



**STRUCTURAL NOTES**

**A. GENERAL**

1. THE GENERAL CONTRACTOR AND SUB-CONTRACTORS MUST DETERMINE THE SCOPE OF THE STRUCTURAL WORK FROM THE CONTRACT DOCUMENTS TAKEN AS A WHOLE. THE STRUCTURAL DRAWINGS MUST NOT BE CONSIDERED SEPARATELY FOR PURPOSES OF BIDDING THE STRUCTURAL WORK. DUE CONSIDERATION MUST BE GIVEN TO OTHER STRUCTURAL WORK OR WORK RELATED TO THE STRUCTURE, INCLUDING NECESSARY COORDINATION DESCRIBED OR IMPLIED BY THE CIVIL AND MEP DRAWINGS.
2. REPRODUCTION OF THE STRUCTURAL CONTRACT DOCUMENTS IN ANY FASHION AS STRUCTURAL SHOP DRAWING DOCUMENTS IS PROHIBITED.
3. SCALES NOTED ON THE DRAWINGS ARE FOR GENERAL INFORMATION ONLY. NO DIMENSIONAL INFORMATION SHALL BE OBTAINED BY DIRECT SCALING OF THE DRAWINGS.
4. DETAILS, SECTIONS AND NOTES SHOWN ON THESE DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR CONDITIONS ELSEWHERE UNLESS OTHERWISE SHOWN OR NOTED.
5. INFORMATION SHOWN REGARDING EXISTING CONDITIONS HAS BEEN OBTAINED BY LIMITED OBSERVATIONS. AREAS NOT VISIBLE HAVE BEEN ASSUMED TYPICAL WITH OBSERVED EXISTING CONDITIONS.
6. INFORMATION ON THE EXISTING STRUCTURE IS TAKEN FROM STRUCTURAL SHEETS S340 & S341 BY HAZEN AND SAWYER ENVIRONMENTAL ENGINEERS & SCIENTISTS. DATED MAY 1999.
7. FOLLOW ALL MANUFACTURER RECOMMENDATIONS FOR PRODUCTS LISTED IN REMEDIAL REPAIRS.

**B. DEMOLITION**

1. FURNISH ALL LABOR AND MATERIALS NECESSARY TO PERFORM THE DEMOLITION WORK IN A COMPLETED MANNER SUCH THAT NEW WORK CAN BE INSTALLED WITH MINIMUM PREPARATION.
2. CONTRACTOR MUST INCLUDE IN THE SCOPE OF WORK ALL ASPECTS OF REQUIRED DEMOLITION, STAGING THE REPAIR TASKS AND SCHEDULING THE WORK IN A MANNER APPROVED BY ACSA, CLEAN UP AFTER PORTIONS OF WORK ARE PERFORMED AND CLEAN UP AFTER THE ENTIRE REPAIR IS COMPLETED.
3. THE CONTRACTOR MUST TAKE PRECAUTIONS TO PREVENT DAMAGE OF THE EXISTING STRUCTURE. IN THE EVENT OF DAMAGE, CONTRACTOR MUST PROVIDE TEMPORARY SHORING AND CONTACT THE STRUCTURAL ENGINEER FOR ASSESSMENT OF THE DAMAGE.
4. SCHEDULE ALL WORK IN A CAREFUL MANNER WITH ALL NECESSARY CONSIDERATION FOR FACILITY OPERATIONS, AND FACILITY PERSONNEL. ANY DAMAGE TO PERSON OR PROPERTY AS A RESULT OF DEMOLITION AND RELATED WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
5. ERECT BARRIERS FENCES, GUARDRAILS, WARNING DEVICES AND SHORING TO PROTECT PERSONNEL WORKING IN THE AREA.
6. SUBMIT PROCEDURES AND SCHEDULE PROPOSED FOR THE ACCOMPLISHMENT OF THE DEMOLITION WORK TO ACSA FOR APPROVAL. INCLUDE SAFE CONDUCT OF THE WORK, DISPOSITION OF MATERIALS, PROTECTION OF REMAINING PROPERTY AND COORDINATION WITH OTHER WORK.

**C. CONCRETE TOPPING**

1. ALL CONCRETE WORK MUST BE IN ACCORDANCE WITH ACI 301, 302, AND 318.
2. PROVIDE CONCRETE WITH A MINIMUM COMPRESSIVE STRENGTH (f<sub>c</sub>) OF 4,500 PSI AT 28 DAYS, A MAXIMUM WATER/CEMENT RATIO OF 0.45, AND A MINIMUM AIR CONTENT OF 7.5% +/- 1.5%. CONCRETE MUST MEET EXPOSURE CLASSES FROM ACI 318 CHAPTER 19 AS FOLLOWS: F2, S0, W1, C1. USE NORMAL WEIGHT AGGREGATES CONFORMING TO ASTM C33, MAXIMUM AGGREGATE SIZE OF 3/8" AND TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150.
3. CONCRETE MIX IS REQUIRED TO HAVE WATERPROOFING ADMIXTURE XYPEX BIO-SAN C500 ADDED TO THE MIX AT A DOSAGE RATE OF 1% OF CEMENTITIOUS CONTENT.
4. FLY ASH CONFORMING TO ASTM C618, TYPE C OR F MAY BE USED TO REPLACE A PORTION OF THE PORTLAND CEMENT IN A CONCRETE MIX. THE AMOUNT OF PORTLAND CEMENT CONTENT MUST NOT BE LESS THAN 70 PERCENT OF THE TOTAL AMOUNT OF CEMENTITIOUS MATERIAL IN THE MIX.
5. GROUND GRANULATED BLAST-FURNACE SLAG CONFORMING TO ASTM C989, MAY BE USED AS TO REPLACE A PORTION OF THE PORTLAND CEMENT IN A CONCRETE MIX. THE AMOUNT OF PORTLAND CEMENT CONTENT MUST NOT BE LESS THAN 70 PERCENT OF THE TOTAL AMOUNT OF CEMENTITIOUS MATERIAL IN THE MIX.
6. TOPPING CONCRETE SHALL CONTAIN 1.5 LBS/YD<sup>3</sup> OF EUCLID PSI FIBERSTRAND OR EQUIVALENT CONFORMING WITH ASTM C1116.
7. CONTRACTOR MUST SUBMIT MIX DESIGN FOR APPROVAL WITH ALL PROPERTIES AND WITH TRIAL BATCH MIXTURE TEST DATA PER ACI REQUIREMENTS.
8. SEE SEQUENCE OF REPAIR NOTES ON SHEET S-501 FOR ADDITIONAL INFORMATION.

**D. SEQUENCE OF CONCRETE TOPPING REPLACEMENT**

1. DEMOLISH AND DISPOSE OF EXISTING +/- 2" THICK CEMENT GROUT TOPPING.
2. ALLOW VISUAL OBSERVATION OF THE TOP SURFACE OF THE UNDERLYING STRUCTURAL SLAB BY THE SER.
3. FOLLOWING THIS ADDITIONAL REVIEW, PROVIDE ANY REMEDIAL REPAIRS THAT MAY NEED TO BE DONE TO RESOLVE ANY OBSERVED DISTRESS. CONCRETE BASE SLAB MUST BE REPAIRED PER GUIDANCE FROM SER FOLLOWING VISUAL OBSERVATION OF CONCRETE SLAB. REPAIR ALL CRACKS AND SPALLS PER DETAILS 2 AND 3 ON S-501. ANY ADDITIONAL REPAIRS DETAILS REQUIRED BASED ON ACTUAL OBSERVED DISTRESS WILL BE DETERMINED FOLLOWING THE SITE OBSERVATION.
4. PREPARE THE SURFACE OF THE STRUCTURAL SLABS OF THE CENTERWELL AND SETTLEMENT ZONES TO RECEIVE THE NEW CONCRETE TOPPING BY APPLYING HIGH PRESSURE WATER OR SHOT BLAST TO REMOVE LAITANCE AND ACHIEVE A MINIMUM SURFACE PROFILE OF ICRI CONCRETE SURFACE PROFILE 6. SER MUST OBSERVE THE CONCRETE SURFACE PROFILE AND PROVIDE RECOMMENDATION TO ACCEPT OR REJECT TO OWNER BEFORE PROCEEDING WITH TOPPING PLACEMENT.
5. FORM THE VERTICAL FACE PITS TO PREVENT TOPPING FROM RUNNING INTO THE WELLS. PROVIDE 3/4" CHAMFER AT EXPOSED EDGES.
6. WET SURFACE TO RECEIVE TOPPING TO BE SATURATED SURFACE DRY (SSD).
7. APPLY SCRUB COAT OF BONDING GROUT OR COMMERCIAL BONDING AGENT TO THE EXISTING STRUCTURAL SLABS, SUCH AS SIKA ARMATEC 110 EPOCEM OR APPROVED EQUAL. BONDING AGENT SHALL BE A BONDING GROUT MEETING ASTM C144 BUT WITH 100% PASSING NO. 30 SIEVE.
8. PLACE NEW MIN 2" THICK CONCRETE TOPPING. PROVIDE A SMOOTH TOPPING SURFACE PER ITEM 9.
9. FINISH TOPPING BY REMOVING THE SCREEDS FROM THE ROTARY ARMS OF THE SLUDGE RAKES, ATTACHING 2X4 FINISHED LUMBER SET SLIGHTLY BELOW THE POSITION OF THE CLARIFIER SCREEDS AND THEN ADVANCING THE RAKES AROUND THE TANK USING AN EXTERNAL DRIVE SYSTEM TO SWEEP THE SURFACE AND PRODUCE THE FINAL FINISH ON THE CONCRETE TOPPING.
10. CURE CONCRETE IN COMPLIANCE WITH ACI 308.1, BEGIN CURING IMMEDIATELY AFTER PLACEMENT. CONTRACTOR TO SUBMIT METHOD AND PRODUCTS FOR REVIEW AND APPROVAL.
  - A. ABSORPTIVE COVER: AASHTO M 182, CLASS 2, BURLAP CLOTH MADE FROM JUTE OR KENAF, WEIGHING APPROXIMATELY 9 OZ./SQ. YD. WHEN DRY.
  - B. MOISTURE-RETAINING COVER: ASTM C171, POLYETHYLENE FILM BURLAP-POLYETHYLENE SHEET.
  - C. CLEAR, WATERBORNE, MEMBRANE-FORMING, DISSIPATING CURING COMPOUND: ASTM C309, TYPE 1, CLASS B.
    - a. ONE APPROVED MANUFACTURER AND PRODUCT IS THE FOLLOWING: DAYTON SUPERIOR CLEAR RESIN CURE J11W CONCRETE MUST BE CURED FOR A MINIMUM OF 7 DAYS PRIOR TO FILLING THE TANK WITH WATER OR PUTTING BACK INTO SERVICE.
11. CONTRACTOR REQUIRED TO SUBMIT A SCHEDULE OF WORK PLAN FOR REVIEW AND APPROVAL WITH MOBILIZATION STARTING IN FEBRUARY AND DEMOBILIZATION BY EARLY MAY AT THE LATEST. THE AMOUNT OF TIME FOR THE TANK TO BE OUT OF SERVICE MUST BE A LIMITED AS POSSIBLE, THIS MEANS THERE IS EXPECTED TO BE CONTINUOUS WORK ONCE THE TANK IS TAKEN OFFLINE.

**E. SPECIAL INSPECTIONS**

1. AN INDEPENDENT AGENCY SHALL PERFORM SPECIAL INSPECTIONS PER THE INTERNATIONAL BUILDING CODE 2018. IN ACCORDANCE WITH INTERNATIONAL BUILDING CODE SECTION 1704.0, THE RESPONSIBLE INSPECTOR SHALL BE A REGISTERED PROFESSIONAL ENGINEER LICENSED IN THE STATE OF VIRGINIA. THESE INSPECTIONS ARE IN ADDITION TO THE INSPECTIONS SPECIFIED IN SECTION 110.
2. WRITTEN REPORTS SHALL BE SUBMITTED TO THE BUILDING OFFICIAL AND REGISTERED DESIGN PROFESSIONAL STATING COMPLIANCE OR NON-COMPLIANCE WITH DESIGN DOCUMENTS AND SPECIFICATIONS. ALL REPORTS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE WHERE THE CONSTRUCTION TAKES PLACE.
3. CONTINUOUS: THE FULL-TIME OBSERVATION OF WORK REQUIRING SPECIAL INSPECTION BY AN APPROVED SPECIAL INSPECTOR WHO IS PRESENT IN THE AREA WHERE THE WORK IS BEING PERFORMED.
4. PERIODIC: THE PART-TIME OR INTERMITTENT OBSERVATION OF WORK REQUIRING SPECIAL INSPECTION BY AN APPROVED SPECIAL INSPECTOR WHO IS PRESENT IN THE AREA WHERE THE WORK HAS BEEN OR IS BEING PERFORMED AND AT THE COMPLETION OF THE WORK.
5. FAILURE TO RETAIN AN INDEPENDENT TESTING AGENCY TO PERFORM THE REQUIRED SERVICES SPECIFIED ABOVE, OR FAILURE TO SUBMIT SIGNED AND SEALED REPORTS, INDICATES NON-COMPLIANCE WITH THE CONTRACT DOCUMENTS.

**A. STRUCTURAL - CONCRETE TOPPING CONSTRUCTION SECTION**

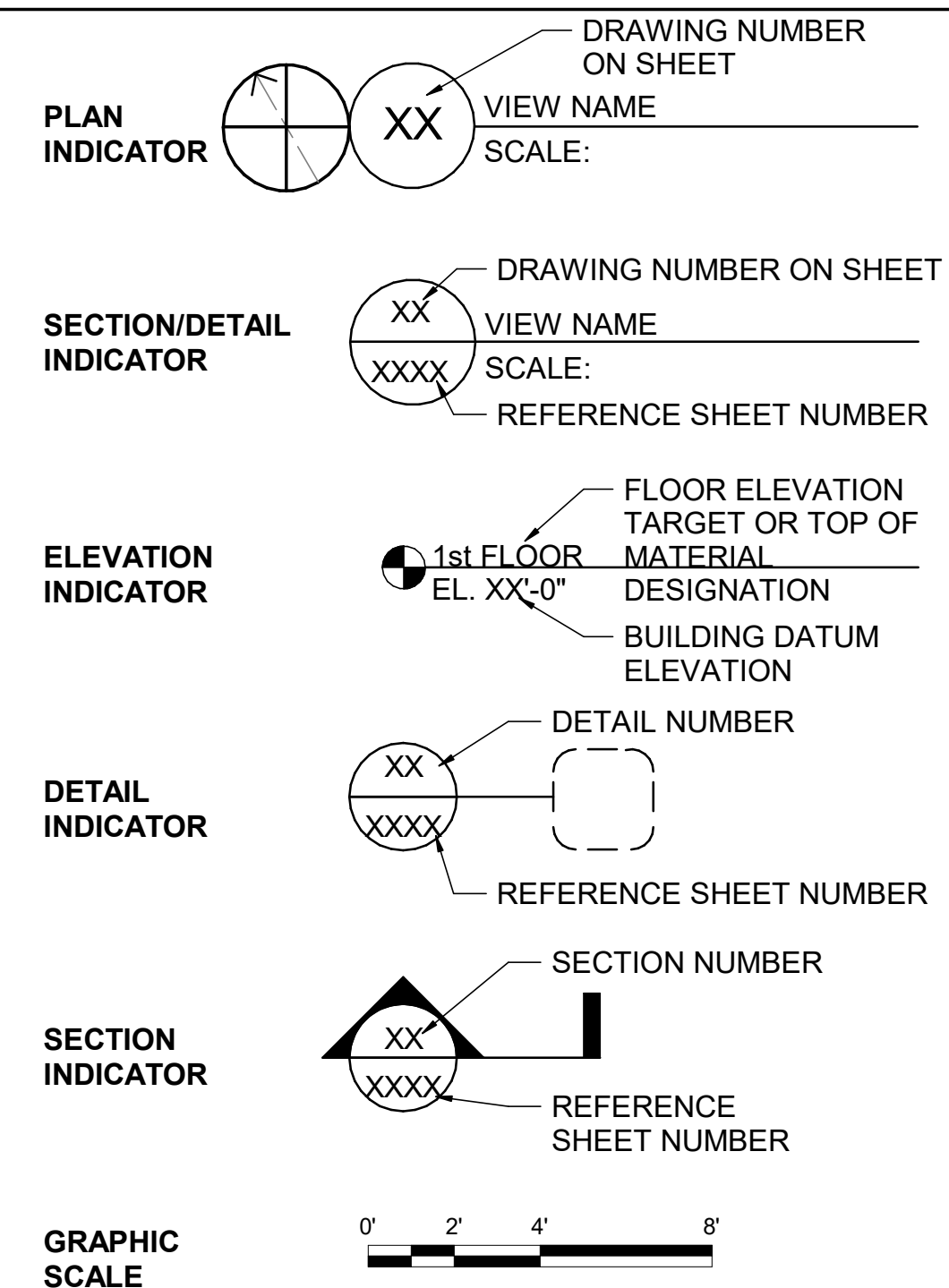
CONCRETE CONSTRUCTION, INCLUDING COMPOSITE DECK - VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.3, 1(ACI 318 REFERENCES NOTED IN IBC TABLE)

INSPECTION REQ (Y/N)	TASK	INSPECTION TYPE	DESCRIPTION
Y	1. VERIFY PROPER CONCRETE SURFACE PROFILE HAS BEEN ACHIEVED AND THAT SURFACE IS PROPERLY CLEANED AND PREPARED FOR TOPPING SLAB.	OBSERVE	REVIEW THE CONCRETE SURFACE PROFILE WITH RESPECT TO ICRI STNADARDS AND LISTED CONCRETE SURFACE PROFILE ON DRAWINGS. VERIFY THAT SURFACED IS PROPERLY CLEANED AND PREPARED PER DRAWINGS AND...
Y	2. VERIFY USE OF REQUIRED MIX DESIGN	OBSERVE	VERIFY THAT ALL MIXES USED COMPLY WITH THE APPROVED CONSTRUCTION DOCUMENTS
Y	3. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORMSLUMP AND AIR CONTENT TESTS, AND DETERMINE THE...	CONTINUOUS	AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TEST VERIFY THESE TESTS ARE PERFORMED BY QUALIFIED TECHNICIANS
Y	4. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED	OBSERVE	
Y	5. INSPECT CONCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES	CONTINUOUS	VERIFY PROPER APPLICATION TECHNIQUES ARE USED DURING CONCRETE CONVEYANCE AND DEPOSITING AVOIDS SEGREGATION OR CONTAMINATION. VERIFY THAT CONCRETE IS PROPERLY CONSOLIDATED
Y	6. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUE	OBSERVE	INSPECT CURING, COLD WEATHER PROTECTION, AND HOT WEATHER PROTECTION PROCEDURES. VERIFY CURED FOR APPROPRIATE TIME BEFORE APPLICATION OF...

**ABBREVIATIONS**

ACI	AMERICAN CONCRETE INSTITUTE
ADD'L	ADDITIONAL
B/	BOTTOM OF
CONC	CONCRETE
DIA	DIAMETER
EX	EXISTING
ICRI	INTERNATIONAL CONCRETE REPAIR INSTITUTE
INFO	INFORMATION
MEP	MECHANICAL, ELECTRICAL, PLUMBING
MIN	MINIMUM
SER	STRUCTURAL ENGINEER OF RECORD
T/	TOP OF

**DRAWING SYMBOLS**



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**AUGUSTA COUNTY SERVICE  
AUTHORITY MIDDLE RIVER REGIONAL  
WWTP**

**SECONDARY CLARIFIER NO. 3 REPAIR**

VERONA, VIRGINIA

REVISION DESCRIPTION

DATE

MRK

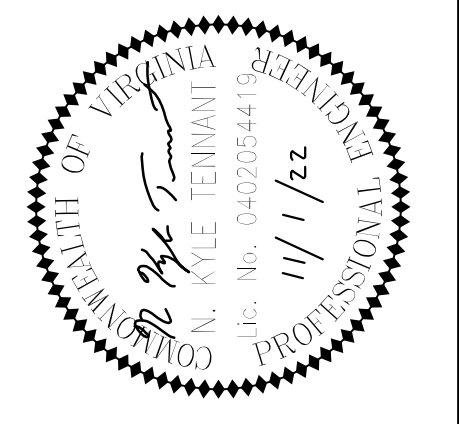
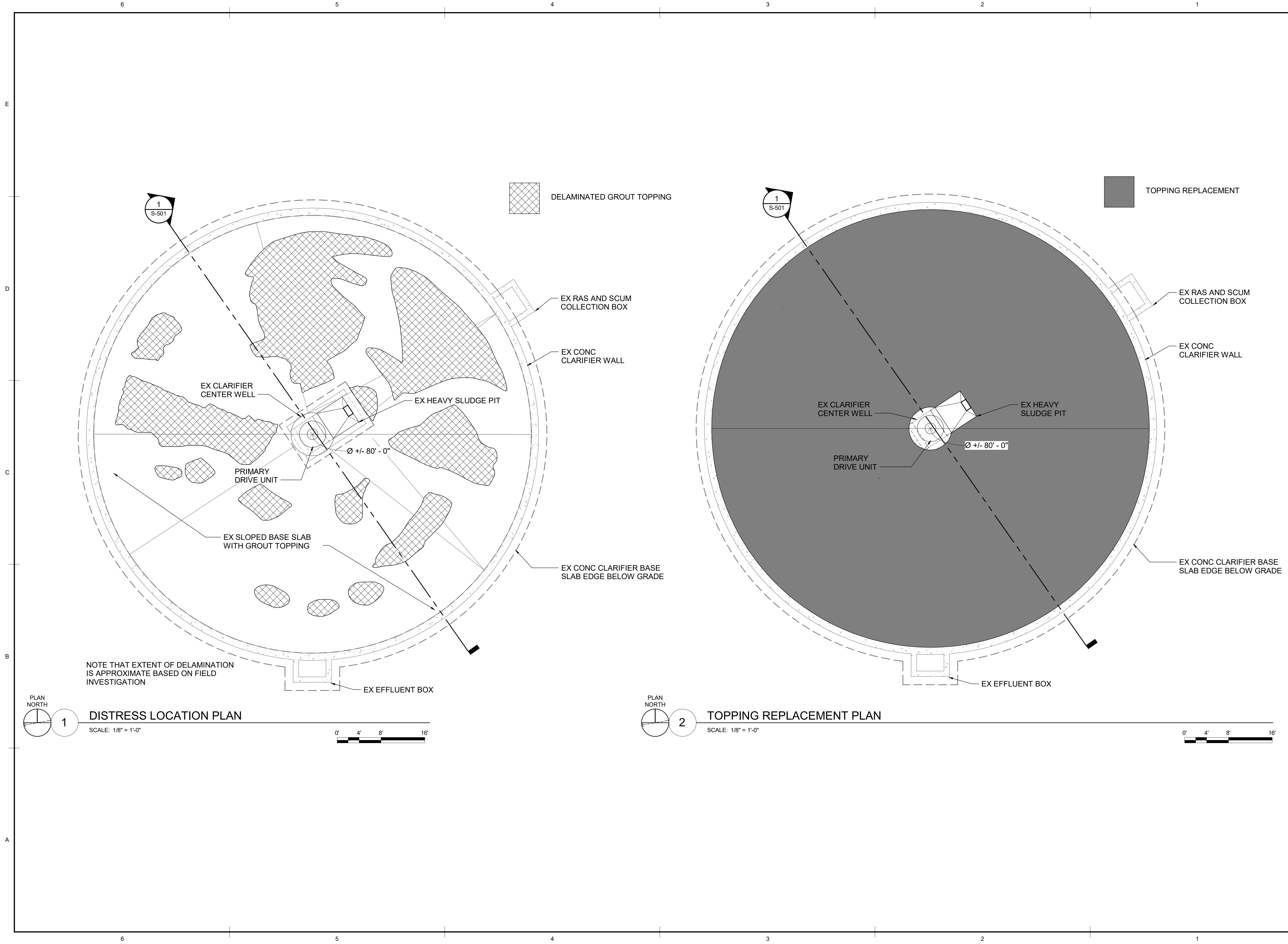
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DATE:	11/01/2022
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CHECK:	SMF

SHEET TITLE  
**STRUCTURAL GENERAL  
NOTES & SPECIAL  
INSPECTIONS**

SHT. NO.	REV. NO.
<b>S-001</b>	

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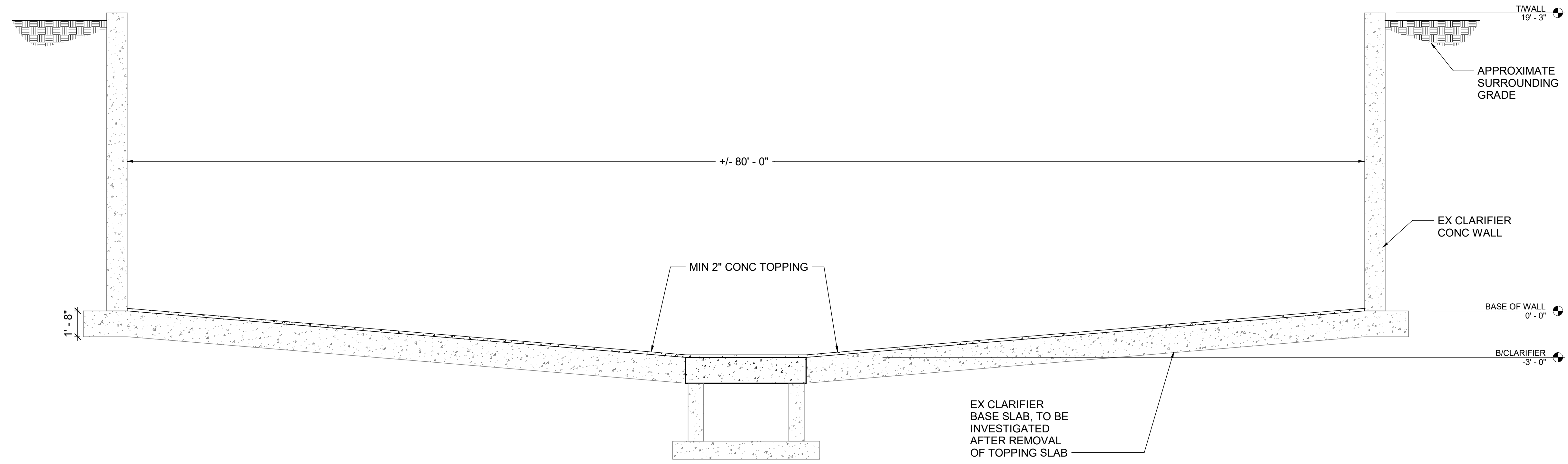
AUGUSTA COUNTY SERVICE  
 AUTHORITY MIDDLE RIVER REGIONAL  
 WWTP  
 SECONDARY CLARIFIER NO. 3 REPAIR  
 VERONA, VIRGINIA

MRK	DATE	REVISION DESCRIPTION

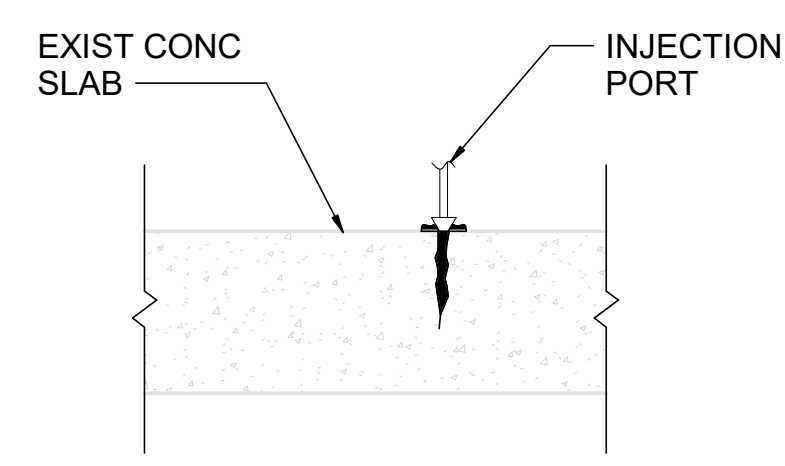
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SHEET TITLE  
**DISTRESS & REPLACEMENT PLAN**

SHT. NO.	REV. NO.
<b>S-101</b>	



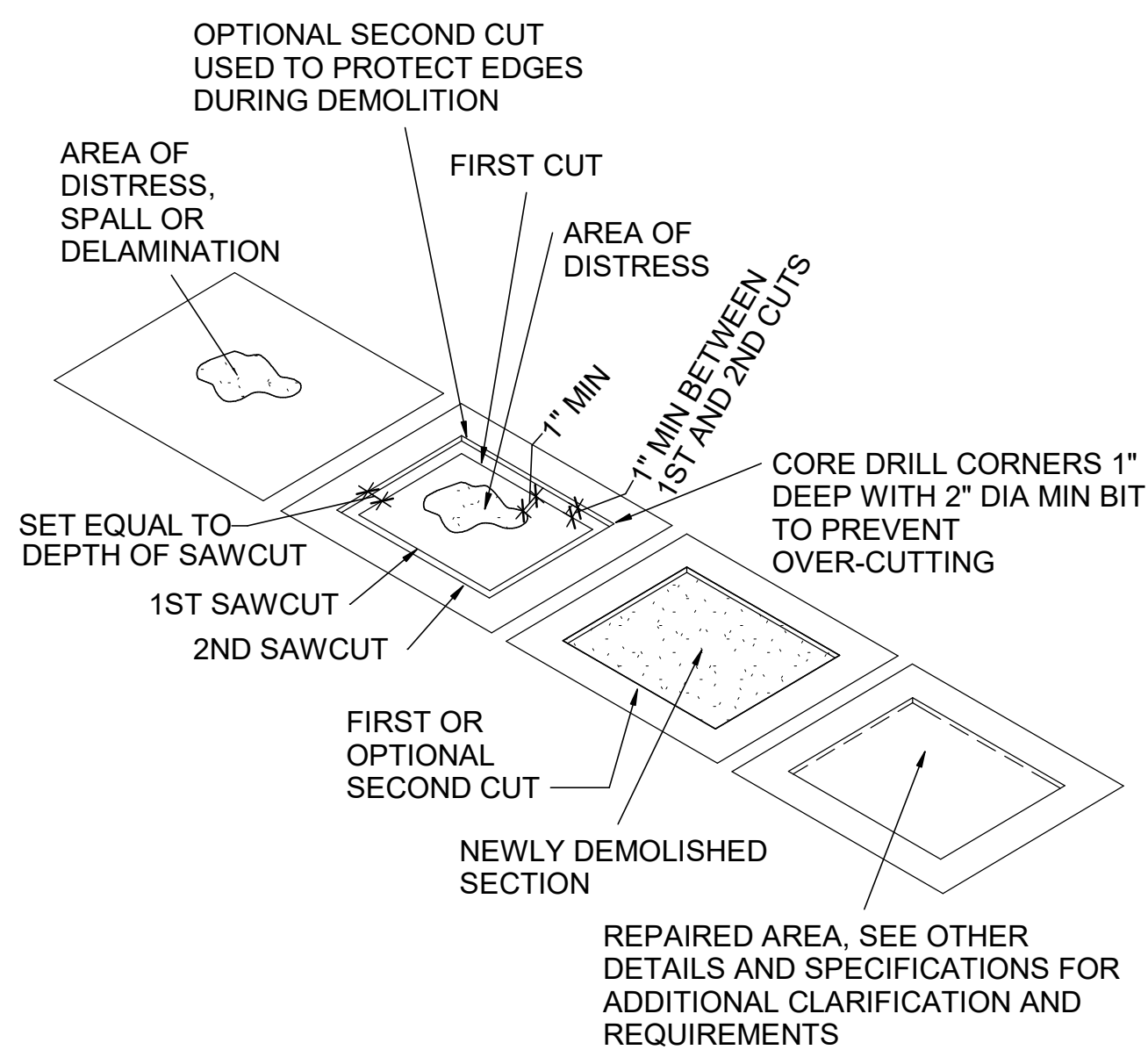
**1 SECTION**  
S-101 SCALE: 1/4" = 1'-0"



- HORIZONTAL SURFACE**
- ROUTE ALONG CRACK WITH GRINDER TO FORM A V-NOTCH 1/2" WIDE X 1/2" DEEP.
  - MARK EXTENTS OF CRACK WITH SPRAY PAINT AND DOCUMENT EXTENT FOR OWNER.
  - BLOW OUT THE V-NOTCH WITH OIL-FREE COMPRESSED AIR.
  - FILL V-NOTCH WITH TWO COMPONENT LOW-VISCOSITY EPOXY RESIN ADHESIVE, BASIS OF DESIGN IS SIKA CRACK FIX.
  - FOLLOW ALL MANUFACTURER'S INSTRUCTIONS FOR EPOXY RESIN ADHESIVE.

**2 DETAIL - CONCRETE CRACK REPAIR**  
NOT TO SCALE

- REPAIR PROCEDURE FOR HORIZONTAL REPAIRS**
- THE BOUNDING PERIMETER OF THE DISTRESSED AREA SHALL BE MARKED TO IDENTIFY THE FIRST AND SECOND CUT LINES. FOR A DELAMINATED SURFACE, HAMMER SOUND AREA TO ESTIMATE THE APPROXIMATE BOUNDARIES OF THE DELAMINATION. THE BOUNDNG PERIMETER OF WORN CONCRETE SURFACE SHALL BE THE LARGEST RECTANGLE THAT ENCOMPASSES THE ENTIRE WORN AREA.
  - REINFORCING DEPTH AND LOCATION SHALL BE DETERMINED PRIOR TO ANY SAW CUTTING TO AVOID CUTTING REINFORCING. SAW CUT (FIRST CUT) PERIMETER OF REPAIR FORMING A RECTANGLE AROUND THE AREA OF DELAMINATION MAINTAINING A MINIMUM OF 1" FROM EDGE OF CONCRETE DISTRESS. CORE DRILL CORNERS 1" DEEP WITH 2" DIA MIN BIT TO PREVENT OVER-CUTTING. DEPTH OF THE FIRST SAW CUT SHALL BE NO MORE THAN HALF OF THE DETERMINED CLEAR COVER OF EXISTING STEEL.
  - AT THE CONTRACTOR'S DISCRETION, TO ASSIST IN CONTAINING ANY RESIDUAL DAMAGE FROM REMOVING THE DISTRESSED CONCRETE INSIDE THE FIRST CUT, SAW CUT AN OPTIONAL SECOND CUT OUTSIDE OF PERIMETER OF FIRST CUT A MINIMUM 1" FROM FIRST CUT. CORE DRILL CORNERS 1" DEEP WITH 2" DIA MIN BIT TO PREVENT OVER-CUTTING. DEPTH OF SECOND SAW CUT SHALL MATCH FIRST CUT. IF OPTIONAL SECOND CUT IS NOT USED, RE-CUT PATCH EDGES IF CHIPPING OR SPALLING OCCURS DURING REMOVAL.
  - REMOVE DISTRESSED CONCRETE WITHIN FIRST SAW CUT BY APPROVED METHODS (HYDRODEMOLITION AND OR 15 LB HAMMER) CREATING THE SURFACE PROFILE AS RECOMMENDED BY THE REPAIR PRODUCT MANUFACTURER, MINIMUM CSP-6.
  - REMOVE CONCRETE BETWEEN FIRST AND SECOND SAW CUT. CAUTION SHALL BE TAKEN NOT TO DAMAGE EDGE OF "SOUND" CONCRETE. NOT APPLICABLE IF SECOND CUT IS NOT USED.
  - IF REINFORCING STEEL IS UNCOVERED BY ANY OF THE REMOVAL STEPS ABOVE STOP WORK AND NOTIFY SER FOR DIRECTION ON HOW TO PROCEED.
  - PREPARE AND CLEAN CONCRETE CAVITY USING HIGH-PRESSURE WATER OR ABRASIVE BLASTING TO REMOVE LOOSE AND BOND INHIBITING MATERIALS AND GENERATE/MAINTAIN THE SPECIFIED SURFACE PROFILE AS RECOMMENDED BY THE REPAIR PRODUCT MANUFACTURER, MINIMUM CSP-6.
  - APPLY PRIMER OR BONDING AGENT AS SPECIFIED OR REQUIRED BY MATERIAL MANUFACTURER, SIKA ARMATEC 110 EPOCEM OR APPROVED EQUAL, WHICH ALSO ACTS AS A CORROSION INHIBITOR.
  - INSTALL SIKAREPAIR 222 OR APPROVED EQUAL REPAIR MATERIAL INTO PREPARED AND APPROVED CAVITY. MAKE NOTE TO FOLLOW ALL PROCEDURES INCLUDING THE ADDITION OF 3/8" COURSE AGGREGATE TO EXTEND MATERIALS DEEPER THAN 1". FINISH SURFACE PER COATING PRODUCT MANUFACTURER'S RECOMMENDATIONS OR TO MATCH EXISTING FINISH SURFACE.
  - CURE REPAIR IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND AS SPECIFIED. WATER CURING IS REQUIRED, SEE SPECIFICATION.
  - AFTER ADEQUATE CURING TIME, HAMMER SOUND REPAIR/PATCH MATERIAL TO ENSURE BONDING TO SUBSTRATE. IF PATCH IS "SOUNDED HOLLOW" INDICATING DEBONDING FROM THE SUBSTRATE, REMOVE AREA OF DELAMINATION AND RE-PATCH BEGINNING WITH STEP 1.



**3 DETAIL - SPALL REPAIR**  
NOT TO SCALE

NO.	REVISION DESCRIPTION	DATE

COMM NO:	222110
DATE:	11/01/2022
DRAWN:	TAG
DESIGN:	NKT
CHECK:	SMF

SHEET TITLE

TYPICAL STRUCTURAL  
DETAILS

SHT. NO.	REV. NO.
S-501	