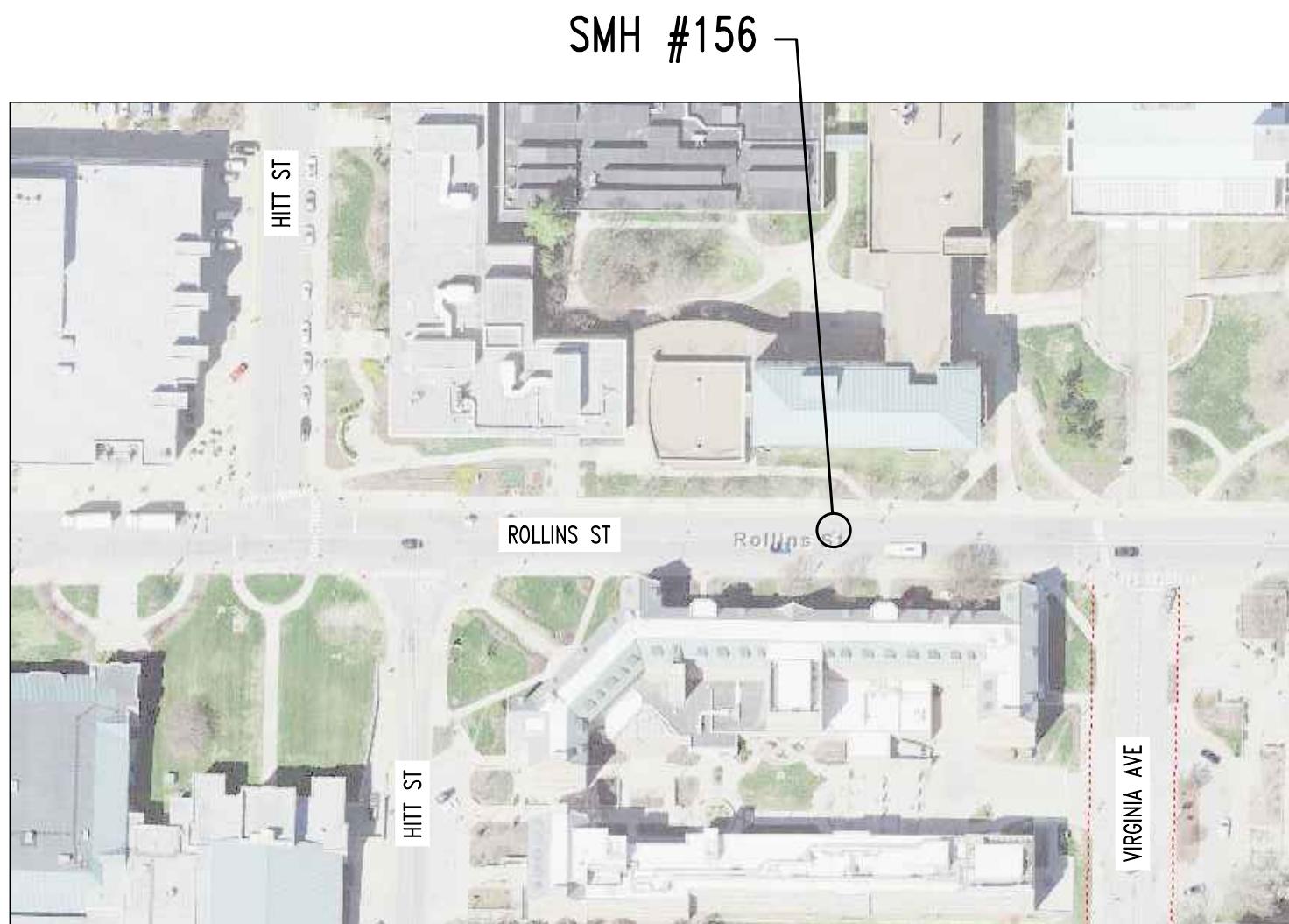
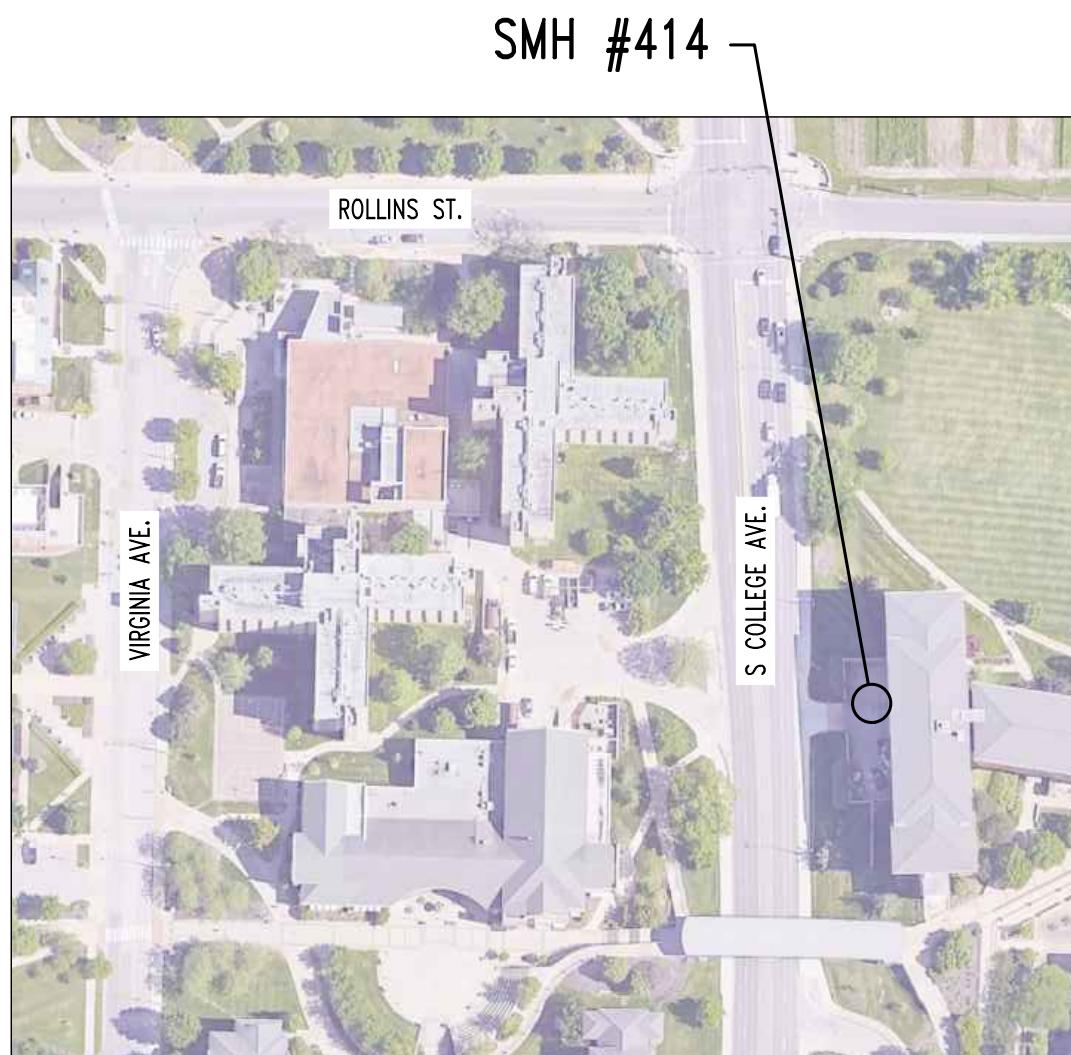


**University of Missouri  
For  
The Curators of the University of Missouri  
MU Project Number CP253191  
Advertisement Date: January 8, 2026  
General Site - Electric & Steam Manholes Concrete Repairs**

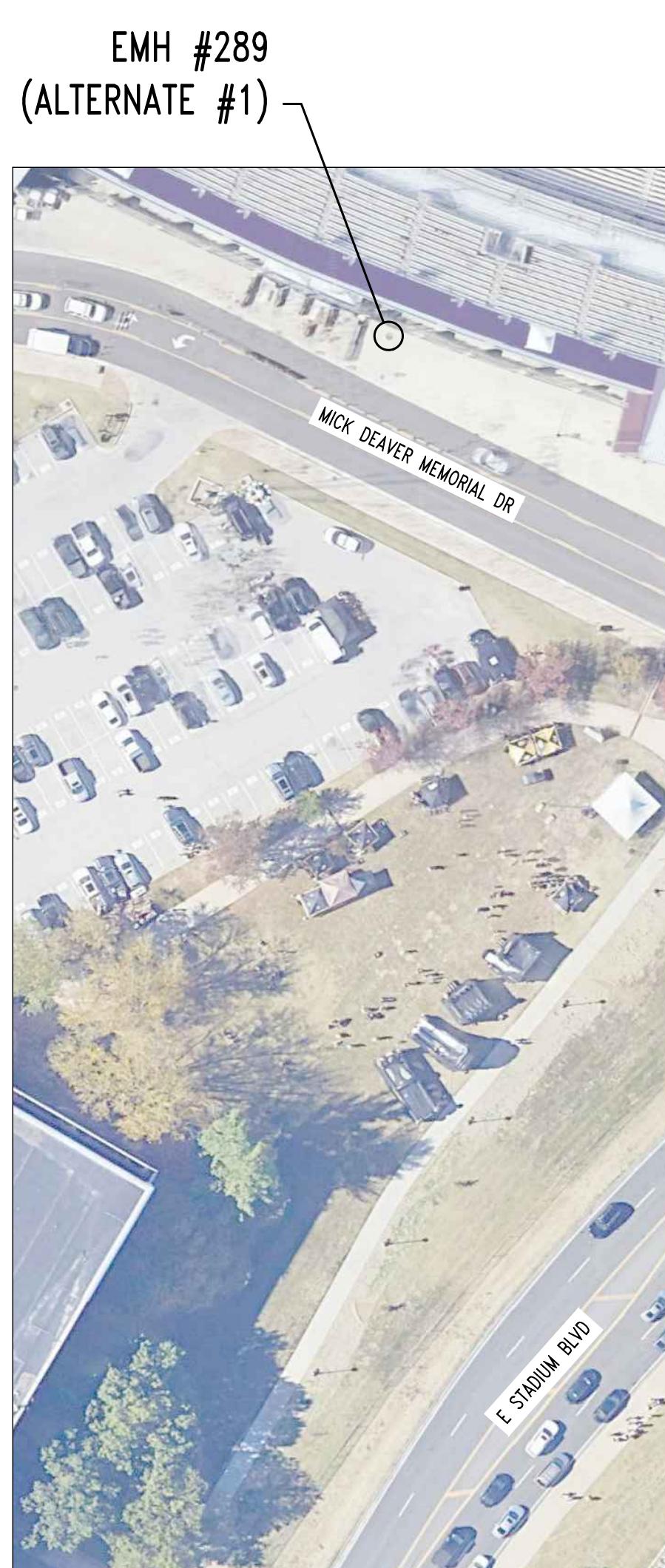
**Columbia, Boone County, Missouri**



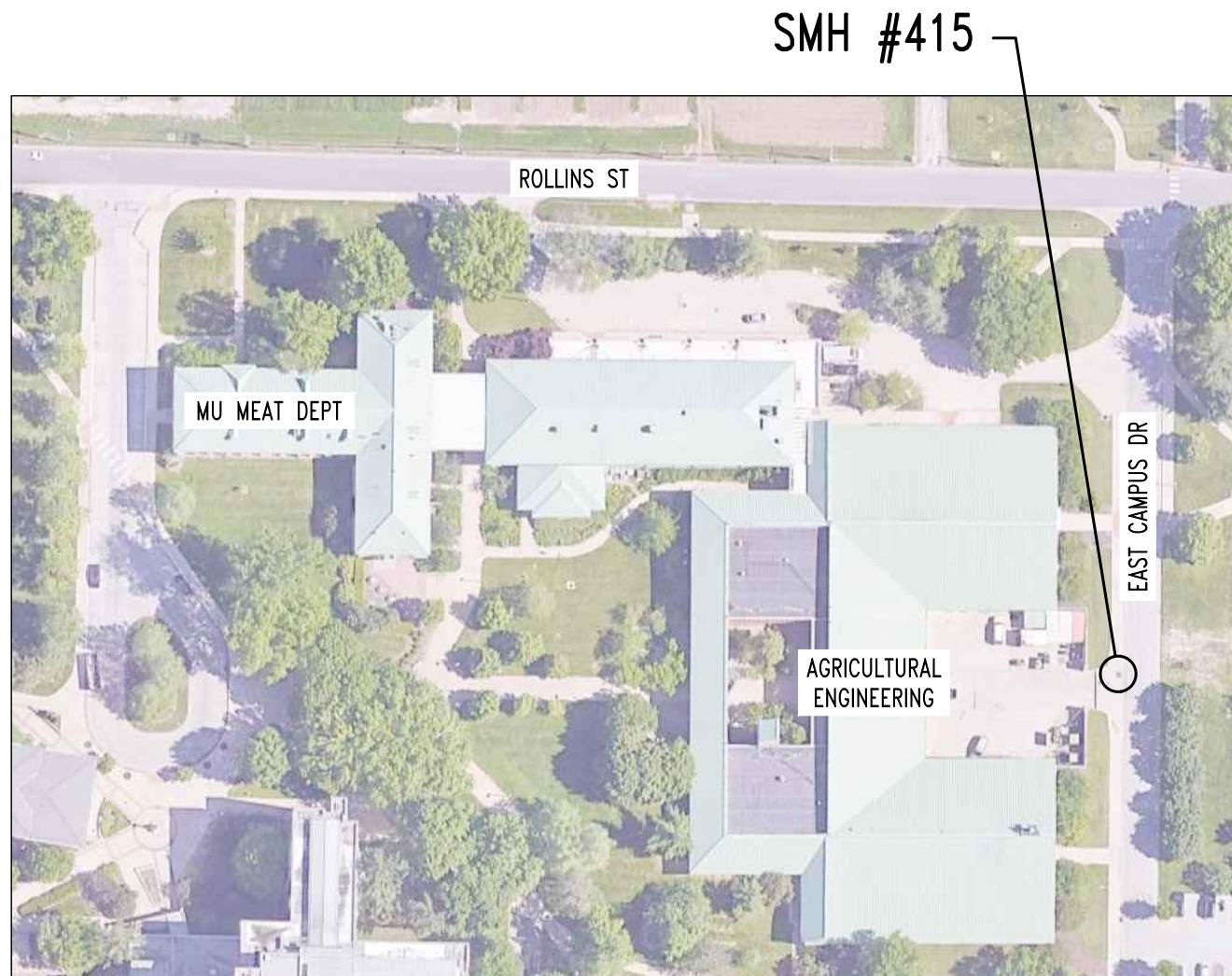
**STEAM & ELECTRIC MANHOLE REPAIR SITE PLAN**



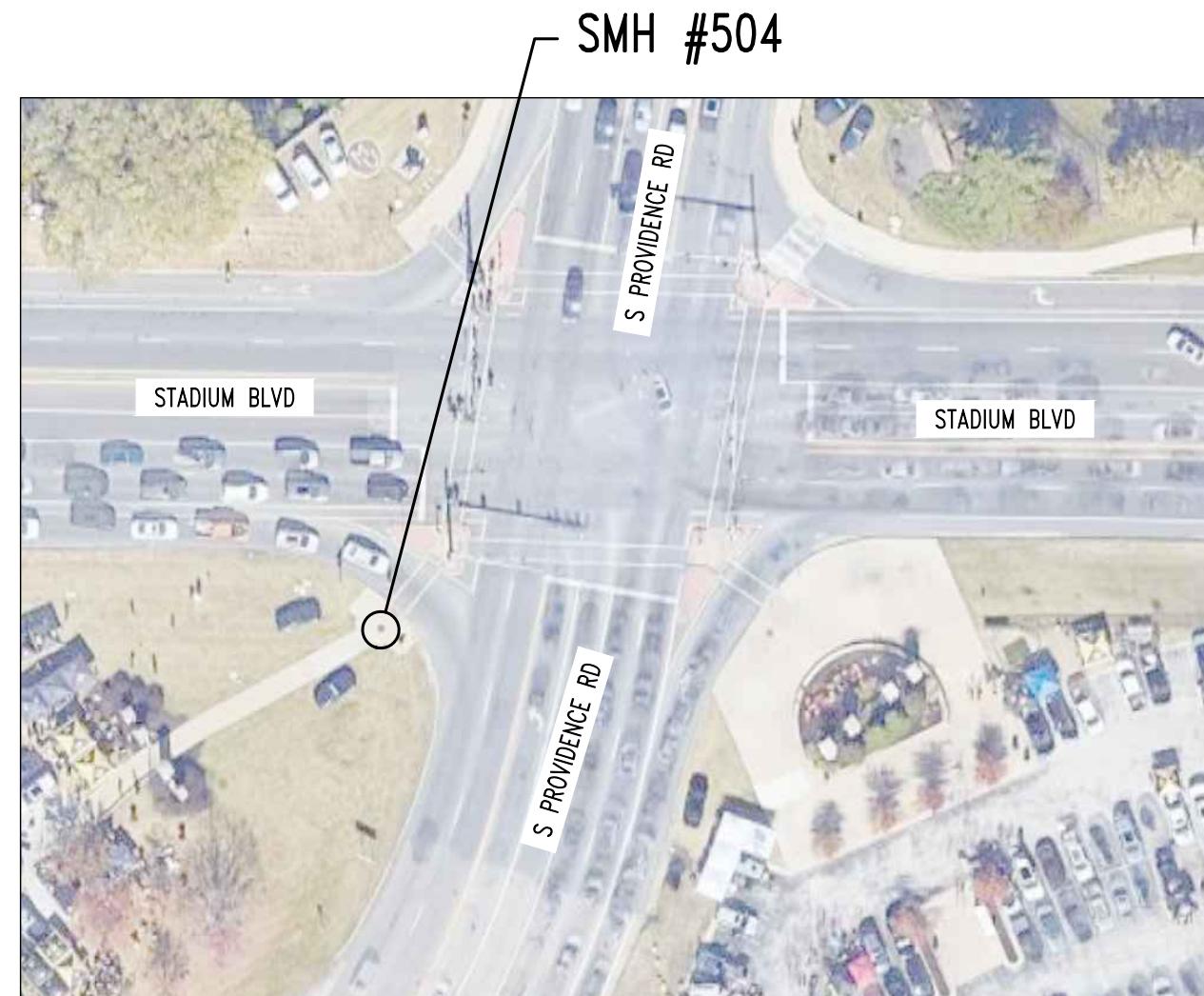
**STEAM MANHOLE REPAIR SITE PLAN**



**EMH #289  
(ALTERNATE #1)**



**STEAM & ELECTRIC MANHOLE REPAIR SITE PLAN**



**STEAM MANHOLE REPAIR SITE PLAN**



**ELECTRIC MANHOLE REPAIR SITE PLAN**



**CERTIFICATION:**

"I HEREBY CERTIFY THESE DRAWINGS AND / OR SPECIFICATIONS HAVE BEEN PREPARED BY ME, OR UNDER MY SUPERVISION, I FURTHER CERTIFY THAT TO THE BEST OF MY KNOWLEDGE THESE DRAWINGS AND / OR SPECIFICATIONS ARE AS REQUIRED BY AND IN COMPLIANCE WITH THE BUILDING CODES OF THE UNIVERSITY OF MISSOURI"

SIGNATURE: *Gregory L. Linnehan*

**CONTRACTOR NOTES:**

1. DISTURBANCE OF LANDSCAPE BEDS IS PROHIBITED & WILL BE REPAIRED @ CONTRACTOR'S EXPENSE.
2. CONTRACTOR IS NOT TO DISRUPT TRAFFIC FLOW.

**SPECIAL INSPECTIONS**

THE FOLLOWING ITEMS REQUIRE SPECIAL INSPECTION IN ACCORDANCE WITH CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE.

- a. CONCRETE GROUT DESIGN MIX (PERIODIC)
- b. PLACING OF CONCRETE AND REINFORCING STEEL (CONTINUOUS OR PERIODIC SAMPLING / PERIODIC REINFORCING)
- c. BOLTS & ANCHORS EMBEDDED IN CONCRETE (PERIODIC)
- d. POST INSTALLED ANCHORS IN CONCRETE (CONTINUOUS)

THE CONTRACTOR SHALL REQUEST SPECIAL INSPECTION OF THE ITEMS LISTED ABOVE PRIOR TO THOSE ITEMS BECOMING INACCESSIBLE AND UNOBSERVABLE DUE TO PROGRESSION OF THE WORK.

**ALTERNATE:**

ALTERNATE #1: REPAIR EMH #289 (SEE SHEET S105)

**SHEET INDEX:**

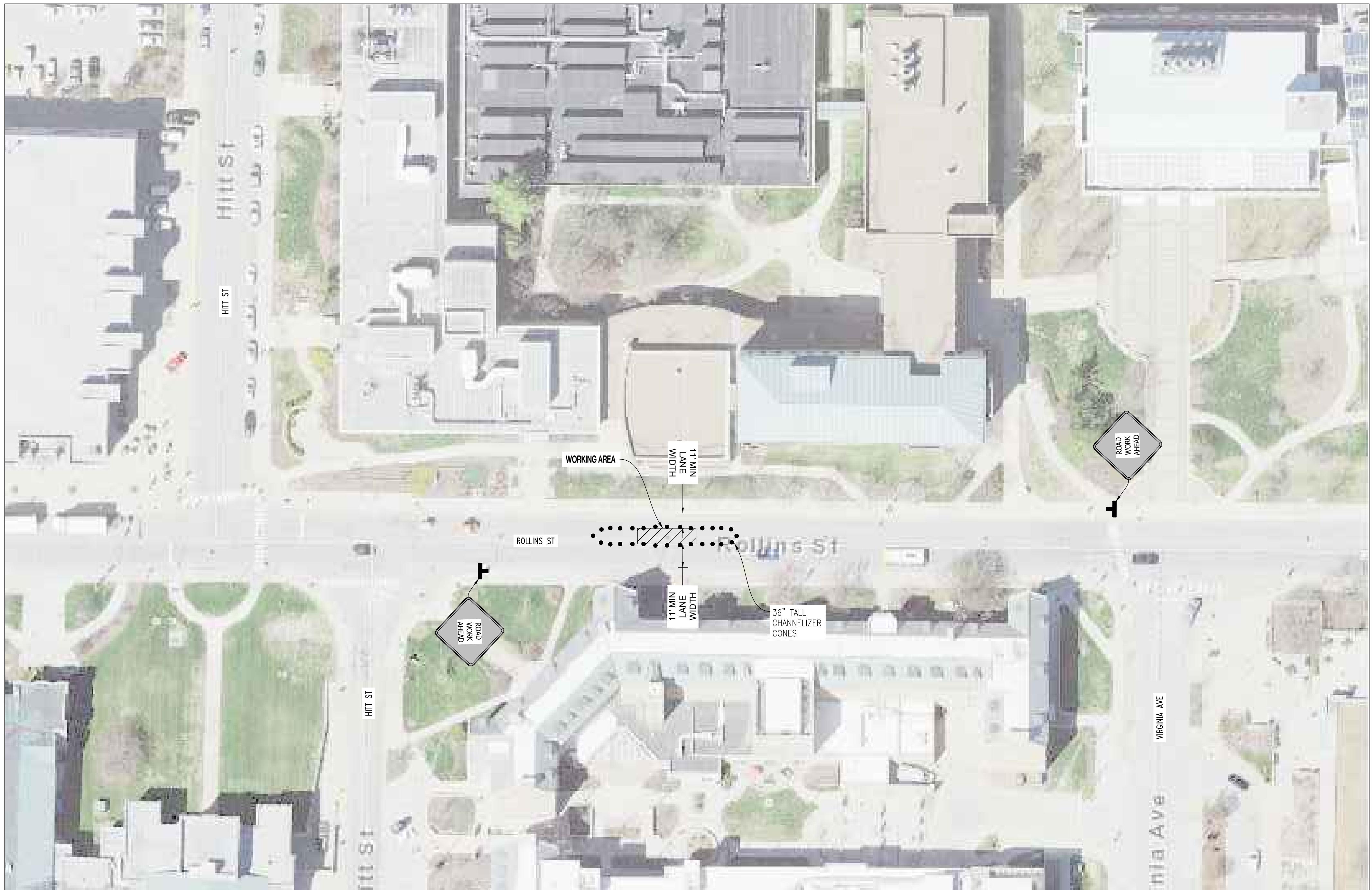
STRUCTURAL / CIVIL:  
COVER - COVER SHEET  
S100 - TRAFFIC CONTROL PLAN  
S101-S104 - MANHOLE PLANS AND SECTIONS  
S105 - MANHOLE PLANS AND SECTIONS (ALTERNATE)  
S200 - MANHOLE REPAIR DETAILS

REVISIONS:	
No. BID SET	Date 01/08/2026
1/8/26	
GREGORY L. LINNEHAN - PE MO LICENSE - 2005001013	

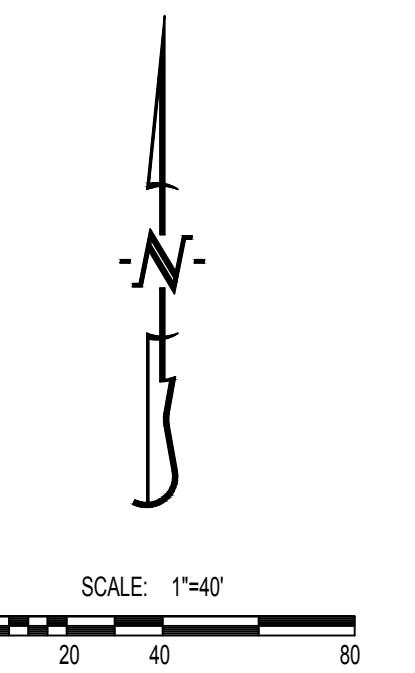
STRUCTURAL ENGINEER:	<b>CROCKETT</b> ENGINEERING CONSULTANTS 1000 W. Nifong Blvd., Bldg. 1 Columbia, Missouri 65203 (319) 471-0924 www.crockettengineering.com Crockett Engineering Consultants, LLC Missouri Certified State of Authority #2000151301
CLIENT:	UNIVERSITY OF MISSOURI 225 UNIVERSITY HALL COLUMBIA, MISSOURI 65211

CP253191 - General Site Electric & Steam Manholes Concrete Repairs COLUMBIA, BOONE COUNTY, MISSOURI
---

DRAWING INCLUDES:
COVER SHEET
DESIGNED: GLL
DRAWN: TGC
PROJECT NO.: 180016
MU PROJECT NO.: CP253191
SHEET: COVER



PLAN AT SMH #156 (SEE SHEET S101)



**GENERAL NOTES**

TRAFFIC CONTROL DEVICES SHALL COMPLY WITH THE MUTCD.

CONTRACTOR SHALL MAINTAIN A MINIMUM CLEAR LANE WIDTH OF 11' AT ALL TIMES.

CONTRACTOR SHALL REFER TO THE CURRENT EDITION OF THE MODOT MANUAL OF TRAFFIC CONTROL FOR FIELD OPERATIONS FOR INFORMATION ON THE PROPER DEPLOYMENT OF TRAFFIC CONTROL DEVICES.

BOTH LANES OF TRAFFIC TO REMAIN OPEN AT ALL TIMES.

**SCHEDULING OF CLOSURES**

ALL WORK IS TO BE DONE BETWEEN MAY 18, 2026 – AUGUST 14, 2026.  
CONTRACTOR IS TO SPECIFY EXACT DATES OF WORK

REGULARLY SCHEDULED WORK SHALL BE COMPLETED BETWEEN 7:00AM AND 7:00PM ON WEEKDAYS AND 8:00AM TO 5:00PM ON SATURDAYS. APPLICATION FOR EXTENDED WORK HOURS SHALL BE COMPLETED AND APPROVED BY THE DIRECTOR OF PUBLIC WORKS FOR ANY TIMES OTHER THAN THESE.

THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING CITY OF COLUMBIA SITE DEVELOPMENT AT LEAST ONE WEEK PRIOR TO THE START OF ANY CLOSURE ONCE CLOSURE APPROVAL HAS BEEN GIVEN.

CONTRACTOR IS RESPONSIBLE FOR NOTIFYING THE FOLLOWING AGENCIES, AS REQUIRED, IMMEDIATELY PRIOR TO CLOSURE OF STREET, DURING CONSTRUCTION FOR INSPECTIONS AND AGAIN WHEN WORK IS COMPLETE AND STREET IS REOPENED:

SITE DEVELOPMENT (ROW INSPECTIONS)	874-7474
BUILDING SAFETY (PLUMBING/BUILDING INSPECTIONS)	874-7474
JOINT COMMUNICATIONS (EMERGENCY SERVICES)	874-8471
COLUMBIA TRANSIT (CITY BUSES)	874-7282
PARKING ENFORCEMENT (PARKING METERS)	874-7674
PUBLIC WORKS STREET DIVISION (STREET PATCHING)	874-6289
UNIVERSITY OF MISSOURI POLICE DEPARTMENT	882-7201

TRAFFIC CONTROL DEVICE LEGEND (ALL SIGNS TO BE ORANGE OR FLUORESCENT ORANGE)		
	PLACE STANDARD HIGHWAY SIGN (MUTCD SIGN # W2-1 SHOULD READ "ROAD WORK AHEAD"). SIGN SHALL BE 48" X 48" MIN.	
	VEHICLE TO BE USED WITH WARNING DEVICE TO HELP WARN PASSING TRAFFIC AND CREATE A BARRIER TO WORKING AREA.	PLACE STANDARD CONE CHANNELIZER WITH REFLECTIVE BAND. CONE SHALL BE 36" MIN. TALL.

REVISIONS:	Date
No. BID SET	01/08/2026
1/8/26	
 STATE OF MISSOURI GREGORY L. LINNEMAN, PE NUMBER PE-2025001013	

STRUCTURAL ENGINEER:	<b>CROCKETT</b> ENGINEERING CONSULTANTS 1000 W. Nifong Blvd., Suite 1 Columbia, Missouri 65203 (319) 471-0962 Crockett Engineering Consultants, LLC Missouri State of Authority #2000151301
----------------------	--

CLIENT:	UNIVERSITY OF MISSOURI 225 UNIVERSITY HALL COLUMBIA, MISSOURI 65211
PROJECT:	CP25391 - General Site Electric & Steam Manholes Concrete Repairs UNIVERSITY OF MISSOURI COLUMBIA, BOONE COUNTY, MISSOURI

DRAWING INCLUDES:	TRAFFIC CONTROL PLAN
DESIGNED:	GLL
DRAWN:	TGC
PROJECT NO.:	180016
MU PROJECT NO.:	CP25391
SHEET:	S100

REVISIONS:  
No. Date  
BID SET 01/08/2026  
1/8/26  
STATE OF MISSOURI  
GREGORY L. LINNEMAN, PE  
NUMBER PE-205001013

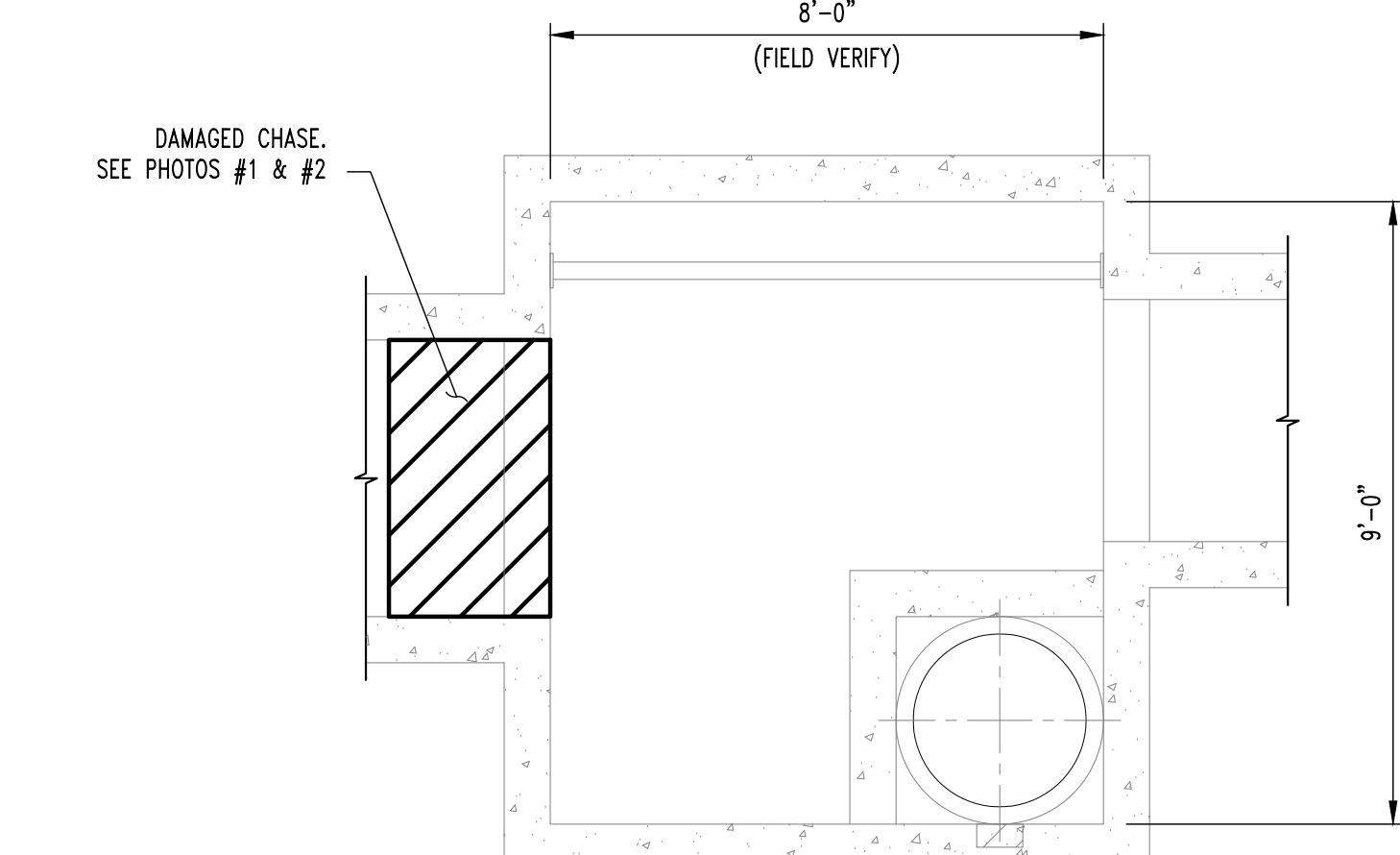
STRUCTURAL ENGINEER:  
**CROCKETT**  
ENGINEERING CONSULTANTS  
1000 W. Nifong Blvd., Bldg. 1  
Columbia, Missouri 65203  
(319) 471-0962  
Crockett Engineering Consultants, LLC  
Missouri Certified State of Authority  
#2000151301

CLIENT:  
UNIVERSITY  
OF MISSOURI  
225 UNIVERSITY HALL  
COLUMBIA, MISSOURI  
65211

CP253191 - General Site  
Electric & Steam Manholes Concrete Repairs  
UNIVERSITY OF MISSOURI  
COLUMBIA, BOONE COUNTY, MISSOURI

#### GENERAL NOTES

- CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL TEMPORARY COOLING AND VENTILATION AS NEEDED TO PERFORM WORK INSIDE THE MANHOLES AND TUNNEL. COOLING AND VENTILATION WILL BE REQUIRED FOR PORTIONS OF THIS PROJECT.
- ALL CONCRETE PATCHING/REPAIR DETAILS AND NOTES ARE PROVIDED ON SHEET S200.
- ALL NEW REINFORCING TO BE MMFX/CHROME X REBAR.
- ALL DAMAGE TO GALVANIZING TO BE REPAIRED w/ HOT GALVANIZING BY CONTRACTOR.
- ALL EXPOSED STEEL TO BE HOT DIPPED GALVANIZED INCLUDING BOLTS, WASHERS, ETC.
- COORDINATE ANY REQUIRED UTILITY SHUT DOWNS w/ MU PROJECT MANAGER.



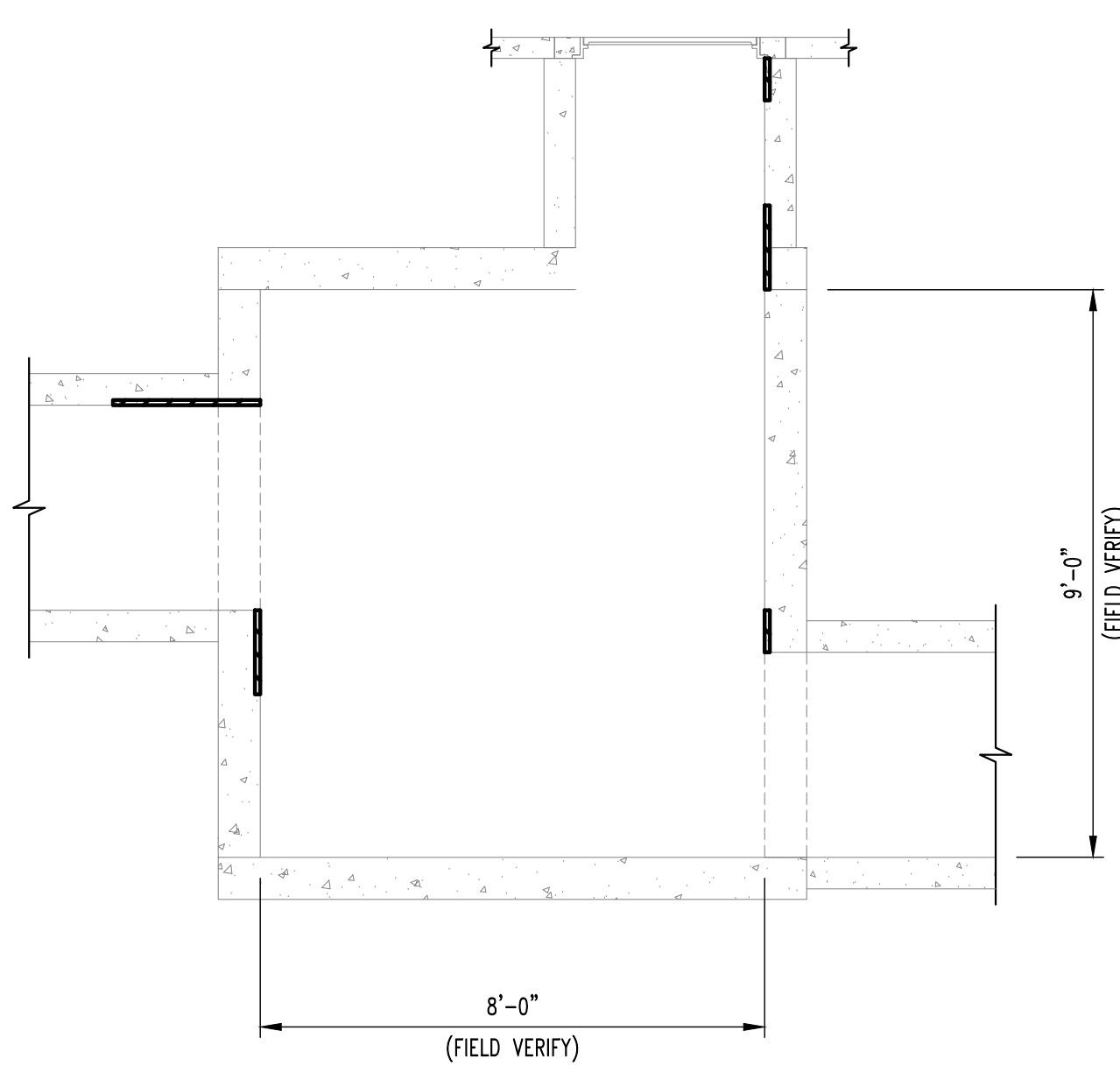
SMH #156 - ROLLINS ST.  
(PHOTO #1)



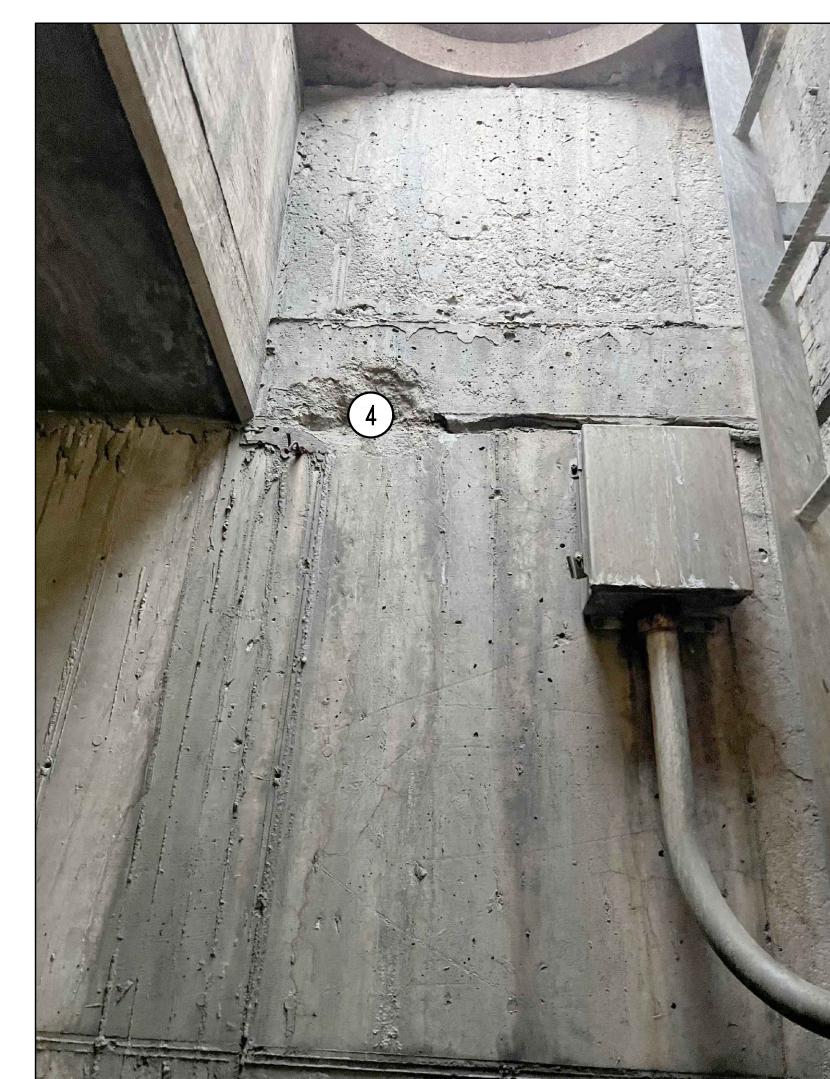
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(PHOTO #2)



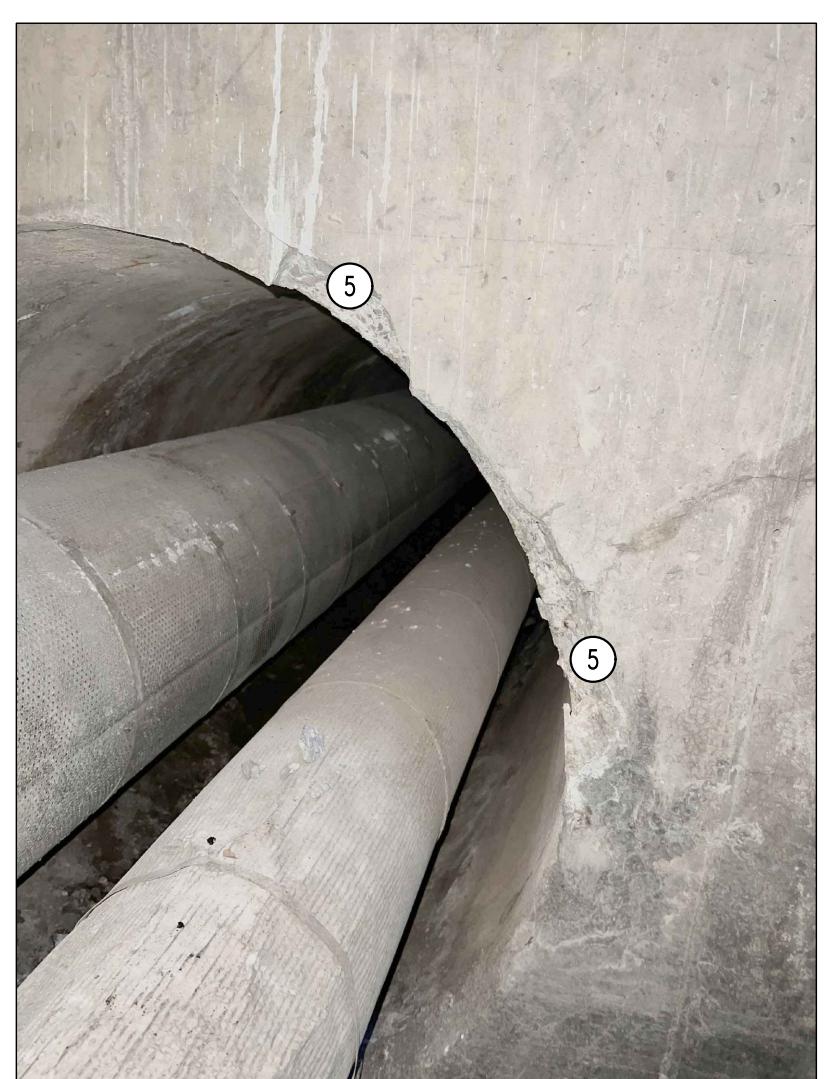
SMH #156 - ROLLINS ST.  
(PHOTO #3)



SMH #156 - ROLLINS ST.  
(PHOTO #4)



SMH #156 - ROLLINS ST.  
(PHOTO #5)



SMH #156 - ROLLINS ST.  
(PHOTO #6)

#### REPAIR NOTES

SMH #156 (ROLLINS STREET) APPROXIMATE REPAIR AREAS

- APPROX. 2'-0"x3'-0" CHASE LID SPALLING (EXPECT REPAIR #2).
- APPROX. 2'-0"x6'-0" PREVIOUS PATCH TO BE REMOVED & REPLACED (EXPECT REPAIR #2).
- APPROX. 12"x18" SPALLING UNDER MANHOLE LID (EXPECT REPAIR #2).
- APPROX. 12"x12" SPALLING @ MANHOLE LID TO RISER ON EAST SIDE (EXPECT REPAIR #2).
- APPROX. 16"x18" SPALLING @ EAST CHASE (EXPECT REPAIR #3).

DRAWING INCLUDES:  
SMH #156  
ROLLINS ST.  
PLAN & PHOTOS

DESIGNED: GLL  
DRAWN: TGC  
PROJECT NO.: 180016  
MU PROJECT NO.: CP253191  
SHEET: S101

REVISIONS:  
No. Date  
BID SET 01/08/2026  
1/8/26  
STATE OF MISSOURI  
GREGORY L. LINNEMAN, P.E.  
NUMBER PE-205001013  
GREGORY L. LINNEMAN - PE  
MO LICENSE - 205001013

#### GENERAL NOTES

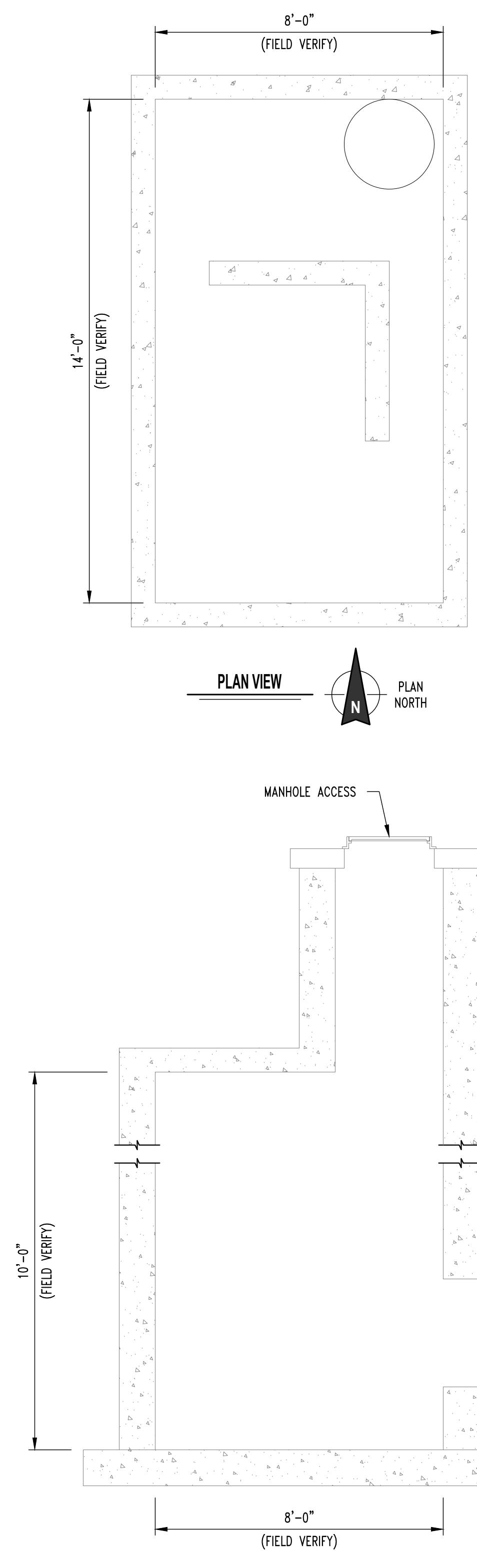
- CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL TEMPORARY COOLING AND VENTILATION AS NEEDED TO PERFORM WORK INSIDE THE MANHOLES AND TUNNEL. COOLING AND VENTILATION WILL BE REQUIRED FOR PORTIONS OF THIS PROJECT.
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- ALL NEW REINFORCING TO BE MMFX/CHROME X REBAR.
- ALL DAMAGE TO GALVANIZING TO BE REPAIRED w/ HOT GALVANIZING BY CONTRACTOR.
- ALL EXPOSED STEEL TO BE HOT DIPPED GALVANIZED INCLUDING BOLTS, WASHERS, ETC.
- COORDINATE ANY REQUIRED UTILITY SHUT DOWNS w/ MU PROJECT MANAGER.

STRUCTURAL ENGINEER:  
**CROCKETT**  
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1000 W. Nifong Blvd., Bldg. 1  
Columbia, Missouri 65203  
(319) 471-0992  
www.crockettengineering.com  
Crockett Engineering Consultants, LLC  
Missouri Certified State of Authority  
#2000151301

CLIENT:  
**UNIVERSITY OF MISSOURI**  
225 UNIVERSITY HALL  
COLUMBIA, MISSOURI  
65211  
**UNIVERSITY OF MISSOURI**  
COLUMBIA, BOONE COUNTY, MISSOURI

DRAWING INCLUDES:  
SMH #414  
SOUTH COLLEGE AVE.  
PLAN & PHOTOS

DESIGNED: GLL  
DRAWN: TGC  
PROJECT NO.: 180016  
MU PROJECT NO.: CP253191  
SHEET: S102



① CONCRETE SPALLING SOUTH SIDE OF EAST/WEST ANCHOR WALL @ WEST END, SEE NOTE #1.  
② OWNER TO REMOVE PRIOR TO REPAIRS.

SMH #414 - SOUTH COLLEGE AVE.  
(PHOTO #1)

③ CONCRETE SPALLING SOUTH WALL OF MANHOLE, SEE NOTE #2.

SMH #414 - SOUTH COLLEGE AVE.  
(PHOTO #2)

④ CONCRETE SPALLING WEST SIDE OF NORTH/SOUTH ANCHOR WALL @ SOUTH END, SEE NOTE #3.

SMH #414 - SOUTH COLLEGE AVE.  
(PHOTO #3)

⑤ CONCRETE SPALLING UNDER NORTH CHASE, SEE NOTE #4.

SMH #414 - SOUTH COLLEGE AVE.  
(PHOTO #4)

#### REPAIR NOTES

##### SMH #414 APPROXIMATE REPAIR AREAS

- 24"x36" CONCRETE REPAIR ON ANCHOR WALL (EXPECT REPAIR #3).
- SOUTH WALL REPAIR SPALL, 3'-0"x4'-0" AREA (EXPECT REPAIR #2).
- REBAR ANCHORAGE CONCRETE REPAIR, 1'-0"x2"x0" AREA (EXPECT REPAIR #2).
- 36"x36" CONCRETE REPAIR ON NORTH WALL (EXPECT REPAIR #2).

REVISIONS:  
No. Date  
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1/26  
STATE OF MISSOURI  
GREGORY L. LINNEMAN, PE  
NUMBER PE-205001013  
1/8/26  
GREGORY L. LINNEMAN - PE  
MO LICENSE # 205001013

STRUCTURAL ENGINEER:  
**CROCKETT**  
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1000 W. Nifong Blvd., Bldg. 1  
Columbia, Missouri 65263  
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OF MISSOURI  
225 UNIVERSITY HALL  
COLUMBIA, MISSOURI  
65211

**CP253191 - General Site**  
**Electric & Steam Manholes Concrete Repairs**  
COLUMBIA, BOONE COUNTY, MISSOURI

DRAWING INCLUDES:  
SMH #415  
EAST OF AG  
ENGINEERING  
PLAN & PHOTOS

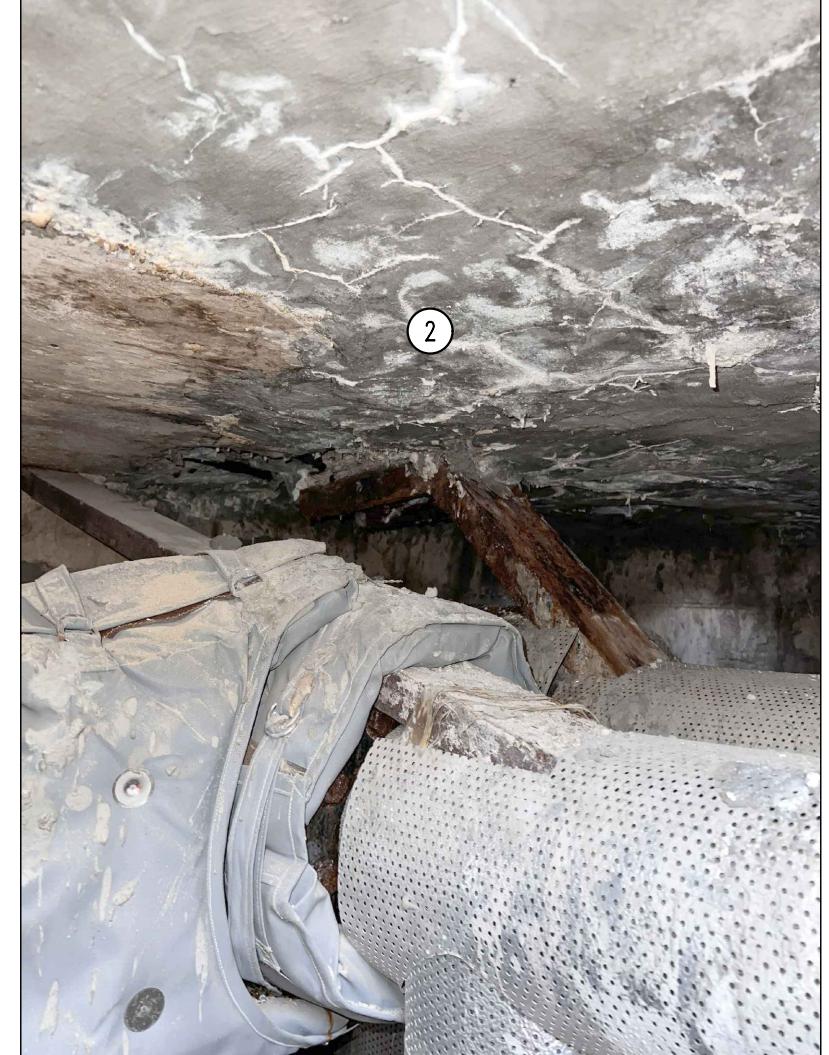
DESIGNED: GLL  
DRAWN: TGC  
PROJECT NO.: 180016  
MU PROJECT NO.: CP253191  
SHEET: S103

## GENERAL NOTES

1. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL TEMPORARY COOLING AND VENTILATION AS NEEDED TO PERFORM WORK INSIDE THE MANHOLES AND TUNNEL. COOLING AND VENTILATION WILL BE REQUIRED FOR PORTIONS OF THIS PROJECT.
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3. ALL NEW REINFORCING TO BE MMFX/CHROME X REBAR.
4. ALL DAMAGE TO GALVANIZING TO BE REPAIRED w/ HOT GALVANIZING BY CONTRACTOR.
5. ALL EXPOSED STEEL TO BE HOT DIPPED GALVANIZED INCLUDING BOLTS, WASHERS, ETC.
6. COORDINATE ANY REQUIRED UTILITY SHUT DOWNS w/ MU PROJECT MANAGER.



SMH #415 - EAST OF AG ENGINEERING  
(PHOTO #1)



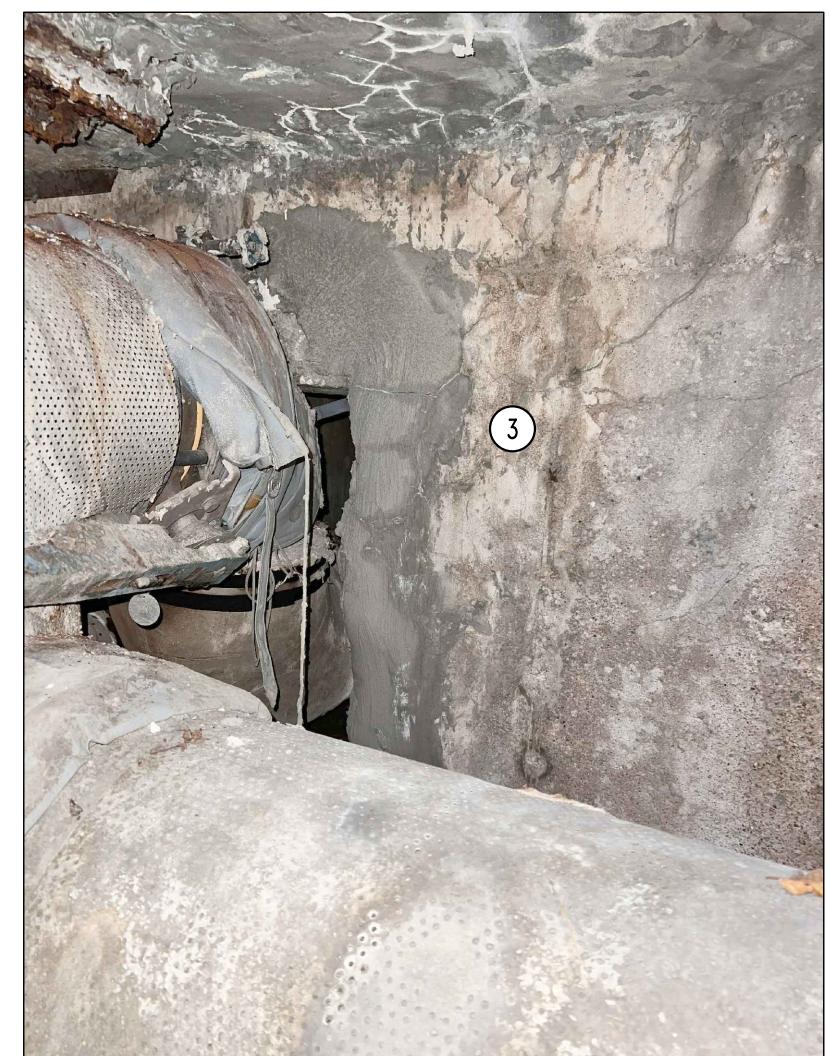
SMH #415 - EAST OF AG ENGINEERING  
(PHOTO #2)



SMH #415 - EAST OF AG ENGINEERING  
(PHOTO #3)



SMH #415 - EAST OF AG ENGINEERING  
(PHOTO #4)



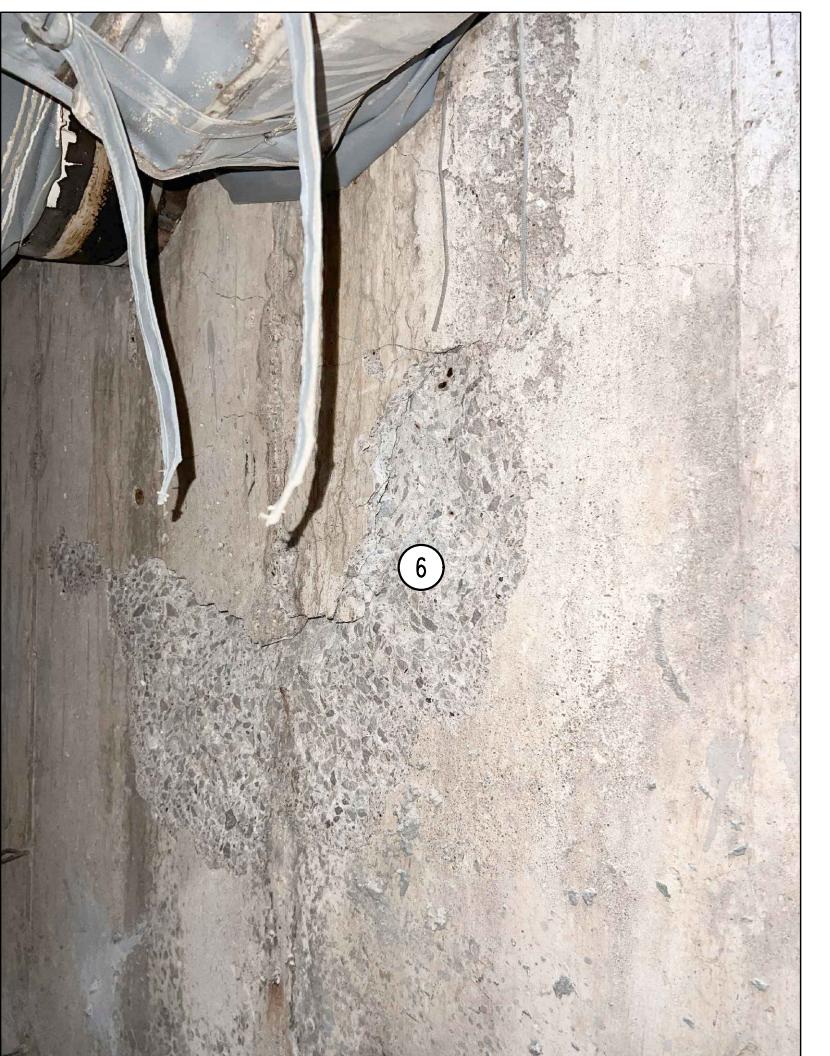
SMH #415 - EAST OF AG ENGINEERING  
(PHOTO #5)



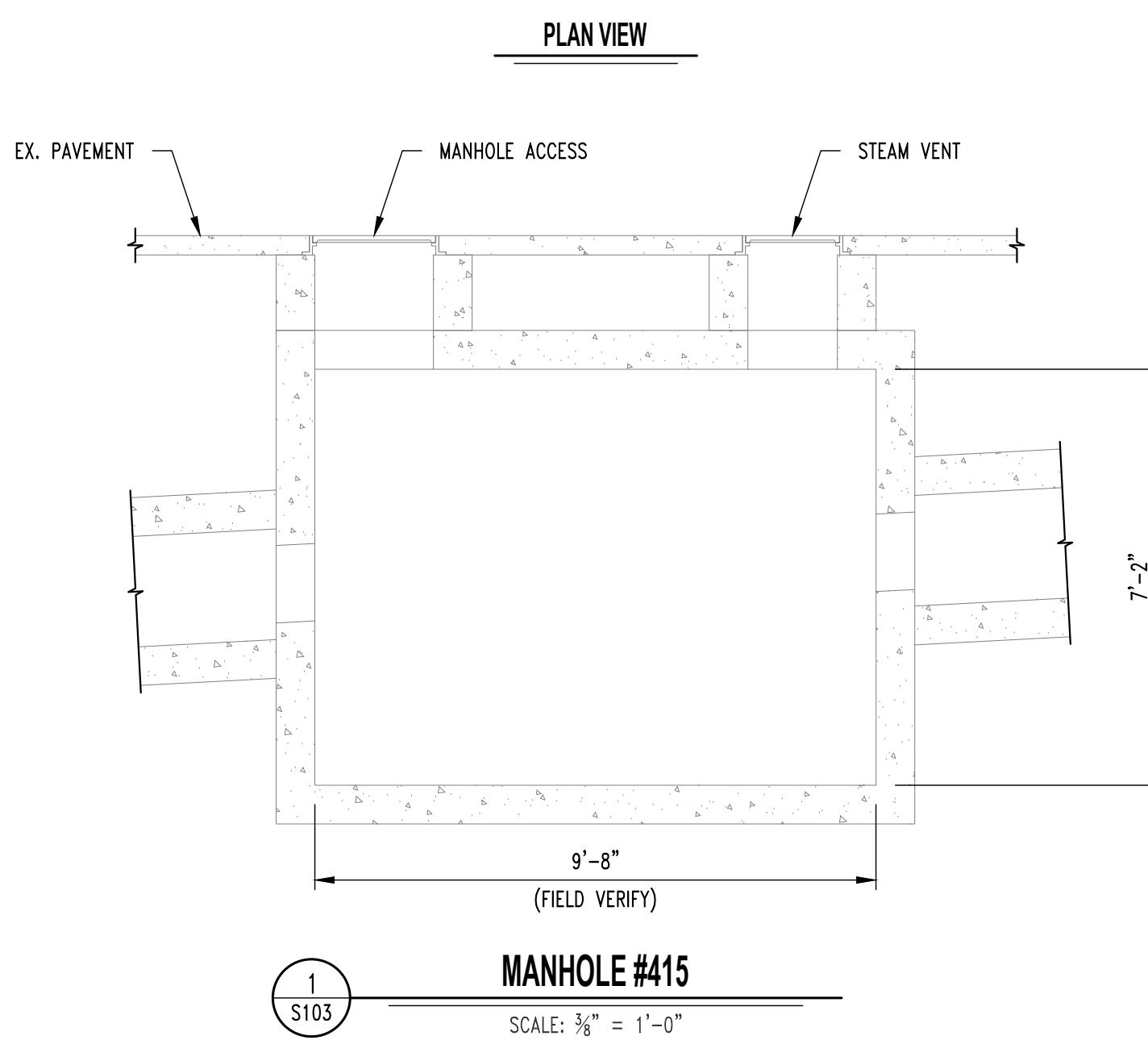
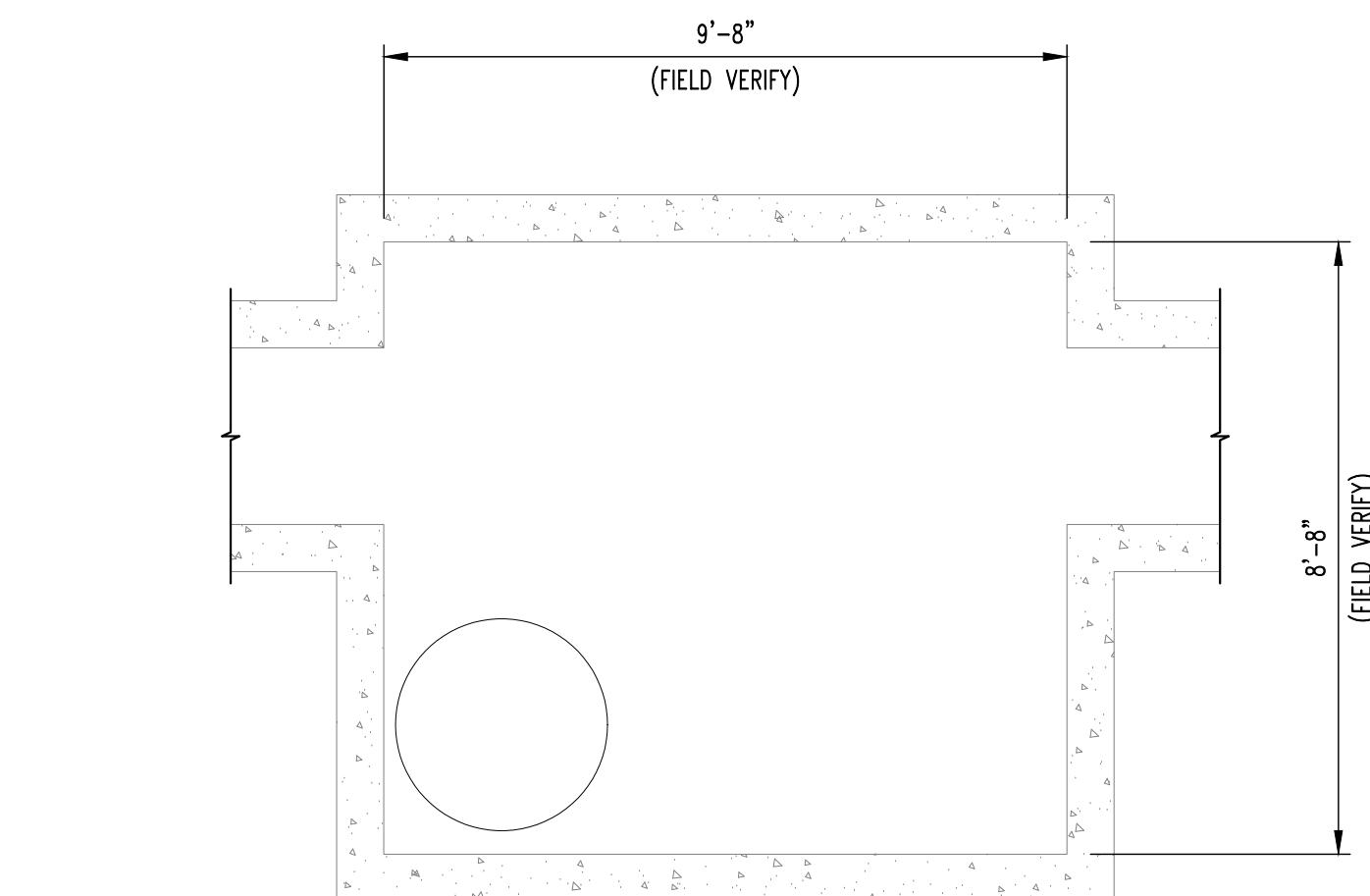
SMH #415 - EAST OF AG ENGINEERING  
(PHOTO #6)



SMH #415 - EAST OF AG ENGINEERING  
(PHOTO #7)



SMH #415 - EAST OF AG ENGINEERING  
(PHOTO #8)



## REPAIR NOTES

### SMH #415 APPROXIMATE REPAIR AREAS

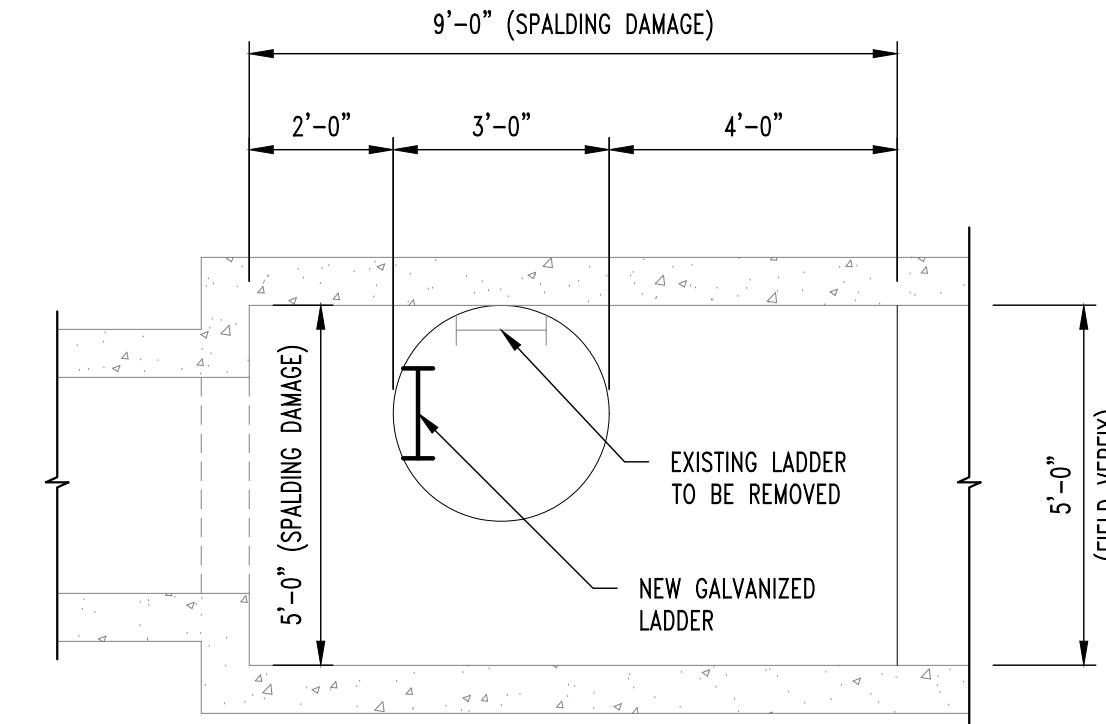
1. EAST WALL CONCRETE SPALLING 48" x 48" (EXPECT REPAIR #2).
2. FULL LID CONCRETE SPALLING & PRIOR PATCHING FAILURE (EXPECT REPAIR #2).
3. SOUTH WALL CONCRETE SPALLING 48" x 48" (EXPECT REPAIR #2).
4. WEST CONCRETE ANCHOR SPALLING 30" x 48" (EXPECT REPAIR #3). (NOTE: ONLY REMOVE LOOSE MATERIAL & PATCH BACK)
5. EAST CONCRETE ANCHOR SPALLING 30" x 48" (EXPECT REPAIR #3). (NOTE: ONLY REMOVE LOOSE MATERIAL & PATCH BACK)
6. NORTH WALL CONCRETE SPALLING 36" x 36" (EXPECT REPAIR #2).

### GENERAL NOTES

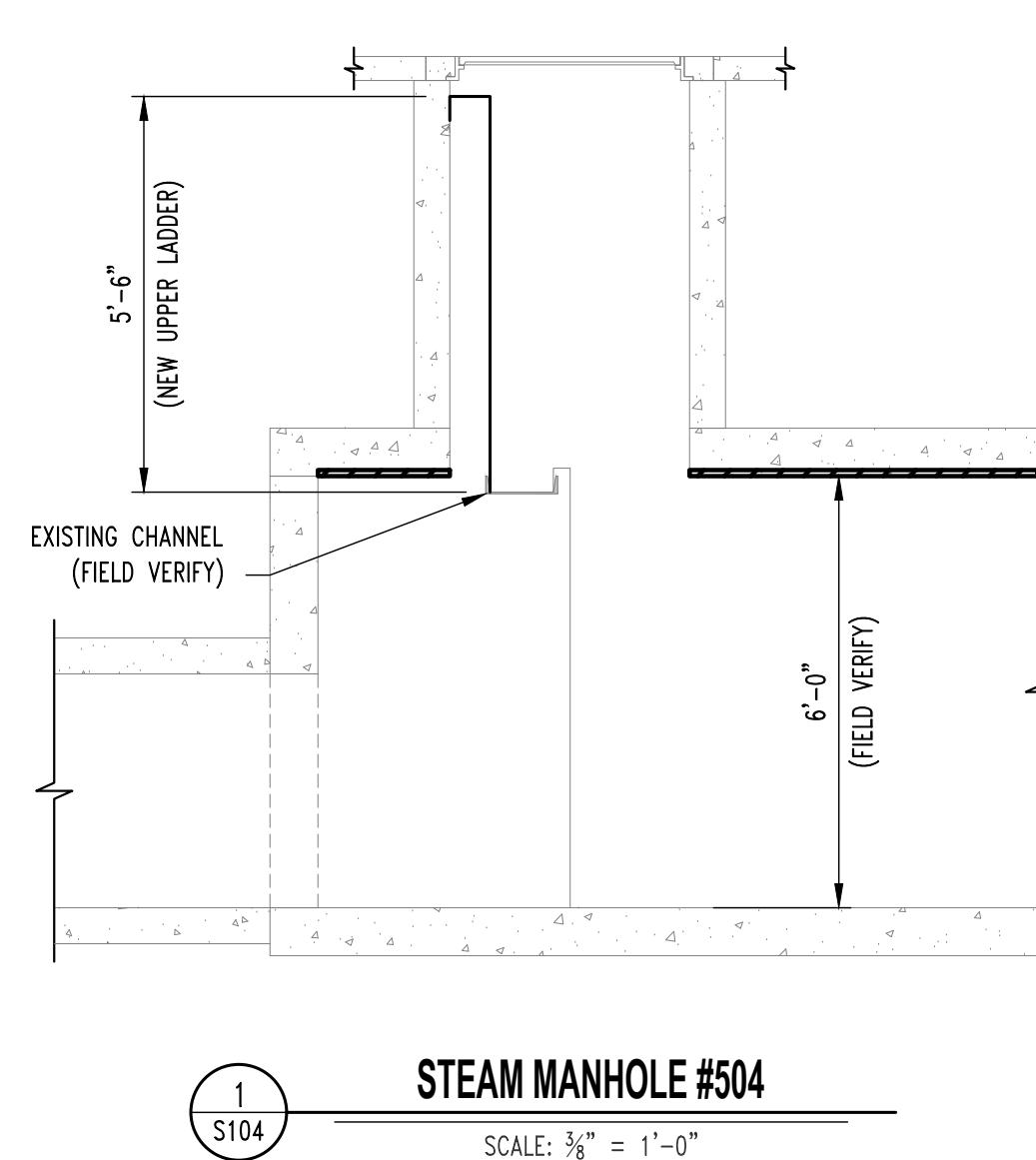
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- ALL EXPOSED STEEL TO BE HOT DIPPED GALVANIZED INCLUDING BOLTS, WASHERS, ETC.
- COORDINATE ANY REQUIRED UTILITY SHUT DOWNS w/ MU PROJECT MANAGER.

REVISIONS:	
No.	Date
BID SET	01/08/2026

1/8/26  
GREGORY L. LINNEMAN - PE  
MO LICENSE - 205001013



PLAN VIEW  
N  
PLAN NORTH



STEAM MANHOLE #504  
S104

SCALE:  $\frac{3}{8}$ " = 1'-0"



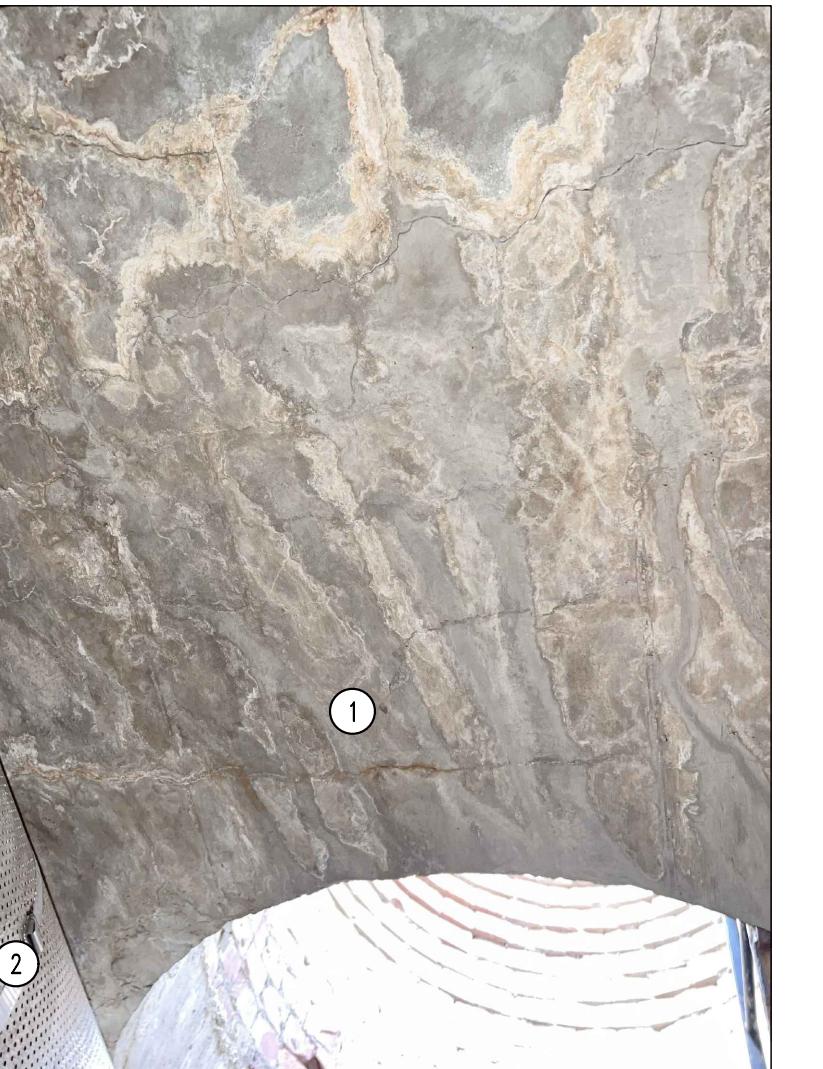
① LID CONCRETE SPALLING. SEE NOTE #1.

SMH #504 - WEST SIDE OF NORTH PROVIDENCE TUNNEL  
(PHOTO #1)



② REMOVE EXISTING LADDER @ NORTH SIDE.  
③ NEW 20" WIDE x 66" TALL GALVANIZED LADDER w/ #6 REBAR RUNGS  
INSTALLED ON WEST SIDE OF MANHOLE. PROVIDE  $\frac{1}{4}$ " BENT PLATE &  $\frac{1}{2}$ "  
GALVANIZED A307 THREADED ROD w/ 4" HILTI HY-270 EPOXY EMBEDMENT.  
TOTAL (4) ANCHORS (FIELD VERIFY DIMENSIONS PRIOR TO FABRICATION).

SMH #504 - WEST SIDE OF NORTH PROVIDENCE TUNNEL  
(PHOTO #2)



① LID EAST SIDE OF RISER CONCRETE SPALL. SEE NOTE #1.  
② PROTECT STEAM PIPE FROM FALLING DEBRIS.

SMH #504 - WEST SIDE OF NORTH PROVIDENCE TUNNEL  
(PHOTO #3)

CP25391 - General Site  
Electric & Steam Manholes Concrete Repairs  
UNIVERSITY OF MISSOURI  
COLUMBIA, MISSOURI  
COLUMBIA, BOONE COUNTY, MISSOURI

DRAWING INCLUDES:  
SMH #504  
WEST SIDE OF NORTH  
PROVIDENCE TUNNEL  
PLAN & PHOTOS

DESIGNED: GLL  
DRAWN: TGC  
PROJECT NO.: 180016  
MU PROJECT NO.: CP25391  
SHEET: S104

### REPAIR NOTES

SMH #504 APPROXIMATE REPAIR AREAS

1. ROOF CONCRETE SPALL 5'-0"x9'-0". EXPECT REPAIR #3.

REVISIONS:  
No. Date  
BID SET 01/08/2026  
1/8/26  
STATE OF MISSOURI  
GREGORY L. LINNEMAN, P.E.  
NUMBER PE-205001013  
MO LICENSE #205001013

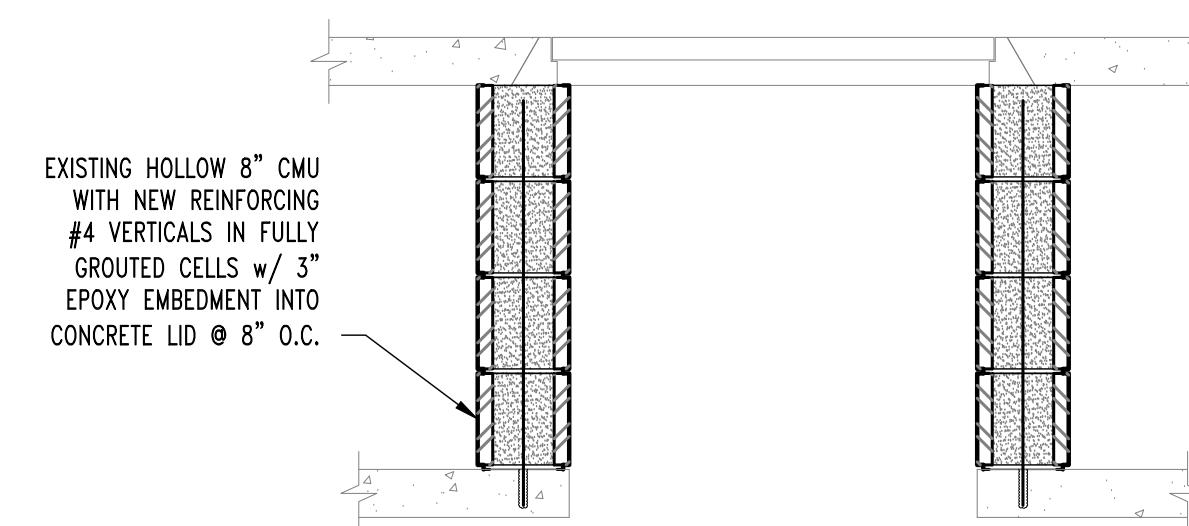
STRUCTURAL ENGINEER:  
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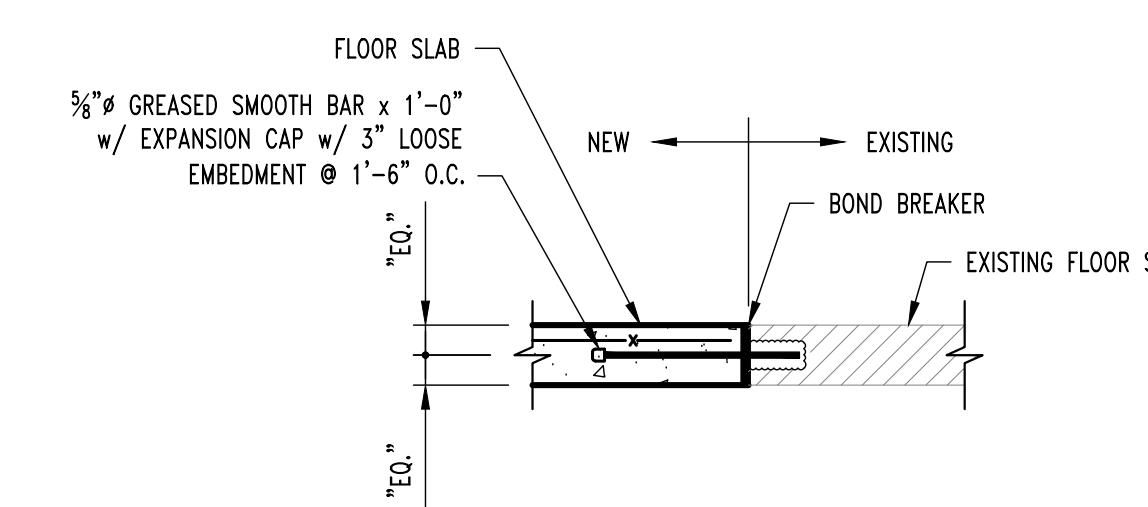
CP253191 - General Site  
Electric & Steam Manholes Concrete Repairs  
UNIVERSITY OF MISSOURI  
COLUMBIA, BOONE COUNTY, MISSOURI

DRAWING INCLUDES:  
EMH #289  
E OF EAST STADIUM  
PRESSBOX  
PLAN & PHOTOS  
(ALTERNATE #1)

DESIGNED: GLL  
DRAWN: TGC  
PROJECT NO.: 180016  
MU PROJECT NO.: CP253191  
SHEET: S105



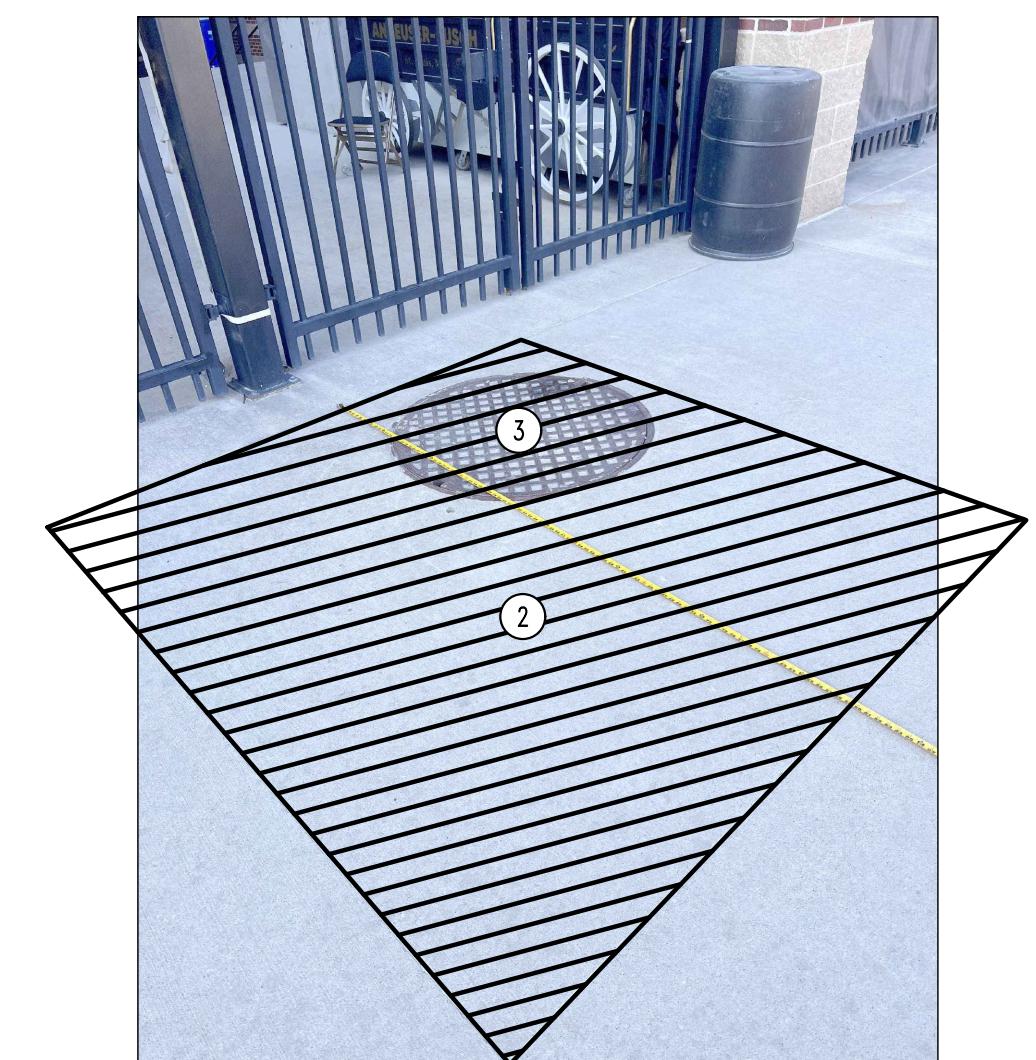
**ELECTRICAL MANHOLE #289**  
S105  
SCALE:  $\frac{1}{4}$ " = 1'-0"  
(ALTERNATE #1)



**TYPICAL NEW SLAB TO EXISTING SLAB SECTION**  
(ALTERNATE #1)



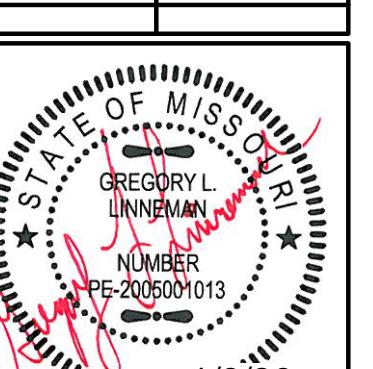
**EMH #289 - E OF EAST STADIUM PRESSBOX**  
(PHOTO #1)  
(ALTERNATE #1)



**EMH #289 - E OF EAST STADIUM PRESSBOX**  
(PHOTO #2)  
(ALTERNATE #1)

1/8/26  
GREGORY L. LINNEMAN - PE  
MO LICENSE #205001013

REVISIONS:  
No. Date  
BID SET 01/08/2026



STRUCTURAL ENGINEER:  
**CROCKETT**  
ENGINEERING CONSULTANTS  
1000 W. Nifong Blvd., Bldg. 1  
Columbia, Missouri 65203  
(319) 471-0992  
Crockett Engineering Consultants, LLC  
Missouri Certified State of Authority  
#2000151301

CLIENT:  
UNIVERSITY  
OF MISSOURI  
225 UNIVERSITY HALL  
COLUMBIA, MISSOURI  
65211

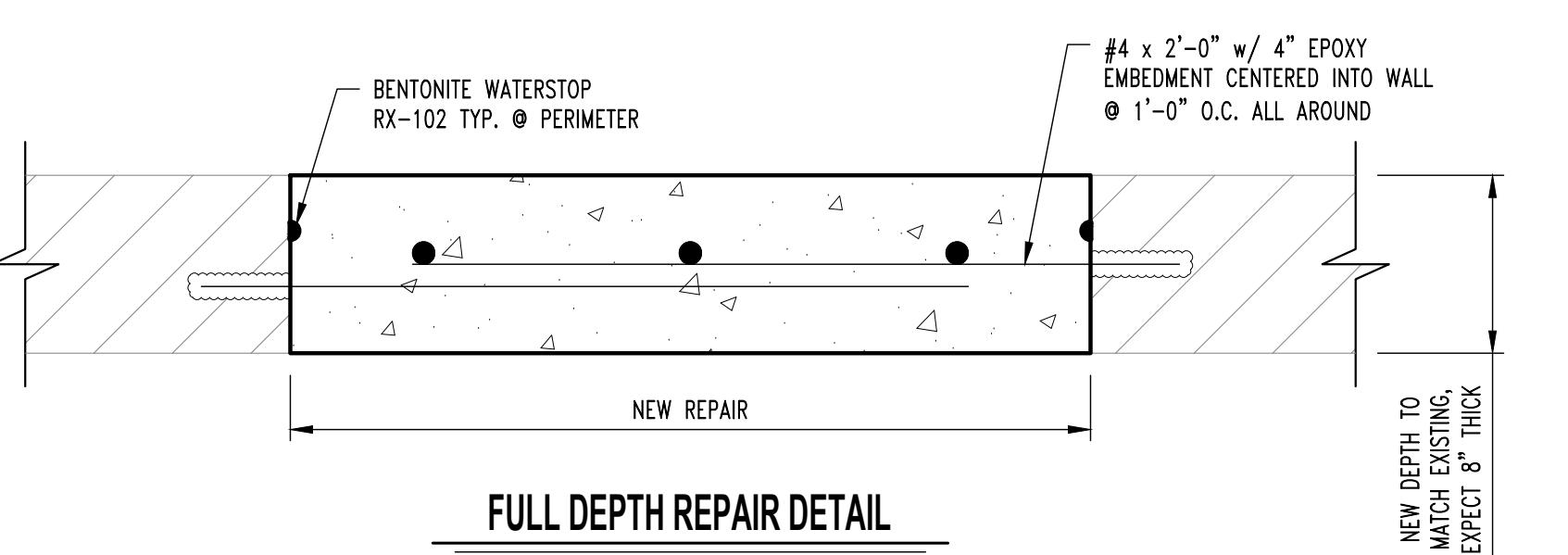
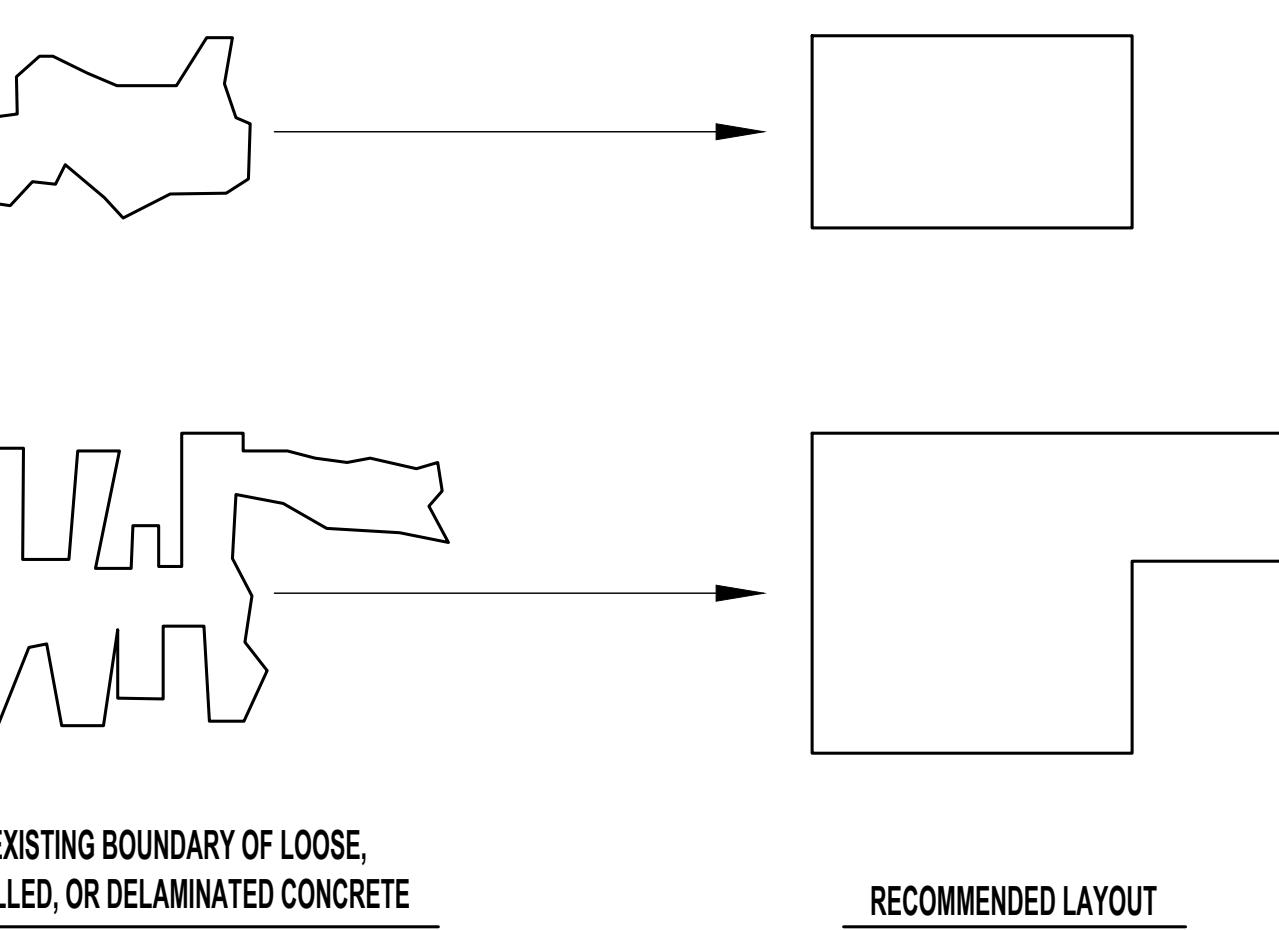
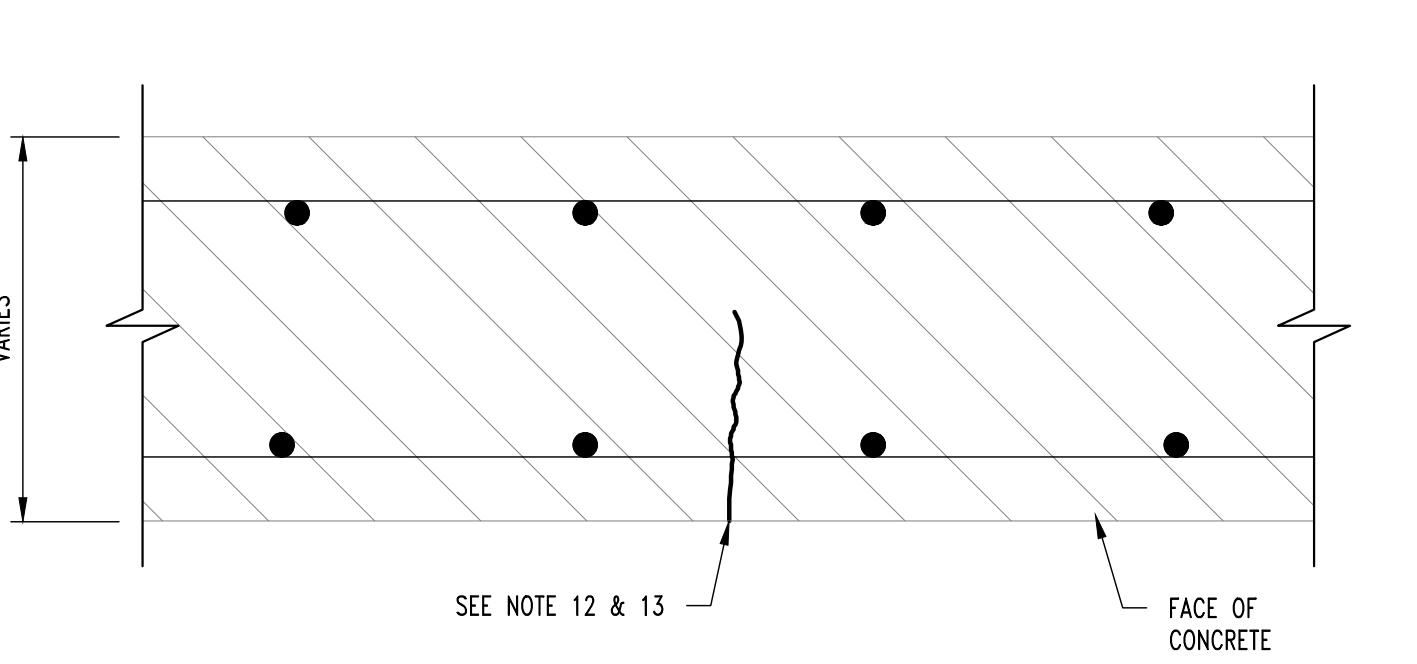
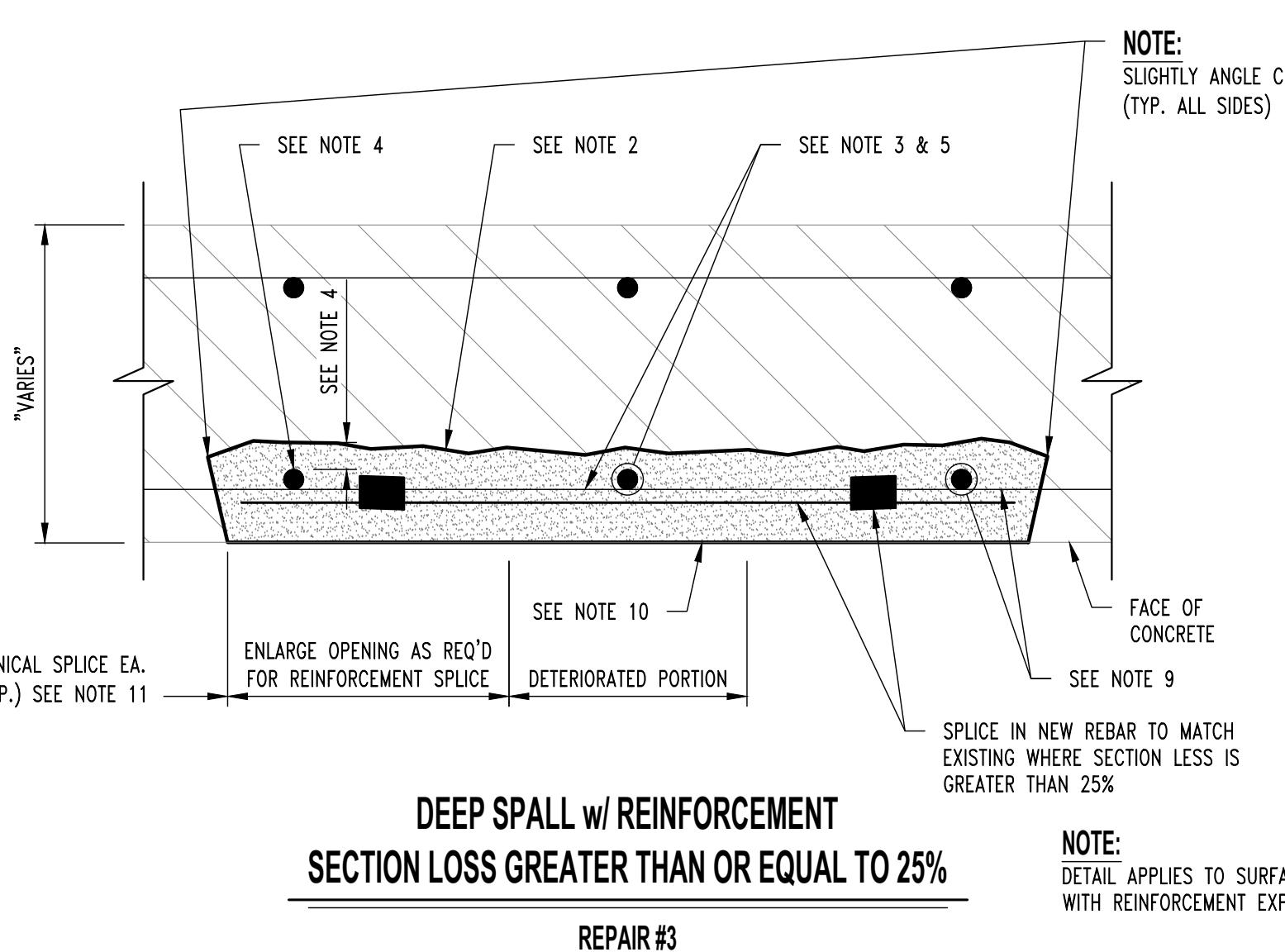
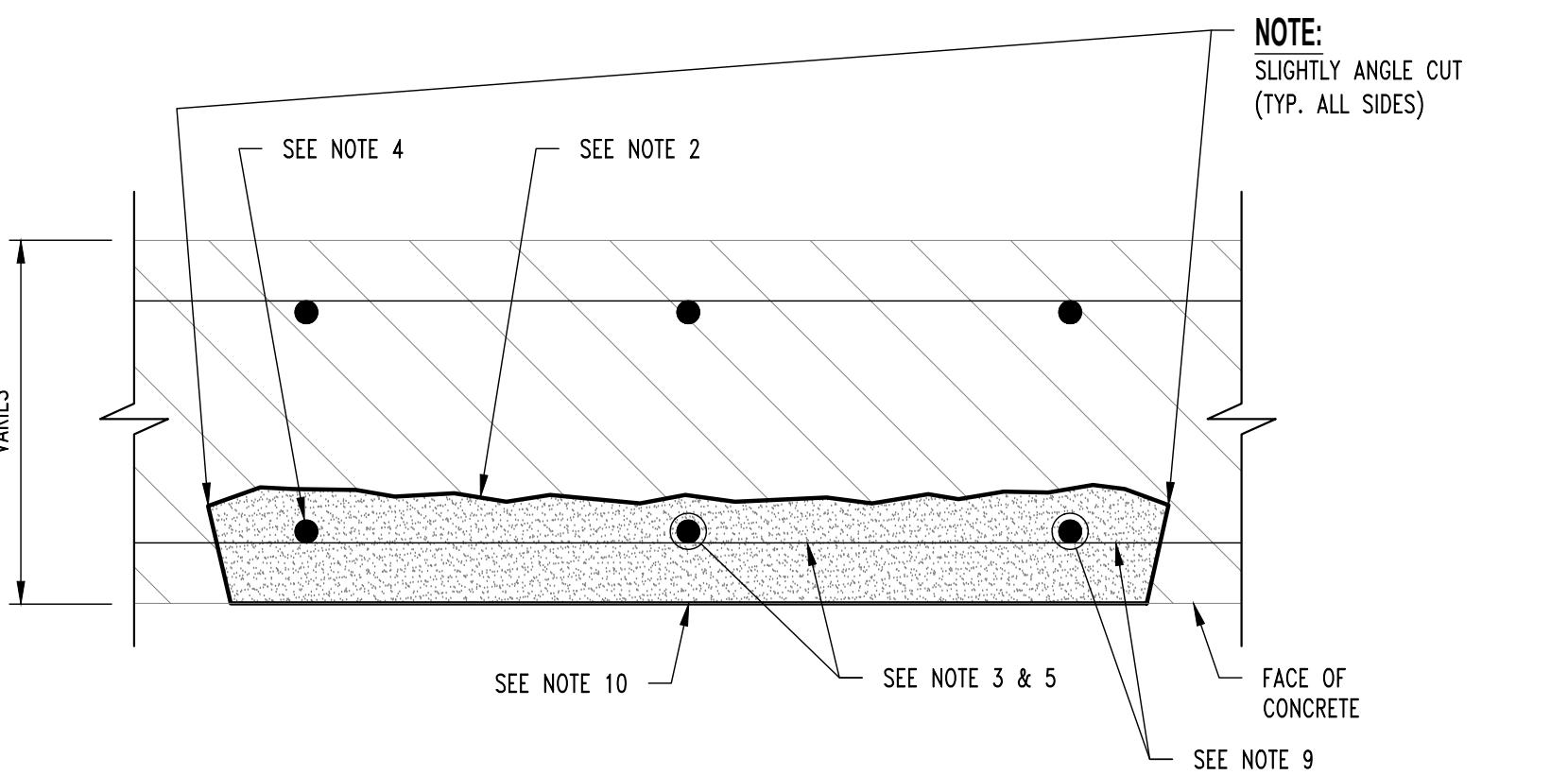
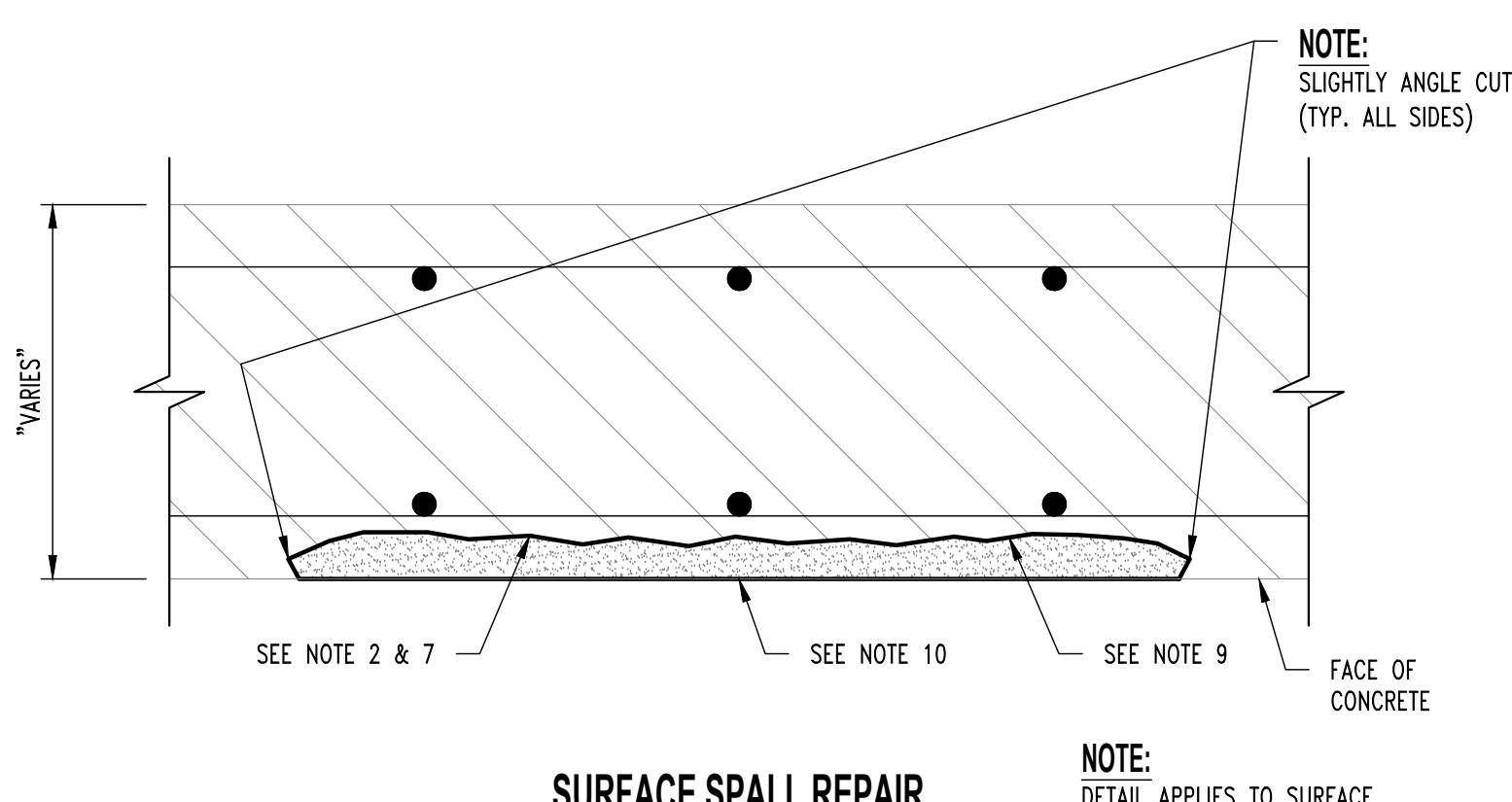
CP253191 - General Site  
Electric & Steam Manholes Concrete Repairs  
UNIVERSITY OF MISSOURI  
COLUMBIA, BOONE COUNTY, MISSOURI

DRAWING INCLUDES:  
REPAIR DETAILS & NOTES

DESIGNED: GLL  
DRAWN: TGC  
PROJECT NO.: 180016  
MU PROJECT NO.: CP253191  
SHEET: S200

### CONCRETE REPAIR NOTES

- PRIOR TO PERFORMING ANY CONCRETE REPAIRS, CONTRACTOR SHALL EXAMINE THE ENTIRE CONCRETE SURFACE BY SOUNDING TO DETECT ANY DEFICIENCIES NOT SHOWN ON THE CONTRACT DOCUMENTS. IF DEFICIENCIES ARE DETECTED, MARK OUTLINE ON CONCRETE SURFACE AND NOTIFY OWNER'S REPRESENTATIVE. PROVIDE OWNER'S REPRESENTATIVE WITH APPROXIMATE SIZE AND LOCATION OF EACH DEFICIENCY NOTED.
- REMOVE ALL LOOSE AND DETERIORATED CONCRETE WHERE INDICATED ON PRINTS, CHIP OUT AND PATCH AREA  $\frac{1}{2}$ " MIN. BEYOND SPALLED SURFACE, AT BOUNDARIES OF DETERIORATED CONCRETE, SAWCUT BOUNDARY TO A MINIMUM DEPTH OF  $\frac{1}{4}$ " WITHOUT CUTTING REINFORCING, DO NOT FEATHER EDGES.
- CARE SHOULD BE EXERCISED NOT TO DAMAGE EXISTING REINFORCING STEEL DURING CONCRETE REMOVAL. CONCRETE REMOVAL SHALL EXTEND TO WHERE BAR IS WELL BONDED TO SURROUNDING CONCRETE. CARE SHALL BE EXERCISED NOT TO DAMAGE THE BAR'S BOND TO SURROUNDING CONCRETE. IF BOND BETWEEN BAR AND CONCRETE IS BROKEN, UNDERCUTTING OF THE BAR IS REQUIRED AS SPECIFIED IN ITEM 4 BELOW.
- IF HALF OF THE THICKNESS OF THE REINFORCEMENT BAR OR MORE IS EXPOSED PROVIDE A MINIMUM OF  $\frac{1}{2}$ " CLEARANCE BETWEEN EXPOSED REINFORCEMENT AND SURROUNDING CONCRETE FOR HAND APPLIED REPAIR MATERIALS AND A MINIMUM OF 1" CLEARANCE FOR SPRAY APPLIED REPAIR MATERIALS.
- MECHANICALLY CLEAN STEEL BY SANDBLASTING OR WIRE BRUSH TO WHITE METAL CONDITION TO REMOVE CORROSION. AFTER CLEANING REINFORCING STEEL, MEASURE DIAMETER AT NARROWEST POINT. IF SECTION LOSS IS GREATER THAN 25% (SEE "REINFORCING BAR DIAMETER TABLE" ON THIS SHEET) ADD NEW REINFORCING BAR MATCHING SIZE OF EXISTING. MAINTAIN A MINIMUM OF  $\frac{1}{2}$ " CONCRETE COVER AT ALL NEW AND EXISTING REINFORCEMENT, ANY REINFORCEMENT TO BE DRILLED AND GROUTED INTO EXISTING CONCRETE SHALL USE HILTI HIT-HY 200 MAX EPOXY ADHESIVE (OR APPROVED EQUAL).
- SCARIFY CONCRETE SURFACE TO OBTAIN CONCRETE SURFACE PROFILE ROUGHENED.
- MINIMUM DEPTH OF PATCH TO BE  $\frac{1}{8}$ ".
- SUBSTRATE SHOULD BE SATURATED SURFACE DRY (SSD) WITH NO STANDING WATER DURING PATCH APPLICATION.
- APPLY CONCRETE PRIMER TO SUBSTRATE PER MANUFACTURERS SPECIFICATIONS. APPLY TWO COATS OF ANTI-CORROSION COATING PER MANUFACTURERS SPECIFICATIONS TO ALL EXPOSED REINFORCEMENT ALLOWING TO PROPERLY DRY BETWEEN COATS. SIKAFERGARD 901 OR APPROVED EQUAL.
- WHILE CONCRETE PRIMER IS STILL WET, APPLY PATCH MATERIAL PER MANUFACTURERS SPECIFICATIONS. FOR APPLICATIONS GREATER THAN 1" IN DEPTH, APPLY PATCH MATERIAL IN LIFTS. SCORE THE TOP SURFACE OF EACH LIFT AND ALLOW EACH LIFT TO REACH FINAL SET THEN REPEAT FROM STEP 8.
- PROVIDE MECHANICAL SPICE CAPABLE OF DEVELOPING 125% FY. MAINTAIN A MINIMUM OF  $\frac{1}{2}$ " CONCRETE COVER AT ALL NEW AND EXISTING REINFORCEMENT.
- CLEAN CRACK SURFACES AND REMOVE ANY FOREIGN MATTER AND DEPOSITS.
- INSTALL POLYMER MODIFIED CEMENTITIOUS PATCHING MATERIAL PER MANUFACTURERS SPECIFICATION AND TOOL SURFACE TO MATCH SURROUNDING SURFACE. SIKATOP-123 OR APPROVED EQUAL.
- LID REPAIRS REQUIRE SHORING TO BE INSTALLED PRIOR TO DAMAGED CONCRETE BEING REMOVED. SHORING SHALL PROVIDE ADEQUATE SUPPORT TO STRUCTURE UNTIL PATCH IS INSTALLED AND CURED.
- ALL UTILITIES IN AREA OF MANHOLE WILL REMAIN ACTIVE DURING THE DURATION OF THE PROJECT INCLUDING THE STEAMLINES INSIDE THE MANHOLE, ALL INSULATION, PIPING EQUIPMENT, STEAM CONDENSATE, ETC. NEEDS TO BE PROTECTED AS TO NOT DAMAGE DURING CONSTRUCTION. ANY DAMAGED MATERIALS WILL BE REPLACED AT THE CONTRACTOR'S EXPENSE.



### DETERIORATED CONCRETE SURFACE REPAIR

NOTE:  
1. REPAIR CONFIGURATIONS TO BE KEPT AS SIMPLE AS POSSIBLE.  
2. CORNERS MUST BE SQUARED TO AVOID FEATHERED EDGES.

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BAR SIZE	NOMINAL DIAMETER (IN.)	MINIMUM ALLOWABLE DIAMETER (IN.)
#3	0.375	0.325
#4	0.500	0.433
#5	0.625	0.541
#6	0.750	0.650
#7	0.875	0.758
#8	1.000	0.866
#9	1.128	0.977
#10	1.270	1.100

### REINFORCING BAR DIAMETER TABLE

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