

DOCUMENT A00803

# **DRAWINGS AND SKETCHES**

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**DISTRICT 1 BRIDGE SECTION**

PROJECT 614019: DISTRICT 1 – SCHEDULED BRIDGE AND CULVERT SUBSTRUCTURE REPAIRS AT VARIOUS LOCATIONS

SUBJECT: TABLE OF CONTENTS

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 DRAWN BY: LDT  
 DATE: 4/28/26  
 CHKD BY: SAO  
 DATE: 4/28/26

NOTES FOR CONTRACTOR:

IF ANY OF THE FOLLOWING CONDITIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL STOP REMOVING DETERIORATED CONCRETE AND IMMEDIATELY NOTIFY THE DISTRICT BRIDGE ENGINEER TO DETERMINE IF THE EXCAVATION CAN BE CONTINUED:

1. WHEN A MAXIMUM EXCAVATION DEPTH OF 6 INCHES IS REACHED IN ANY SUBSTRUCTURE REPAIR.
2. WHEN THE EXCAVATION ENCROACHES ON THE BEARING DEVICES.
3. WHEN THE COLUMN SPACING IS MORE THAN 16 FT, OR MORE THAN TWO ADJACENT BEAMS ARE SUPPORTED BY THE COLUMN BAY IN PIER CAP REPAIR.
4. WHEN THE PIER CAP OVERHANG, (MEASURING FROM THE FACE OF THE COLUMN), IS MORE THAN 4 FT, AND/OR THE BEARING DEVICES ARE WITHIN THE OUTER HALF OF THE OVERHANG IN PIER END CAP REPAIR.



**DISTRICT 1 BRIDGE SECTION**

PROJECT 614019: DISTRICT 1 – SCHEDULED BRIDGE AND CULVERT SUBSTRUCTURE REPAIRS AT VARIOUS LOCATIONS

SUBJECT: NOTES FOR CONTRACTOR

SHEET: 2 OF 11  
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SUBSTRUCTURE CONCRETE REPAIR NOTES:

1. SUBSTRUCTURE REPAIRS SHALL CONSIST OF REMOVING DETERIORATED CONCRETE, PREPARING THE REPAIR SURFACE, FORMING WHERE REQUIRED, PLACING AND FINISHING NEW CONCRETE OR CEMENTITIOUS MORTAR. THE SCOPE OF REPAIRS MAY ALSO REQUIRE APPLYING CONCRETE PENETRANT/SEALER (ITEM 964.01) TO THE REPAIRED SUBSTRUCTURE UNITS. THE LIMITS FOR THE CONCRETE PENETRANT/SEALER WILL BE ESTABLISHED BY THE ENGINEER.
2. THE REPAIR IS DESIGNATED AS A DEEP PATCH WHEN THE EXCAVATED DEPTH TO SOUND CONCRETE EXCEEDS 2" FROM THE FACE OF THE CONCRETE OR REINFORCING STEEL IS ENCOUNTERED.
3. THE REPAIR IS DESIGNATED AS A SHALLOW DEPTH WHEN THE DEPTH OF SOUND CONCRETE IS REACHED AT OR LESS THAN 2" FROM THE FACE OF THE CONCRETE AND REINFORCING STEEL IS NOT ENCOUNTERED.
4. 4000 PSI, ¾ INCH, 660 CEMENT CONCRETE (ITEM 905.) SHALL BE USED FOR ALL DEEP PATCH REPAIRS. ALL SHALLOW DEPTH REPAIRS SHALL BE PATCHED WITH CEMENTITIOUS MORTAR FOR PATCHING (ITEM 909.2) OR IF THE REPAIR DEPTH IS NO MORE THAN 1" IN DEPTH, REPAIRS SHALL BE PATCHED WITH EPOXY MORTAR FOR PATCHING (ITEM 964.7). CEMENTITIOUS MORTAR SHALL BE SELECTED FROM MASSDOT QUALIFIED PRODUCT LIST AND APPROVED BY THE ENGINEER.
5. THE CONTRACTOR SHALL ESTABLISH LIMITS OF REPAIRS AT THE DIRECTION OF THE ENGINEER. THE EXTENT, LOCATION AND REPAIR TYPE (DEEP PATCH OR SHALLOW DEPTH REPAIR) ARE TO BE FIELD VERIFIED AND APPROVED BY THE ENGINEER AFTER THE CONTRACTOR HAS SOUNDED AND MARKED OUT THE REPAIR AREA. THE AREAS OF REPAIR SHALL BE MADE APPROXIMATELY RECTANGULAR WITH THE SIDES GENERALLY PERPENDICULAR TO THE SURFACE BEING REPAIRED.
6. THE DETERIORATED CONCRETE SHALL BE REMOVED AS REQUIRED TO PROVIDE GOOD SOUND CONCRETE ON WHICH NEW CONCRETE CAN BE PLACED AND SATISFACTORILY BONDED TO UNDAMAGED OR UNDISTURBED REINFORCEMENT.
7. SAW CUT ALONG NEAT LINES AROUND REPAIR AREA PRIOR TO CONCRETE EXCAVATION. USE SAW CUT DEPTH OF ½", OR AS REQUIRED TO AVOID CUTTING REINFORCING STEEL.
8. SUBSTRUCTURE REPAIR SHOULD INCLUDE THE REMOVAL OF ALL DETERIORATED, LOOSE, SPALLED, AND HOLLOW SOUNDING CONCRETE. THE DETERIORATED CONCRETE SHALL BE REMOVED FROM WITHIN THE REPAIR AREAS TO THE DEPTH OF SOUND CONCRETE. WHEN REINFORCING STEEL IS UNCOVERED, CARE SHALL BE TAKEN SO AS NOT TO DAMAGE THE STEEL OR ITS BOND TO THE SURROUNDING CONCRETE. MAXIMUM 25 LB. HAMMERS WITH CHISEL POINTS SHALL BE USED FOR CONCRETE REMOVAL. MAXIMUM 15 LB. HAMMERS SHALL BE USED ONCE REINFORCING STEEL IS EXPOSED.
9. THE CONTRACTOR SHALL STOP REMOVING DETERIORATED CONCRETE WHEN A MAXIMUM DEPTH OF 6 INCHES IS REACHED. THE DISTRICT BRIDGE ENGINEER SHALL BE IMMEDIATELY NOTIFIED TO DETERMINE IF THE EXCAVATION CAN BE CONTINUED.



DISTRICT 1 BRIDGE SECTION

PROJECT 614019: DISTRICT 1 – SCHEDULED BRIDGE AND CULVERT SUBSTRUCTURE REPAIRS AT VARIOUS LOCATIONS

SUBJECT: SUBSTRUCTURE CONCRETE REPAIR NOTES

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10. IF REINFORCING STEEL IS EXPOSED THEN CLEAN BY MECHANICAL CLEANING OR HIGH PRESSURE WASHING WITH WATER THAT CONTAINS NO DETERGENTS OR BOND INHIBITING CHEMICALS. WHERE ACTIVE CORROSION HAS OCCURRED THAT WOULD INHIBIT BONDING, CLEAN STEEL USING ABRASIVE BLASTING METHODS ACCEPTABLE TO THE ENGINEER.
11. AFTER REMOVAL AND EDGE PREPARATIONS ARE COMPLETE, REMOVE BOND INHIBITING MATERIALS (DIRT, GREASE, LOOSELY BONDED AGGREGATE) BY ABRASIVE BLASTING OR HIGH PRESSURE WATER BLASTING WITH WATER THAT CONTAINS NO DETERGENTS OR BOND INHIBITING CHEMICALS. CHECK THE CONCRETE SURFACES AFTER CLEANING TO ENSURE THAT SURFACE IS FREE FROM ADDITIONAL LOOSE AGGREGATE OR THAT ADDITIONAL DELAMINATIONS ARE NOT PRESENT.
12. EXISTING REINFORCING BARS, WHICH ARE BROKEN OR HAVE LOST 25% OR MORE OF THEIR CROSS SECTIONAL AREA, OR AS REQUIRED BY THE ENGINEER, SHALL BE REPAIRED BY SPLICING IN NEW REINFORCING BARS OF THE SAME DIAMETER. SEE EXISTING BRIDGE PLANS FOR BAR SIZES. SPLICE LAPS ARE TO BE AT LEAST 32 BAR DIAMETERS. MISSING OR DETERIORATED REINFORCING STEEL SHALL BE REPLACED AS DIRECTED BY THE ENGINEER AND WILL BE PAID UNDER ITEM 910.1.
13. ALL SURFACES WHERE NEW CONCRETE WILL BE BONDED TO EXISTING CONCRETE SHALL BE PRE-WETTED WITH CLEAN WATER TO SATURATED SURFACE (SSD) CONDITION (WITH NO STANDING WATER) IMMEDIATELY PRIOR TO THE CONCRETE PLACEMENT. IF INDICATED ON THE PLANS OR DIRECTED BY THE ENGINEER, APPLY EPOXY BONDING COMPOUND SUITABLE FOR BONDING FRESH CONCRETE TO HARDENED CONCRETE FOR LOAD BEARING APPLICATIONS TO INTERFACE BETWEEN NEW AND EXISTING CONCRETE. THE EPOXY BONDING COMPOUND SHALL CONFORM TO AASHTO M 235 TYPE V, GRADE AND CLASS SHALL BE SPECIFIED FOR EACH APPLICATION AND SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND THE SPECIAL PROVISIONS. THE COST ASSOCIATED WITH THIS WORK WILL BE INCIDENTAL TO ITEMS 905., 909.2, AND 964.7.
14. IN GENERAL, EPOXY BONDING COMPOUND SHALL BE USED FOR ALL SHALLOW DEPTH REPAIR AND HORIZONTAL SURFACES OF DEEP PATCH REPAIR, SUCH AS TOP EXCAVATED SURFACES OF PIER CAP AND BEAM SEAT.
15. IF EPOXY BONDING COMPOUND IS USED, THE FORMS SHALL BE INSTALLED AT LEAST ONCE PRIOR TO APPLICATION OF THE EPOXY BONDING COMPOUND IN ORDER TO ENSURE FORMS CAN BE REINSTALLED AND FILLED BEFORE THE EPOXY BONDING COMPOUND HARDENS.
16. ALL CONCRETE SURFACES ONCE CURED, SHALL BE RUBBED TO PRODUCE A SMOOTH FINISH TO MATCH EXISTING SURFACES. WET CURING IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES SECTION 901.38 WILL BE REQUIRED.
17. CONCRETE PIER CAPS, COLUMNS, ABUTMENT SEATS, AND EXPOSED SECTIONS OF ABUTMENT STEMS SHALL (AS DETERMINED BY THE ENGINEER) RECEIVE A CONCRETE PENETRANT/SEALER (ITEM 964.01), 30 DAYS AFTER ALL REPAIRS HAVE BEEN MADE.



**DISTRICT 1 BRIDGE SECTION**

PROJECT 614019: DISTRICT 1 - SCHEDULED BRIDGE AND CULVERT SUBSTRUCTURE REPAIRS AT VARIOUS LOCATIONS

SUBJECT: SUBSTRUCTURE CONCRETE REPAIR NOTES (CONT.)

SHEET: 4 OF 11
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18. THE CONTRACTOR SHALL FOLLOW THE CONCRETE PIER CAPS AND COLUMNS REPAIR SEQUENCE OUTLINED ON THE PLANS. THE CONTRACTOR WILL HAVE THE OPTION TO SUBMIT AN ALTERNATE REPAIR PROCEDURE FOR REVIEW AND APPROVAL. THE CONTRACTOR MAY ALSO USE TEMPORARY SHORING TO COMPLETE THE REPAIRS IN ONE STAGE. IF SHORING IS PROPOSED TO ACCOMMODATE THE CONTRACTOR'S MEANS AND METHODS OR REPAIR SCHEDULE, NO ADDITIONAL COMPENSATION WILL BE ALLOWED. THIS SHALL REQUIRE APPROVAL OF THE ENGINEER AND THE SHORING WILL BE CONSIDERED INCIDENTAL TO THE REPAIR WORK.
  
19. THE REPAIR PHASING AND SEQUENCE MAY BE MODIFIED BY THE ENGINEER SO THAT THE SECTIONS WITH WORSE DETERIORATION ARE REPAIRED FIRST.

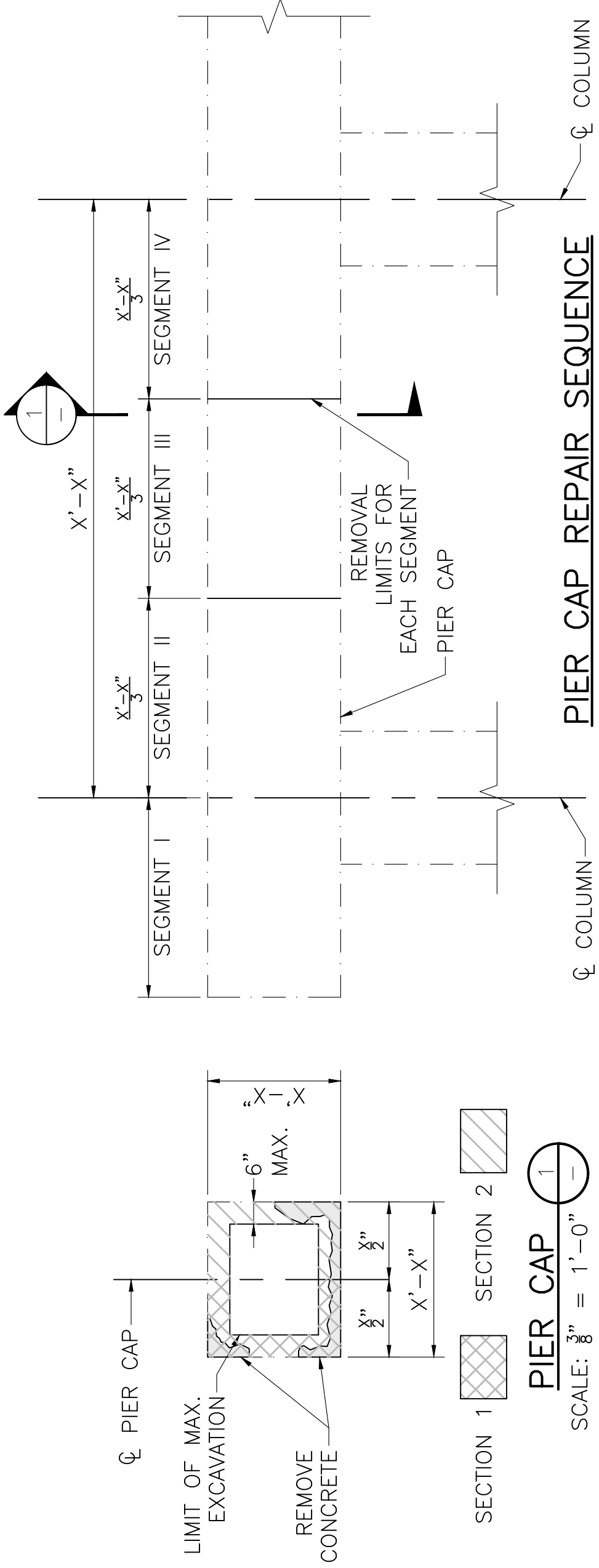


**DISTRICT 1 BRIDGE SECTION**

PROJECT 614019: DISTRICT 1 – SCHEDULED BRIDGE AND CULVERT SUBSTRUCTURE REPAIRS AT VARIOUS LOCATIONS

SUBJECT: SUBSTRUCTURE CONCRETE REPAIR NOTES (CONT.)

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**NOTES:**

1. CONCRETE ELEMENTS ARE DIVIDED INTO SEGMENTS. WORK TO BE PERFORMED ON SECTIONS AS SHOWN.
2. THE CONTRACTOR SHALL PROVIDE A TEMPORARY SHORING SYSTEM TO SUPPORT THE PIER CAP DEAD AND LIVE LOADS IF THE EXCAVATION LIMITS ARE TO BE EXTENDED PER EVALUATION OF THE DISTRICT BRIDGE ENGINEER.
3. THE CONTRACTOR SHALL PROVIDE A TEMPORARY SHORING SYSTEM TO SUPPORT THE PIER CAP DEAD AND LIVE LOADS IF THE EXCAVATION IS WITHIN 6" OF THE BEARING.
4. CONTRACTOR SHALL STAGE THE WORK SO THAT THE SECTIONS IN POOREST CONDITION ARE REPAIRED FIRST, AS APPROVED BY THE ENGINEER.
5. CONTRACTOR SHALL NOT WORK ON ADJACENT SECTIONS SIMULTANEOUSLY UNLESS APPROVED BY THE DISTRICT BRIDGE ENGINEER.
6. CONTRACTOR SHALL WAIT 72 HOURS AFTER COMPLETING REPAIRS TO A SECTION BEFORE REPAIRS TO ADJACENT SECTIONS, HOWEVER HE/SHE MAY PERFORM WORK ON OTHER BRIDGE ELEMENTS.
7. CONTRACTOR SHALL STOP REMOVING DETERIORATING CONCRETE WHEN A MAXIMUM DEPTH OF 6 IN. IS REACHED. THE ENGINEER SHALL BE IMMEDIATELY NOTIFIED IF MORE REMOVAL SEEMS NECESSARY ON THE BRIDGE SECTION.
8. EXISTING REINFORCING NOT SHOWN.
9. THE CONTRACTOR SHALL SUBMIT AN ALTERNATE REPAIR SEQUENCE FOR APPROVAL OF THE ENGINEER WHEN TEMPORARY SHORING IS UTILIZED DURING REPAIRS.
10. MAXIMUM SEGMENT LENGTH SHALL BE LIMITED TO 8 FEET.

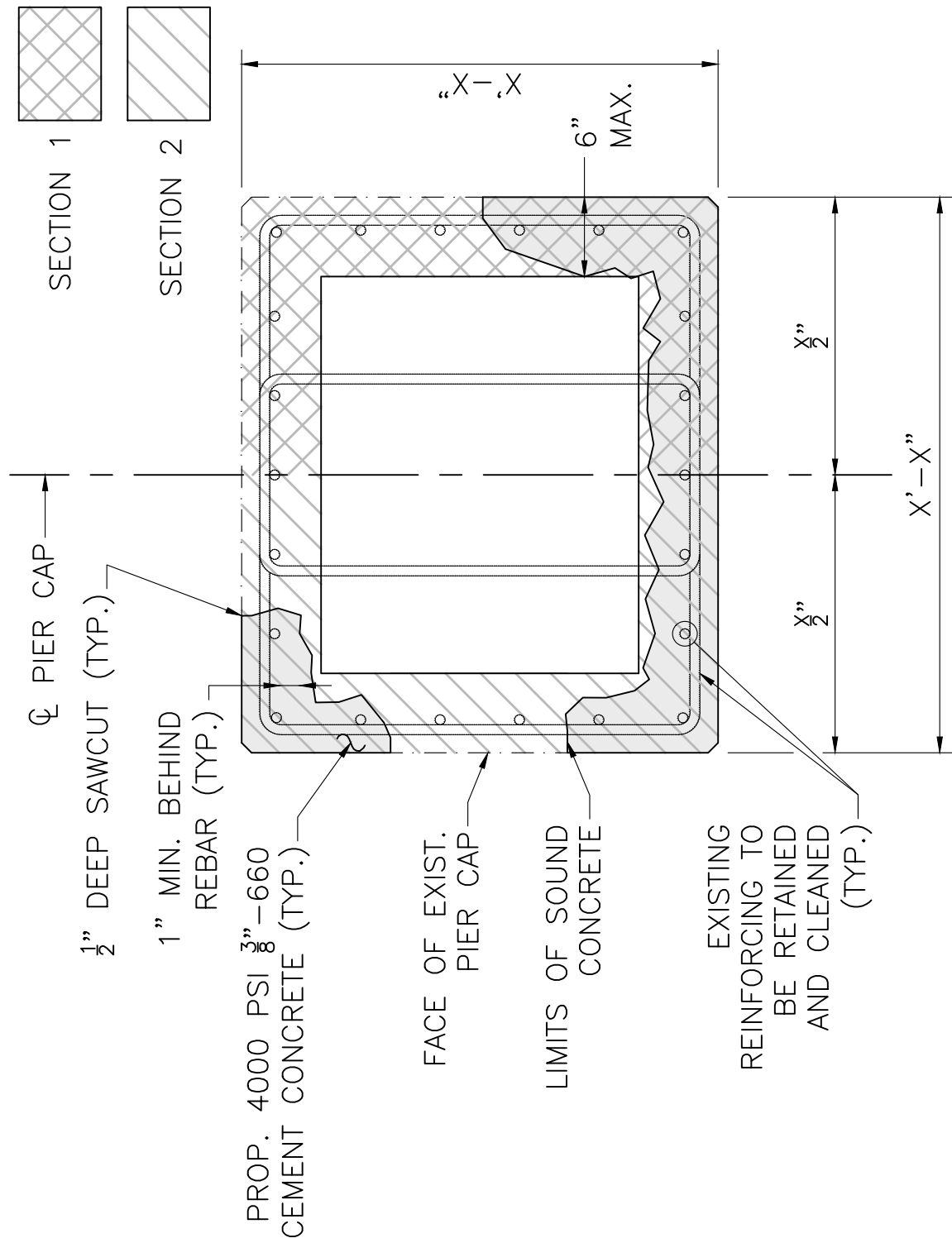


**DISTRICT 1 BRIDGE SECTION**

PROJECT 614019: DISTRICT 1 - SCHEDULED BRIDGE AND CULVERT SUBSTRUCTURE REPAIRS AT VARIOUS LOCATIONS

SUBJECT: PIER CAP REPAIR SEQUENCE

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**PIER CAP REPAIR SECTION**

SCALE: 1" = 1'-0"

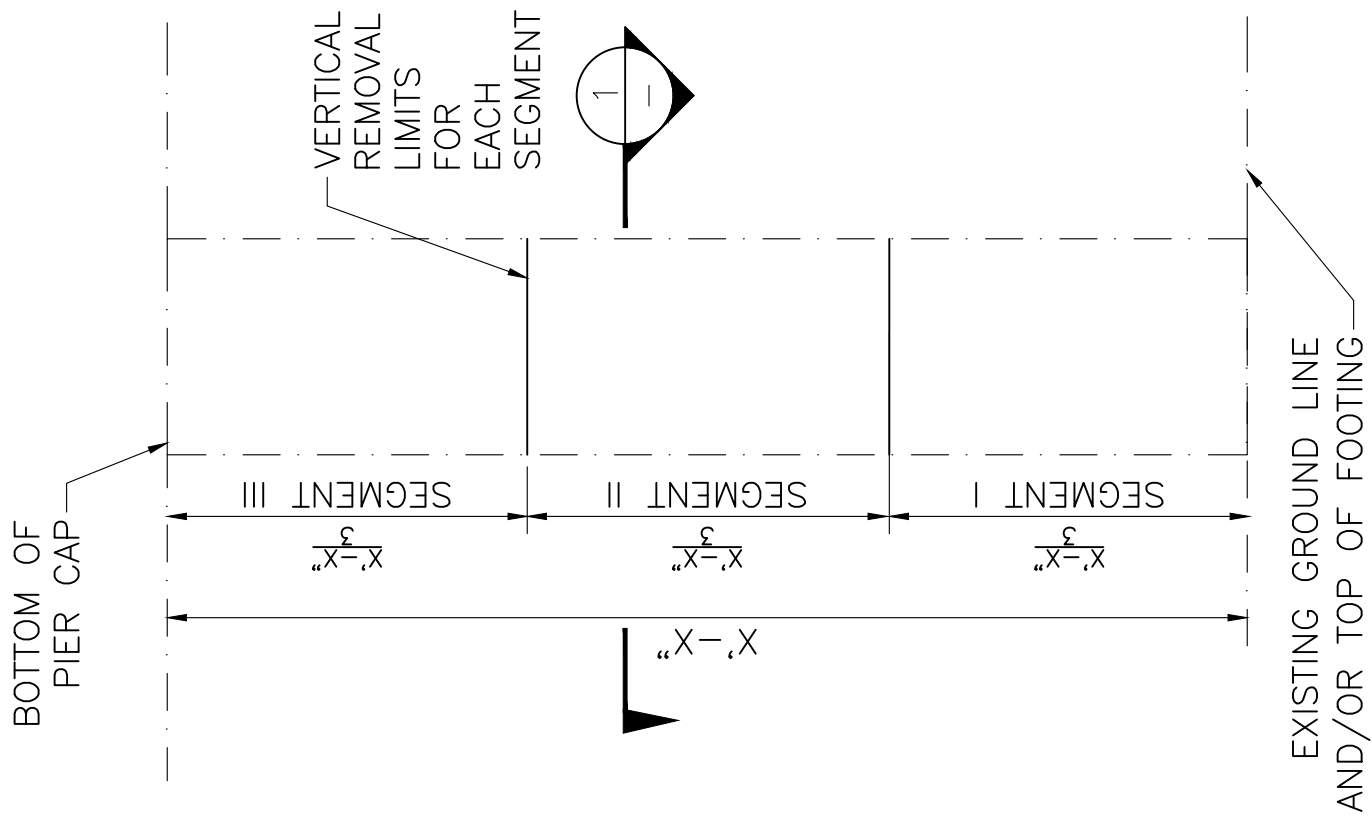


DISTRICT 1 BRIDGE SECTION

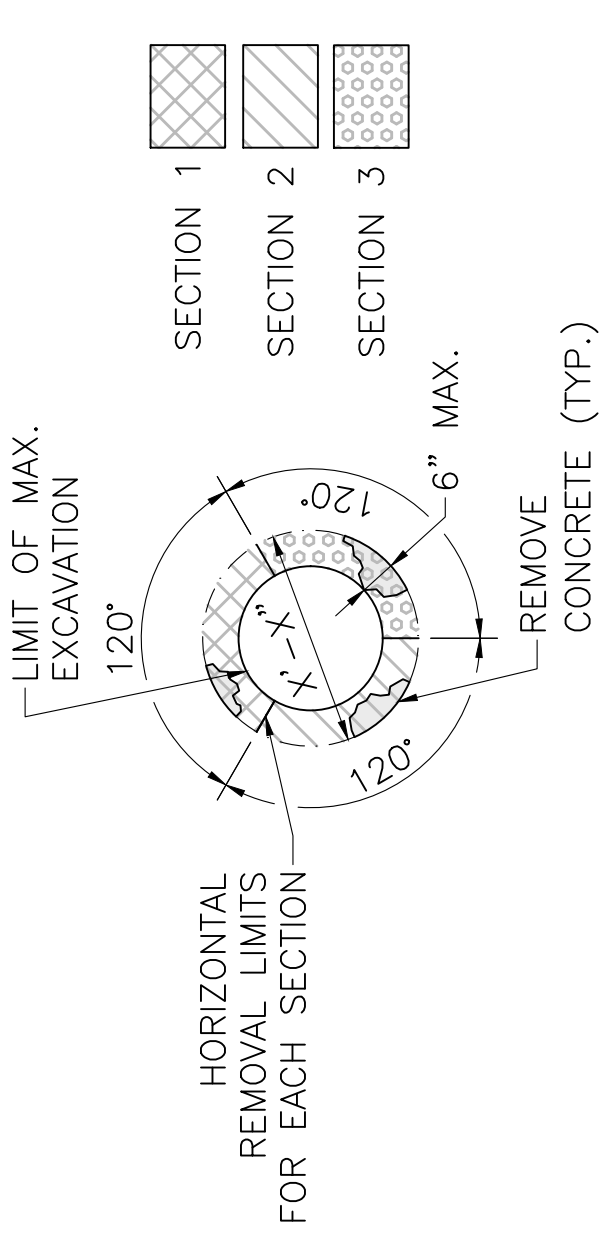
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SUBJECT: PIER CAP REPAIR SECTION

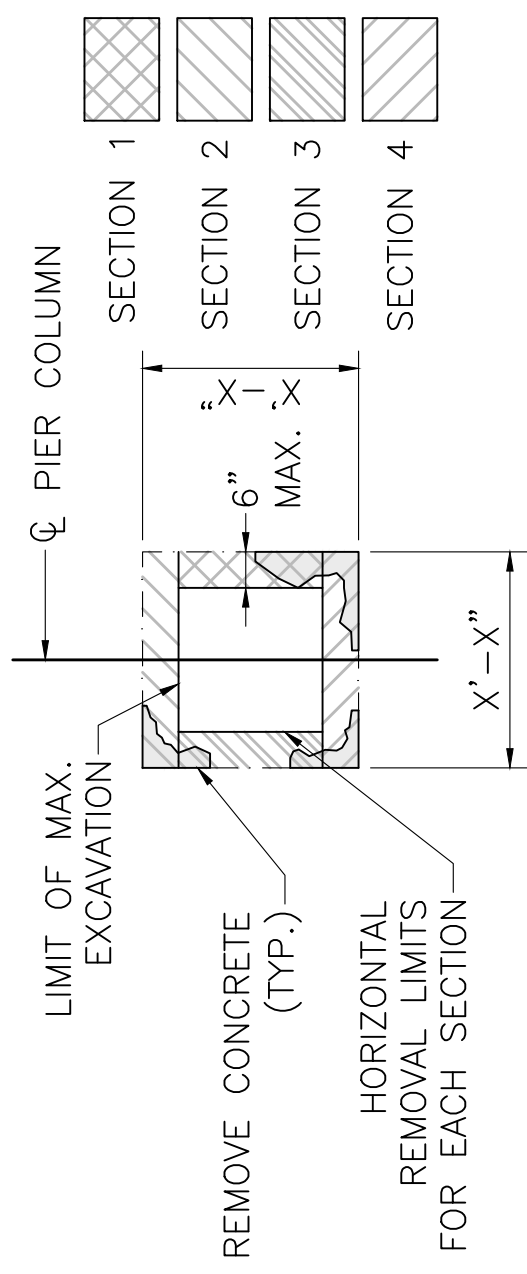
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**PIER COLUMN REPAIR SEQUENCE**  
SCALE:  $\frac{3}{8}'' = 1' - 0''$



**CIRCULAR COLUMN**



**RECTANGULAR COLUMN**

**PIER COLUMN**  
SCALE:  $\frac{3}{8}'' = 1' - 0''$



DISTRICT 1 BRIDGE SECTION

PROJECT 614019: DISTRICT 1 - SCHEDULED BRIDGE AND CULVERT SUBSTRUCTURE REPAIRS AT VARIOUS LOCATIONS

SUBJECT: PIER COLUMN REPAIR SEQUENCE

SHEET: 8 OF 11

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**PIER COLUMN REPAIR SEQUENCE NOTES:**

1. CONCRETE ELEMENTS ARE DIVIDED INTO SEGMENTS. WORK TO BE PERFORMED ON SECTIONS AS DEFINED BELOW.
2. THE CONTRACTOR SHALL PROVIDE A TEMPORARY SHORING SYSTEM TO SUPPORT THE PIER CAP DEAD AND LIVE LOADS IF THE EXCAVATION LIMITS ARE TO BE EXTENDED PER EVALUATION OF THE DISTRICT BRIDGE ENGINEER.
3. NOTE CONTRACTOR SHALL STAGE THE WORK SO THAT THE WORSE SECTIONS ARE REPAIRED FIRST.
4. CONTRACTOR SHALL NOT WORK ON ADJACENT SECTIONS SIMULTANEOUSLY UNLESS APPROVED BY THE DISTRICT BRIDGE ENGINEER.
5. CONTRACTOR SHALL WAIT 72 HOURS AFTER COMPLETING REPAIRS TO A SECTION BEFORE CHIPPING ADJACENT SECTIONS, HOWEVER HE/SHE MAY PERFORM WORK ON OTHER BRIDGE ELEMENTS.
6. CONTRACTOR SHALL STOP REMOVING DETERIORATING CONCRETE WHEN A MAXIMUM DEPTH OF 6 IN. IS REACHED. THE ENGINEER SHALL BE IMMEDIATELY NOTIFIED IF MORE REMOVAL SEEMS NECESSARY.
7. EXISTING REINFORCING NOT SHOWN.
8. THE CONTRACTOR SHALL SUBMIT AN ALTERNATE REPAIR SEQUENCE FOR APPROVAL OF THE ENGINEER WHEN TEMPORARY SHORING IS UTILIZED DURING REPAIRS.
9. WHEN HEIGHT OF COLUMN IS MORE THAN 18 FEET, THE CONTRACTOR WILL BE RESTRICTED TO 6 FOOT SEGMENTS.

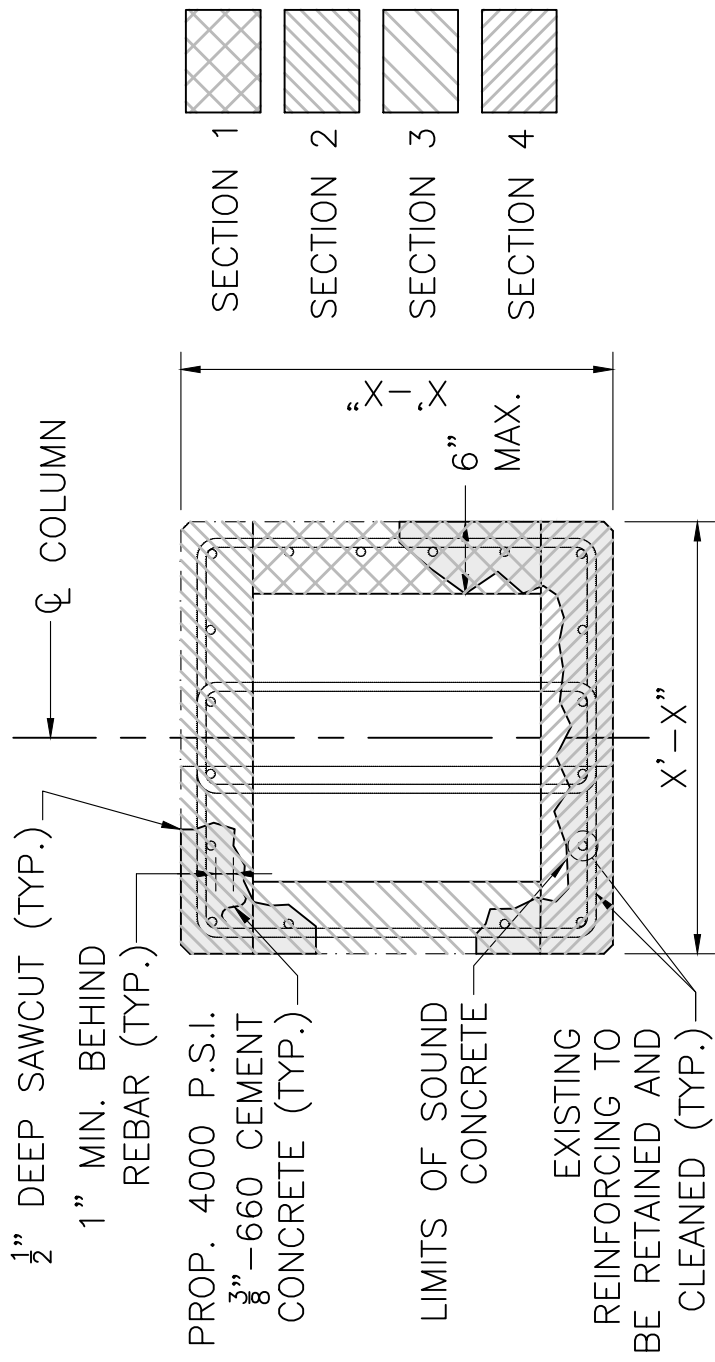


**DISTRICT 1 BRIDGE SECTION**

PROJECT 614019: DISTRICT 1 – SCHEDULED BRIDGE AND CULVERT SUBSTRUCTURE REPAIRS AT VARIOUS LOCATIONS

SUBJECT: PIER COLUMN REPAIR SEQUENCE NOTES

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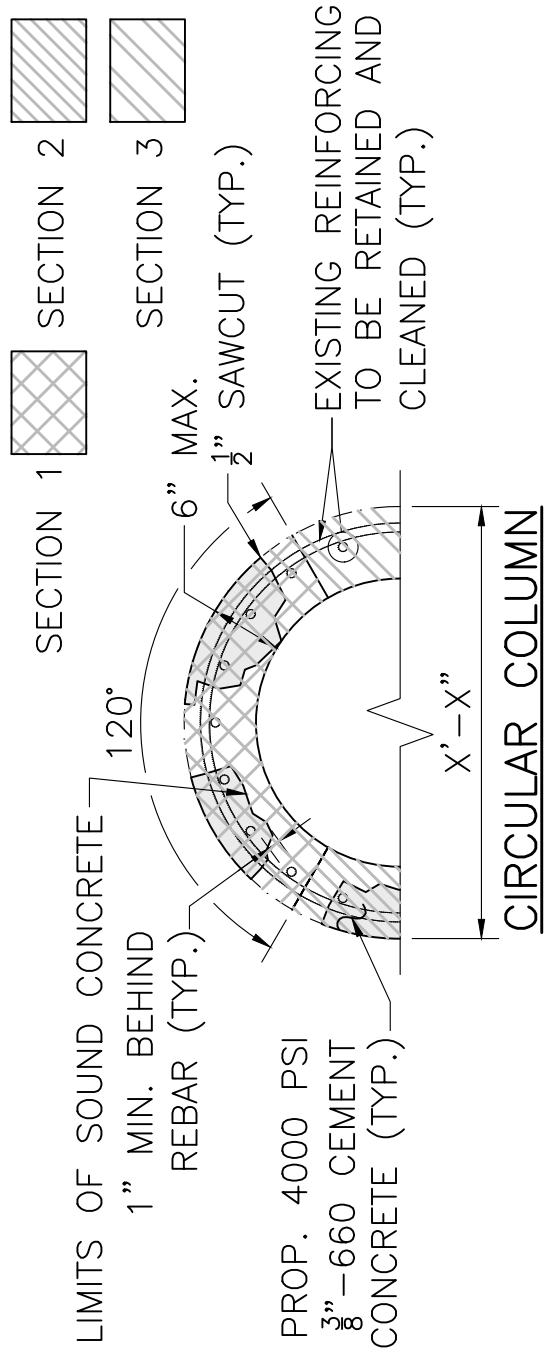
RECTANGULAR COLUMN

NOTE:

IF THERE IS LESS THAN 1 1/2" CONCRETE COVER, THEN THE CONTRACTOR SHALL BUILD OUT THE FORM TO ENSURE A MINIMUM OF 1 1/2" COVER.

COLUMN REPAIR SECTION

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



CIRCULAR COLUMN

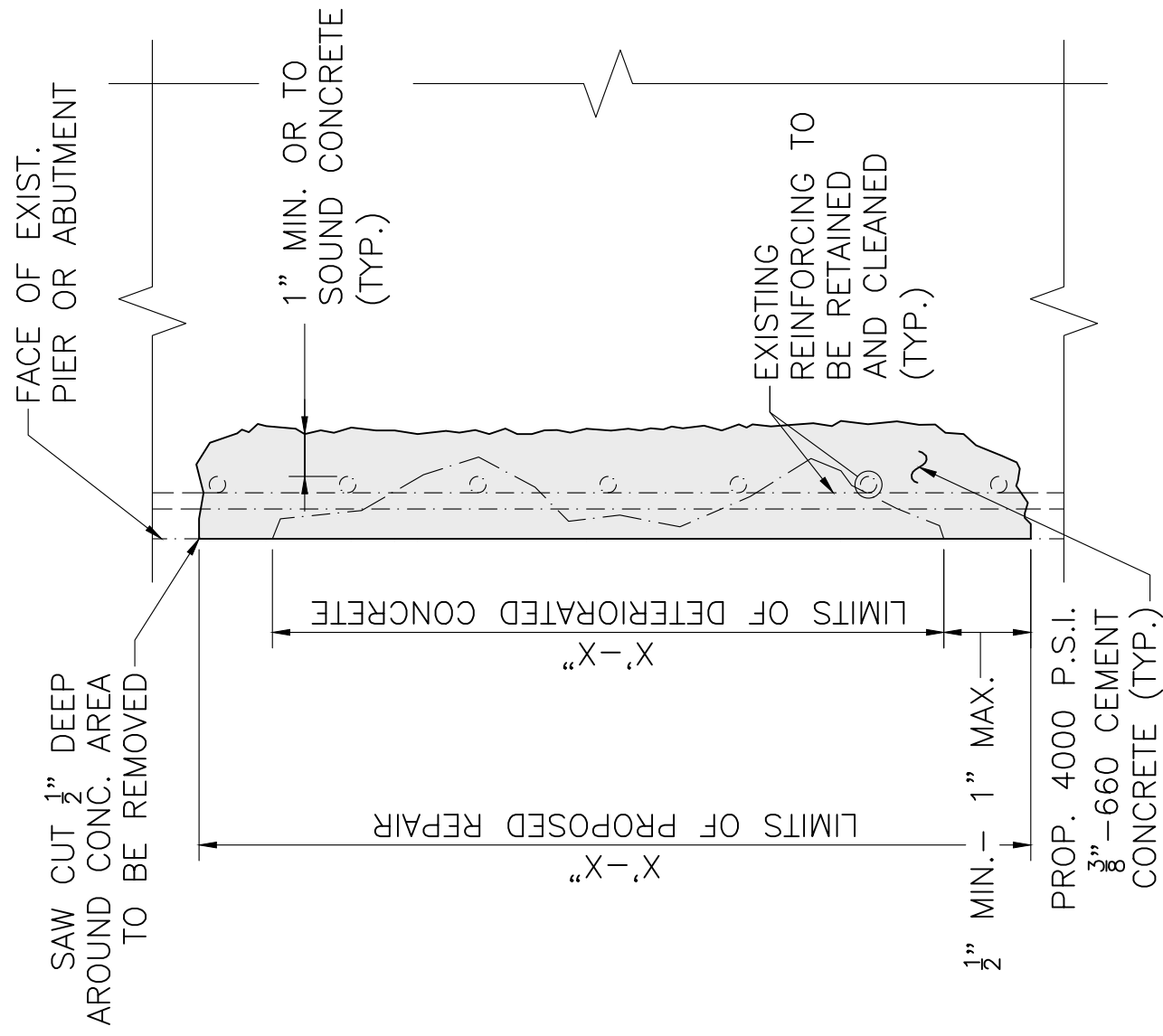


DISTRICT 1 BRIDGE SECTION

PROJECT 614019: DISTRICT 1 - SCHEDULED BRIDGE AND CULVERT SUBSTRUCTURE REPAIRS AT VARIOUS LOCATIONS

SUBJECT: PIER COLUMN REPAIR SECTION

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**NOTE:**  
 IF THERE IS LESS THAN 1½" CONCRETE COVER, THEN THE CONTRACTOR SHALL BUILD OUT THE FORM TO ENSURE A MINIMUM OF 1½" COVER.

**PARTIAL DEPTH REPAIR**  
 SCALE: 1½" = 1'-0"



**DISTRICT 1 BRIDGE SECTION**

PROJECT 614019: DISTRICT 1 - SCHEDULED BRIDGE AND CULVERT SUBSTRUCTURE REPAIRS AT VARIOUS LOCATIONS

SUBJECT: ABUTMENT OR PIER STEM REPAIR SECTION

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