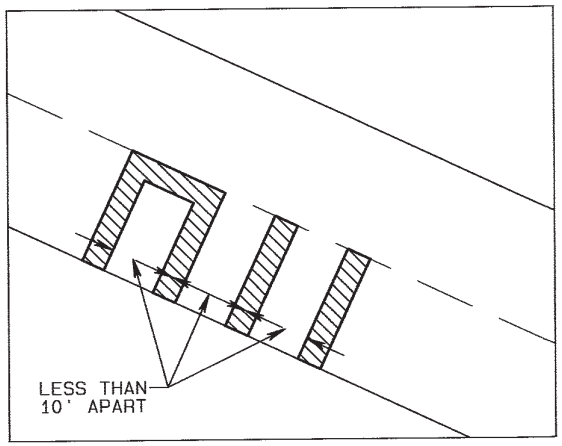
Chee Chew — CIVIL DESIGN ENGINEER — 12.11.19 — DATE

WE 12/11/19 — CITY ENGINEER — DATE

DWG. NO. 53 H

REVISIONS			
NO.	DATE	BY	REMARKS

NOT ACCEPTABLE



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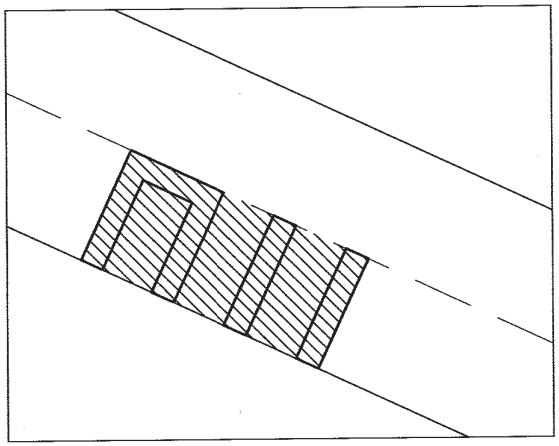

NOTES

1. IN THE CASE OF A SERIES OF PATCHES OR PATCHES FOR SERVICE LINES OFF A MAIN TRENCH, REPAIR THE PAVEMENT OVER THE PATCHES BY GRINDING AND OVERLAY WHEN THE SPACING BETWEEN THE PATCHES IS LESS THAN 10 FEET. IN CASES WHERE THE EXISTING PAVEMENT IS IN POOR CONDITION (IN THE STRATEGIC PAVING PLAN) AND MAY REQUIRE OVERLAY WITHIN THE NEXT FEW YEARS, THIS REQUIREMENT MAY BE MODIFIED OR WAIVED BY THE CITY ENGINEER.

NOT TO SCALE

CITY OF MEMPHIS
DIVISION OF ENGINEERING

DESIGN STANDARD

FOR

PAVEMENT REPAIR PATCHES IN SERIES

Chee Chew — CIVIL DESIGN ENGINEER — 12.11.19 — DATE

WZ 12/11/19 — CITY ENGINEER — DATE

DWG. NO. 53 I