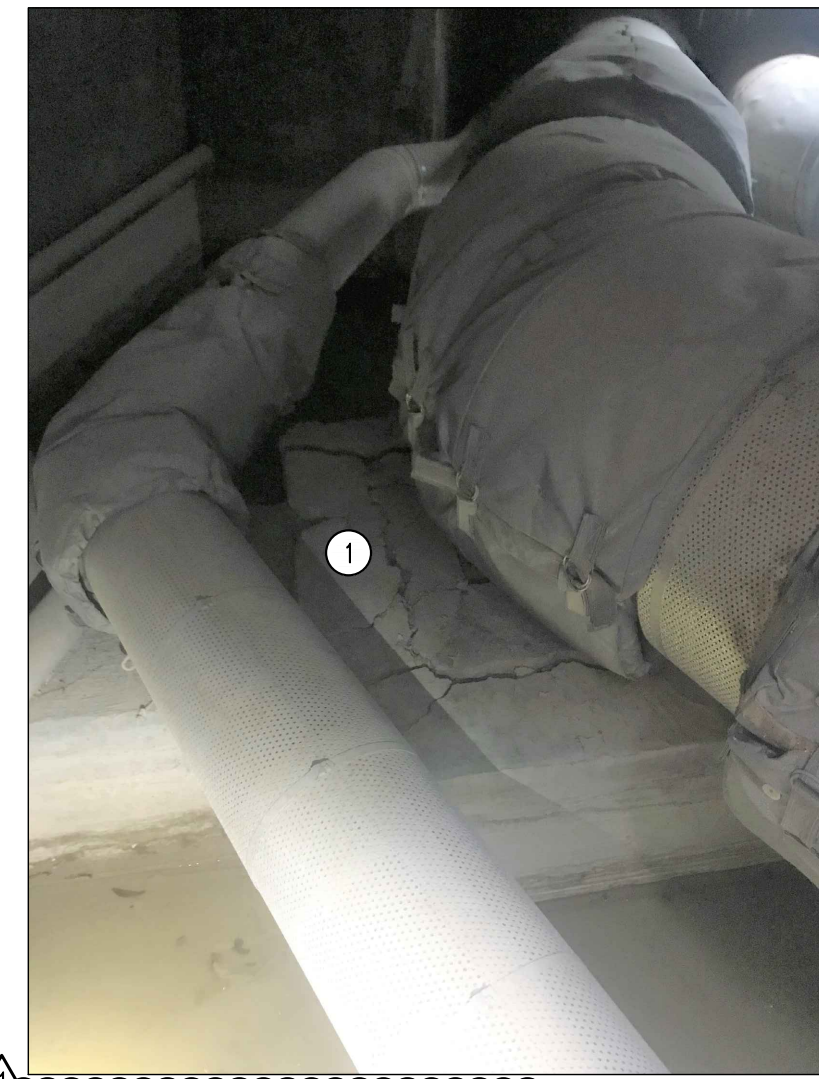


PLAN VIEW



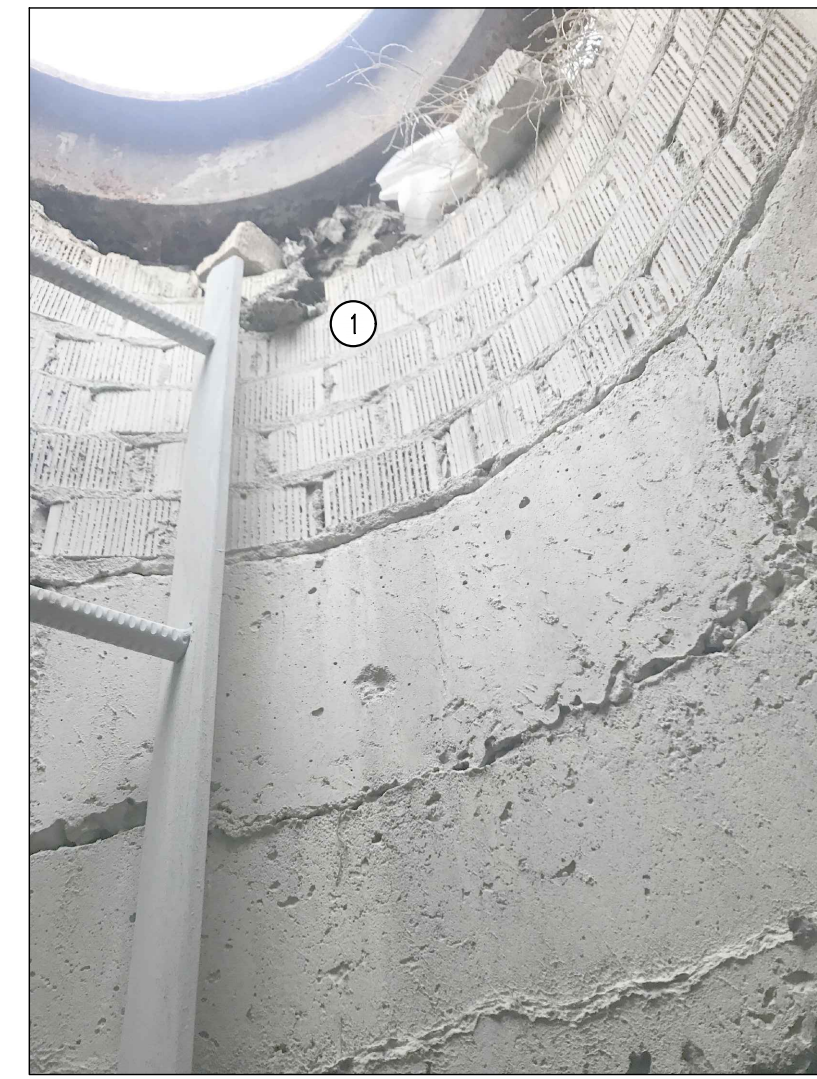
1 SPALLED CONCRETE, SEE REPAIR NOTE 1.

SMH #324 - NORTH OF HOSPITAL



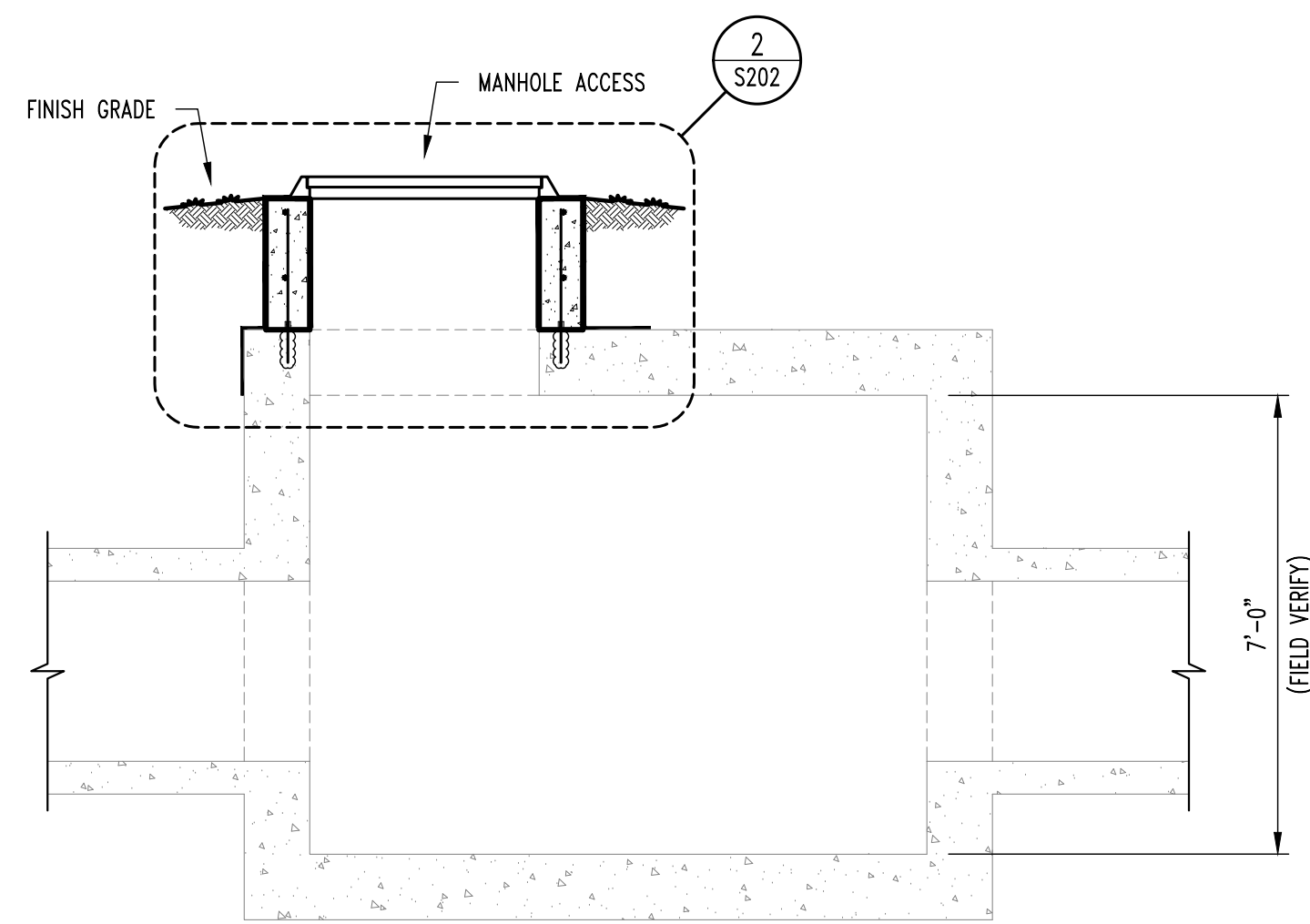
1 SPALLED CONCRETE, SEE REPAIR NOTE 2.

SMH #324 - NORTH OF HOSPITAL

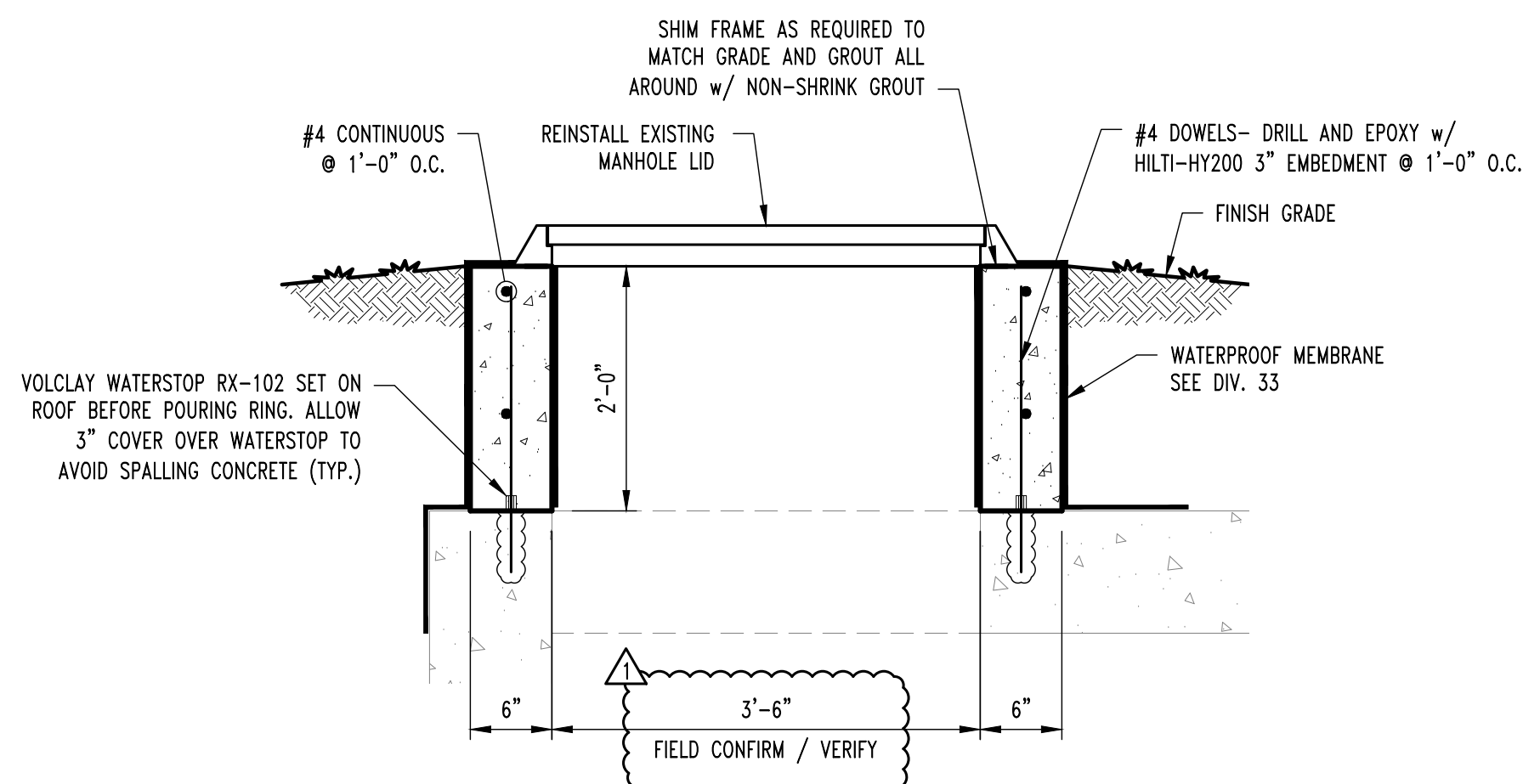


1 DAMAGED BRICK RISER, SEE REPAIR NOTE 3.

SMH #324 - NORTH OF HOSPITAL



1 STEAM MANHOLE #324
SCALE: 3/8" = 1'-0"



2 RISER DETAIL
SCALE: 3/8" = 1'-0"

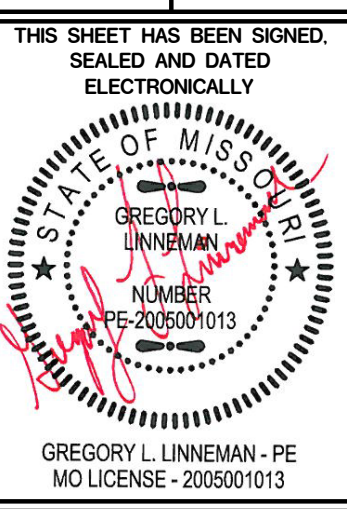
GENERAL NOTES

- 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 S300.
- ALL 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.

WATERPROOFING NOTES

- THE EXISTING MANHOLE WATERPROOFING IS ASSUMED TO BE ACM AND SHALL BE TESTED BY OWNERS REPRESENTATIVE ONCE EXPOSED FOR POSSIBLE ACM MATERIALS. ABATEMENT OF ALL MATERIALS WILL BE BY CONTRACTOR UNDER THIS CONTRACT.
- WATERPROOFING SHOP DRAWINGS SHALL BE PROVIDED PER THE SPECIFICATIONS IN DIVISION 33.
- ALL CONCRETE WATERPROOFING SHALL INSPECTED BY THE OWNER PRIOR TO PROCEEDING TO NEXT STEP OF INSTALLATION. OWNER SHALL RECEIVE 24 HOUR NOTICE OF INSPECTIONS BEING REQUIRED. THESE INSPECTIONS FOR APPROVAL INCLUDE:
 - SUBSTRATE CONDITIONS READY FOR WATERPROOFING
 - FLASHING INSTALLATION COMPLETE
 - MEMBRANE INSTALLATION COMPLETE
 - PROTECTION AND DRAINAGE INSTALLATION COMPLETE

No.	Date
BID SET	01/12/2022
ADDENDUM #1	02/04/2022



STRUCTURAL ENGINEER
CROCKETT
 ENGINEERS & ARCHITECTS
 1000 W. N. HIGHWAY 40
 COLUMBIA, MISSOURI 65203
 www.crockettengineering.com
 (314) 487-0292
 Missouri License #2005001013

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

CP220041 - VARIOUS LOCATIONS
 REPAIR CONCRETE IN STEAM MANHOLES
 UNIVERSITY OF MISSOURI
 COLUMBIA, BOONE COUNTY, MISSOURI

DRAWING INCLUDES:

SMH #324
 PLAN & PHOTOS

DESIGNED: GLL

DRAWN: RCA

PROJECT NO.: 180016

MU PROJECT NO.: CP220041

SHEET:

S202

REPAIR NOTES

- SMH #324 APPROXIMATE REPAIR AREAS
- THERE IS AN 24 INCH X 20 INCH X 22 INCH TALL ANCHOR w/ 3 INCH DEEP CRACKS ALL AROUND. (REPAIR #3 EXPECTED) CONTRACTOR TO CONTACT EM PRIOR TO REPAIR OF ANCHOR TO COORDINATE UTILITY SHUTDOWN AS NEEDED, STEAM LINES WILL ONLY BE ABLE TO BE SHUT DOWN ONE AT A TIME AND ANCHORS WILL ONLY BE ABLE TO BE REPAIRED ONE AT A TIME.
 - THERE IS AN 40 INCH X 42 INCH X 22 INCH TALL ANCHOR w/ 3 INCH DEEP CRACKS ALL AROUND. (REPAIR #3 EXPECTED) CONTRACTOR TO CONTACT EM PRIOR TO REPAIR OF ANCHOR TO COORDINATE UTILITY SHUTDOWN AS NEEDED.
 - DAMAGED BRICK RISER TO BE REMOVED & REPLACED, REFER TO DETAIL 2/S203.

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.
2. ALL CONCRETE PATCHING/REPAIR DETAILS AND NOTES ARE PROVIDED ON SHEET S300.
3. ALL 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.

REVISIONS:

No.	Date
BID SET	01/12/2022
ADDENDUM #1	02/04/2022

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY
 MISSOURI PROFESSIONAL ENGINEER
 GREGORY L. LINNEMAN
 NUMBER: 200501013
 FE-200501013
 GREGORY L. LINNEMAN - PE
 MO LICENSE - 200501013

STRUCTURAL ENGINEER
CROCKETT
 ENGINEERS AND ARCHITECTS
 1000 W. N. HIGHWAY 63
 COLUMBIA, MISSOURI 65203
 (314) 447-0292
 www.crockettengineering.com
 Crockett Engineering Consultants, LLC
 Missouri License # 200501013

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

CP220041 - VARIOUS LOCATIONS
 REPAIR CONCRETE IN STEAM MANHOLES
 UNIVERSITY OF MISSOURI
 COLUMBIA, BOONE COUNTY, MISSOURI

DRAWING INCLUDES:

SMH #603
 PLAN & PHOTOS

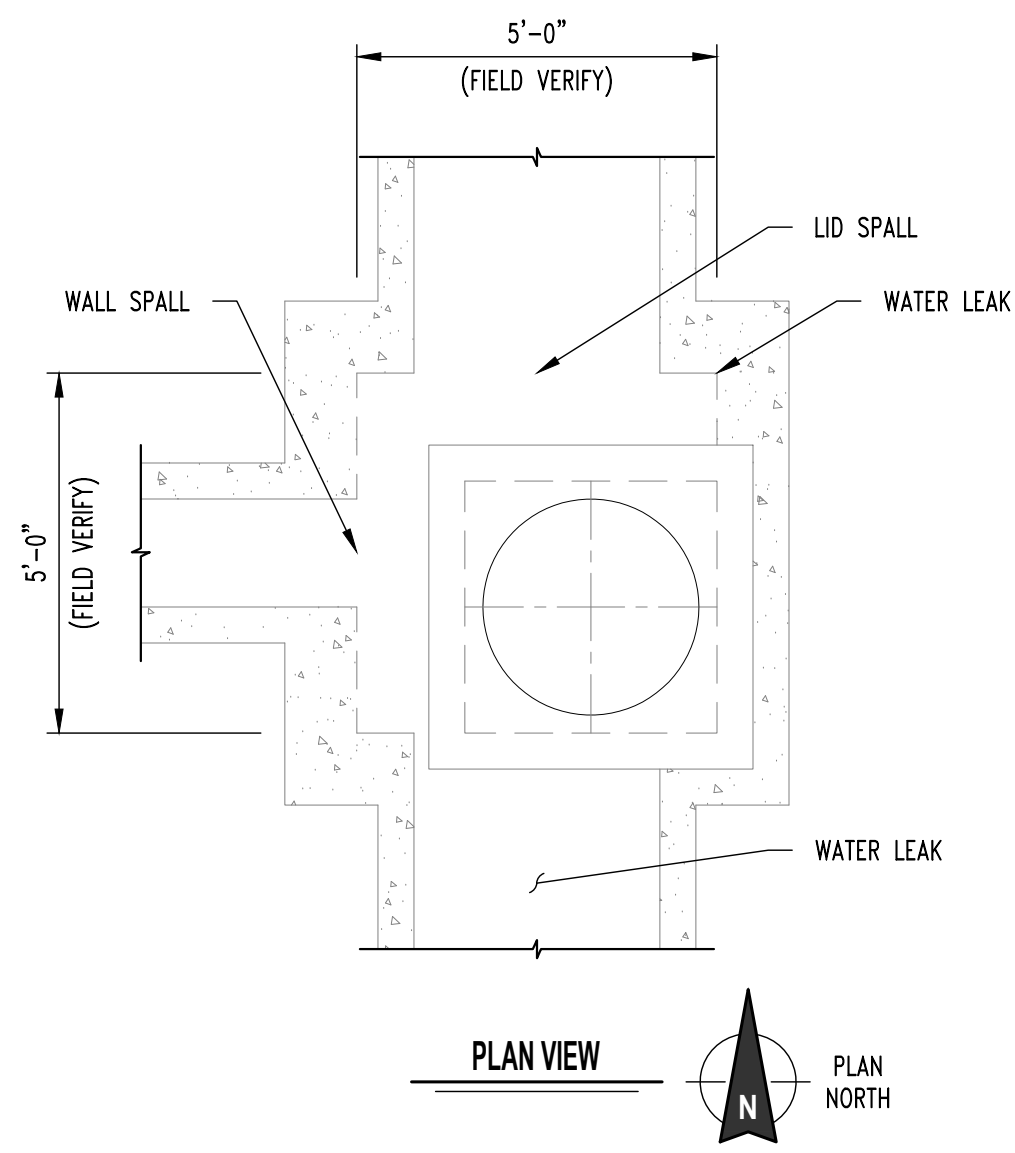
DESIGNED: GLL

DRAWN: RCA

PROJECT NO.: 180016

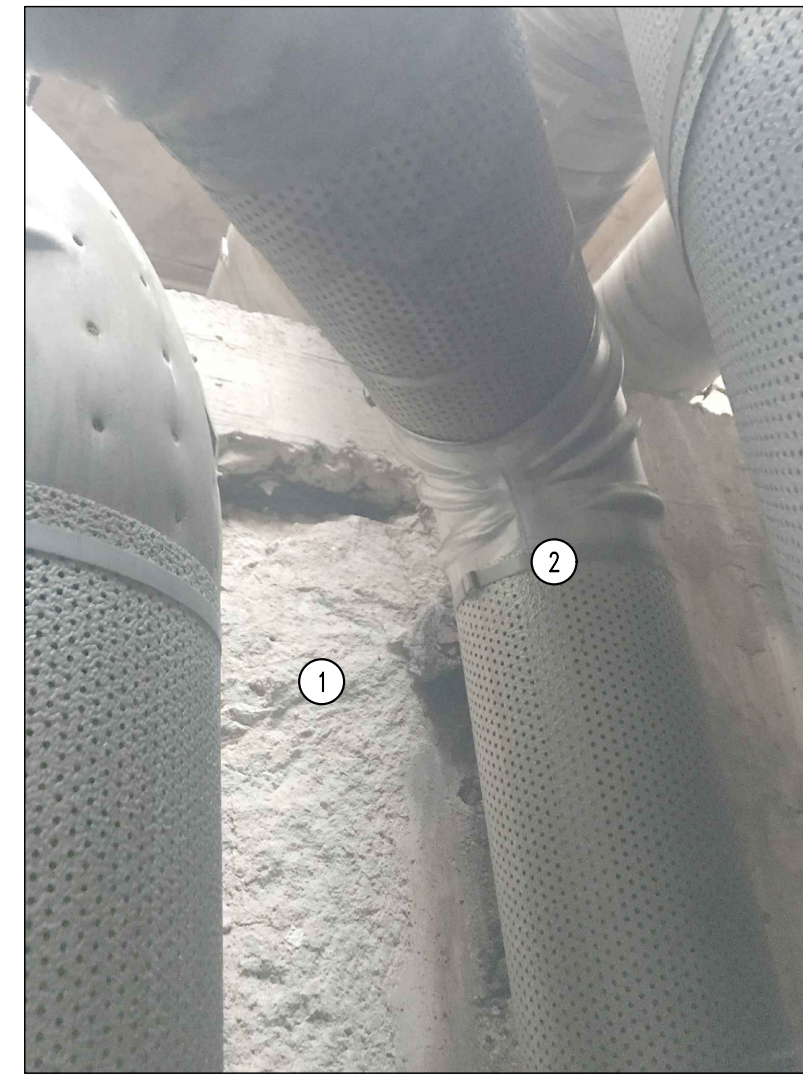
MU PROJECT NO.: CP220041

SHEET:
 S204



- ① SPALLED CONCRETE, SEE REPAIR NOTE 1.
- ② PIPE TO BE REMOVED BY OWNER.

SMH #603 - GENERAL SERVICES BUILDING



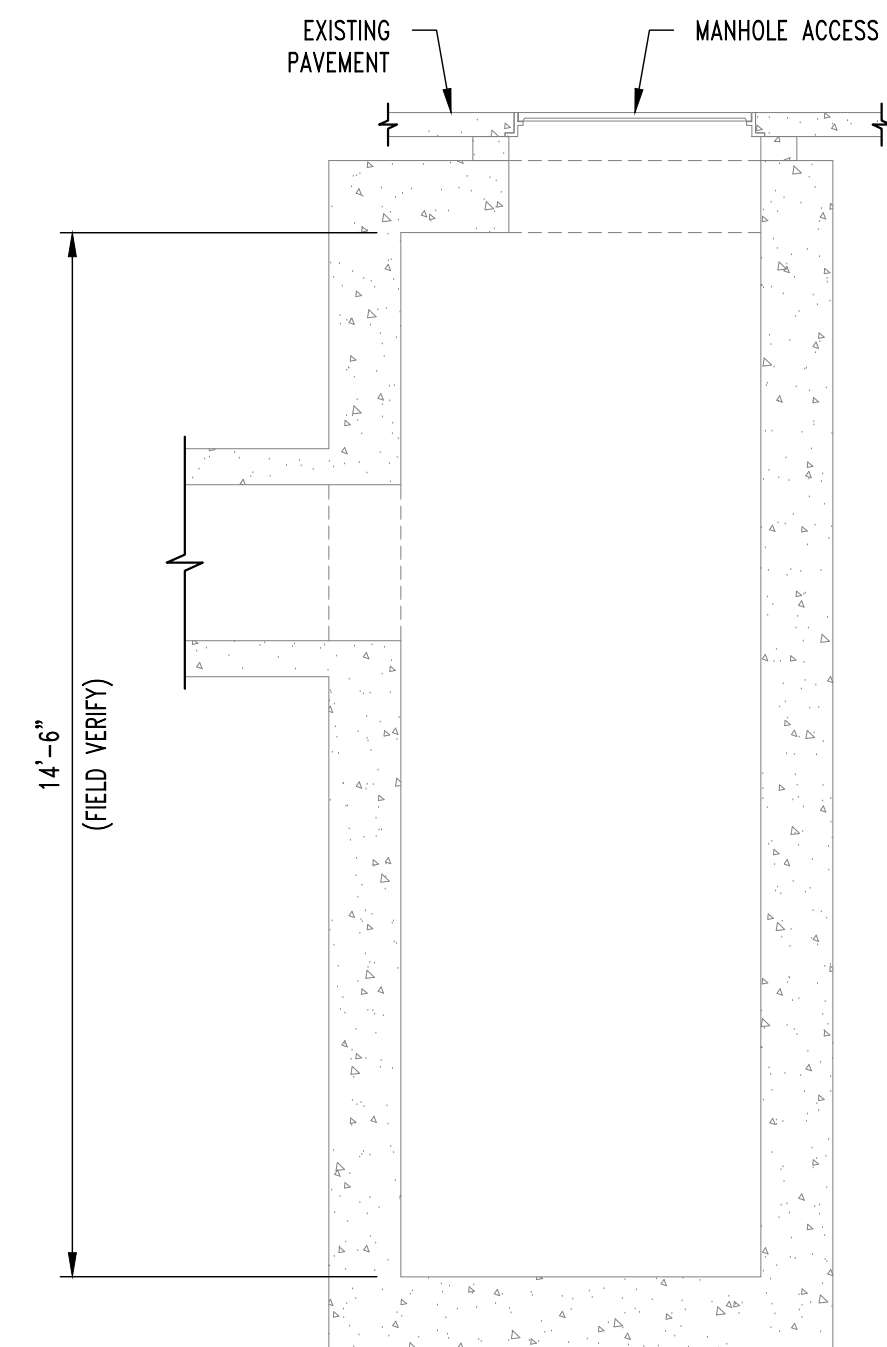
- ① SPALLED CONCRETE, SEE REPAIR NOTE 1.
- ② PIPE TO BE REMOVED BY OWNER.

SMH #603 - GENERAL SERVICES BUILDING



- ① WATER LEAK, SEE REPAIR NOTE 3.

SMH #603 - GENERAL SERVICES BUILDING



1
 S204

STEAM MANHOLE #603

SCALE: 3/8" = 1'-0"

SMH #603 NOTES

1. CONTRACTOR SHALL PROVIDE BARRIERS & SIGNAGE COORDINATED w/ MoDOT. SHOULDER CLOSURE SHALL REMAIN IN PLACE UNTIL ALL WORK IS COMPLETED IN HOLE, INCLUDING WORK BY OWNER.
2. ONCE STEAM SHUT DOWN HAS BEEN COORDINATED w/ OWNER & COMPLETED, CONTRACTOR SHALL REMOVE ALL LOOSE DEBRIS BEHIND PIPING LOCATED @ WEST WALL.
3. OWNER WILL REMOVE TWO PIPES CLOSEST TO WEST WALL. ALLOW THREE DAYS FOR THIS WORK.
4. CONTRACTOR TO COMPLETE CONCRETE REPAIRS ONCE PIPES REMOVED.
5. ONCE COMPLETE w/ REPAIRS OWNER WILL REINSTALL PIPES, ALLOW TWO WEEKS FOR THIS WORK.

REPAIR NOTES

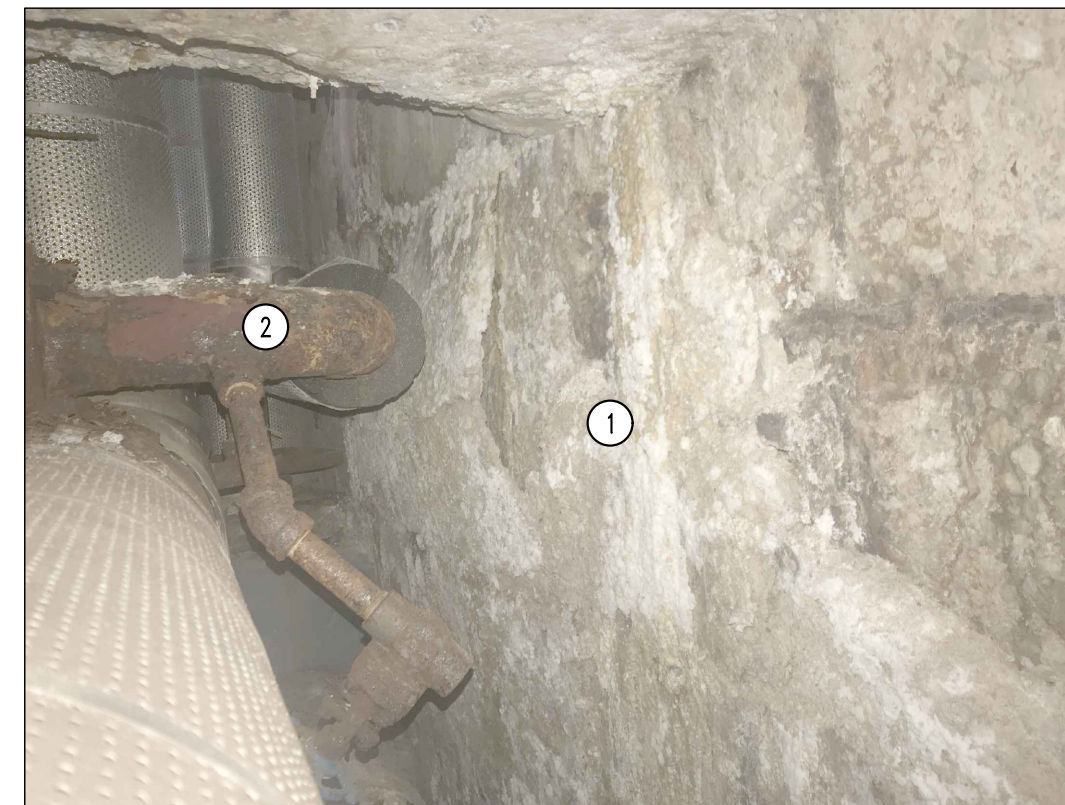
SMH #603 APPROXIMATE REPAIR AREAS

1. WEST WALL 5'-0" x 5'-0" AREA 3" DEEP, NEW PATCH CAN'T EXTEND PAST FACE OF ORIGINAL CONCRETE DUE TO TIGHT CONDITIONS WITH EXISTING STEAM LINES TO BE REINSTALLED.
2. CORNER OF CHASE TO NORTH 1'-0" x 4'-0" LONG AREA 3" DEEP.
3. (2) SMALL WATER LEAKS SHALL BE INJECTED w/ INJECTABLE WATERSTOP SEAL GUARD II OR PRIOR APPROVED EQUAL.



- ① WATER LEAK, SEE REPAIR NOTE 3.

SMH #603 - GENERAL SERVICES BUILDING



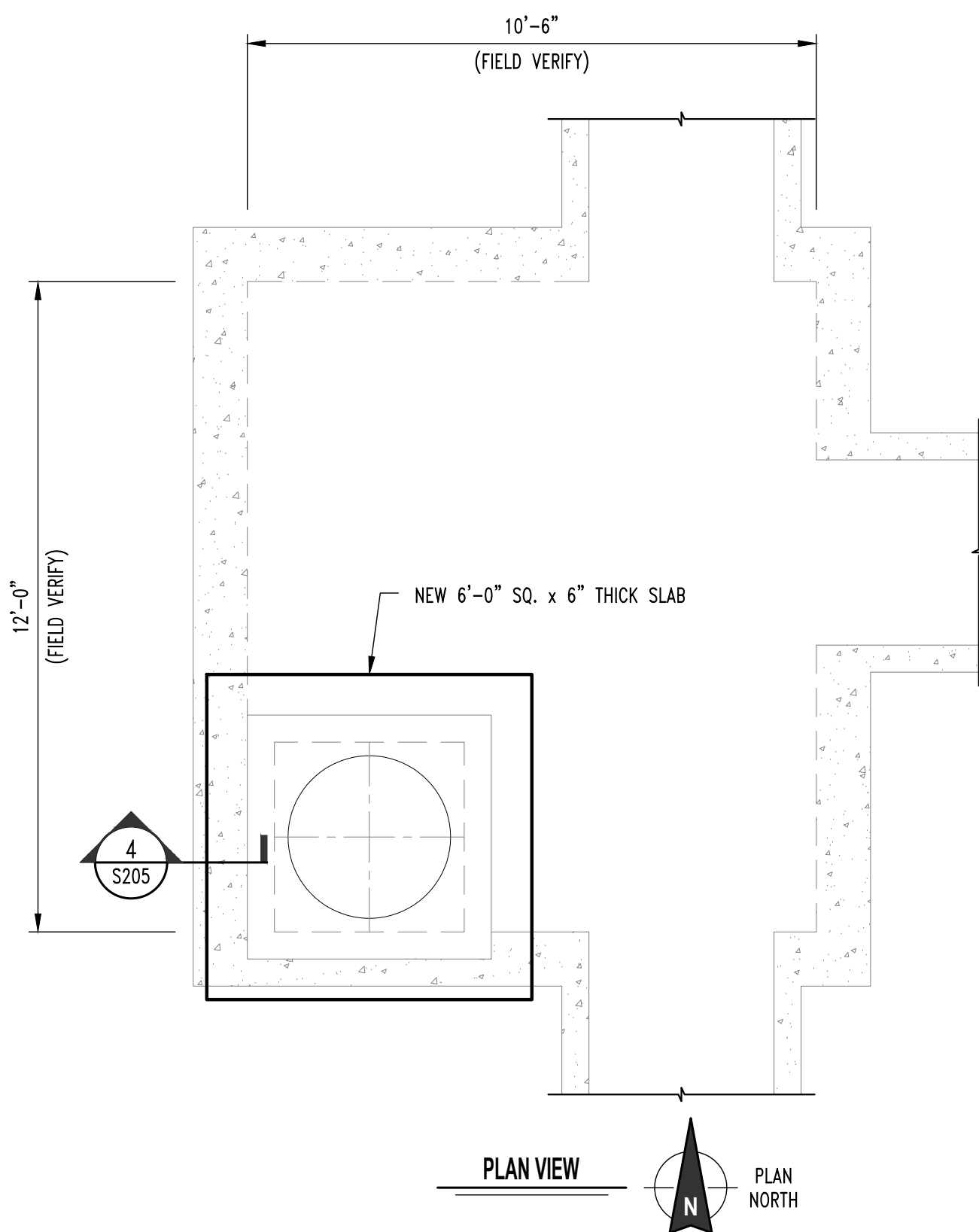
- ① SPALLED CONCRETE, SEE REPAIR NOTE 1.
- ② PIPE TO BE REMOVED BY OWNER.

SMH #603 - GENERAL SERVICES BUILDING



- ① SPALLED CONCRETE, SEE REPAIR NOTE 2.

SMH #603 - GENERAL SERVICES BUILDING



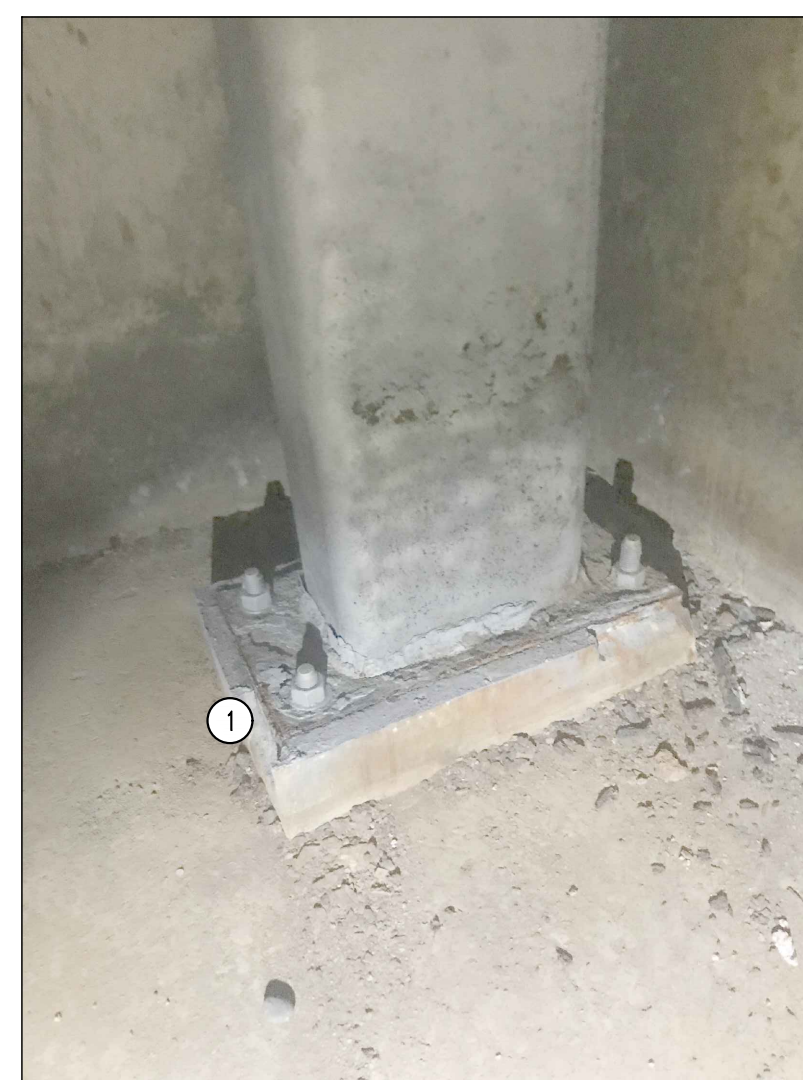
1 STEAM MANHOLE #363 (ALTERNATE #1)

SCALE: 3/8" = 1'-0"



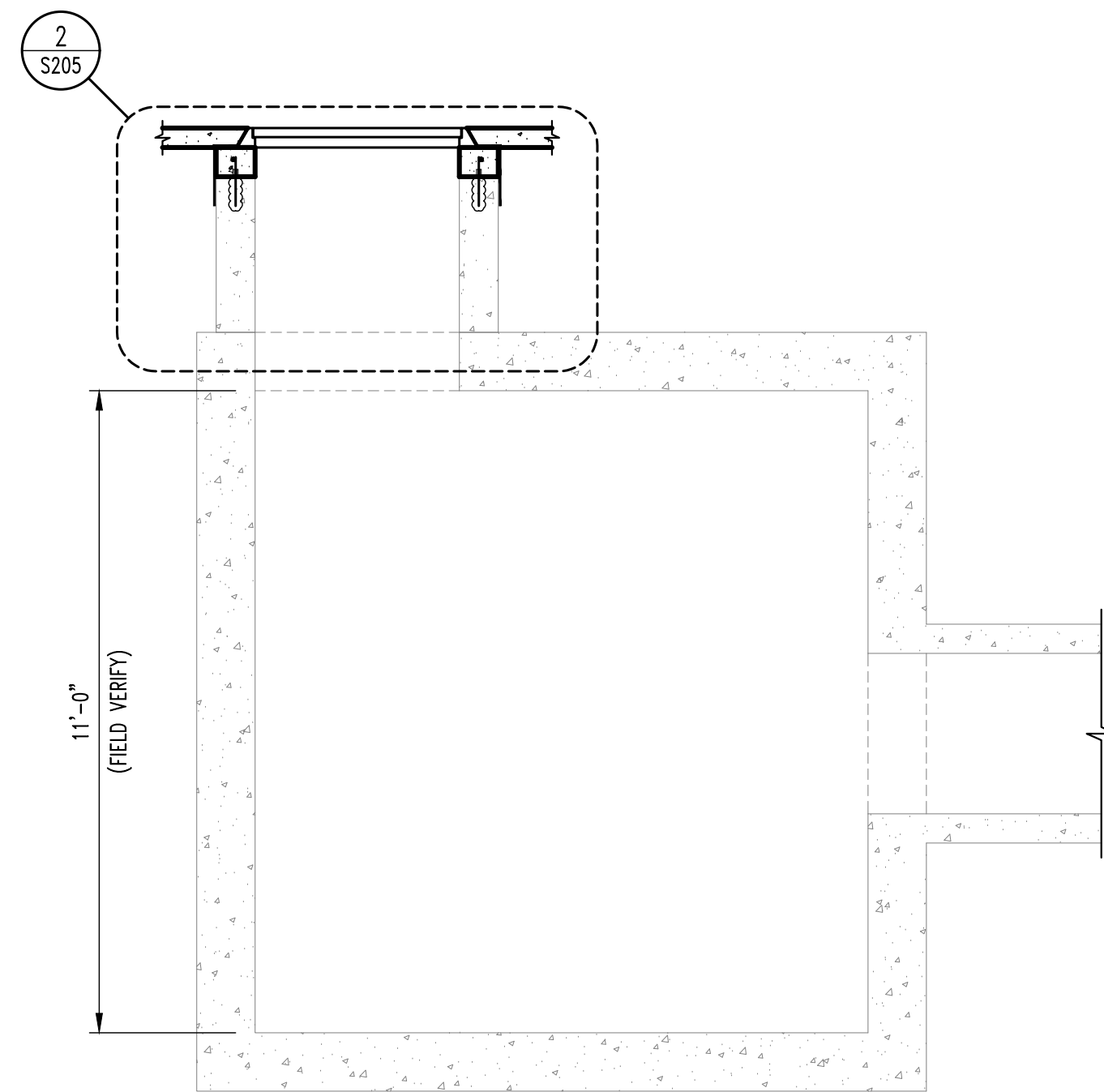
1 SPALLED CONCRETE, SEE REPAIR NOTE 1.

SMH #363 - HOSPITAL DRIVE



1 DAMAGED BASE PLATE, SEE REPAIR NOTE 2.

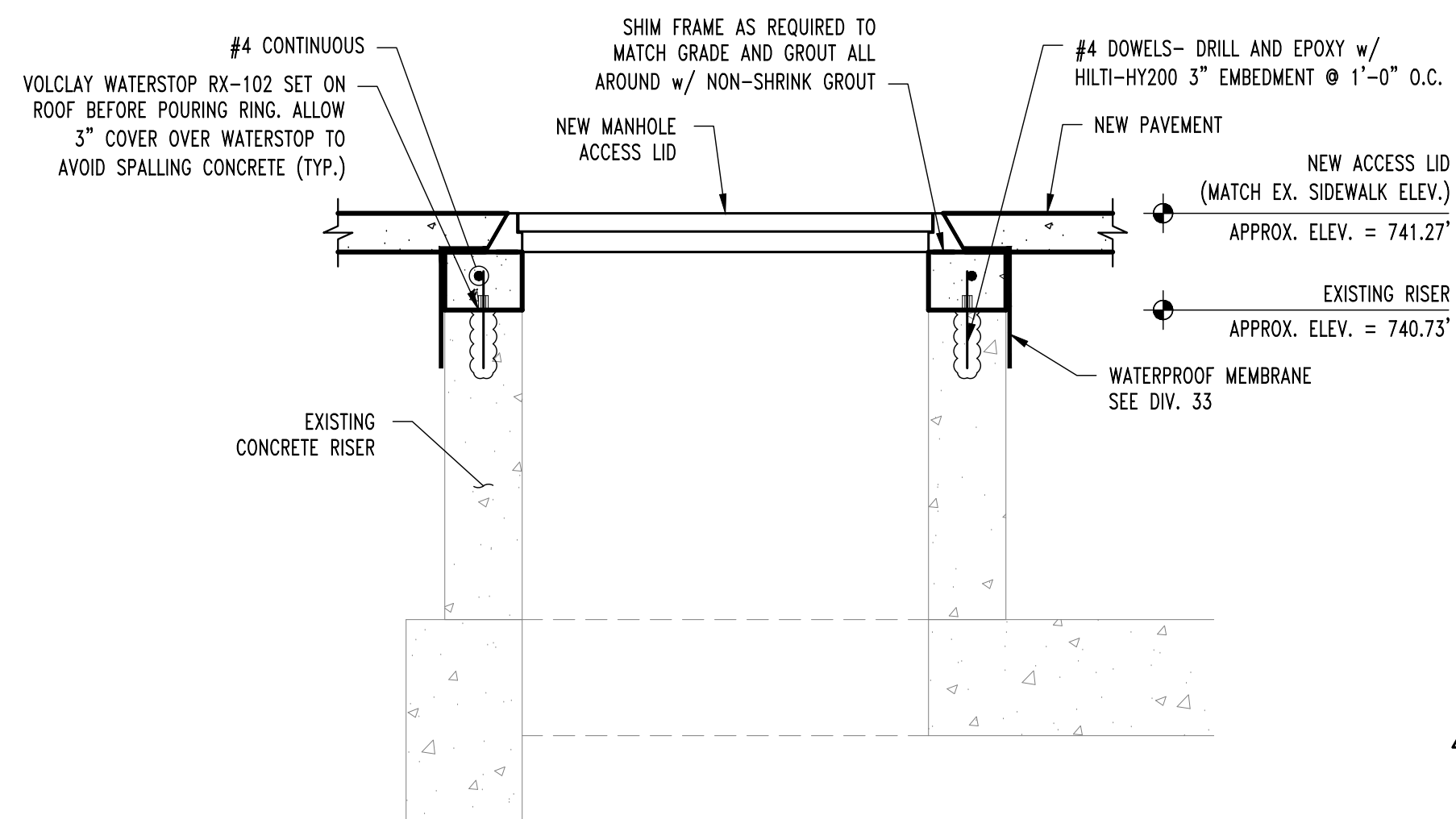
SMH #363 - HOSPITAL DRIVE



2 S205

1 STEAM MANHOLE #363 (ALTERNATE #1)

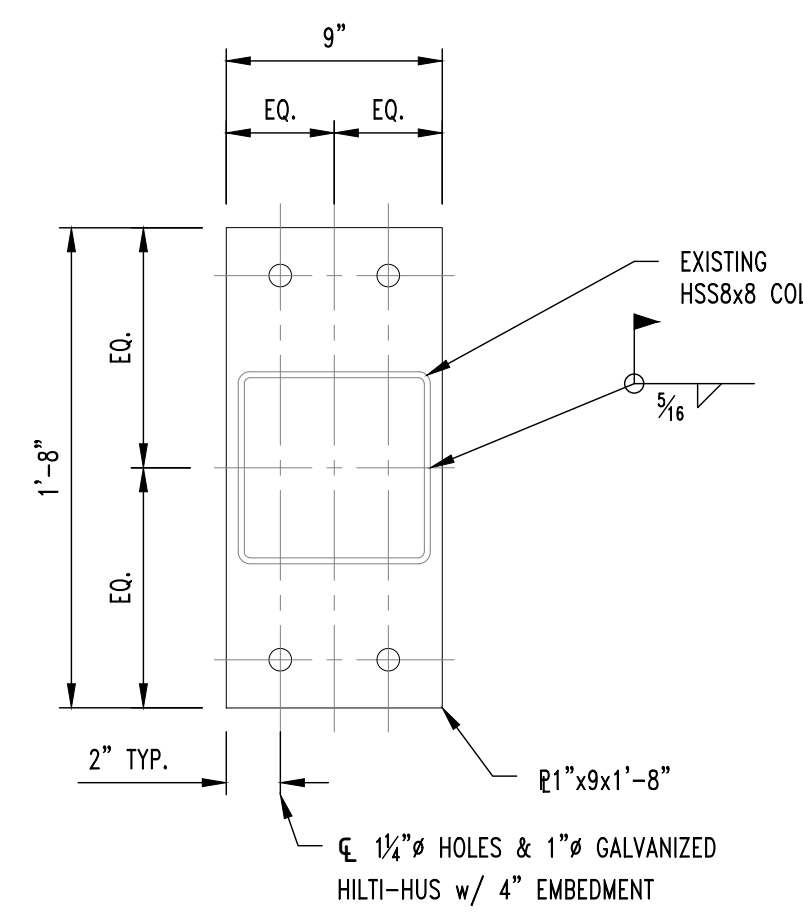
SCALE: 3/8" = 1'-0"



2 S205

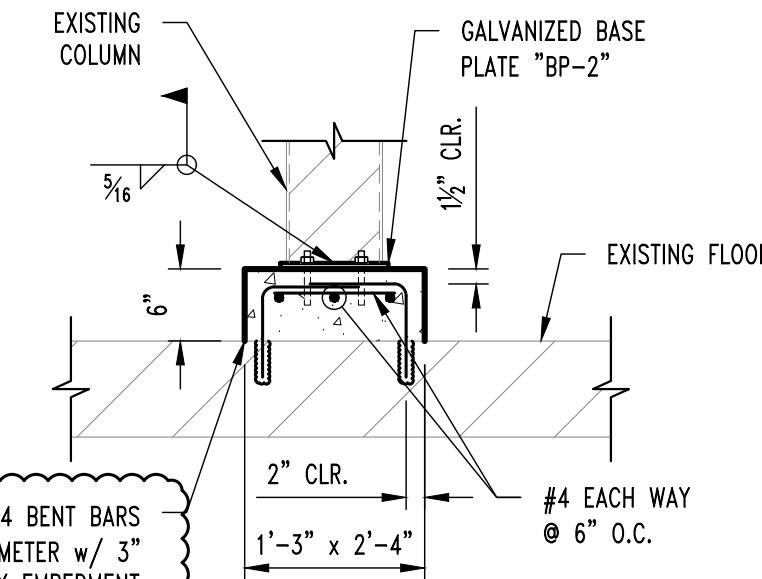
RISER DETAIL

SCALE: 3/4" = 1'-0"



BASE PLATE "BP-2"

(FIELD CONFIRM DIMENSIONS PRIOR TO FABRICATION)



3 S205

BASE ANCHORAGE DETAIL

SCALE: 3/4" = 1'-0"

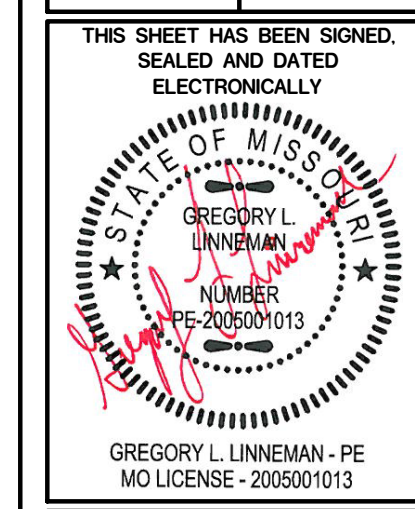
GENERAL NOTES

- 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 S300.
- ALL 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.

WATERPROOFING NOTES

- THE EXISTING MANHOLE WATERPROOFING IS ASSUMED TO BE ACM AND SHALL BE TESTED BY OWNERS REPRESENTATIVE ONCE EXPOSED FOR POSSIBLE ACM MATERIALS. ABATEMENT OF ALL MATERIALS WILL BE BY CONTRACTOR UNDER THIS CONTRACT.
- WATERPROOFING SHOP DRAWINGS SHALL BE PROVIDED PER THE SPECIFICATIONS IN DIVISION 33.
- ALL CONCRETE WATERPROOFING SHALL INSPECTED BY THE OWNER PRIOR TO PROCEEDING TO NEXT STEP OF INSTALLATION. OWNER SHALL RECEIVE 24 HOUR NOTICE OF INSPECTIONS BEING REQUIRED. THESE INSPECTIONS FOR APPROVAL INCLUDE:
 - SUBSTRATE CONDITIONS READY FOR WATERPROOFING
 - FLASHING INSTALLATION COMPLETE
 - MEMBRANE INSTALLATION COMPLETE
 - PROTECTION AND DRAINAGE INSTALLATION COMPLETE

REVISIONS:	
No.	Date
BID SET	01/12/2022
ADDENDUM #1	02/04/2022



STRUCTURAL ENGINEER
CROCKETT
 ENGINEERING CONSULTANTS
 1000 W. MISSOURI DRIVE
 COLUMBIA, MISSOURI 65203
 (573) 487-0292
 www.crockettengineering.com
 Crockett Engineering Consultants, LLC
 Missouri License #2005001013

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

**CP220041 - VARIOUS LOCATIONS
 REPAIR CONCRETE IN STEAM MANHOLES**
**UNIVERSITY OF MISSOURI
 COLUMBIA, BOONE COUNTY, MISSOURI**

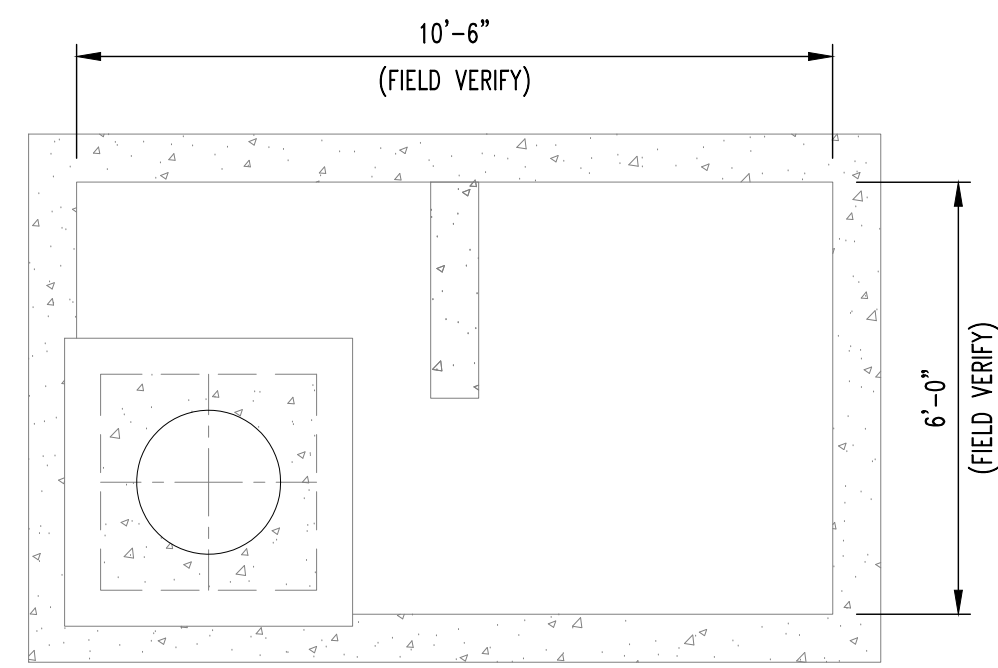
DRAWING INCLUDES:
 SMH #363 (ALTERNATE #1) PLAN & PHOTOS

DESIGNED: GLL
 DRAWN: RCA
 PROJECT NO.: 180016
 MU PROJECT NO.: CP220041
 SHEET: S205

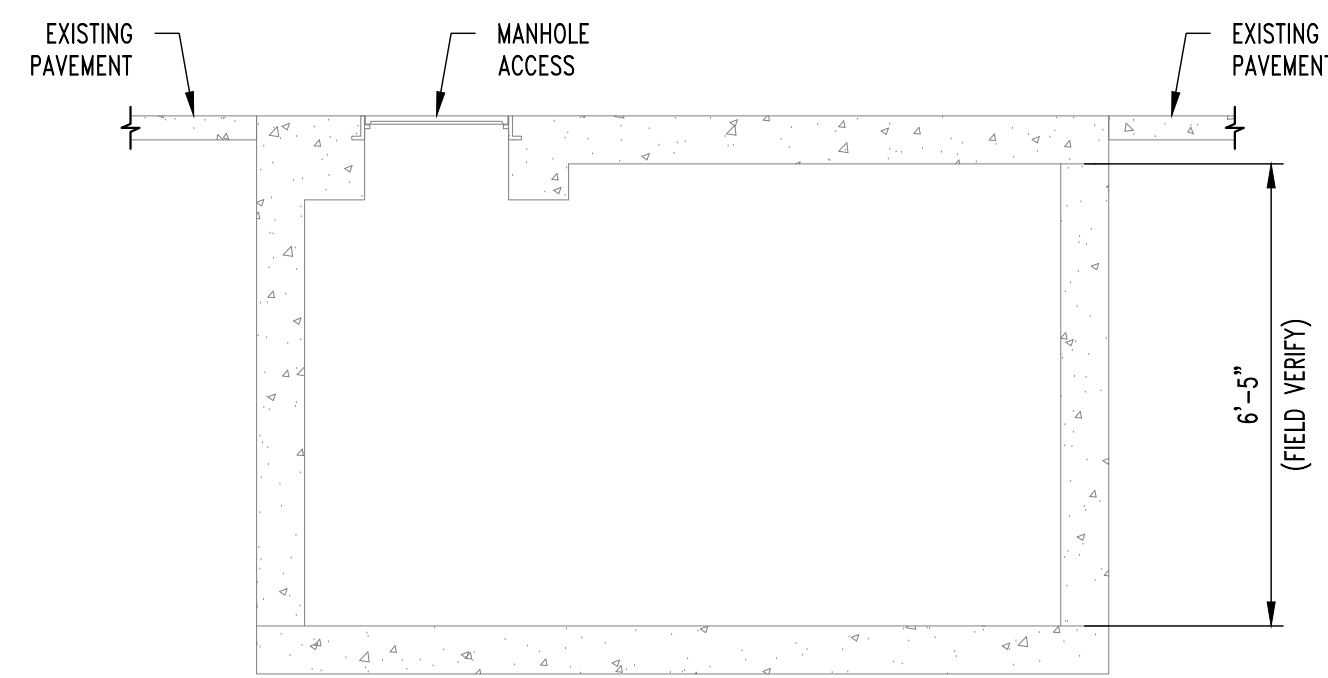
REPAIR NOTES

SMH #363 APPROXIMATE REPAIR AREAS

- BOTH CHASES HAVE SPALLED 6 INCHES THICK X 48 INCHES LONG X 6 INCHES DEEP. (REPAIR #3 EXPECTED)
- (2) EXISTING HSS COLUMNS REQUIRE NEW BASEPLATES. SEE DETAIL 3/S205. PRIOR TO REPAIR, STEAM SYSTEM WILL NEED TO BE SHUT DOWN TO WORK ON THIS ELEMENT. STEAM LINES WILL ONLY BE ABLE TO BE SHUT DOWN ONE AT A TIME AND ANCHORS WILL ONLY BE ABLE TO BE REPLACED ONE AT A TIME. CONTRACTOR SHALL COORDINATE WITH OWNER ONE WEEK IN ADVANCE FOR SYSTEM SHUT DOWN. ADDITIONALLY, NEW EXPANSION ANCHORS INTO LID ARE REQUIRED WHERE ONES HAVE NOT BEEN INSTALLED. USE SAME ANCHORS AS IN BASEPLATE DETAIL. CONTRACTOR PROVIDE VERTICAL PIPE SUPPORT PRIOR TO REPAIR. REPAIR DELAMINATION BEHIND LADDER.
- THERE ARE A TOTAL OF 4 FEET OF CRACKS THAT WILL NEED TO BE EPOXY INJECTED WITH SIKADUR INJECTION GEL OR APPROVED EQUAL.



PLAN VIEW

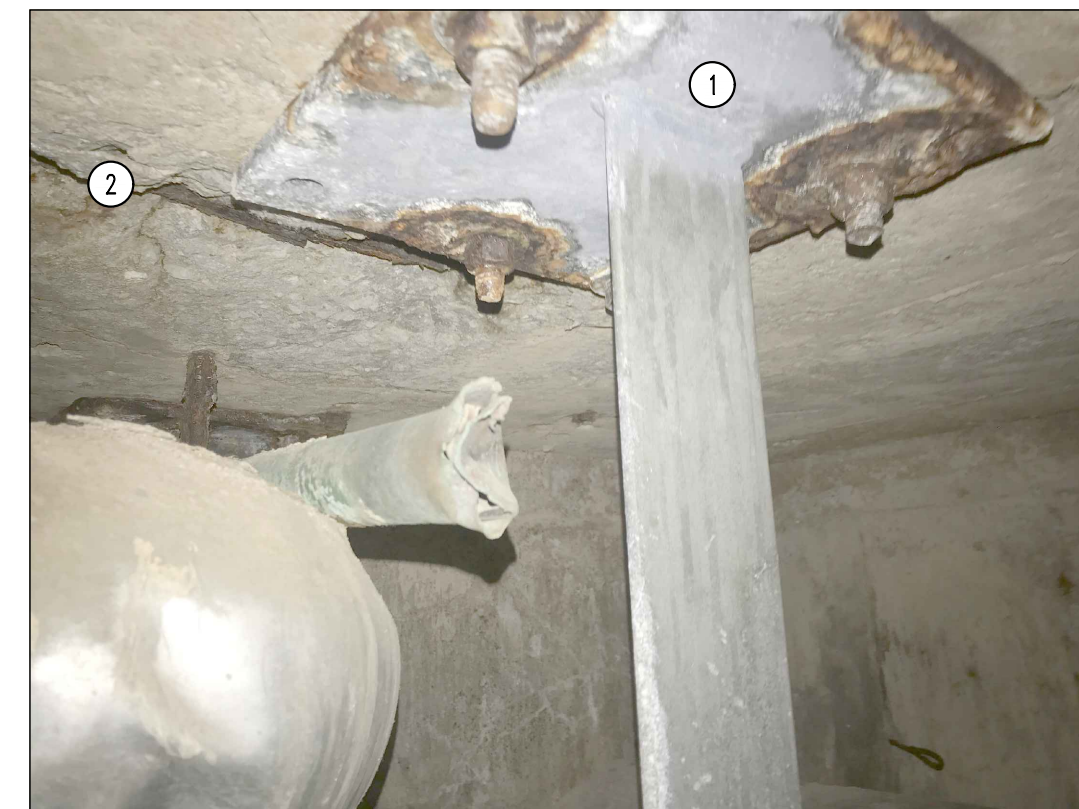


1 S206 STEAM MANHOLE #004 (ALTERNATE #2)
SCALE: 3/8" = 1'-0"

REPAIR NOTES

SMH #004 APPROXIMATE REPAIR AREAS

1. IN THE LID THERE IS REBAR EXPOSED, APPROX. 2'-0" x 4'-0". (REPAIR #3 EXPECTED)
2. CONCRETE AROUND PIPE PENETRATIONS (2 TOTAL) IN THE NORTH AND EAST WALL, 6" @ PERIMETER (REPAIR #2 EXPECTED)
3. SPALLING AT AND AROUND LID, 12" ALL SIDES (REPAIR #3 EXPECTED)
4. SPALLED CONCRETE AT EXISTING CAP PLATE (36"x36") (EXPECT REPAIR #2), REPAIR CAP PLATE & BASE PLATE SEE "BP-3" @ DETAIL 2/S206. COORDINATE STEAM SHUT DOWN WITH OWNER PRIOR TO REPAIR.
5. 6"x24" SPALL REPAIR AT CENTER WALL, (REPAIR #3 EXPECTED)
6. 24"x24" STEEL PLATE AT SOUTH WALL TO BE REMOVED AND CONCRETE REPAIRED, (FULL DEPTH REPAIR EXPECTED)



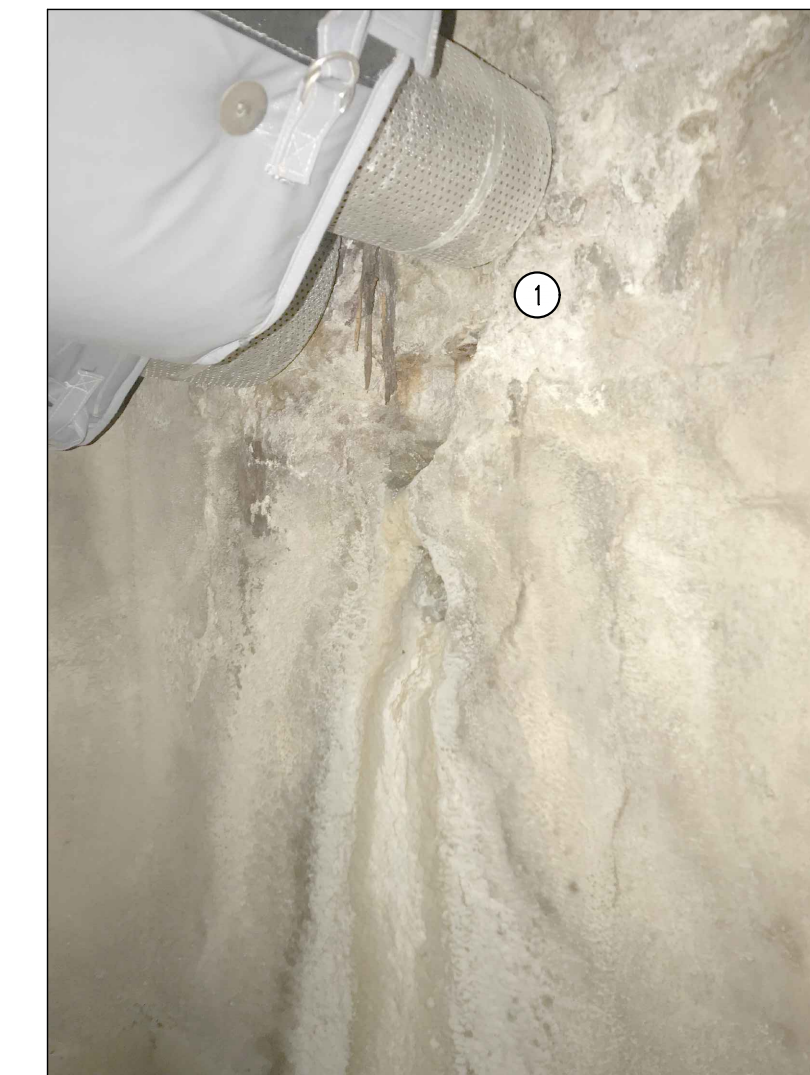
1 CAP PLATE DAMAGE, SEE REPAIR NOTE 4.
2 EXPOSED REBAR, SEE REPAIR NOTE 1.

SMH #004 - S 5th St



1 SPALLING, SEE REPAIR NOTE 2.

SMH #004 - S 5th St



1 SPALLING, SEE REPAIR NOTE 2.

SMH #004 - S 5th St



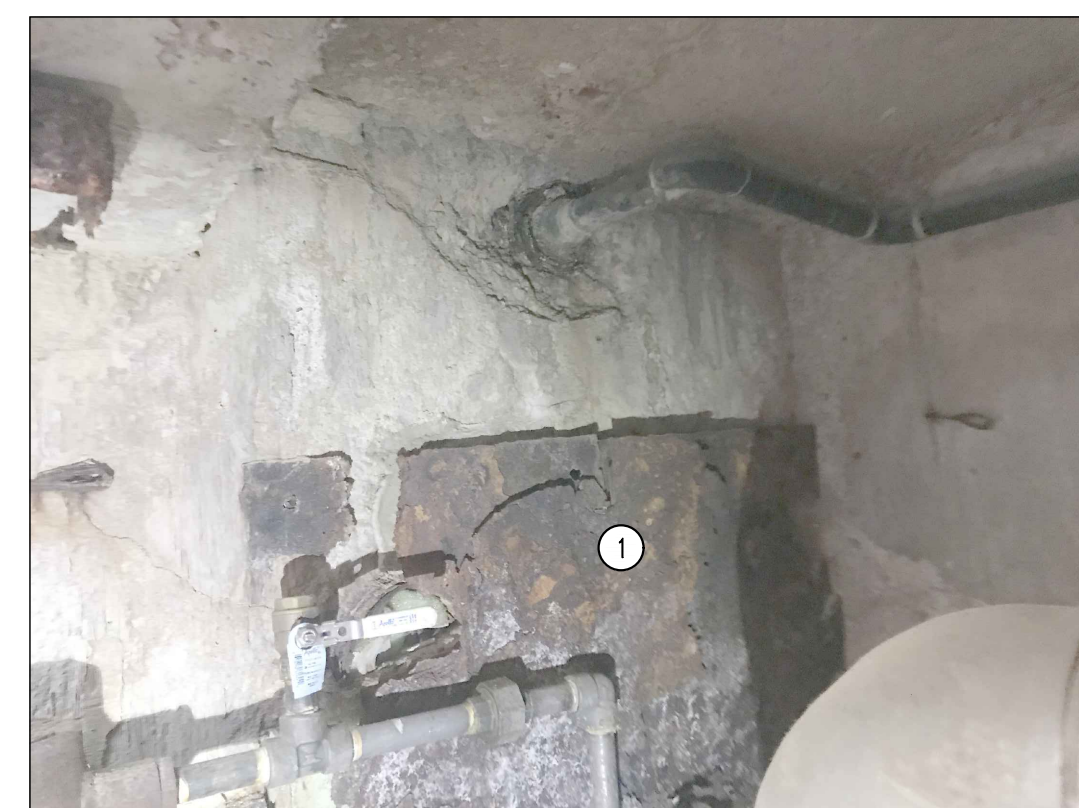
1 SPALLED LID, SEE REPAIR NOTE 1.

SMH #004 - S 5th St



1 EXPOSED REBAR, SEE REPAIR NOTE 3.

SMH #004 - S 5th St

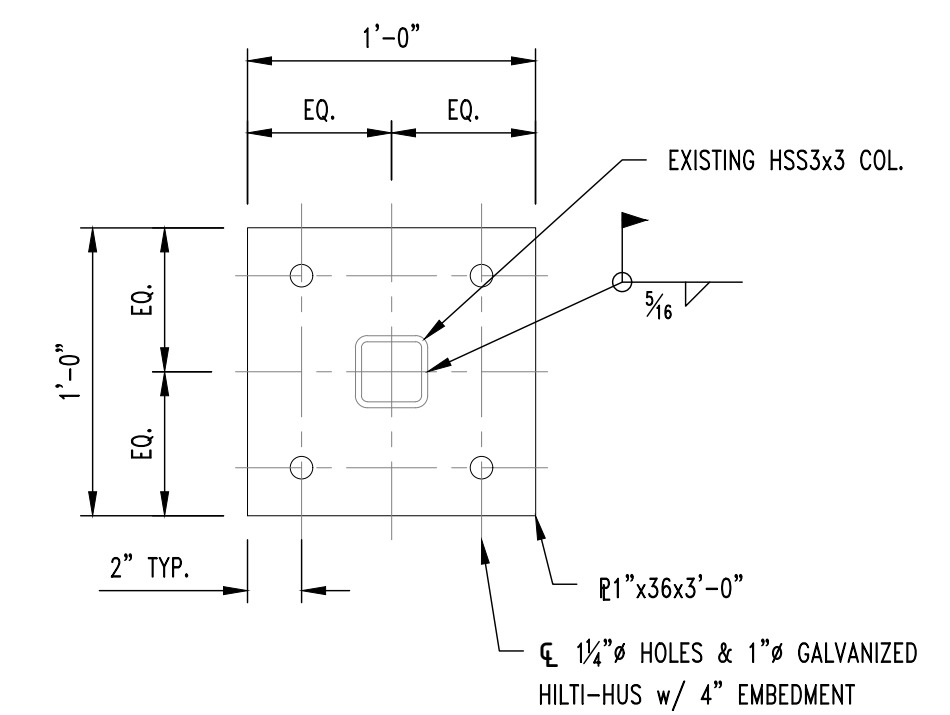


1 STEEL PLATE, SEE REPAIR NOTE 6.

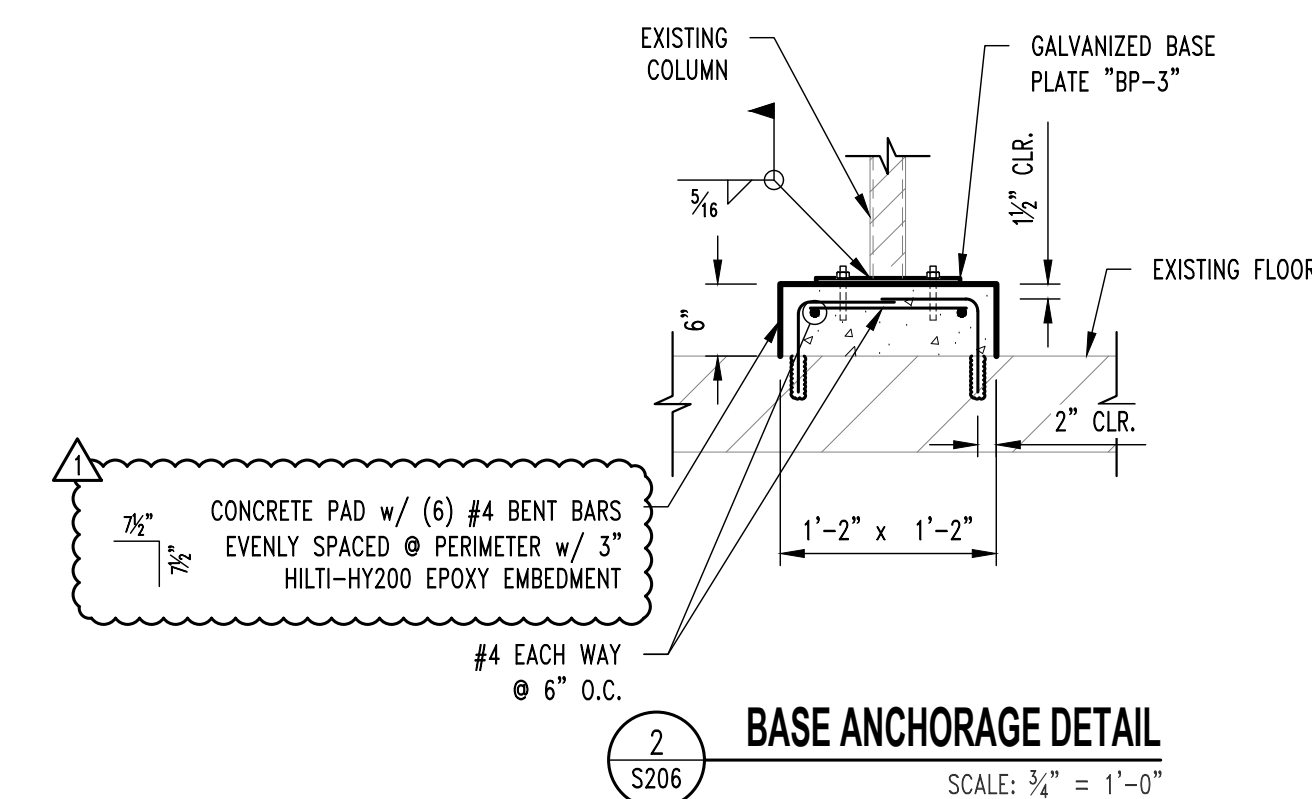
SMH #004 - S 5th St

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.
2. ALL CONCRETE PATCHING/REPAIR DETAILS AND NOTES ARE PROVIDED ON SHEET S300.
3. ALL 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.



BASE PLATE "BP-3"
(FIELD CONFIRM DIMENSIONS PRIOR TO FABRICATION)



2 S206 BASE ANCHORAGE DETAIL
SCALE: 3/4" = 1'-0"

No.	Date
BID SET	01/12/2022
ADDENDUM #1	02/04/2022

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY
GREGORY L LINNEMAN
REGISTERED PROFESSIONAL ENGINEER
MISSOURI
NUMBER: FE-2005001013
GREGORY L LINNEMAN - PE
MO LICENSE - 2005001013

STRUCTURAL ENGINEER
CROCKETT
ENGINEERS ARCHITECTS
1000 W. N. MILLS BLVD. SUITE 100
COLUMBIA, MISSOURI 65205
(314) 447-0292
www.crockettengineering.com
Crockett Engineering Consultants, LLC
Missouri License # 0000013101

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

CP220041 - VARIOUS LOCATIONS
REPAIR CONCRETE IN STEAM MANHOLES
UNIVERSITY OF MISSOURI
COLUMBIA, BOONE COUNTY, MISSOURI

DRAWING INCLUDES:
SMH #004 (ALTERNATE #2) PLAN & PHOTOS

DESIGNED: GLL
DRAWN: RCA
PROJECT NO.: 180016
MU PROJECT NO.: CP220041
SHEET: S206