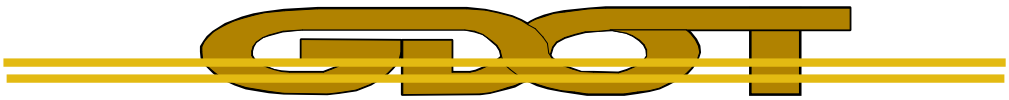


Georgia Department of Transportation

GEORGIA DEPARTMENT OF TRANSPORTATION

BRIDGE STRUCTURE MAINTENANCE AND REHABILITATION REPAIR MANUAL

OFFICE OF BRIDGE AND STRUCTURAL DESIGN
BRIDGE MAINTENANCE UNIT

June 29, 2012

Version 06.01.12

Disclaimer: These rehabilitation and maintenance procedures are for GDOT Maintenance Personnel and local municipality's infrastructure maintenance personnel, and are general guidelines only for performing the many tasks assigned to bridge maintenance personnel. This manual does not cover maintenance of traffic.

This manual is not designed to establish a legal standard of care. It is published solely for information and general guidance purposes and is not to be used as a substitute for sound engineering practices and any use will be at one's own risk. The Georgia Department of Transportation and the authors of this document make no warranties either express or implied as to the accuracy or fitness for any particular purpose and are not responsible for the consequences of the use and misuse of the contents of this document.

Other helpful links:

GDOT Bridge Design Policies & Manuals Page:

http://www.dot.ga.gov/doingbusiness/PoliciesManuals/bridge/Pages/default.aspx

GDOT Bridge Design Software:

http://www.dot.ga.gov/doingbusiness/PoliciesManuals/bridge/Pages/PCBridgeDesignSoftware.aspx

GDOT Construction Standards and Details:

http://standarddetails.dot.ga.gov/stds_dtls/

GDOT Standard Specifications:

http://www.dot.ga.gov/doingbusiness/TheSource/Pages/specifications.aspx

GDOT Special Provisions:

http://www.dot.ga.gov/doingbusiness/TheSource/Pages/special_provisions.aspx

GDOT Qualified Products List:

http://www.dot.ga.gov/doingbusiness/Materials/qpl/Pages/default.aspx

Other Useful Documents:

GDOT Operations Work Zone Traffic Control – June 2006

See Appendix A for additional documents.

Please send direct comments, recommendations and questions to the Bridge Maintenance Unit care of Clayton Bennett, State Bridge Inspection Engineer: clbennett@dot.ga.gov or (404) 635-2889.

Table of Contents

Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ASTM	American Society for Testing and Materials
BFPR	Back Face Paving Rest
MUTCD	Manual of Uniform Traffic Control Devices
QPL	Quality Product List
RCDG	Reinforced Concrete Deck Girder

Glossary

A

Abutment: Bridge substructure at end of bridge which transfers loads from superstructure to foundation and provides lateral support for the approach roadway embankment. All bridges begin and end on an abutment.

Anchorage: The complete assemblage of members and parts, embedded in concrete, rock or other fixed material, designed to hold a portion of a structure in correct position. The anchorage is part of the superstructure.

Anchor Bolt: A metal rod or bar commonly threaded and fitted with a nut and washer at one end only, used to secure in a fixed position upon the substructure the bearings of a bridge, the base of a column, a pedestal, shoe, or other member of a structure. An anchor bolt is part of the superstructure.

Angle: A basic member shape, usually steel, in the form of an "L".

Approach Slab: A reinforced concrete slab placed on the approach embankment adjacent to and usually resting upon the abutment back wall; the function of the approach slab is to carry wheel loads on the approaches directly to the abutment, thereby transitioning any approach roadway misalignment due to approach embankment settlement.

Apron: A form of scour (erosion) protection consisting of concrete, riprap, or other construction material placed adjacent to abutments, bents and ends of culverts to prevent undermining.

B

Backfill: Material, usually soil or coarse aggregate, used to fill the unoccupied portion of a substructure excavation such as behind an abutment stem and backwall.

Backwall: The topmost portion of an abutment above the elevation of the bridge seat, functioning primarily as a retaining wall with a live load surcharge; it may serve also as a support for the extreme end of the bridge deck and the approach slab. A backwall is part of the substructure.

Bank: Sloped sides of a waterway channel or approach roadway, short for embankment.

Base Plate: Steel plate, whether cast, rolled or forged, connected to a column, bearing or other member to transmit and distribute its load to the substructure. It is part of the bearing assembly.

Batter: The inclination of a surface in relation to a horizontal or a vertical plane; commonly designated on bridge detail plans as a ratio (e.g., 2:12, H:V).

Battered Pile: A pile driven in an inclined position to resist horizontal forces as well as vertical forces.

Beam: A linear structural member designed to span from one support to another and support vertical loads.

Bearing Assembly: A support element transferring loads from superstructure to substructure while permitting limited movement capability.

Bearing Plate: A steel plate, which transfers loads from the superstructure to the substructure.

Bent: A substructure unit made up of one or more columns or column-like members connected at their top-most ends by a cap, holding them in their correct positions.

Berm: The line that defines the location where the top surface of an approach embankment or causeway is intersected by the surface of the side slope.

Beveled Washer: A wedge-shaped washer used in connections incorporating members with sloped flange legs (e.g. channels and S-beams).

Blanket: A streambed protection against scour placed adjacent to abutments and piers.

Box Culvert: A culvert of rectangular or square cross-section.

Bracing: A system of secondary members that maintains the geometric configuration of primary members.

Bridge: A structure including supports erected over a depression or an obstruction, such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening.

Bridge Culvert: A soil interaction structure in an embankment that functions as a bridge. This structure may carry a highway, railway or pathway over a waterway, railway, highway or pathway. Culvert structure types include pipes, pipe arches, boxes and rigid frames and may be constructed of various materials with a length 20 feet or greater measured along the center line of the roadway.

Bridge Site: The position or location of a bridge and its surrounding area.

Brush Curb: A narrow curb, 9 inches or less in width, which prevents a vehicle from brushing against the railing or parapet.

Built-Up Member: A column or beam composed of plates and angles or other structural shapes united by bolting, riveting or welding to enhance section properties.

C

Cap: The topmost portion of a pier or a pile bent serving to distribute the loads upon the columns or piles and to hold them in their proper relative positions.

Catch Basin: A receptacle, commonly box shaped and fitted with a grilled inlet and a pipe outlet drain, designed to collect the rainwater and floating debris from the roadway surface and retain the solid material so that it may be periodically removed. They are usually located at the ends of a bridge.

Chamfer: An angled edge or corner, typically formed in concrete. Usually 45^{o} measuring ½" to ¾".

Channel: A waterway connecting two bodies of water or containing moving water; A rolled steel member having a C-shaped cross section.

Coating: A material that provides a continuous film over a surface in order to protect or seal it; a film formed by the material.

Column: A general term applying to a vertical member resisting compressive stresses and having, in general, a considerable length in comparison with its transverse dimensions.

Column Bent: A bent shaped pier that uses columns incorporated with a cap beam.

Concrete: A stone-like mass made from a mixture of aggregates and cementing material, which is moldable prior to hardening.

Concrete Pile: A pile constructed of reinforced concrete or precast and driven into the ground or cast-in place in a hole bored into the ground.

Construction Joint: A pair of adjacent surfaces in reinforced concrete where two pours have met. Reinforcement steel may or may not extend through this joint.

Corrosion: The general disintegration of metal through oxidation (Rust).

Cover: The clear thickness of concrete from the face of a reinforcing bar to the surface of the concrete; The depth of backfill (soil) over the top of a pipe or culvert.

Cover Plate: A plate used in conjunction with a flange or other structural shapes to increase flange section properties in a beam, column, or similar member.

Crack: A break without complete separation of parts.

Creosote: An oily liquid obtained by the distillation of coal or wood tar and used as a wood preservative. No longer used.

Cribbing: A construction consisting of wooden, metal or reinforced concrete units so assembled as to form an open cellular-like structure for supporting a superimposed load or for resisting horizontal or overturning forces acting against it.

Culvert: A drainage structure beneath an embankment (e.g. corrugated metal pipe, concrete box culvert).

Curb: A low barrier at the side limit of the roadway used to guide the movement of vehicles.

D

Debris: Material including floating wood, trash, suspended sediment or bed load moved by a flowing stream.

Deck: That portion of a bridge which provides direct support for vehicular and pedestrian traffic, supported by a superstructure.

Deck Joint: A gap allowing for rotation or horizontal movement between two spans or an approach and a span.

Delamination: Surface separation of concrete into layers; Separation of glue-laminated timber plies.

Deterioration: Decline in quality over a period of time due to chemical or physical degradation.

Dowel: A length of bar embedded in two parts of a structure to hold the parts in place and to transfer stress.

Drain Hole: Hole in a member or a wall to provide means for the exit of accumulated water or other liquid; also known as drip hole.

Drift Bolt: A short length of metal bar used to connect and hold in position wooden members placed in contact; similar to a dowel.

Drop Inlet: A type of inlet structure that conveys the water from a higher elevation to a lower outlet elevation smoothly without a free fall at the discharge.

E

Elastomeric Pad: A synthetic rubber pad used in bearings that compresses under loads and accommodates horizontal movement by deforming. (Bearing Pad).

Embankment: A mound of earth constructed above the natural ground surface to carry a road or to prevent water from passing beyond desirable limits; also known as bank (end fill).

End Post: The end compression member of a truss, either vertical or inclined in position and extending from top chord to bottom chord. Or, the part at the end of a bridge that guardrail is attached to.

Epoxy: A synthetic resin which cures or hardens by chemical reaction between components which are mixed together shortly before use.

Expansion Joint: A joint designed to permit expansion and contraction movements produced by temperature changes, loadings or other forces.

F

Field Coat: A coat of paint applied after the structure is assembled and its joints completely connected; quite commonly a part of the field erection procedure; field painting.

Fill: Material, usually earth, used to change the surface contour of an area, to construct an embankment or to "fill" a scour hole.

Fillet: A curved portion forming a junction of two surfaces that would otherwise intersect at an angle.

Flange: The (usually) horizontal parts of a rolled I-shaped beam or of a built-up girder extending transversely across the top and bottom of the web.

Footing: The enlarged, lower portion of a substructure, which distributes the structure load either to the earth or to supporting piles. The most common bridge application for footing is the concrete slab; footer is a colloquial term for footing.

Forms: The molds that hold concrete in place while it is hardening; also known as form work, shuttering; see LAGGING, STAY-IN-PLACE FORMS.

Foundation: The supporting material upon which the substructure portion of a bridge is placed.

G

Galvanize: To coat with zinc.

Girder: A horizontal flexural member that is the main or primary support for a structure; any large beam, especially if built up.

Grout: Mortar having a sufficient water content to render it free-flowing, used for filling (grouting) the joints in masonry, for fixing anchor bolts and for filling cored spaces; usually a thin mix of cement, water and sometimes sand or admixtures.

Grouting: The process of filling in voids with grout.

Gutter: A paved ditch; area adjacent to a roadway curb used for drainage.

H

Hairline Cracks: Very narrow cracks (less than 1/64”) that form in the surface of concrete.

H-Beam: A rolled steel member having an H-shaped cross-section (flange width equals beam depth) commonly used for piling; also H-pile.

High Strength Bolt: Bolt and nut made of high strength steel, usually complying with ASTM Standard A-325 or A-490.

I

I-Beam: A structural member with a cross−sectional shape similar to the capital letter "I".

Inlet: An opening in the floor of a bridge leading to a drain; roadway drainage structure which collects surface water and transfers it to pipes.

J

Jacking: The lifting of elements using a type of jack (e.g., hydraulic), sometimes acts as a temporary support system.

Jacket: A protective shell surrounding a pile made of fabric, concrete or other material.

Joint: In masonry, the space between individual stones or bricks; in concrete, a division in continuity of the concrete; in a truss, point at which members of a truss are joined.

K

Keeper Plate: A plate, which is connected to a sole plate, designed to prohibit a beam from becoming dislodged from the bearing.

L

Lagging: Horizontal members spanning between piles to form a wall; forms used to produce curved surfaces.

Longitudinal Bracing: Bracing that runs lengthwise with a bridge and provides resistance against longitudinal movement and deformation of transverse members.

M

Maintenance: Repairs performed on a bridge structure to keep it at an adequate level of service.

Maintenance and Protection of Traffic: The management of vehicular and pedestrian traffic through a construction zone to ensure the safety of the public and the construction workforce.

Mortar: A mixture of portland cement, sand, and water laid between bricks, stones or blocks.

N

Necking: The elongation and contraction in area that occurs when a ductile material is stressed.

Neoprene: A synthetic rubber-like material used in expansion joints and elastomeric bearings.

O

Outlet: In hydraulics, the discharge end of drains, sewers, culverts or bridges.

Overlay: See WEARING SURFACE.

P

Parapet: A low wall along the outmost edge of the roadway of a bridge to protect vehicles and pedestrians.

Pedestal: Concrete or built-up metal member constructed on top of a bridge seat for the purpose of providing a specific bearing seat elevation.

Pier: A substructure unit that supports the spans of a multi-span superstructure at an intermediate location between its abutments.

Pier cap: The topmost horizontal portion of a pier that distributes loads from the superstructure to the vertical pier elements.

Pile: A shaft-like linear member which carries loads to underlying rock or soil strata.

Pile Bent: A row of driven or placed piles extending above the ground surface supporting a pile cap; see BENT.

Pile Cap: A slab or beam which acts to secure the piles in position laterally and provides a bridge seat to receive and distribute superstructure loads.

Piping: Removal of fine particles from within a soil mass by flowing water, usually associated with culverts.

Plate Girder: A large I-shaped beam composed of a solid web plate with flange plates attached to the web plate by flange angles or fillet welds.

Pop-Out: Conical fragment broken out of a concrete surface by pressure from reactive aggregate particles (spall).

Priming coat: The first coat of paint applied to the metal or other material of a bridge; also known as base coat, or primer.

Programmed Repair: Those repairs that may be performed in a scheduled program.

Protective System: A system used to protect bridges from environmental forces that cause steel and concrete to deteriorate and timber to decay, typically a coating system.

Q

R

Railing: A fence-like construction built at the outermost edge of the roadway or the sidewalk portion of a bridge to protect pedestrians and vehicles.

Rapid Set Concrete: A high early strength hydraulic concrete that achieves a minimum design strength of 5,000 PSI within 24 hours.

Rapid Setting Patching Material: A very early strength bag mix polymer concrete that achieves a minimum design strength of 1,200 PSI within 2 hours.

Rebar: See REINFORCING BAR.

Rehabilitation: Significant repair work to a structure.

Reinforced Concrete: Concrete with steel reinforcing bars embedded in it to supply increased tensile strength and durability.

Reinforcing Bar: A steel bar, plain or with a deformed surface, which bonds to the concrete and supplies tensile strength to the concrete.

Resurfacing: A layer of wearing surface material that is put over the approach or deck surface in order to create a more uniform riding surface.

Rip-Rap: Stones, blocks of concrete or other objects placed upon river and stream beds and banks, lake, tidal or other shores to prevent scour by water flow or wave action.

S

Safety Curb: A curb between 9 inches and 24 inches wide serving as a limited use refuge or walkway for pedestrians crossing a bridge.

Scaling: The gradual disintegration of a concrete surface due to the failure of the cement paste caused by chemical attack or freeze/thaw cycles.

Scour: Removal of a streambed or bank area by stream flow; erosion of streambed or bank material due to flowing water; often considered as being localized around piers and abutments of bridges.

Scour Protection: Protection of submerged material by steel sheet piling, rip rap, concrete lining, or combination thereof.

Scupper: An opening in the deck of a bridge to provide means for water accumulated upon the roadway surface to drain.

Section Loss: Loss of a member's cross sectional area usually by corrosion or decay.

Shim: A thin plate inserted between two elements to fix their relative position and to transmit bearing stress.

Shop: A factory or workshop.

Shoring: A strut or prop placed against or beneath a structure to restrain movement; temporary soil retaining structure.

Slope Protection: A thin surfacing of rip rap, concrete, filter fabric or other material deposited upon a sloped surface to prevent its disintegration by rain, wind or other erosive action; a slope paving - concrete.

Spall: Depression in concrete caused by a separation of a portion of the surface concrete, revealing a fracture parallel with or slightly inclined to the surface.

Specifications: A detailed description of requirements, materials, tolerances, etc., for construction which are not shown on the drawings; also known as specs.

Spillway: A channel used to carry water away from the top of a slope to an adjoining outlet.

Standard Barrier: A low, reinforced concrete wall wider at the base, tapering vertically to near mid-height, and then continuing straight up to its top. The shape is designed to direct automotive traffic back toward its own lane of travel and prevent crossing of a median or leaving the roadway. Commonly used on new and reconstructed bridges in place of decorative balustrades, railings or parapets.

Stay-In-Place Forms: A corrugated metal sheet for forming deck concrete that will remain in place after the concrete has set; the forms do not contribute to deck structural capacity after the deck has cured; see FORMS, S.I.P FORMS.

Stirrup: U-shaped bar used as a connection device in timber and metal bridges; U-shaped bar placed in concrete to resist diagonal tension (shear) stresses.

Substructure: The abutments and piers built to support the bridge superstructure.

Superstructure: The entire portion of a bridge structure that primarily receives and supports traffic loads and in turn transfers these loads to the bridge substructure.

Surface Corrosion: Rust that has not yet caused measurable section loss.

Sway Bracing: Diagonal brace located at the top of a through truss, transverse to the truss and usually in a vertical plane, to resist transverse horizontal forces.

Swedged Bolt: Bolt with deformations to increase bond in concrete; see ANCHOR BOLT.

T

Timber: Wood suitable for construction purposes.

Toe of Slope: The location defined by the intersection of the embankment with the existing ground at a lower elevation; also known as toe.

Traffic Control: Modification of normal traffic patterns by signs, cones, flagmen, etc.

U

V

Voids: An empty or unfilled space in concrete.

W

Washer: A small metal ring used beneath the nut or the head of a bolt to distribute the load or reduce galling during tightening.

Wearing Surface: The topmost layer of material applied upon a roadway to receive the traffic loads and to resist the resulting disintegrating action; also known as wearing course.

Weld: A joint between pieces of metal at faces that have been made plastic and caused to flow together by heat or pressure.

Weep Hole: A hole in a concrete element (abutment backwall or retaining wall) used to drain water from the soil behind the element; any small hole installed for drainage.

Wingwall: The retaining wall extension of an abutment intended to restrain and hold in place the material under the approach slab or approach roadway embankment.

X

Y

Z

1 Introduction

1.1 Purpose of This Manual

This manual is intended as a reference for preventative and corrective maintenance activities applicable to state and local bridge structures.

This manual is designed to address the most common types of bridge structure distress by outlining practical procedures for corrective and preventive maintenance. These procedures are not meant to be all-inclusive, or to rule out other maintenance procedures. This manual does not address the environmental, historic preservation, or safety implications of these activities.

Some Federal, State, and local laws or rules or regulations may render some procedures inappropriate in specific situations. On-site supervisors are responsible for ensuring that procedures considered are consistent with environmental standards and safety codes within the jurisdictions involved, and that any permits required are obtained before starting work.

1.2 Bridge Components

Some common terms are used to define the components of each bridge. Personnel responsible for bridge maintenance should know the basic components, their role, and their significance to help with ranking recommendations in a maintenance plan.

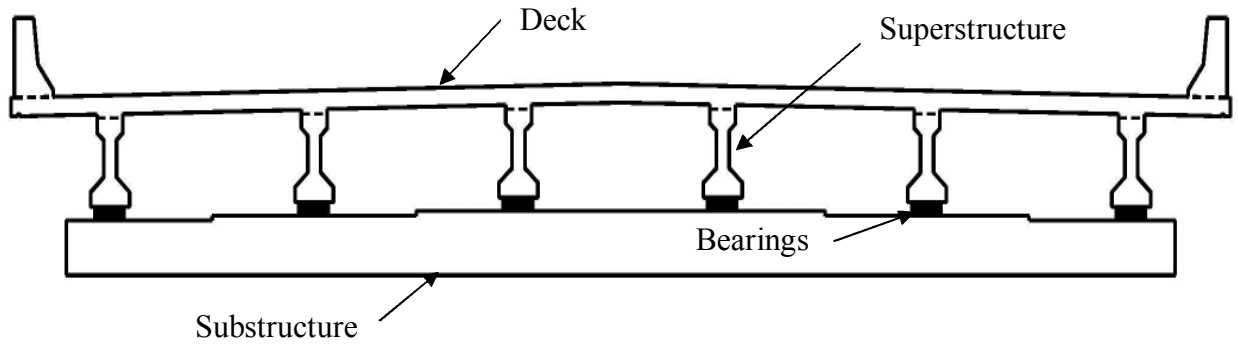
Deck: Supports the roadway on which traffic flows, and also distributes traffic (live) loads and dead loads.

Superstructure: Supports loads transmitted through the deck.

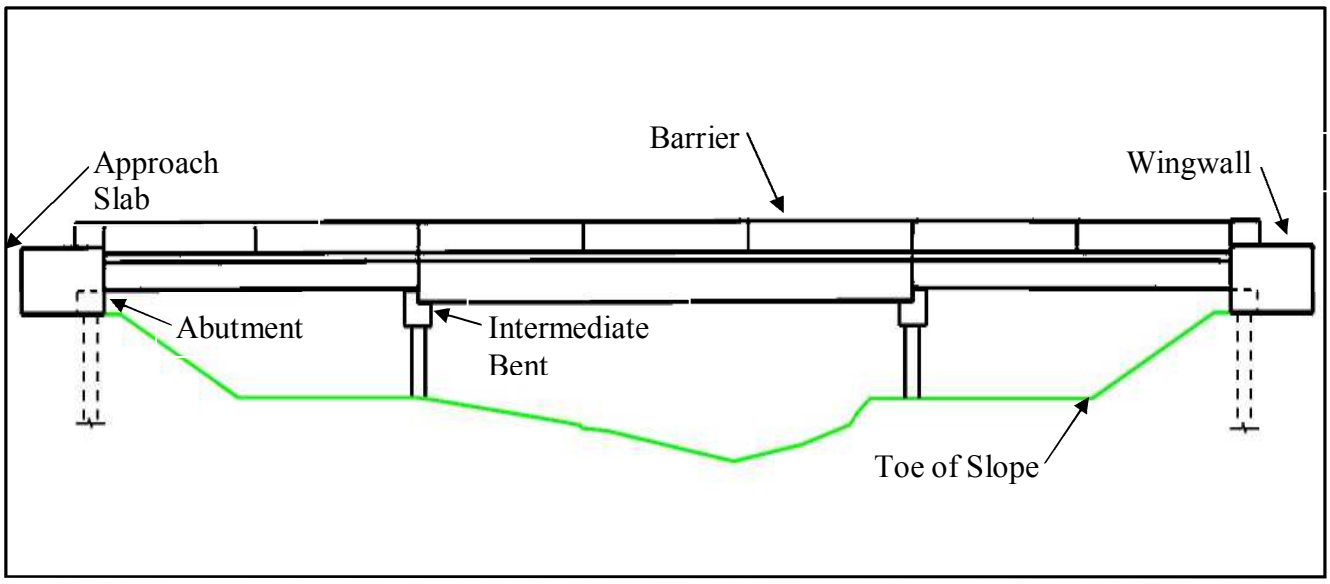
Bearings: Support that transfer loads from the superstructure to the substructure, while permitting limited rotation and longitudinal movement.

Substructure: Elements that transfer all loads from the superstructure to the ground.

Expansion Joint: Assembly or material designed to safely absorb the expansion and contraction of the superstructure and to protect the bearings from water and debris.



Bridge Typical Section



Bridge Elevation View

1.3 Bridge Culvert Components

Some common terms are used to define the components of each culvert. Personnel responsible for culvert maintenance should know the basic components, their role, and their significance to help with ranking recommendations in a maintenance plan.

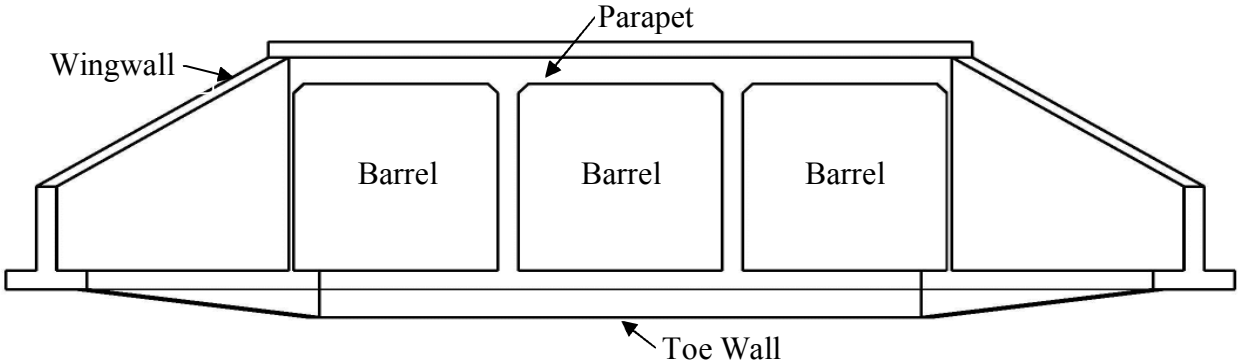
Apron: area that is intended to eliminate the potential for scour caused by water exiting the culvert.

Barrel: opening that will allow water to pass unobstructed under roadway

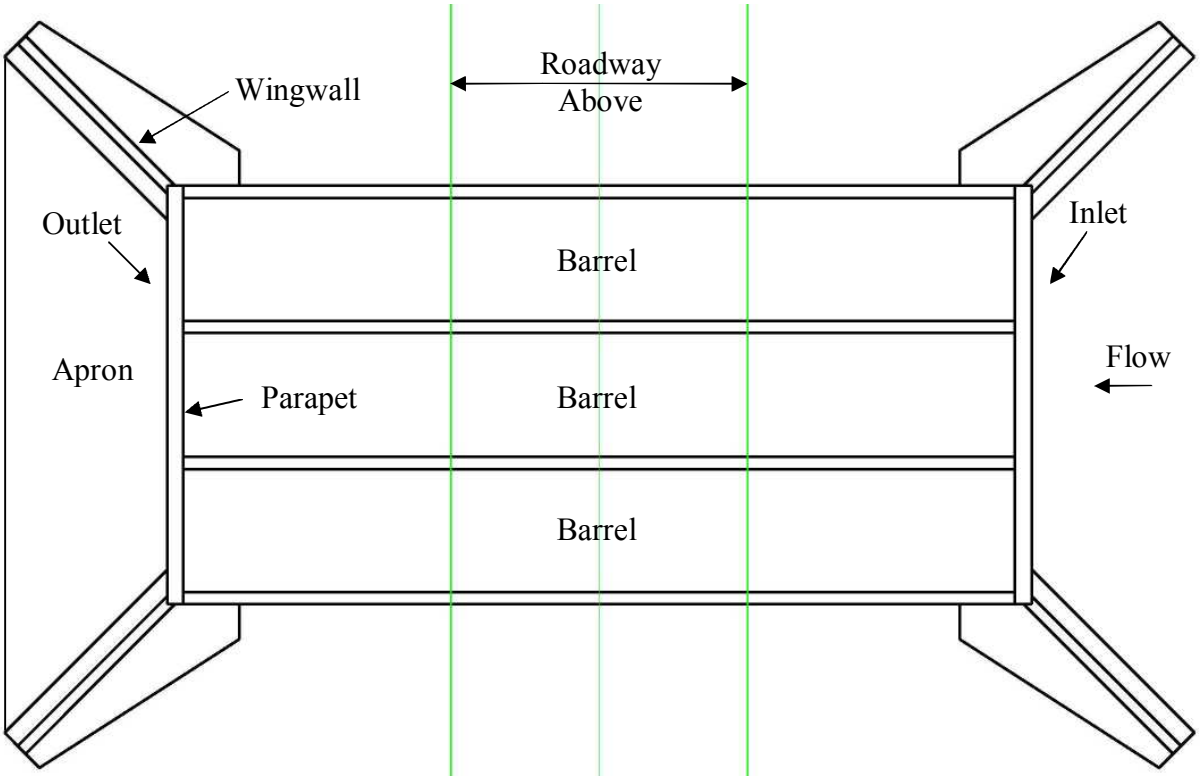
Wingwall: A tapering wall that originates from the corner of the culvert and is intended to retain soil under the roadway.

Parapet: short wall across top of openings used to retain fill material

Toe Wall: A full width wall that extends downward from the bottom of the culvert at both ends.



Bridge Culvert Elevation View



Bridge Culvert Plan View

1.4 Environmental Considerations

Damage or degradation to the environment shall be avoided to the extent possible during maintenance activities. The term "environment" as used in connection with highway maintenance work refers to the natural surroundings including soil, water, air, plant and animal life, and archaeological and historical resources.

All personnel must be aware of the need for environmental protection in the performance of their duties. While some environmentally sensitive areas are easily identified, others are not so obvious to untrained persons. Maintenance employees have a responsibility to take reasonable steps to protect the environment, even when resources are not easily identified.

1.4.1 Permits

In addition to federal regulations, state environmental agencies, tribal and city or county health ordinances may have environmental restrictions on work done on or near bridges.

Before initiating bridge repair activities, the District Maintenance Engineer, or local municipality will confirm what, if any, environmental permits are required.

1.4.2 Coordination

Georgia DOT's Office of Environmental Services and the District Environmentalist can provide information on identifying, protecting, and avoiding or minimizing harm to environmental resources.

Before beginning work in the field, contact the District Maintenance Office to inquire if any Memorandum of Agreements (MOA) have been reached between GDOT and any regulatory agency or authority.

1.4.3 Documents

All personnel shall be familiar with and adhere to the following:

- "WORKSITE EROSION CONTROL MANUAL"
- "REQUIREMENTS FOR GDOT MAINTENANCE ACTIVITIES AND OPERATIONS"
- "GENERAL FACILITY ENVIRONMENTAL GUIDELINES"

1.5 General Notes for All Maintenance and Repair Activities

The following notes apply to all maintenance discussed in this manual.

1. All work shall adhere to the Georgia Standard Specifications for Construction, Current Edition, and Current Supplemental Specifications.

2. No material shall be salvaged.

3. The foreman shall dispose of materials from the existing bridge structures.

4. It shall be the responsibility of the foreman to locate or furnish an environmentally approved disposal area as necessary for this project and disposal shall be accomplished in a manner acceptable to and as directed by the engineer. Disposal sites shall be approved by the District Environmentalist prior to any work on this item.

5. All work will be completed within the existing right-of-way.

6. In addition to contacting the Utility Protection Center (1-800-282-7411), the manager responsible for the maintenance activities shall also contact each utility owner. The foreman shall advise the utility company owner/representative at least one week prior to any work in their respective areas. The owner responsible for the work will be responsible for any damages to any utility damages to any utility attachments resulting from this work.

2 Bridge Structure Maintenance Activities

Despite even the most aggressive preventive maintenance program, some deterioration or damage of elements will occur. This chapter presents corrective activities that can be performed to repair typical deterioration or damage. The activities are broken down into eight separate categories:

1. Activity 800 – Bridge Joint Sealing
2. Activity 805 – Header Joint Reconstruction/Repair
3. Activity 810 – Deck Repair
4. Activity 815 – Bridge Curb/Rail Repair
5. Activity 820 – Culvert Repair
6. Activity 825 – Pile Replacement and Related Repairs
7. Activity 830 – Repair Main Structural Members
8. Activity 845 – Other Bridge Maintenance

Activity 800.01 – Bridge Deck Joint Sealing (Silicone)

Before Repair

After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Clean existing bridge expansion joints of all dirt, refuse, and existing sealant by sand blasting. Seal joints using silicone sealant (Type D) as per sub-sections 461.3.05.C and 833.2.06 of the Georgia DOT Specifications.

Material Specifications:

- None

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

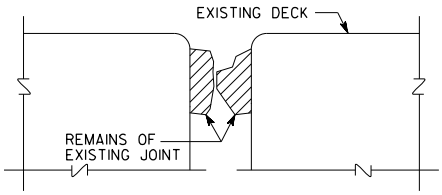
- Section 461 – Sealing Roadway and Bridge Joint and Cracks

Georgia Special Provisions & Supplemental Specifications:

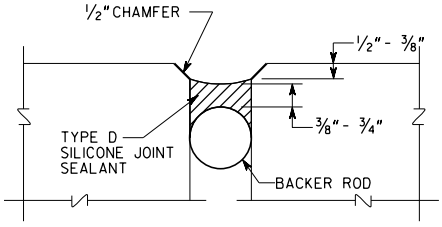
- None

Qualified Products List:

- QPL 15
- QPL 60



EXISTING CONDITION



FINAL CONDITION

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
SILICONE PUMP / DISPENSER
SAND BLASTER / AIR GUN
ANGLE GRINDER WITH DIAMOND WHEEL
DISPOSABLE GLOVES

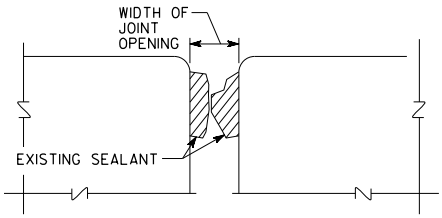
MATERIALS

BACKER ROD
SILICONE SEALANT (TYPE D)
SANDBLAST MEDIA

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

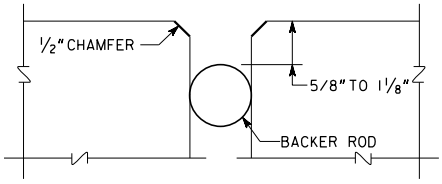
CONSTRUCTION DETAIL
BRIDGE DECK JOINT SEALING (SILICONE)
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	800.01



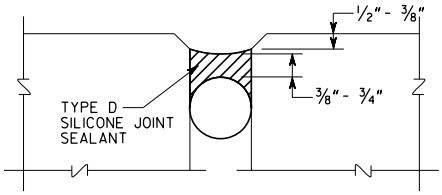
STEP 1

1. COMPLETELY REMOVE REMAINS OF EXISTING JOINT AND ALL SEALANT.
2. CLEAN JOINT WITH WIRE BRUSH. DO NOT WIDEN JOINT ANY MORE THAN REQUIRED FOR CLEANING.
3. USING ANGLE GRINDER, ROUND EDGES OF JOINT TO ½" CHAMFER.
4. THOROUGHLY CLEAN THE EXISTING JOINT OPENING OF ALL MATERIAL AND DEBRIS BY SANDBLASTING, USING COMPRESSED AIR TO REMOVE DUST AND DIRT.



STEP 2

1. INSTALL THE BOND BREAKER (BACKER ROD OR TAPE). IF BACKER ROD IS USED, SIZE 25% LARGER THAN JOINT WIDTH. BACKER ROD SHOULD BE INSTALLED SO THAT SILICONE DEPTH IS SUFFICIENT AFTER BACKER ROD EXPANDS.
2. SPRAY OR BRUSH CONCRETE SURFACE WITH PRIME COAT.



STEP 3

1. INSTALL SILICONE SEALANT. SILICONE SHOULD BE INSTALLED AS SOON AS POSSIBLE AFTER THE BOND BREAKER IS INSTALLED. THE SEALANT SHOULD BE PUMPED IN WITH EQUIPMENT SUFFICIENT TO DELIVER THE NECESSARY VOLUME OF MATERIAL TO COMPLETELY FILL THE JOINT AS SPECIFIED IN ONE PASS WITHOUT VOIDS.
2. A CAULK GUN MAY BE USED FOR TOUCH UP WORK OR SMALL APPLICATIONS ONLY.
3. SETTING TIME IS APPROXIMATELY 15 MINUTES.
4. CLEAN THE PAVEMENT OF SURPLUS SEALANT.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL BRIDGE DECK JOINT SEALING (EPOXY) NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 800.01

Activity 800.02 – Bridge Deck Joint Sealing (Evazote)

Before Repair

After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Clean existing bridge expansion joints of all dirt, refuse, and existing sealant and seal joints using low density polyethylene seal as per section 449.2.D of the Georgia DOT Specifications.

Material Specifications:

- None

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

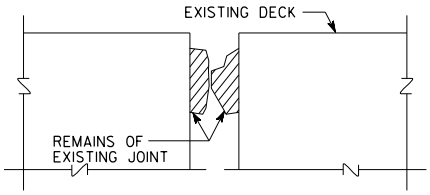
- Section 461 – Bridge Deck Joint Seals
  - (Low-Density, Closed Cell, Cross-Linked, Ethylene Vinyl Acetate, Polyethylene Copolymer, Nitrogen-Blown Seal)

Georgia Special Provisions & Supplemental Specifications:

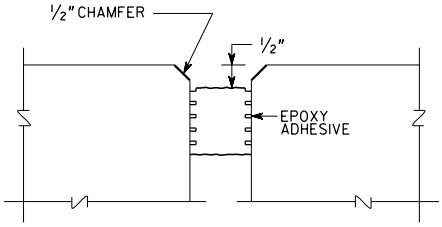
- None

Qualified Products List:

- None



EXISTING CONDITION



FINAL CONDITION

NOTES:

1. MEASUREMENT OF JOINT SHOULD BE TAKEN BETWEEN 60-70 DEGREES FAHRENHEIT.
2. EVAZOTE JOINT MATERIAL SHOULD BE INSTALLED WITH AMBIENT TEMPERATURE BELOW 75 DEGREES FAHRENHEIT AND ABOVE 45 DEGREES FAHRENHEIT.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
WIRE BRUSH
PORTABLE AIR COMPRESSOR
SAND BLASTER / AIR GUN
ANGLE GRINDER WITH DIAMOND WHEEL
DISPOSABLE GLOVES

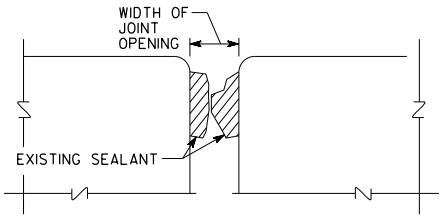
MATERIALS

EPOXY ADHESIVE
EVAZOTE MATERIAL
SANDBLAST MEDIA

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

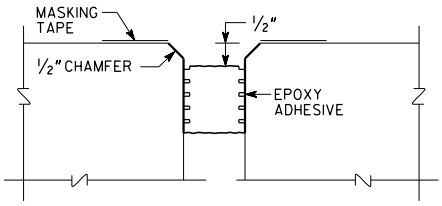
CONSTRUCTION DETAIL
BRIDGE DECK JOINT SEALING (EVAZOTE)
NO SCALE
JUNE 2012

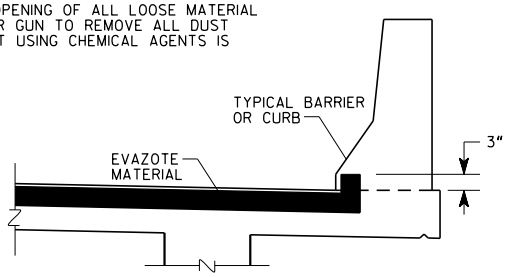
REVISION DATE	DRAWING NO.
	800.02



STEP 1

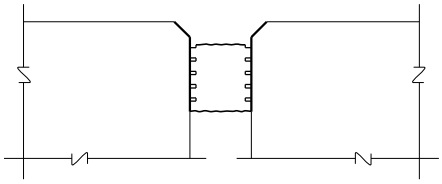
1. USING A WIRE BRUSH, COMPLETELY REMOVE REMAINS OF EXISTING JOINT MATERIAL AND SEALANT. TAKE CARE NOT TO DAMAGE OR ENLARGE THE EXISTING JOINT OPENING.
2. USING AN ANGLE GRINDER, CHAMFER EDGES OF JOINT OPENING TO 1/2".
3. EVAZOTE MATERIAL TO BE INSTALLED SHALL BE THE WIDTH OF THE JOINT OPENING PLUS 1/4". THE WIDTH OF JOINT OPENING IS MEASURED WHEN THE AMBIENT TEMPERATURE IS BETWEEN 70°-80° FAHRENHEIT.
4. MINIMUM WIDTH OF EXPANSION JOINT OPENING IS 1". WIDEN EXPANSION JOINT OPENING AS REQUIRED BY SAW CUTTING ALONG FACE OF JOINT, ALL SIDES OF JOINT MUST BE PARALLEL AND PLANE.
5. THOROUGHLY CLEAN THE EXISTING JOINT OPENING OF ALL LOOSE MATERIAL AND DEBRIS BY SANDBLASTING, USE AN AIR GUN TO REMOVE ALL DUST AND DIRT FROM AREA. CLEANING THE JOINT USING CHEMICAL AGENTS IS NOT ALLOWED.





STEP 2

1. APPLY MASKING TAPE ON TOP OF DECK ALONG EDGE OF JOINT TO PROTECT DECK FROM EPOXY.
2. CUT SIZED EVAZOTE MATERIAL TO LENGTH. (LENGTH OF EXP JT. + 3" FOR EACH BARRIER)
3. CUT GROOVES ON SIDES OF EVAZOTE MATERIAL (1/8" WIDE X 1/8" DEEP) THE FULL LENGTH OF MATERIAL THAT CONTACT THE CONCRETE DECK.
4. APPLY EPOXY LIBERALLY TO SIDES OF EVAZOTE MATERIAL AND TO VERTICAL CONCRETE FACES OF JOINT.
5. FORCE EVAZOTE MATERIAL INTO OPENING TO A DEPTH OF 1/2" BELOW THE TOP OF CONCRETE SURFACE.



STEP 3

1. REMOVE MASKING TAPE AND REMOVE EXCESS EPOXY FROM EVAZOTE MATERIAL AND DECK SURFACE.
2. ALLOW EPOXY TO CURE ACCORDING TO MANUFACTURES DIRECTION.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL BRIDGE DECK JOINT SEALING (EVAZOTE) NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 800.02

Activity 805.01 – Header Joint Reconstruction – Asphalt Overlay

Before Repair After Repairs

General Notes:

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Thoroughly clean existing reinforcement of concrete scale and rust by sand blasting before bonding into new construction.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Refer to Activity 800.01 – Bridge Deck Joint Sealing (Silicone) or 800.02 – Bridge Deck Joint Seal (Evazote), for additional details. Match existing joint size and type.

Material Specifications:

- Concrete: 24 – Hour, Class AA, f'_c = 3,500 psi
  : Rapid Setting Patching Material
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

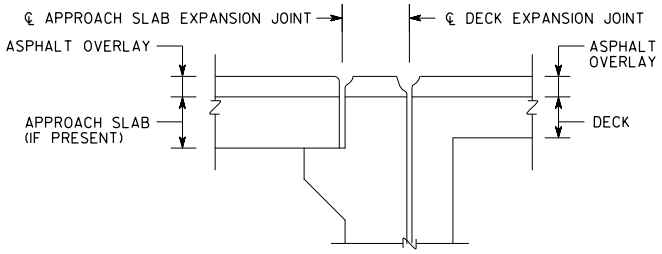
- Section 500 – Concrete Structures
- Section 504 – Twenty-Four Hour Accelerated Strength Concrete
- Section 511 – Reinforcement Steel
- Section 521 – Patching Concrete Bridge Deck
- Section 886 – Epoxy Resin Adhesive

Georgia Special Provisions & Supplemental Specifications:

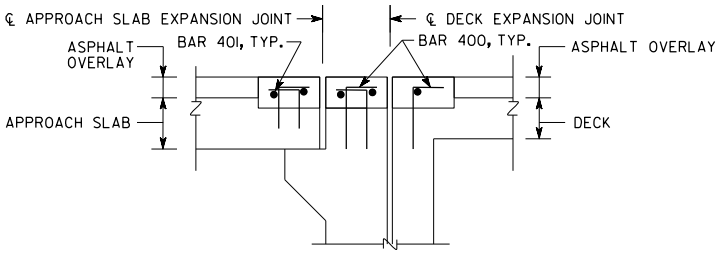
- None

Qualified Products List:

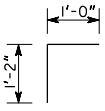
- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-15 Epoxy Resin Adhesives
- QPL-27 Rapid Setting Patching Material



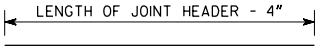
EXISTING CONDITION



FINAL CONDITION



BAR 400



BAR 401

NOTES:

1) BAR 401 MAY BE PLACED IN SECTIONS WITH 1'-2" MINIMUM LAP.

2) LENGTH OF HEADER IS MEASURED FROM GUTTER TO GUTTER ALONG BRIDGE SKEW.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
CONCRETE SAW
SAND BLASTER / AIR GUN
ANGLE GRINDER WITH DIAMOND WHEEL
PNEUMATIC CHIPPING HAMMER
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
HAMMER DRILL W/ 5/8" CONC. BIT
CHOP SAW W/ STEEL BLADES
CIRCULAR SAW W/ WOOD BLADE
MISC. BUCKETS & HAND TOOLS

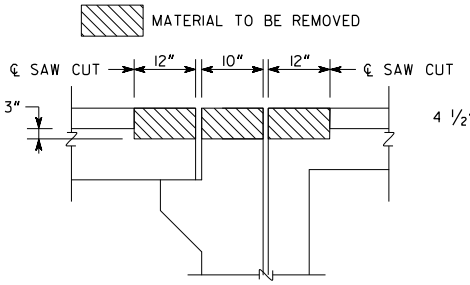
MATERIALS

TYPE II EPOXY RESIN ADHESIVE, IF REQUIRED
TYPE VIII EPOXY
BAR 400
BAR 401
RAPID SET CONCRETE OR
RAPID SET PATCHING MATERIAL
MATERIALS FOR FORMWORK
SANDBLAST MEDIA

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

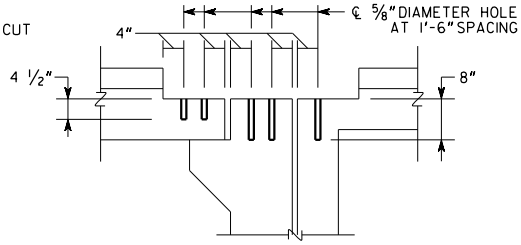
CONSTRUCTION DETAIL
HEADER JOINT RECONSTRUCTION-ASPHALT OVERLAY
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	805.01



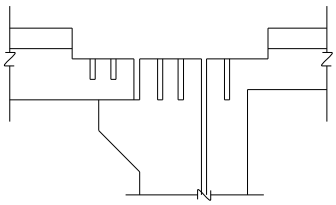
STEP 1

1. SAW CUT AT EDGE OF JOINT HEADER AND 1" INTO DECK.
2. REMOVE JOINT HEADER AND 3" OF CONCRETE DECK WITHOUT DAMAGING REINFORCING STEEL.



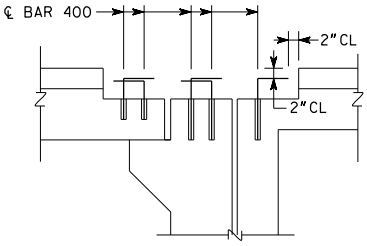
STEP 2

1. DRILL 5/8" DIAMETER HOLES 4" FROM EDGE OF CONCRETE AT 1'-6" SPACING.



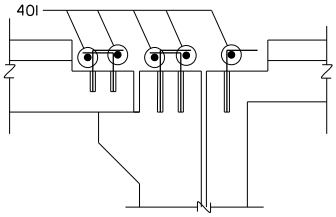
STEP 3

1. CLEAN 5/8" Ø HOLES OUT WITH COMPRESSED AIR.



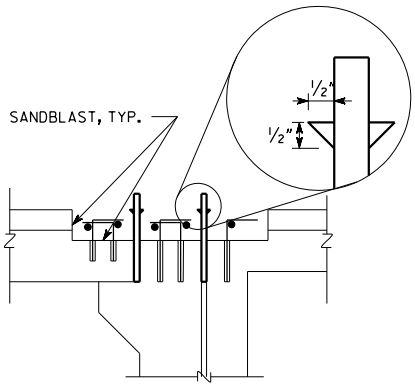
STEP 4

1. FIELD CUT LEGS OF BAR 400 TO MAINTAIN 2" CLEAR.
2. INSTALL TYPE VIII EPOXY INTO 5/8" HOLES IN ACCORDANCE TO THE MANUFACTURER'S SPECIFICATIONS.
3. PLACE BAR 400 INTO HOLES.
4. TWIST BAR 400 TO MAINTAIN 2" CLEAR.



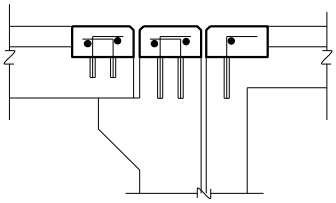
STEP 5

1. PLACE BAR 401.
2. TIE BAR 401 TO EACH BAR 400.



STEP 6

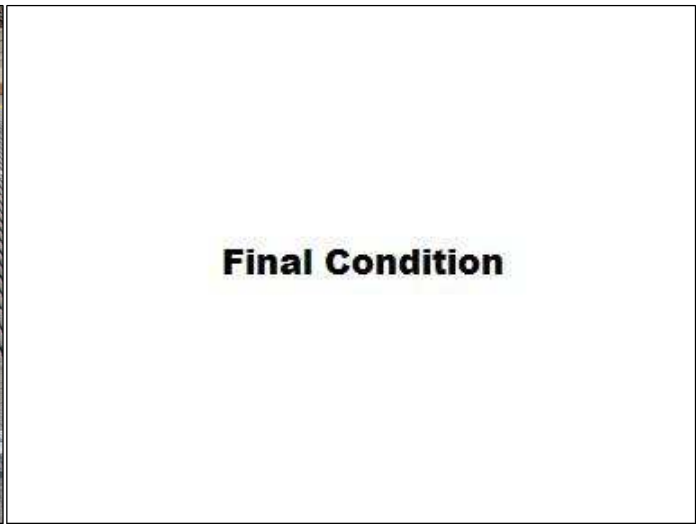
1. SANDBLAST AND BLOW CLEAN CONCRETE SURFACES AND REINFORCING STEEL.
2. APPLY TYPE II EPOXY RESIN ADHESIVE TO CONCRETE SURFACES.
3. FORM VERTICAL FACE OF JOINT HEADER WITH 1/2" CHAMFER.



STEP 7

1. FILL AREAS WITH RAPID SET CONCRETE WHILE EPOXY IS STILL TACKY.
2. FINISH FLUSH TO EXISTING DECK. BROOM FINISH CONCRETE SURFACE.
3. ALLOW TO FULLY CURE FOLLOWING MANUFACTURER'S RECOMMENDATIONS.
4. REMOVE ALL FORMWORK.
5. INSTALL JOINT MATERIAL IN ACCORDANCE WITH ACTIVITY 800.01 OR 800.02.

Activity 805.02 – Header Joint Reconstruction – Concrete Deck



Before Repair After Repairs

General Notes:

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Thoroughly clean existing reinforcement of concrete scale and rust by sand blasting before bonding into new construction.

Refer to Activity 800.01 – Bridge Deck Joint Sealing (Silicone) or 800.02 – Bridge Deck Joint Seal (Evazote), for additional details. Match existing joint size and type.

Material Specifications:

- Concrete: 24 – Hour, Class AA, f'_c = 3,500 psi
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

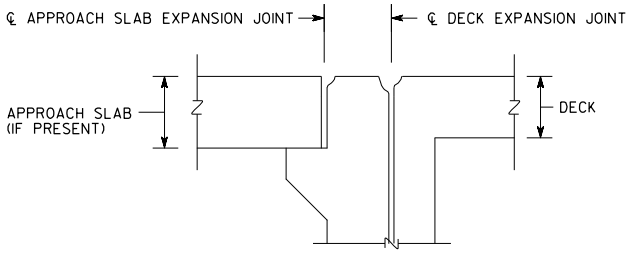
- Section 500 – Concrete Structures
- Section 504 – Twenty-Four Hour Accelerated Strength Concrete
- Section 511 – Reinforcement Steel
- Section 886 – Epoxy Resin Adhesive

Georgia Special Provisions & Supplemental Specifications:

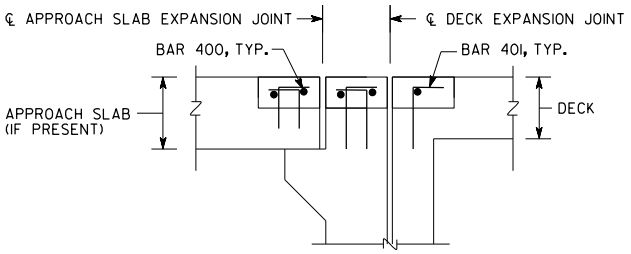
- None

Qualified Products List:

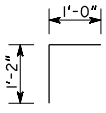
- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-15 Epoxy Resin Adhesives



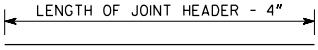
EXISTING CONDITION



FINAL CONDITION



BAR 400



BAR 401

NOTES:

1) BAR 401 MAY BE PLACED IN SECTIONS WITH 1'-2" MINIMUM LAP.

2) LENGTH OF HEADER IS MEASURED FROM GUTTER TO GUTTER ALONG BRIDGE SKEW.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
CONCRETE SAW
SAND BLASTER / AIR GUN
ANGLE GRINDER WITH DIAMOND WHEEL
PNEUMATIC CHIPPING HAMMER
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
HAMMER DRILL W/ 5/8" CONC. BIT
CHOP SAW W/ STEEL BLADES
CIRCULAR SAW W/ WOOD BLADE
MISC. BUCKETS & HAND TOOLS

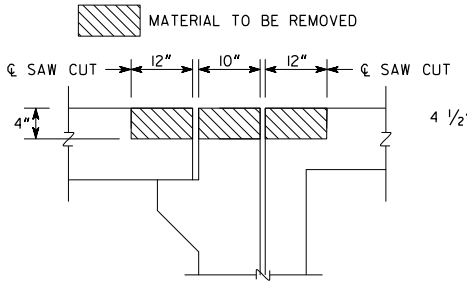
MATERIALS

TYPE II EPOXY RESIN ADHESIVE, IF REQUIRED
TYPE VIII EPOXY
BAR 400
BAR 401
RAPID SET CONCRETE OR
RAPID SET PATCHING MATERIAL
MATERIALS FOR FORMWORK
SANDBLAST MEDIA

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

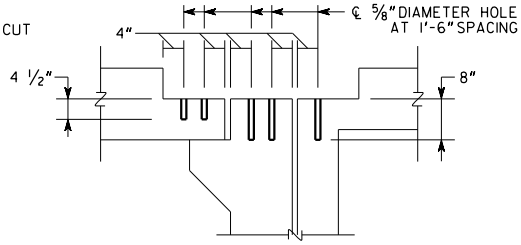
CONSTRUCTION DETAIL
HEADER JOINT RECONSTRUCTION-CONCRETE DECK
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	805.02



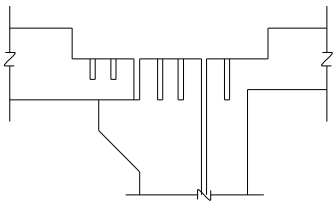
STEP 1

1. SAW CUT AT EDGE OF JOINT HEADER AND 1" INTO DECK.
2. REMOVE JOINT HEADER AND 4" OF CONCRETE DECK WITHOUT DAMAGING REINFORCING STEEL.



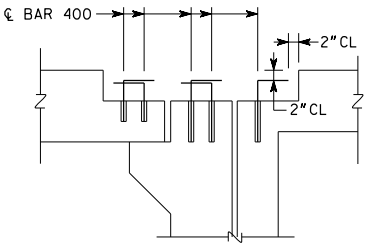
STEP 2

1. DRILL 5/8" DIAMETER HOLES 4" FROM EDGE OF CONCRETE AT 1'-6" SPACING.



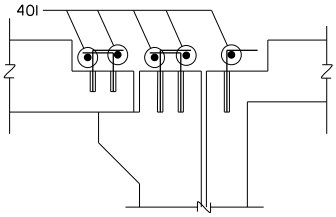
STEP 3

1. CLEAN 5/8"Ø HOLES OUT WITH COMPRESSED AIR.



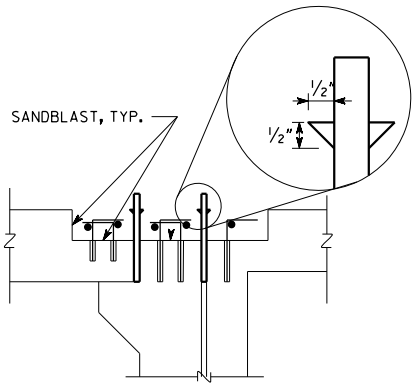
STEP 4

1. FIELD CUT LEGS OF BAR 400 TO MAINTAIN 2" CLEAR.
2. INSTALL TYPE VIII EPOXY INTO 5/8"HOLES IN ACCORDANCE TO THE MANUFACTURER'S SPECIFICATIONS.
3. PLACE BAR 400 INTO HOLES.
4. TWIST BAR 400 TO MAINTAIN 2"CLEAR.



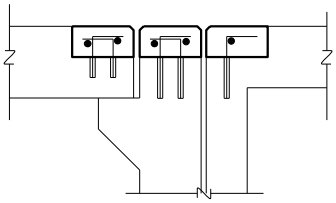
STEP 5

1. PLACE BAR 401.
2. TIE BAR 401 TO EACH BAR 400.



STEP 6

1. SANDBLAST AND BLOW CLEAN CONCRETE SURFACES AND REINFORCING STEEL.
2. APPLY TYPE II EPOXY RESIN ADHESIVE TO CONCRETE SURFACES.
3. FORM VERTICAL FACE OF JOINT HEADER WITH 1/2" CHAMFER.



STEP 7

1. FILL AREAS WITH RAPID SET CONCRETE WHILE EPOXY IS STILL TACKY.
2. FINISH FLUSH TO EXISTING DECK. BROOM FINISH CONCRETE SURFACE.
3. ALLOW TO FULLY CURE FOLLOWING MANUFACTURER'S RECOMMENDATIONS.
4. REMOVE ALL FORMWORK.
5. INSTALL JOINT MATERIAL IN ACCORDANCE WITH ACTIVITY 800.01 OR 800.02.

Activity 810.01 – Deck Spall Repair

Before Repair

After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Thoroughly clean existing reinforcement of concrete scale and rust before bonding into new construction.

Material Specifications:

- Concrete: 24-Hour, Class AA, f'_c = 3,500 psi
  : Rapid Setting Patching Material

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

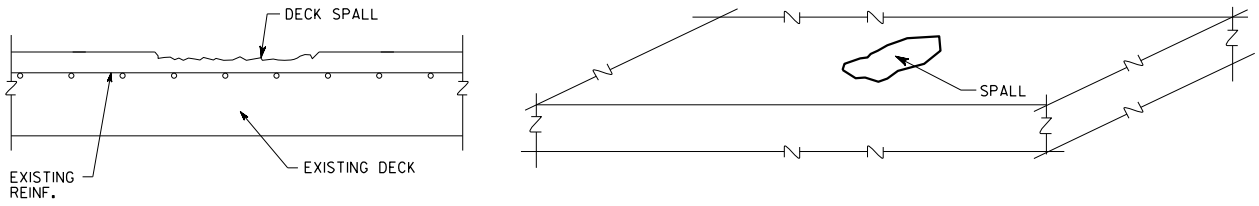
- Section 504 – Twenty-Four Hour Accelerated Strength Concrete
- Section 886 – Epoxy Resin Adhesive
- Section 934 – Rapid Setting Patching Material for Portland Cement Concrete

Georgia Special Provisions & Supplemental Specifications:

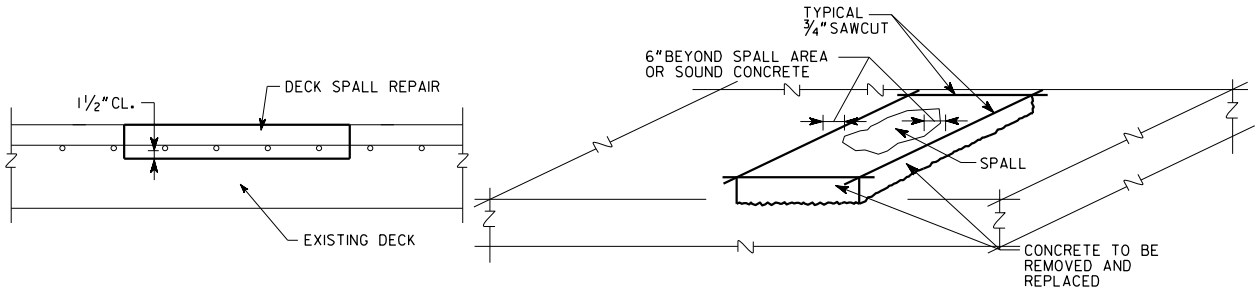
- Section 521 – Patching Concrete Bridge Deck

Qualified Products List:

- QPL-10 List of Approved Concrete Plants
- QPL-15 Epoxy Resin Adhesive
- QPL-27 Rapid Setting Patching Material



EXISTING CONDITION



FINAL CONDITION

NOTE:

1. ALL DAMAGE TO EXISTING DECK REINFORCEMENT MUST BE REPAIRED BY REPLACING DAMAGED AREA OF REINFORCEMENT WITH APPROPRIATE SIZE OF BAR LONG ENOUGH TO OVERLAP UNDAMAGED REINFORCEMENT BY 18"IN BOTH DIRECTIONS.
2. REMOVE ALL DAMAGED MATERIAL TO SOUND SOLID CONCRETE.

EQUIPMENT

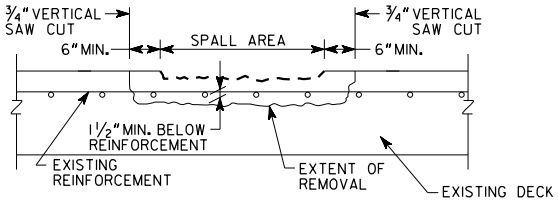
PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
CONCRETE SAW
SAND BLASTER / AIR GUN
PNEUMATIC CHIPPING HAMMER
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
MISC. BUCKETS & HAND TOOLS

MATERIALS

RAPID SET CONCRETE OR
RAPID SET PATCHING MATERIAL
TYPE II EPOXY RESIN ADHESIVE, IF REQUIRED
SANDBLAST MEDIA

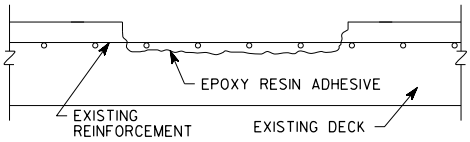
SHEET 1 OF 2

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL DECK SPALL REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 810.01



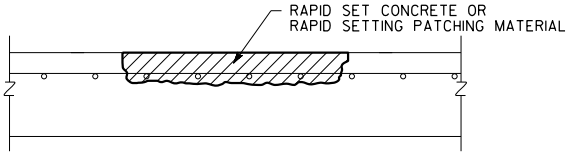
STEP 1

1. DEFINE LIMITS OF REMOVAL THAT WILL ENCOMPASS THE SPALL AREA PLUS A MINIMUM OF 6" ON ALL SIDES. INCREASE AREA OF REMOVAL AS NEEDED TO ENSURE ONLY SOUND CONCRETE REMAINS.
2. SAW-CUT THE DECK ¾" DEEP VERTICALLY ALONG DETERMINED LIMITS OF REMOVAL. ALL SAW-CUTS SHALL BE RECTANGLE SHAPE. EXTEND SAW CUT APPROXIMATELY 1" BEYOND CUT LINE INTERSECTION.
3. USING A 30LB CHIPPING HAMMER, REMOVE ALL CONCRETE WITHIN LIMITS OF REMOVAL DOWN TO A MINIMUM DEPTH OF 1½" BELOW TOP MAT OF REINFORCING STEEL.
4. CLEAN ANY CORRODED REINFORCING BY SANDBLASTING.
5. USE COMPRESSED TO AIR REMOVE DUST AND LOOSE CONCRETE DEBRIS.



STEP 2

1. FOR USE OF RAPID SET CONCRETE APPLY TYPE II EPOXY RESIN ADHESIVE TO CONCRETE SURFACE. FOR USE OF RAPID SETTING PATCHING MATERIAL FOLLOW MANUFACTURERS DIRECTION FOR REQUIREMENTS OF EPOXY RESIN.



STEP 3

1. FOR RAPID SET CONCRETE FILL DAMAGED AREA WHILE EPOXY IS STILL TACKY. FOR RAPID SET MATERIAL FOLLOW MANUFACTURERS DIRECTION.
2. FINISH FLUSH TO EXISTING DECK, BROOM FINISH CONCRETE SURFACE.
3. ALLOW TO FULLY CURE FOLLOWING MANUFACTURER'S RECOMMENDATIONS.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL DECK SPALL REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 810.01

Activity 810.02 – Full Depth Deck Repair

Before Repair

After Repairs

General Notes:

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Bend existing reinforcement to be utilized in new construction in a manner to provide the maximum lap possible or as shown on the plans. Thoroughly clean existing reinforcement of concrete scale and rust by sandblasting before bonding into new construction.

Material Specifications:

- Concrete: 24-Hour Class AA, f'_c = 3,500 psi
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Use Special Care over streams and rivers.
- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

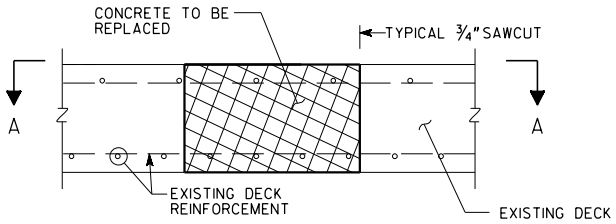
- Section 504 – Twenty-Four Hour Accelerated Strength Concrete
- Section 886 – Epoxy Resin Adhesive

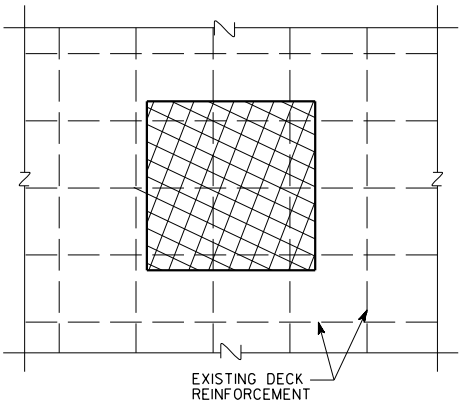
Georgia Special Provisions & Supplemental Specifications:

- None

Qualified Products List:

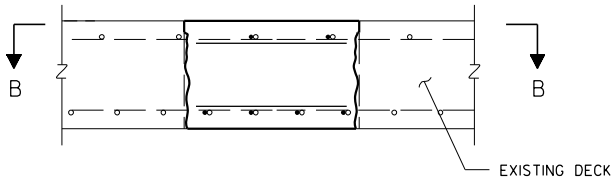
- QPL-10 – List of Approved Concrete Plants
- QPL-15 – Epoxy Resin Adhesive

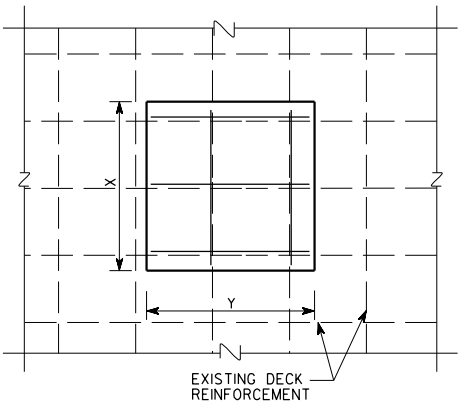




SECTION A-A

EXISTING CONDITION



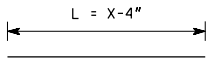


SECTION B-B

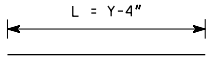
FINAL CONDITION

NOTES:

1. CONTACT GDOT STATE BRIDGE MAINTENANCE ENGINEER PRIOR TO USE OF THIS DETAIL.
2. EDGES OF OPENING ARE TO BE CUT PARALLEL AND / OR PERPENDICULAR TO THE CENTERLINE OF BRIDGE.
3. ALL DAMAGE TO EXISTING DECK REINFORCEMENT MUST BE REPAIRED BY REPLACING DAMAGED AREA OF REINFORCEMENT WITH APPROPRIATE SIZE OF BAR LONG ENOUGH TO OVERLAP UNDAMAGED REINFORCEMENT BY 18" IN BOTH DIRECTIONS.
4. IF AREA BEING REPAIRED IS ABOVE AN ACTIVE TRAFFIC LANE, THEN THE LANE BELOW SHOULD BE CLOSED TO ALL TRAFFIC UNTIL ALL WORK IS COMPLETED.
5. INSPECT AREA BELOW SECTION TO BE REMOVED TO IDENTIFY POSSIBLE CONFLICTS.



BAR 500



BAR 501

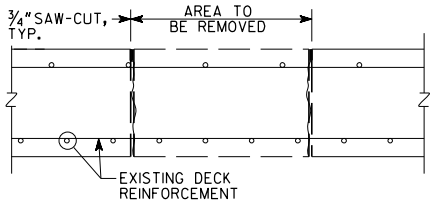
EQUIPMENT

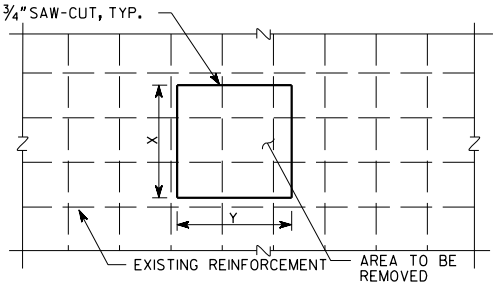
- PERSONAL SAFETY EQUIPMENT AS NEEDED
- PORTABLE AIR COMPRESSOR
- PORTABLE ELECTRIC GENERATOR
- CONCRETE SAW
- SAND BLASTER / AIR GUN
- ANGLE GRINDER WITH DIAMOND WHEEL
- PNEUMATIC CHIPPING HAMMER
- MOBILE CONCRETE MIXER
- CONCRETE HAND TOOLS
- HAMMER DRILL W/ 1" CONC. BIT
- CHOP SAW W/ STEEL BLADES
- CIRCULAR SAW W/ WOOD BLADE
- MISC. BUCKETS & HAND TOOLS
- DRILL W/ 1/8" WOOD BIT

MATERIALS

- RAPID SET CONCRETE
- 2"X 4" BLOCKING TIMBERS
- FORMWORK MATERIALS
- TYPE II EPOXY RESIN ADHESIVE
- TIE WIRE
- 500 BARS
- SANDBLAST MEDIA

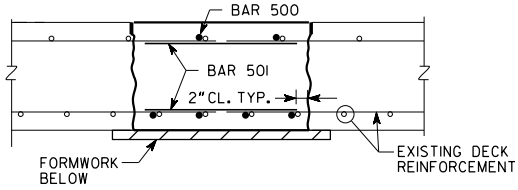
GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL FULL DEPTH DECK REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 810.02

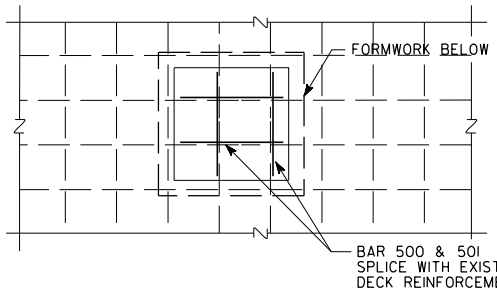




STEP 1

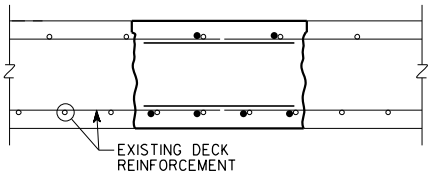
1. DEFINE LIMITS OF REMOVAL THAT WILL ENCOMPASS THE DAMAGED AREA PLUS A MINIMUM OF 6"ON ALL SIDES. INCREASE AREA OF REMOVAL AS NEEDED TO ENSURE ONLY SOUND CONCRETE REMAINS.
2. SAW-CUT THE DECK ¾" DEEP VERTICALLY ALONG DETERMINED LIMITS OF REMOVAL. ALL SAW-CUTS SHALL BE RECTANGLE SHAPE. EXTEND SAW CUT APPROXIMATELY 1" BEYOND CUT LINE INTERSECTION.
3. USING A 30LB CHIPPING HAMMER, REMOVE ALL CONCRETE WITHIN LIMITS OF REMOVAL, TAKING CARE NOT TO DAMAGE EXISTING DECK REINFORCEMENT.

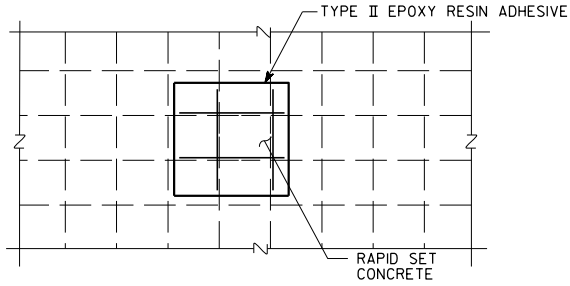




STEP 2

1. REPLACE DAMAGED REINFORCEMENT AS REQUIRED.
2. SANDBLAST AND USE COMPRESSED AIR TO CLEAN OPENING TO REMOVE LOOSE CONCRETE AND CONTAMINANTS.
3. INSTALL FORMWORK BELOW.





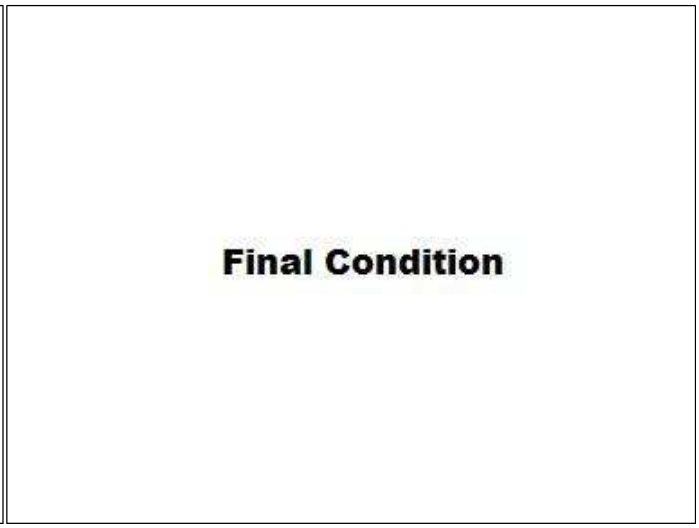
STEP 3

1. APPLY TYPE II EPOXY RESIN ADHESIVE TO THE EXPOSED CONCRETE IN THE HOLE.
2. POUR RAPID SET CONCRETE WHILE EPOXY IS STILL TACKY, SCREED FLUSH TO THE DECK AND BROOM FINISH CONCRETE.
3. LET CURE FOR THREE HOURS MINIMUM BEFORE REMOVING FORMWORK.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL FULL DEPTH DECK REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 810.02

Activity 810.03 – Full Depth Deck Repair – Driving Piles

Before Repair



After Repairs

General Notes:

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Bend existing reinforcement to be utilized in new construction in a manner to provide the maximum lap possible or as shown on the plans. Thoroughly clean existing reinforcement of concrete scale and rust by sandblasting before bonding into new construction.

Material Specifications:

- Concrete: 24-Hour Class AA, f'_c = 3,500 psi
- Rapid Setting Patching Material
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

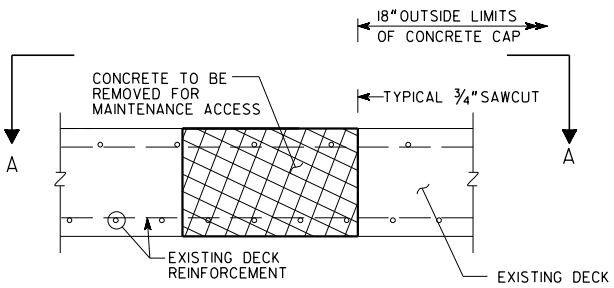
- Section 504 – Twenty-Four Hour Accelerated Strength Concrete
- Section 886 – Epoxy Resin Adhesive
- Section 934 – Rapid Setting Patching Material for Portland Cement Concrete

Georgia Special Provisions & Supplemental Specifications:

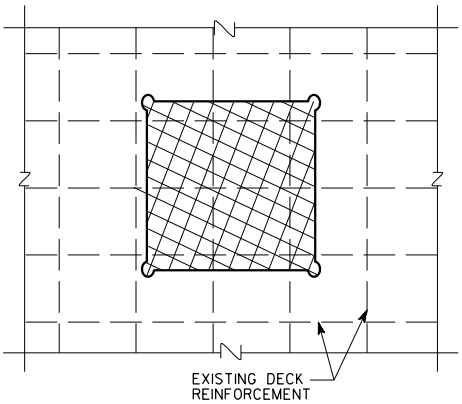
- None

Qualified Products List:

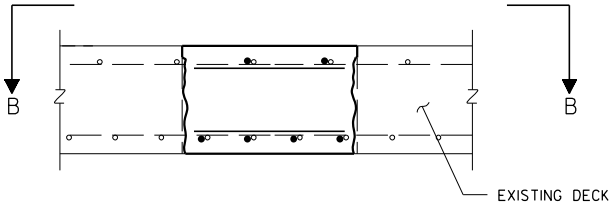
- QPL-10 – List of Approved Concrete Plants
- QPL-15 – Epoxy Resin Adhesive
- QPL-27 – Rapid Setting Patching Material



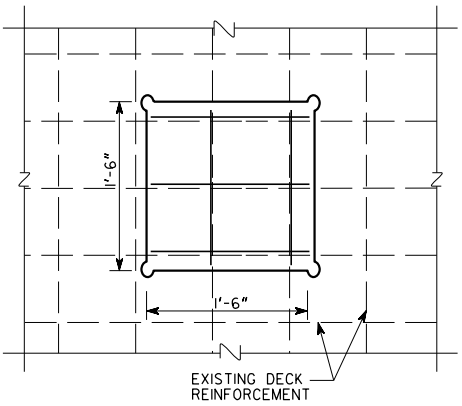
EXISTING CONDITION



SECTION A-A



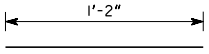
FINAL CONDITION



SECTION B-B

NOTES:

1. THIS DETAIL IS INTENDED FOR USE ON HOLES CUT INTO DECK TO FACILITATE PILE DRIVING OPERATIONS, CONTACT GDOT STATE BRIDGE MAINTENANCE ENGINEER FOR ALTERNATE USES.
2. EDGES OF OPENING ARE TO BE CUT PARALLEL AND / OR PERPENDICULAR TO THE CENTERLINE OF BRIDGE.
3. ALL DAMAGE TO EXISTING DECK REINFORCEMENT MUST BE REPAIRED BY REPLACING DAMAGED AREA OF REINFORCEMENT WITH APPROPRIATE SIZE OF BAR LONG ENOUGH TO OVERLAP UNDAMAGED REINFORCEMENT BY 18" IN BOTH DIRECTIONS.
4. IF AREA BEING REPAIRED IS ABOVE AN ACTIVE TRAFFIC LANE, THEN THE LANE BELOW SHOULD BE CLOSED TO ALL TRAFFIC UNTIL ALL WORK IS COMPLETED.
5. INSPECT AREA BELOW SECTION TO BE REMOVED TO IDENTIFY POSSIBLE CONFLICTS.



BAR 500

EQUIPMENT

- PERSONAL SAFETY EQUIPMENT AS NEEDED
- PORTABLE AIR COMPRESSOR
- PORTABLE ELECTRIC GENERATOR
- CONCRETE SAW
- SAND BLASTER / AIR GUN
- ANGLE GRINDER WITH DIAMOND WHEEL
- PNEUMATIC CHIPPING HAMMER
- MOBILE CONCRETE MIXER
- CONCRETE HAND TOOLS
- HAMMER DRILL W/ 1" CONC. BIT
- CHOP SAW W/ STEEL BLADES
- CIRCULAR SAW W/ WOOD BLADE
- MISC. BUCKETS & HAND TOOLS
- DRILL W/ 1/8" WOOD BIT

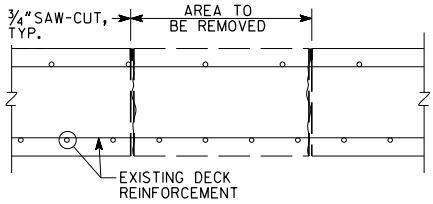
MATERIALS

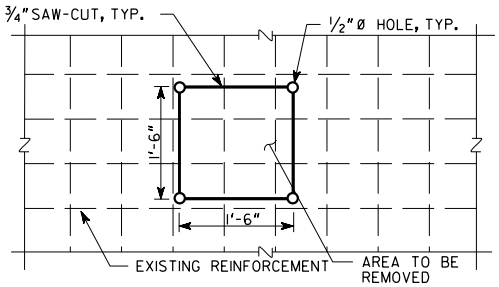
- RAPID SET CONCRETE OR RAPID SET PATCHING MATERIAL
- 2"X 4" BLOCKING TIMBERS
- 24"X 24"X ½" PLYWOOD
- TYPE II EPOXY RESIN ADHESIVE, IF REQUIRED
- TIE WIRE
- 500 BARS
- SANDBLAST MEDIA

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION DETAIL
FULL DEPTH DECK REPAIR - DRIVING PILES
NO SCALE
JUNE 2012

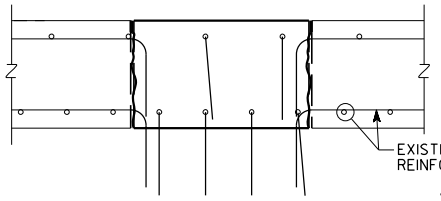
REVISION DATE	DRAWING NO.
	810.03

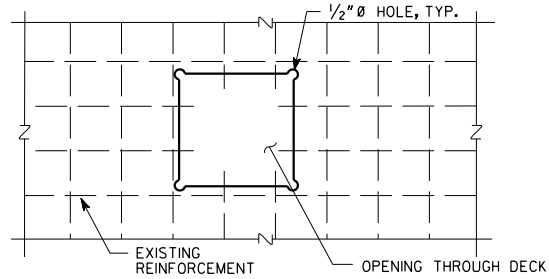




STEP 1

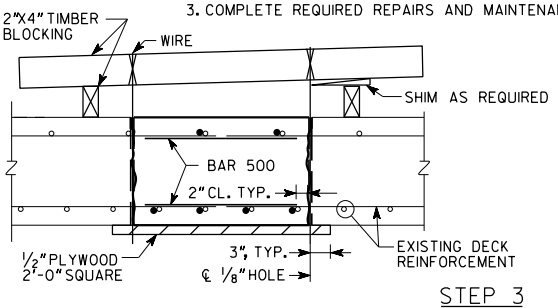
1. DEFINE AND MARK LIMITS OF AREA TO BE REMOVED.
2. DRILL ½"HOLE THROUGH DECK AT EACH CORNER OF AREA TO BE REMOVED.
3. SAW-CUT TOP OF DECK ¾"VERTICALLY FROM HOLE TO HOLE AROUND THE PERIMETER. ALL SAW CUTS SHALL BE SQUARE SHAPE.
4. REMOVE CONCRETE USING HAND TOOLS AND CHIPPING HAMMER TAKING CARE NOT TO DAMAGE EXISTING DECK REINFORCEMENT.

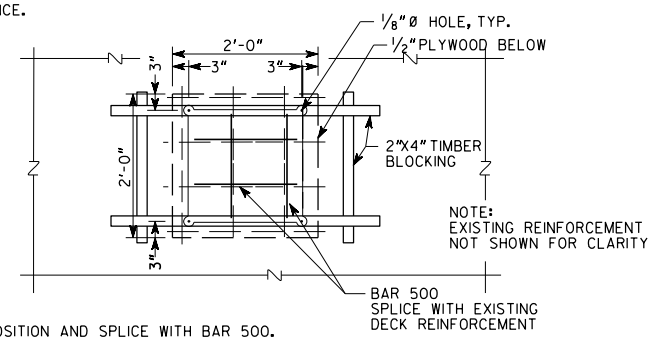




STEP 2

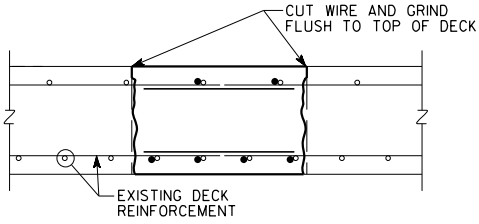
1. USING A SAW, CUT EXPOSED REINFORCEMENT AT MIDPOINT. USE OF A CUTTING TORCH IS NOT PERMITTED.
2. BEND REINFORCEMENT DOWN INTO HOLE TO ALLOW PILE TO BE INSERTED AND DRIVEN.
3. COMPLETE REQUIRED REPAIRS AND MAINTENANCE.

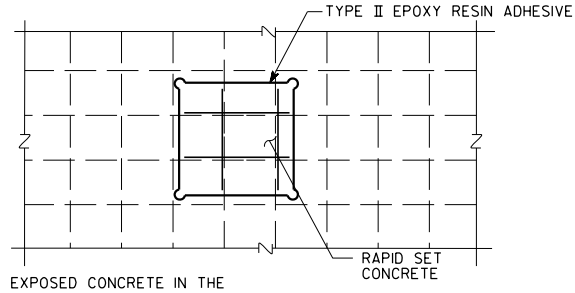




STEP 3

1. BEND EXISTING REINFORCEMENT BACK INTO POSITION AND SPLICE WITH BAR 500.
2. SANDBLAST AND USE COMPRESSED AIR TO CLEAN OPENING TO REMOVE LOOSE CONCRETE AND CONTAMINANTS.
3. DRILL A ⅛"HOLE IN EACH CORNER OF A PIECE OF 2'-0"SQUARE X ½"PLYWOOD AS SHOWN ABOVE.
4. THREAD WIRE THROUGH HOLES AND LEAVE LONG ENOUGH TO SUSPEND THE PLYWOOD UNDER DECK.
5. PASS PLYWOOD DOWN THROUGH OPENING AND MANEUVER TO CENTER WIRE IN ½"Ø CORNER HOLES THROUGH CONCRETE AND FULLY COVER OPENING.
6. ATTACH WIRES TO 2X4'S ABOVE TOP OF DECK, SHIMS MAY BE REQUIRED TO APPLY TENSION TO WIRE AND ACHIEVE A SNUG FIT AGAINST BOTTOM OF DECK.





STEP 4

1. APPLY TYPE II EPOXY RESIN ADHESIVE TO THE EXPOSED CONCRETE IN THE HOLE.
2. POUR RAPID SET CONCRETE WHILE EPOXY IS STILL TACKY, SCREED FLUSH TO THE DECK AND BROOM FINISH CONCRETE.
3. LET CURE FOR THREE HOURS MINIMUM BEFORE REMOVING 2"X4"BLOCKING, PLYWOOD AND WIRE HANGERS.
4. ON UNDERSIDE OF DECK, CUT WIRE AS CLOSE AS POSSIBLE TO FACE OF CONCRETE. ON TOP OF DECK, CUT WIRE AS CLOSE AS POSSIBLE TO FACE OF CONCRETE AND GRIND FLUSH WITH SURFACE OF DECK.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL FULL DEPTH DECK REPAIR - DRIVING PILES NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 810.03

Activity 815.01 – Brush Curb Post Repair

Before Repair

After Repairs

General Notes:

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Bend existing reinforcement to be utilized in new construction in a manner to provide the maximum lap possible or as shown on the plans. Thoroughly clean existing reinforcement of concrete scale and rust before bonding into new construction.

Material Specifications:

- Concrete: Class AA, f'_c = 3,500 psi
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications

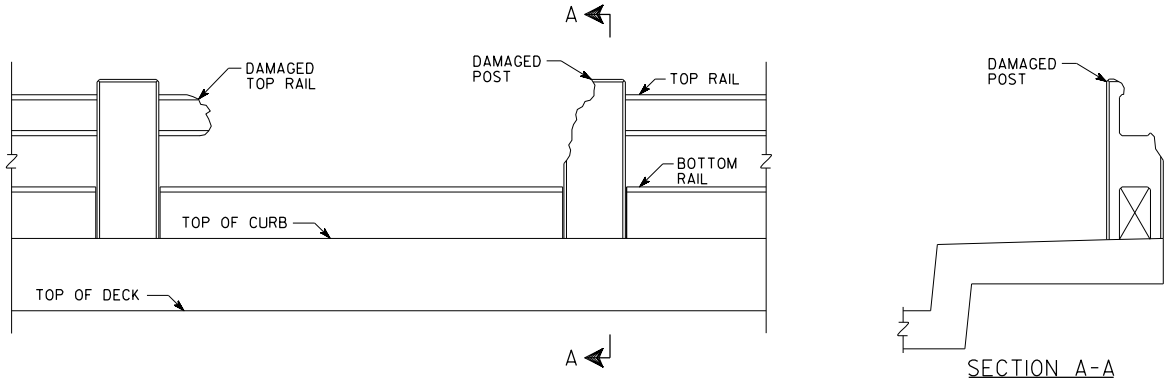
- Section 500 – Concrete Structures
- Section 511 – Reinforcement Steel
- Section 886 – Epoxy Resin Adhesive

Georgia Special Provisions & Supplemental Specifications:

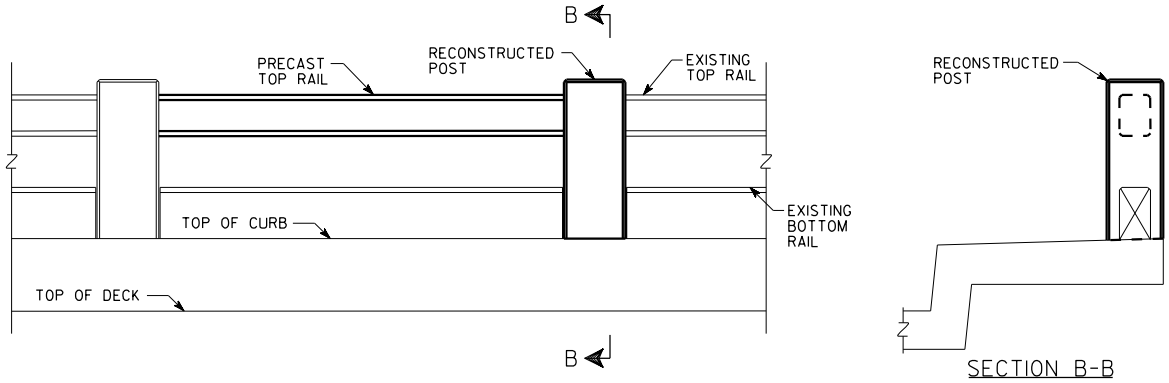
- None

Qualified Products List:

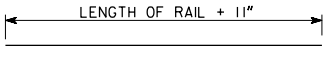
- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-15 Epoxy Resin Adhesives
- QPL-19 Bar Supports
- QPL-20 (A) Preformed Joint Filler and (B) Preformed Foam Joint Filler



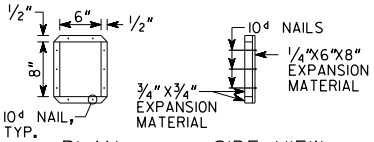
EXISTING CONDITION



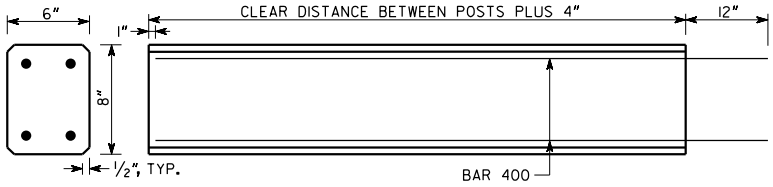
FINAL CONDITION



BAR 400



DETAILS OF EXPANSION MATERIAL



DETAILS OF PRECAST RAIL

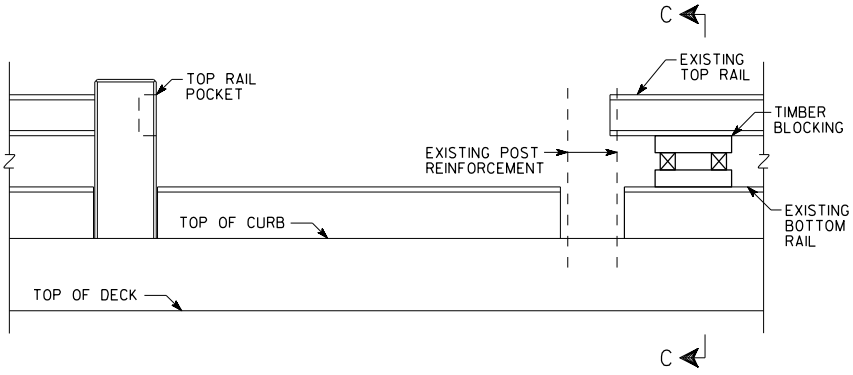
EQUIPMENT

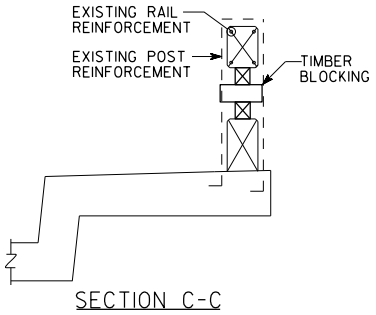
PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
SAND BLASTER / AIR GUN
ANGLE GRINDER WITH DIAMOND WHEEL
PNEUMATIC CHIPPING HAMMER
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
CHOP SAW W/ STEEL BLADES
CIRCULAR SAW W/ WOOD BLADE
MISC. BUCKETS & HAND TOOLS

MATERIALS

2"X 4" BLOCKING TIMBERS
PRECAST RAIL
EXPANSION MATERIAL
10d NAILS
MATERIALS FOR FORMWORK
TYPE II EPOXY RESIN ADHESIVE
RAPID SET CONCRETE
SAND BLASTING MEDIA
TIE WIRE
BAR 400

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL BRUSH CURB POST REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 815.01

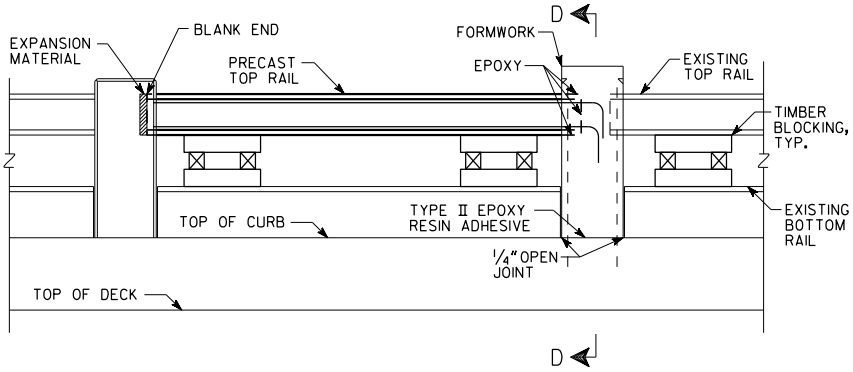


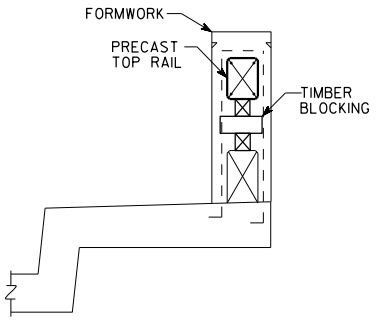


SECTION C-C

STEP 1

1. SUPPORT ADJACENT RAILING WITH TIMBER BLOCKING.
2. FULLY REMOVE ALL DAMAGED CONCRETE COMPONENTS, TAKING CARE NOT TO DAMAGE EXISTING REINFORCEMENT.
3. STRAIGHTEN OR REPOSITION STEEL AS NEEDED FOR REPAIRS, SPLICING OR REPLACING MAY BE REQUIRED.

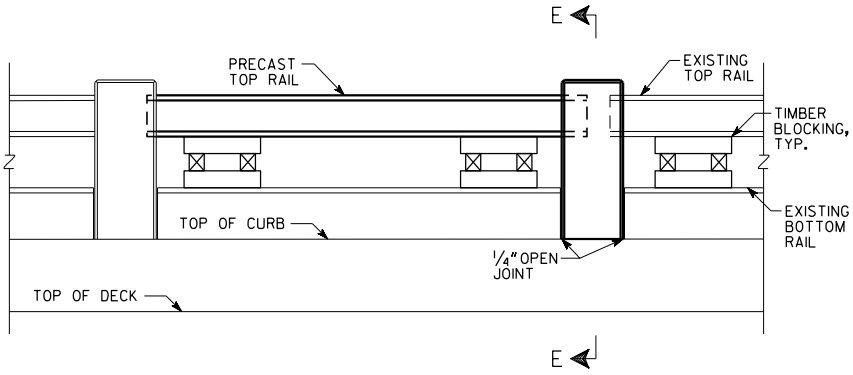


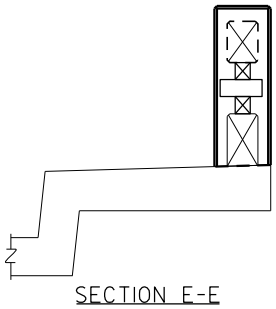


SECTION D-D

STEP 2

1. PLACE EXPANSION MATERIAL IN EXISTING RAIL POCKET.
2. SET UP TIMBER BLOCKING TO SUPPORT PRECAST TOP RAIL.
3. PLACE EXPANSION END OF PRECAST TOP RAIL INTO EXISTING RAIL POCKET AND ALIGN RAIL TO FINAL POSITION (BEND REINFORCEMENT AS NECESSARY TO AVOID INTERFERENCE WITH EXISTING TOP RAIL).
4. CONSTRUCT FORMWORK FOR POST (FORMWORK SHALL BE SETUP TO PROVIDE POST DIMENSIONS THAT MATCH EXISTING POST. SEE PLANS AND/OR STANDARDS IF AVAILABLE).
5. APPLY TYPE II EPOXY RESIN ADHESIVE TO EXISTING CONCRETE WHERE FRESH CONCRETE IS TO BE PLACED.





SECTION E-E

STEP 3

1. POUR RAPID SET CONCRETE WHILE EPOXY ADHESIVE IS STILL TACKY.
2. LET CURE FOR THREE HOURS MINIMUM.
3. REMOVE FORMWORK AND ALL TIMBER BLOCKING.
4. FINISH SURFACES WITH RUBBING STONE TO MATCH EXISTING.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL BRUSH CURB POST REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 815.01

Activity 815.02 – Full Depth Standard Barrier Repair

Before Repair | After Repairs

General Notes:

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Bend existing reinforcement to be utilized in new construction in a manner to provide the maximum lap possible or as shown on the plans. Thoroughly clean existing reinforcement of concrete scale and rust by sand blasting before bonding into new construction.

Material Specifications:

- Concrete: Class AA, f'_c = 3,500 psi
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications

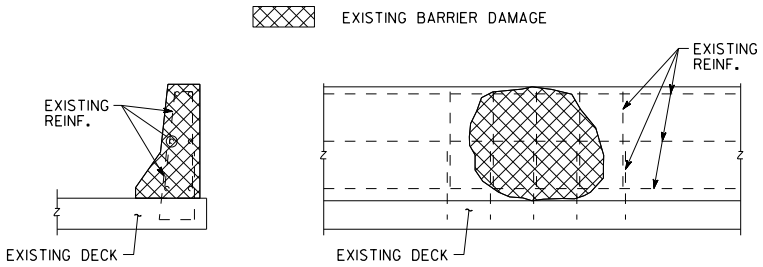
- Section 500 – Concrete Structures
- Section 511 – Reinforcement Steel
- Section 621 – Concrete Barrier
- Section 886 – Epoxy Resin Adhesive

Georgia Special Provisions & Supplemental Specifications:

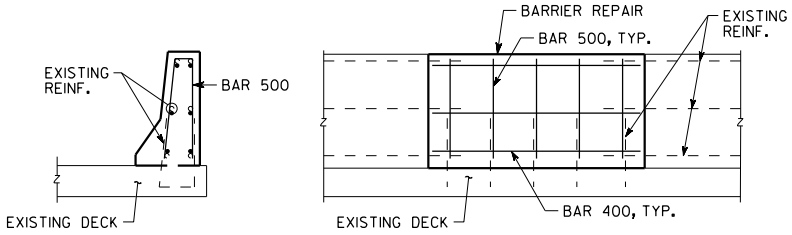
- None

Qualified Products List:

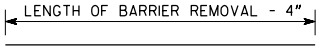
- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-15 Epoxy Resin Adhesives
- QPL-19 Bar Supports
- QPL-20 (A) Preformed Joint Filler and (B) Preformed Foam Joint Filler



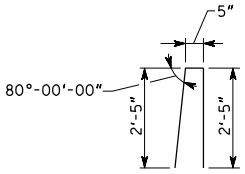
EXISTING CONDITION



FINAL CONDITION



BAR 400



BAR 500

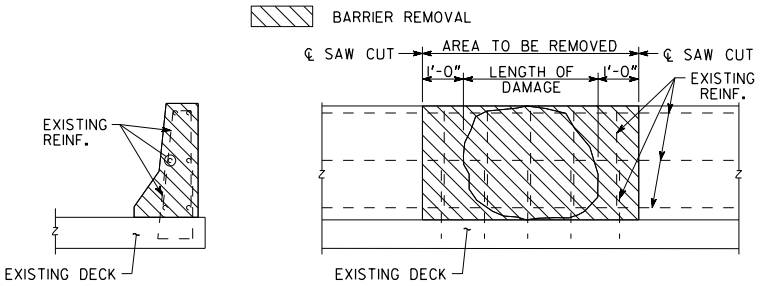
EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
SAND BLASTER / AIR GUN
ANGLE GRINDER WITH DIAMOND WHEEL
CONCRETE SAW
PNEUMATIC CHIPPING HAMMER
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
CHOP SAW W/ STEEL BLADES
CIRCULAR SAW W/ WOOD BLADE
MISC. BUCKETS & HAND TOOLS

MATERIALS

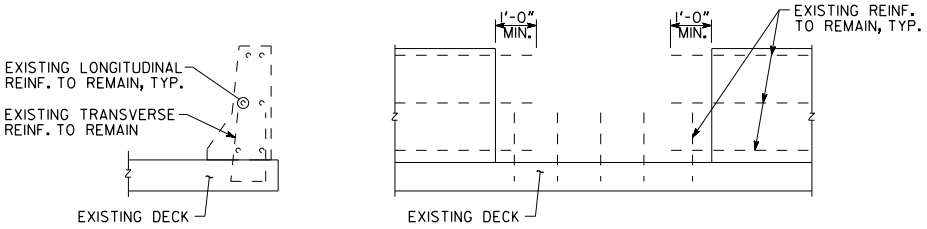
BAR 400
BAR 500
RAPID SET CONCRETE
MATERIALS FOR FORMWORK
TYPE II EPOXY RESIN ADHESIVE
SANDBLAST MEDIA

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL FULL DEPTH STANDARD BARRIER REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 815.02



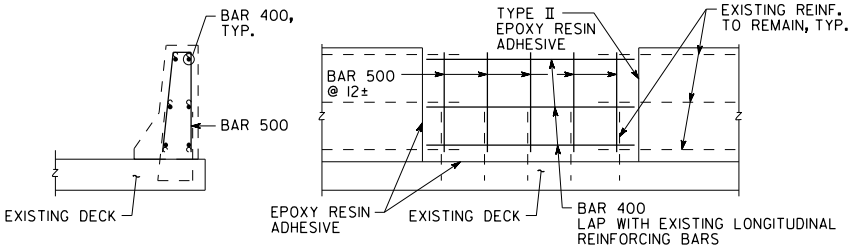
STEP 1

1. DEFINE AND MARK LIMITS OF AREA TO BE REMOVED
2. SAW CUT FULL HEIGHT OF BARRIER.
3. REMOVE BARRIER CONCRETE TO SOUND CONCRETE USING HAND TOOLS AND CHIPPING HAMMER TAKING CARE NOT TO DAMAGE EXISTING REINFORCING STEEL.



STEP 2

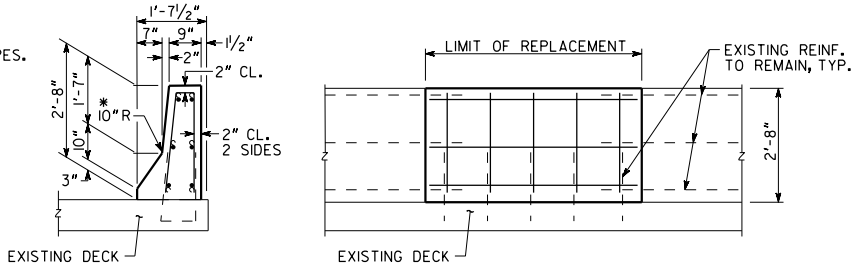
1. REMOVE EXISTING TRANSVERSE REINFORCING BARS.
2. USING A SAW, CUT EXPOSED EXISTING LONGITUDINAL REINFORCING BARS AS NECESSARY TO PROVIDE A 1'-0" MIN. LAP WITH NEW REINFORCING BARS.



STEP 3

1. PLACE NEW 400 AND 500 REINFORCING BARS. LAP WITH EXISTING REINFORCING BARS REMAINING.
2. SANDBLAST AND USE COMPRESSED AIR TO CLEAN CONCRETE SURFACES AND REINFORCING STEEL.
3. PLACE FORMWORK.
4. APPLY EPOXY RESIN ADHESIVE TO THE EXPOSED CONCRETE SURFACES.

* OPTIONAL:
REPLACE 10" RADIUS WITH STRAIGHT INTERSECTING SLOPES.



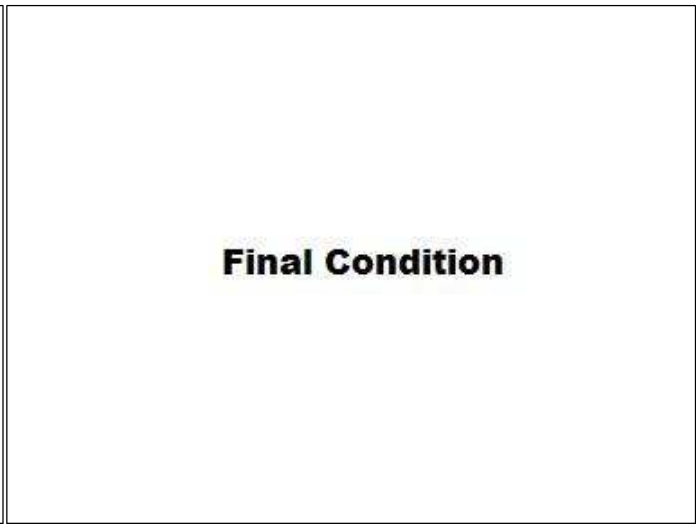
STEP 4

1. POUR CONCRETE WHILE EPOXY RESIN ADHESIVE IS STILL TACKY.
2. FINISH FLUSH TO EXISTING BARRIER.
3. ALLOW TO FULLY CURE FOLLOWING MANUFACTURER'S RECOMMENDATIONS.
4. REMOVE ALL FORMWORK.

			SHEET 2 OF 2
GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL FULL DEPTH STANDARD BARRIER REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 815.02

Activity 815.03 – Standard Barrier Top Spall Repair

Before Repair



After Repairs

General Notes:

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Bend existing reinforcement to be utilized in new construction in a manner to provide the maximum lap possible or as shown on the plans. Thoroughly clean existing reinforcement of concrete scale and rust by sand blasting before bonding into new construction.

Material Specifications:

- Concrete: Class AA, f'_c = 3,500 psi
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications

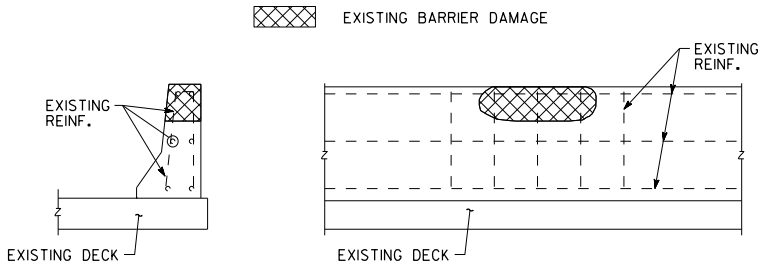
- Section 500 – Concrete Structures
- Section 511 – Reinforcement Steel
- Section 886 – Epoxy Resin Adhesive

Georgia Special Provisions & Supplemental Specifications:

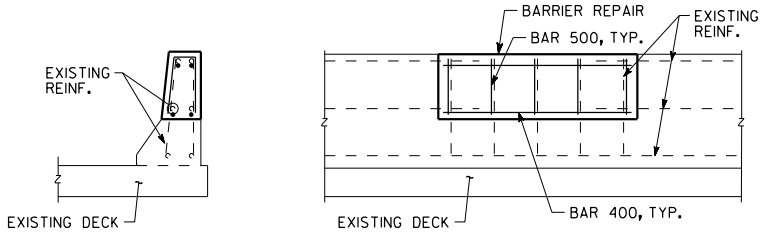
- None

Qualified Products List:

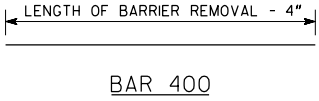
- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-15 Epoxy Resin Adhesives
- QPL-19 Bar Supports
- QPL-20 (A) Preformed Joint Filler and (B) Preformed Foam Joint Filler



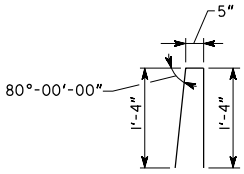
EXISTING CONDITION



FINAL CONDITION



BAR 400



BAR 500

NOTE: REPAIR DETAIL INTENDED FOR HEAVY DAMAGE TO BARRIER WITH EXPOSED REBAR. NOT INTENDED FOR MINOR SPALLING IN BARRIER.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT
AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
CONCRETE SAW
SAND BLASTER / AIR GUN
PNEUMATIC CHIPPING HAMMER
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
CHOP SAW W/ STEEL BLADES
CIRCULAR SAW W/ WOOD BLADE
MISC. BUCKETS & HAND TOOLS

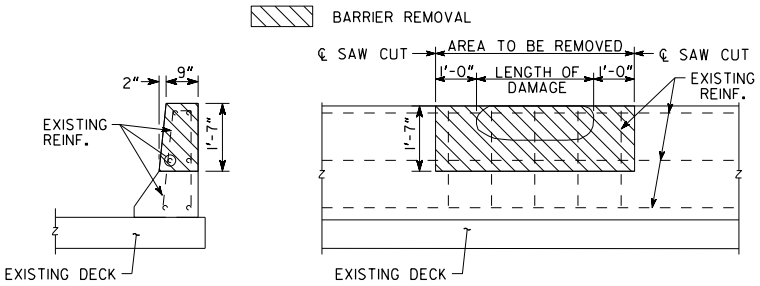
MATERIALS

TYPE II EPOXY RESIN ADHESIVE, IF REQUIRED
BAR 400
BAR 500
RAPID SET CONCRETE OR
RAPID SET PATCHING MATERIAL
MATERIALS FOR FORMWORK
SANDBLAST MEDIA
TIE WIRE

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

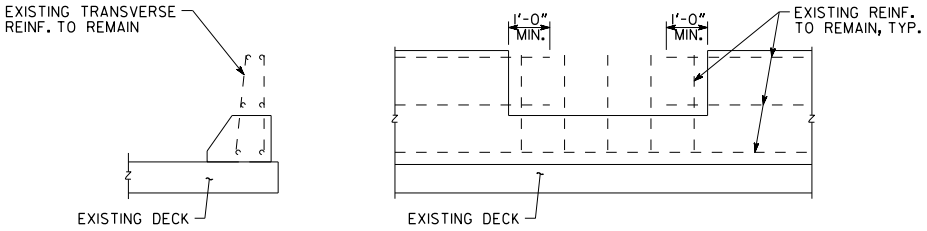
CONSTRUCTION DETAIL
STANDARD BARRIER TOP SPALL REPAIR
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	815.03



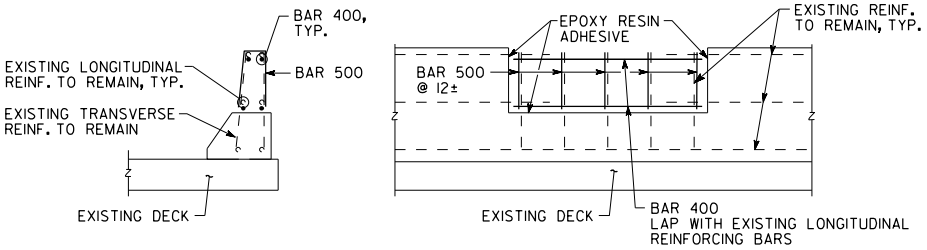
STEP 1

1. DEFINE AND MARK LIMITS OF AREA TO BE REMOVED
2. SAW CUT TO A DEPTH BEYOND DAMAGED AREA.
3. REMOVE BARRIER CONCRETE TO SOUND CONCRETE USING HAND TOOLS AND CHIPPING HAMMER TAKING CARE NOT TO DAMAGE EXISTING REINFORCING STEEL.



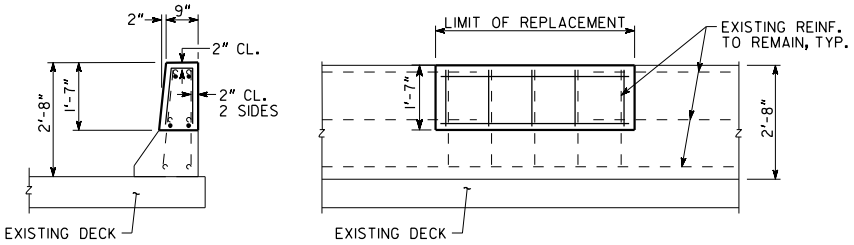
STEP 2

1. USING A SAW, CUT AND REMOVE TOP LEG OF EXPOSED EXISTING TRANSVERSE REINFORCING BARS.
2. USING A SAW, CUT EXPOSED EXISTING LONGITUDINAL REINFORCING BARS AS NECESSARY TO PROVIDE A 1'-0" MIN. LAP WITH NEW REINFORCING BARS.



STEP 3

1. PLACE NEW 400 AND 500 REINFORCING BARS. LAP WITH EXISTING REINFORCING BARS REMAINING.
2. SANDBLAST AND USE COMPRESSED AIR TO CLEAN CONCRETE SURFACES AND REINFORCING STEEL.
3. PLACE FORMWORK.
4. APPLY TYPE II EPOXY RESIN ADHESIVE TO THE EXPOSED CONCRETE SURFACES.

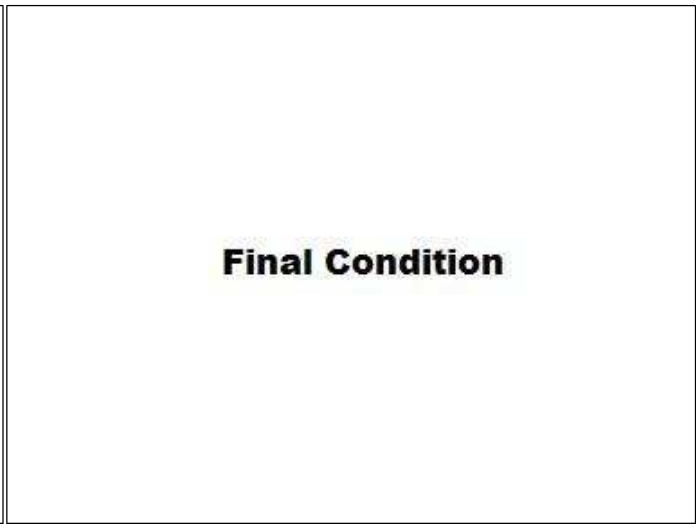


STEP 4

1. POUR CONCRETE WHILE EPOXY RESIN ADHESIVE IS STILL TACKY.
2. FINISH FLUSH TO EXISTING BARRIER.
3. ALLOW TO FULLY CURE FOLLOWING MANUFACTURER'S RECOMMENDATIONS.
4. REMOVE ALL FORMWORK.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL STANDARD BARRIER TOP SPALL REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 815.03

Activity 815.04 - Standard Barrier Gutter Spall Repair



Before Repair | After Repairs

General Notes:

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Bend existing reinforcement to be utilized in new construction in a manner to provide the maximum lap possible or as shown on the plans. Thoroughly clean existing reinforcement of concrete scale and rust by sand blasting before bonding into new construction.

Material Specifications:

- Concrete: Class AA, f'_c = 3,500 psi
- Reinforcing Steel, Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications

- Section 500 – Concrete Structures
- Section 511 – Reinforcement Steel
- Section 886 – Epoxy Resin Adhesive

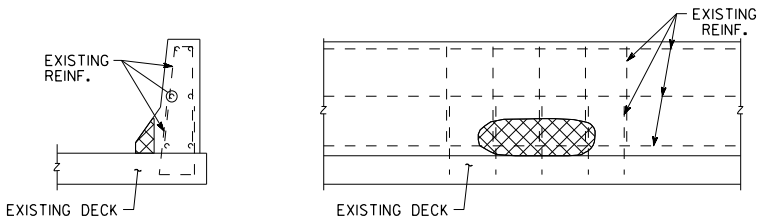
Georgia Special Provisions & Supplemental Specifications:

- None

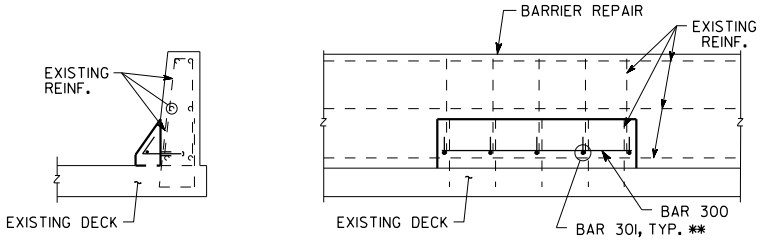
Qualified Products List:

- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-15 Epoxy Resin Adhesives

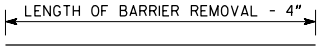
EXISTING BARRIER DAMAGE



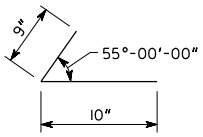
EXISTING CONDITION



FINAL CONDITION



BAR 300



BAR 301

NOTE: ** 301 BARS SHALL BE ANCHORED WITH TYPE VIII EPOXY ADHESIVE (5" MIN. EMBED.).

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
CONCRETE SAW
SAND BLASTER / AIR GUN
PNEUMATIC CHIPPING HAMMER
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
HAMMER DRILL W/ ½"CONC. BIT
CIRCULAR SAW W/ WOOD BLADE
MISC. BUCKETS & HAND TOOLS

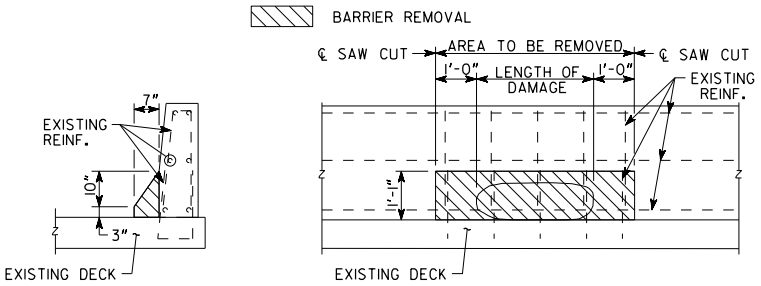
MATERIALS

TYPE II EPOXY RESIN ADHESIVE, IF REQUIRED
TYPE VIII EPOXY
BAR 300
BAR 301
RAPID SET CONCRETE OR
RAPID SET PATCHING MATERIAL
MATERIALS FOR FORMWORK
SANDBLAST MEDIA
TIE WIRE

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

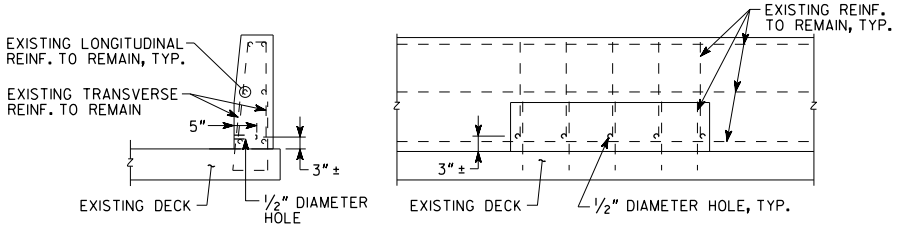
CONSTRUCTION DETAIL
STANDARD BARRIER GUTTER SPALL REPAIR
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	815.04



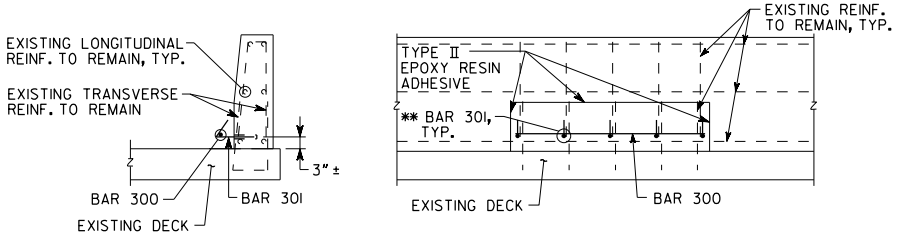
STEP 1

1. DEFINE AND MARK LIMITS OF AREA TO BE REMOVED
2. SAW CUT DAMAGED AREA TO BE REMOVED.
3. REMOVE BARRIER CONCRETE TO SOUND CONCRETE USING HAND TOOLS AND CHIPPING HAMMER TAKING CARE NOT TO DAMAGE EXISTING REINFORCING STEEL.



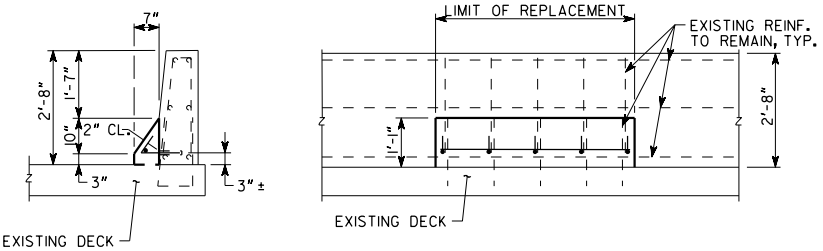
STEP 2

1. DRILL ½" DIAMETER HOLES 3"± FROM THE DECK SURFACE AT APPROXIMATELY 12" SPACING.
2. CLEAN ½" DIAMETER HOLE OUT WITH COMPRESSED AIR.



STEP 3

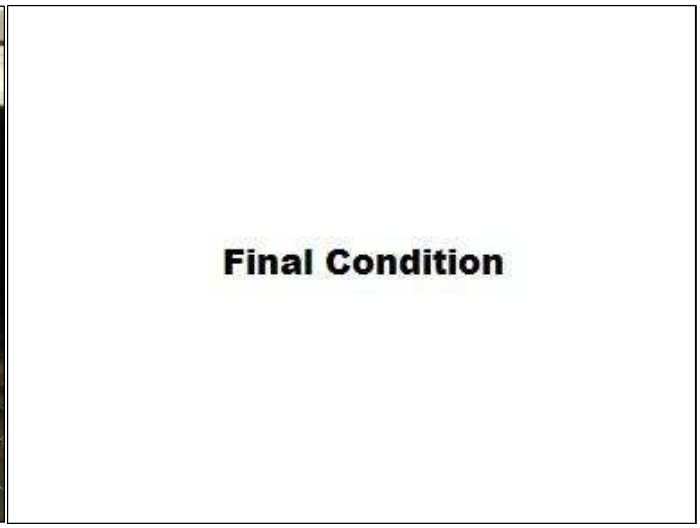
1. INSTALL TYPE VIII EPOXY INTO ½" DIAMETER HOLES IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
2. PLACE NEW 300 AND 301 REINFORCING BARS.
3. SANDBLAST AND USE COMPRESSED AIR TO CLEAN CONCRETE SURFACES AND REINFORCING STEEL.
4. PLACE FORMWORK.
5. APPLY TYPE II EPOXY RESIN ADHESIVE TO THE EXPOSED CONCRETE SURFACES.



STEP 4

1. POUR CONCRETE WHILE EPOXY RESIN ADHESIVE IS STILL TACKY.
2. FINISH FLUSH TO EXISTING BARRIER.
3. ALLOW TO FULLY CURE FOLLOWING MANUFACTURER'S RECOMMENDATIONS.
4. REMOVE ALL FORMWORK.

Activity 820.01 – Culvert Toe Wall Placement



Before Repair

After Repairs

General Notes:

Coordinate all work in the stream with the District Environmentalist.

Traffic can be maintained onsite during this activity.

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

All reinforcing steel shall be epoxy coated.

Material Specifications:

- Concrete: Class A, f'_c = 3,000 psi
- Reinforcing Steel, Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications

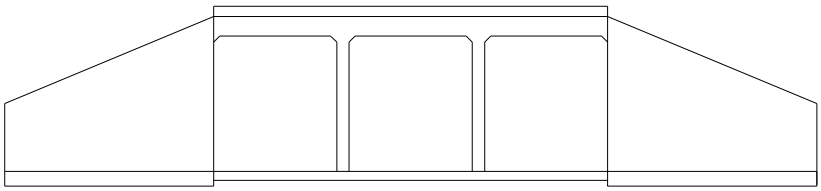
- Section 500 – Concrete Structures
- Section 511 – Reinforcement Steel
- Section 514 – Epoxy Coated Steel Reinforcement
- Section 886 – Epoxy Resin Adhesive

Georgia Special Provisions & Supplemental Specifications:

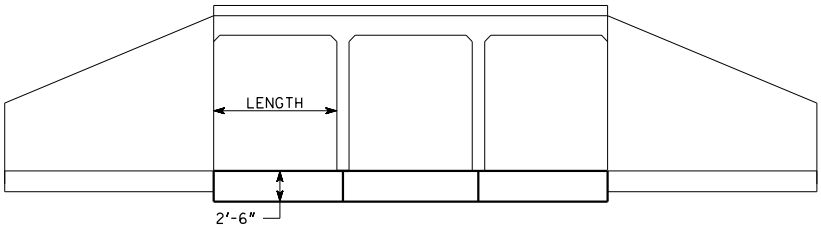
- None

Qualified Products List:

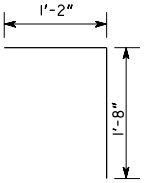
- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-15 Epoxy Resin Adhesives
- QPL-38 Epoxy Powders for Coating Steel Reinforcing Bars & Coated Tie Wires for Epoxy Coated Reinforcing Bars



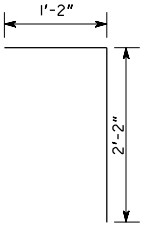
EXISTING CONDITION



FINAL CONDITION

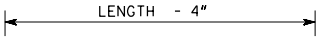


BAR 401



BAR 402

NOTE: ALL REINFORCEMENT SHALL BE EPOXY COATED



BAR 400

EQUIPMENT

TRAFFIC CONTROL AS NEEDED
PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
CONCRETE SAW
SAND BLASTER / AIR GUN
SAND BAGS / WATER PUMP
PNEUMATIC CHIPPING HAMMER
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
HAMMER DRILL W/ 5/8" CONC. BIT
CHOP SAW W/ STEEL BLADES
CIRCULAR SAW W/ WOOD BLADE
MISC. BUCKETS & HAND TOOLS
DIGGING EQUIPMENT

MATERIALS

TYPE II EPOXY RESIN ADHESIVE
TYPE VIII EPOXY
BAR 400
BAR 401
BAR 402
CONCRETE
MATERIALS FOR FORMWORK
SANDBLAST MEDIA
FOUNDATION BACKFILL MATERIAL
MATERIAL FOR STREAM DIVERSION

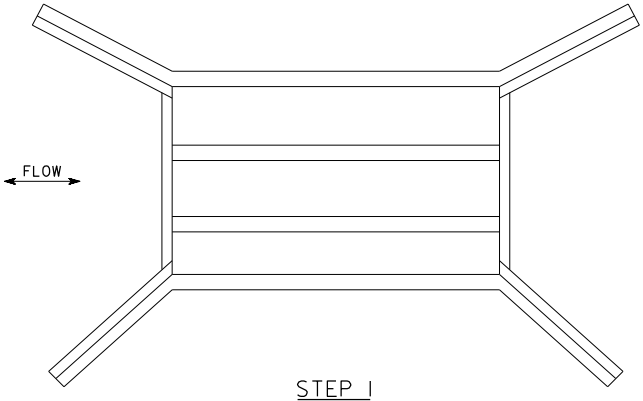
SHEET 1 OF 3

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION DETAIL
CULVERT TOE WALL PLACEMENT
NO SCALE
JUNE 2012

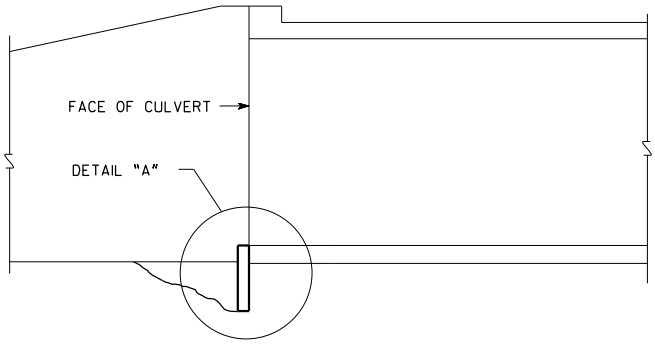
REVISION DATE

DRAWING NO.
820.01



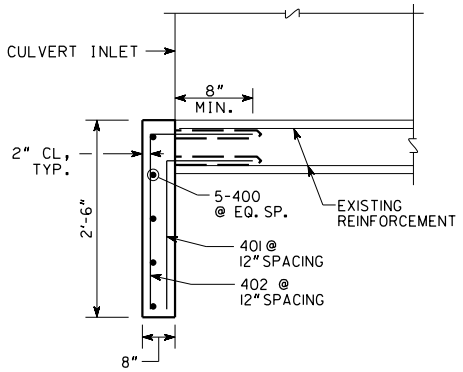
STEP 1

1. DEFINE LIMITS OF THE INLET TO BE PLACED.
2. DIVERT WATER INTO ADJACENT BARRELS WHERE THE INLETS WILL BE REPAIRED.



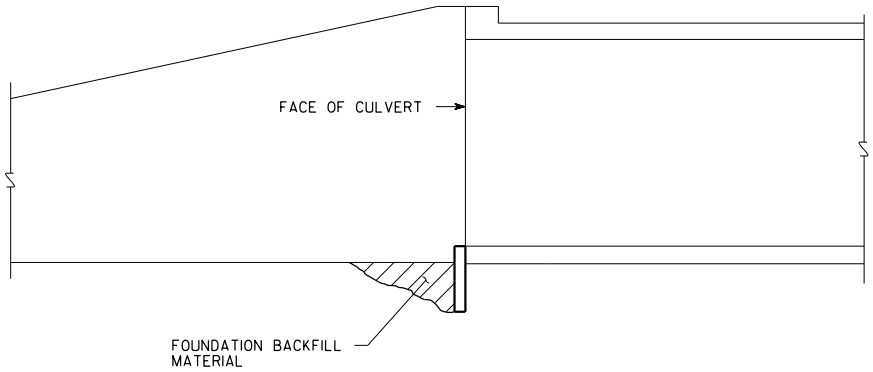
STEP 2

1. FORM THE NEW TOE WALL TO BE CONSTRUCTED AND PLACE THE REINFORCEMENT AS SHOWN IN DETAIL "A".
2. APPLY TYPE II EPOXY RESIN ADHESIVE TO CONCRETE SURFACE.
3. FILL FORMED AREA WITH CONCRETE WHILE EPOXY IS STILL TACKY.
4. ALLOW TO FULLY CURE, REMOVE FORMS.
5. REPEAT STEP 2 AS REQUIRED FOR ADDITIONAL BARRELS.



DETAIL "A"

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL CULVERT TOW WALL PLACEMENT NO SCALE JUNE 2012	REVISION DATE	SHEET 2 OF 3 DRAWING NO. 820.01



STEP 3

1. PLACE FOUNDATION BACKFILL MATERIAL AND COMPACT AS NEEDED WHERE NEW TOE WALL WAS CONSTRUCTED.

2. PLACE RIP RAP IN ACCORDANCE WITH 820.03 CULVERT RIP RAP PROTECTION.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL CULVERT INLET PLACEMENT NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 820.01

Activity 820.02 – Culvert Piping/Void Repair

Before Repair

After Repairs

General Notes:

Coordinate all work in the stream with the District Environmentalist.

Traffic can be maintained onsite during this activity.

Material Specifications:

- Concrete: Flowable Fill, f'_c = 125 psi
- Non-shrink Grout

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications

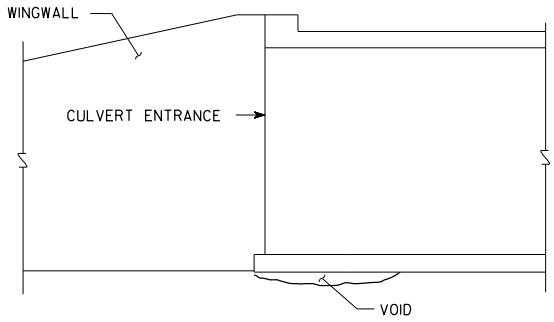
- Section 600 – Controlled Low Strength Flowable Fill

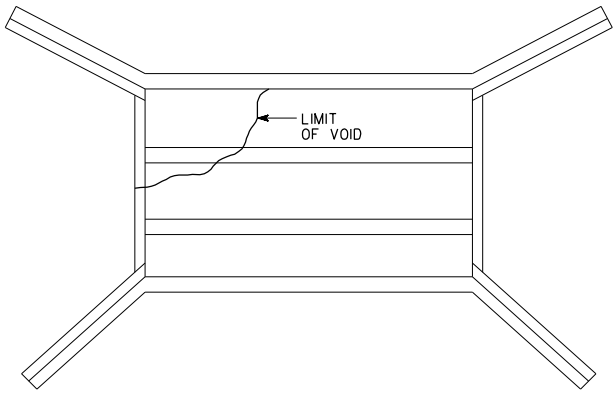
Georgia Special Provisions & Supplemental Specifications:

- None

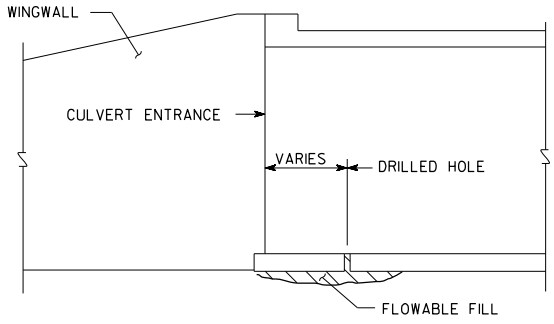
Qualified Products List:

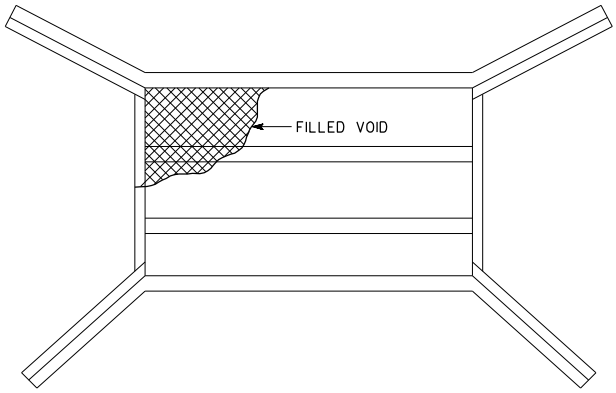
- None





EXISTING CONDITION





FINAL CONDITION

EQUIPMENT

TRAFFIC CONTROL AS NEEDED
PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE ELECTRIC GENERATOR
SAND BAGS / WATER PUMP
CONCRETE CORE DRILL W/ STAND AND BITS
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
CONCRETE PUMP
MISC. BUCKETS & HAND TOOLS

MATERIALS

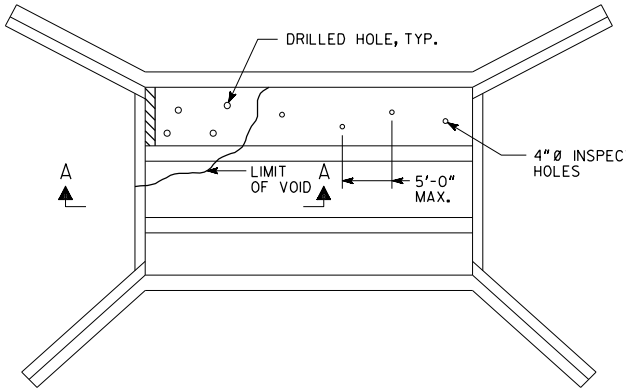
FLOWABLE FILL
NON-SHRINK GROUT
MATERIALS FOR STREAM DIVERSION
WOODEN PLUGS

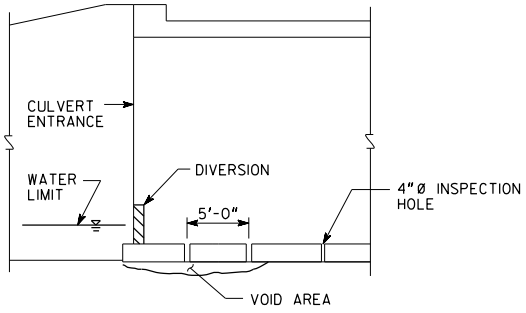
GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION DETAIL
CULVERT PIPING - VOID REPAIR
NO SCALE
JUNE 2012

REVISION DATE

DRAWING NO.
820.02

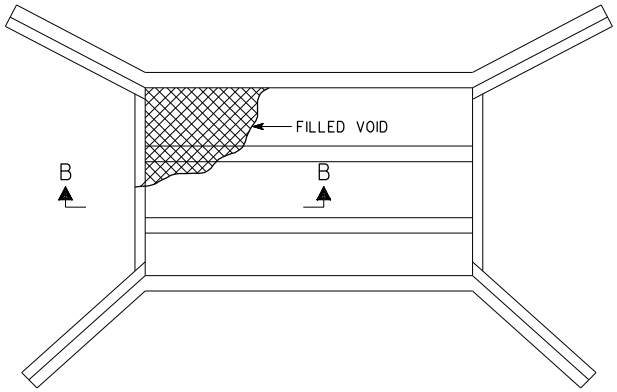


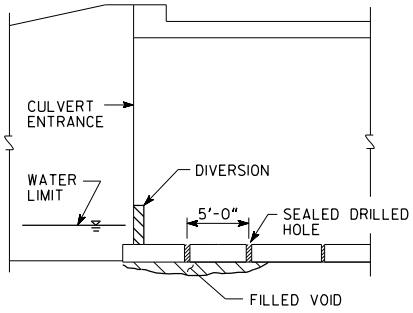


SECTION A-A

STEP 1

1. DIVERT WATER INTO ADJACENT BARRELS WHERE THE VOIDS WILL BE FILLED.
2. DEFINE LIMITS OF VOID TO BE FILLED. DRILL 4"Ø HOLES THROUGHOUT THE BOTTOM OF BARREL TO DETERMINE WHERE VOIDS ARE PRESENT. IF A VOID IS FOUND WATER WILL PROTRUDE FROM THE HOLE. IF WATER IS PROTRUDING CONTINUE DRILLING APPROXIMATELY FIVE FEET APART UNTIL NO WATER IS FOUND. IF A HOLE HAS BEEN DRILLED AND NO WATER PRESENT, PATCH HOLE WITH NON- SHRINK GROUT.





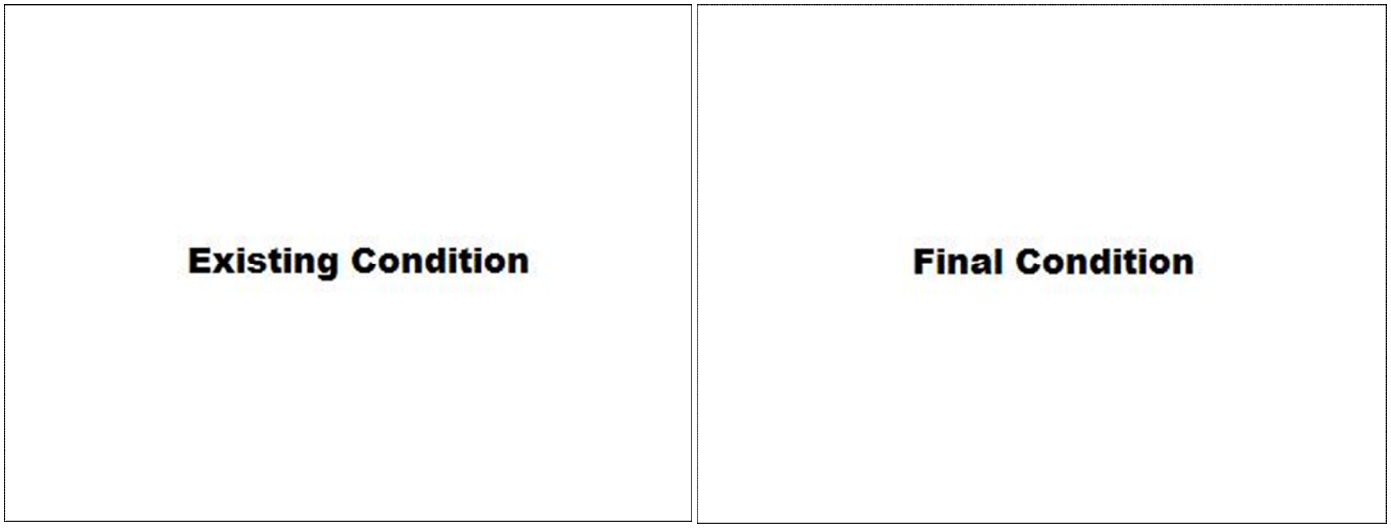
SECTION B-B

STEP 2

1. ALL EXCEPT TWO HOLES ARE SEALED WITH WOODEN PLUGS.
2. PUMP THE FLOWABLE FILL INTO THE VOID THROUGH ONE HOLE UNTIL IT IS VISIBLE IN THE SECOND HOLE.
3. ONE OF THE TWO OPEN HOLES IS THEN PLUGGED.
4. THE SLURRY IS THEN PUMPED INTO THE THIRD HOLE THAT HAS BEEN OPENED.
5. THE OPERATION IS CONTINUED UNTIL FLOWABLE FILL HAS BEEN PUMPED INTO EACH HOLE AND THE ENTIRE AREA HAS BEEN SEALED.
6. CARE SHOULD BE TAKEN TO GUARD AGAINST OVER CHARGING AT ANY LOCATION SINCE THIS MAY CAUSE ADDITIONAL CRACKING. A NUMBER OF SMALL CHARGES WILL PRODUCE A BETTER RESULT.
7. WHEN PUMPING IS COMPLETE ALL DRILLED HOLES SHOULD BE FILLED WITH NON-SHRINK GROUT. (DO NOT USE THE FLOWABLE FILL TO CAP THE HOLES)
8. REPEAT STEPS FOR THE REMAINING CELLS.
9. REMOVE ALL SANDBAGS.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL CULVERT PIPING - VOID REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 820.02

Activity 820.03 – Culvert Rip Rap Protection



Before Repair After Repairs

General Notes:

Coordinate all work in the stream with the District Environmentalist.

Verify all dimensions and elevations in the field prior to ordering material.

Material Specifications:

- None

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100-9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications:

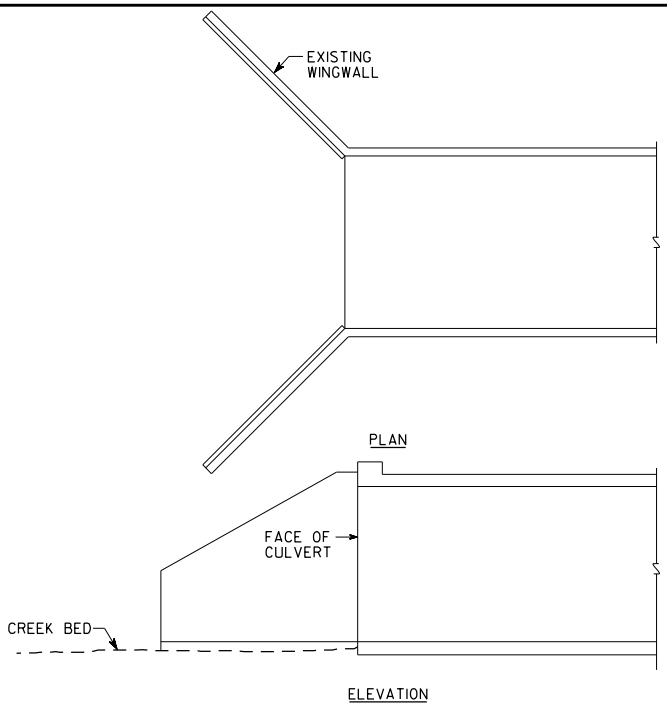
- Section 603 – Rip Rap
- Section 805 – Rip Rap and Curbing Stone
- Section 881 – Fabrics

Georgia Special Provisions & Supplemental Specifications:

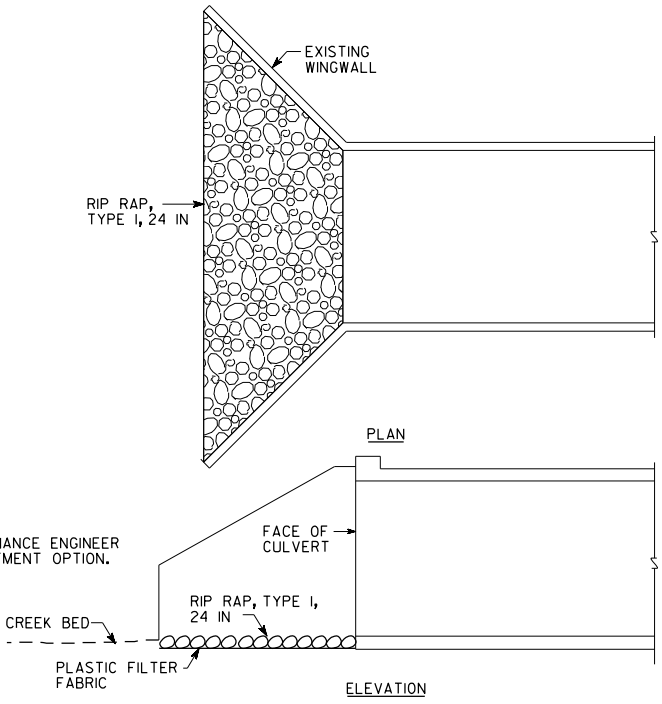
- None

Qualified Products List:

- QPL-28 Filter Fabric



EXISTING CONDITION



NOTE:

CONTACT DISTRICT MAINTENANCE ENGINEER FOR GROUTING END TREATMENT OPTION.

FINAL CONDITION

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
CHAINSAW & MISC. CLEARING EQUIPMENT
DIGGING EQUIPMENT
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
CONCRETE PUMP
MISC. BUCKETS & HAND TOOLS

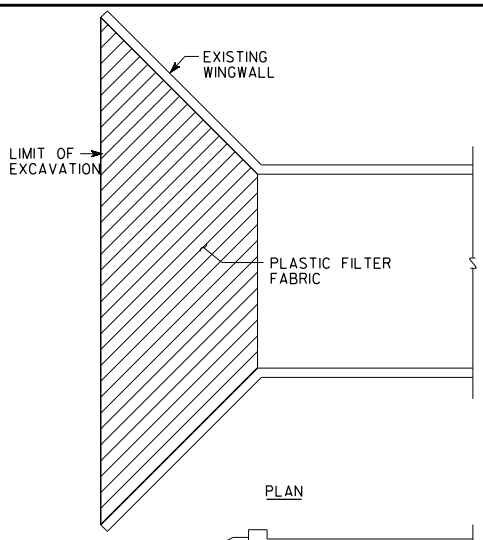
MATERIALS

PLASTIC FILTER FABRIC
RIP RAP, TYPE I, 24 IN
GROUT, AS NEEDED

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

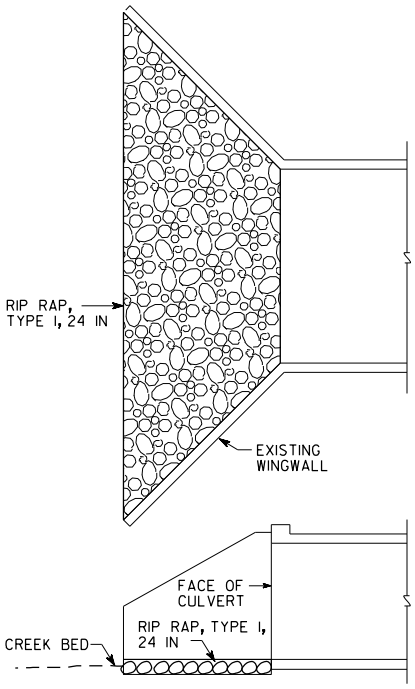
CONSTRUCTION DETAIL
CULVERT RIP RAP PROTECTION
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	820.03



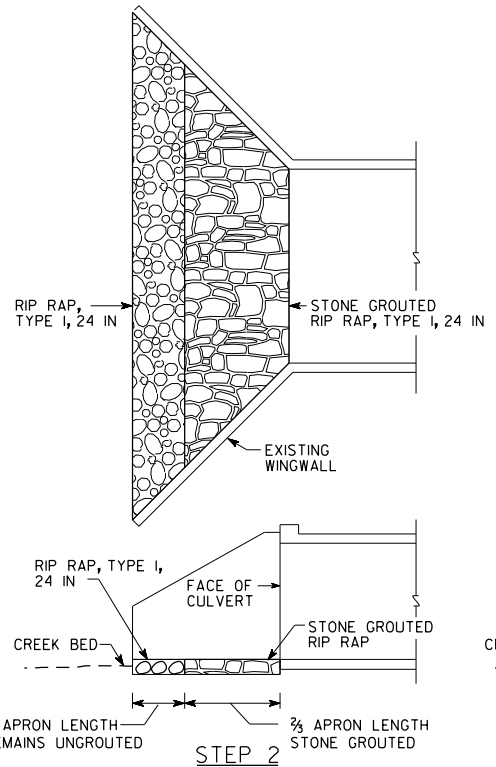
STEP 1

1. REMOVE ALL SEDIMENT AND DEBRIS TO A DEPTH OF 1'-0" BELOW BOTTOM OF CULVERT FROM BOX CULVERT OPENING TO THE END OF BOTH WINGWALLS.
2. FILL AND COMPACT ANY LARGE VOID AREAS WITH SUITABLE FILL MATERIAL AS REQUIRED TO PROVIDE AN EVEN SURFACE.
3. LINE EXCAVATED AREA WITH PLASTIC FILTER FABRIC.



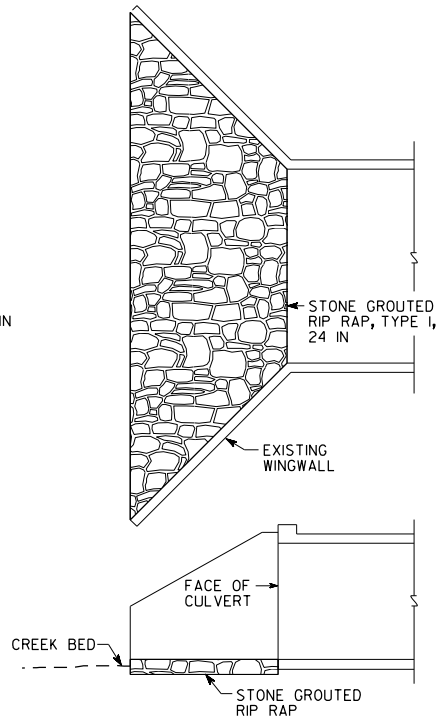
STEP 2 OPTION I

1. PLACE RIP RAP, TYPE I IN A LEVEL LAYER ALONG BOTTOM OF CREEK BANK EVEN WITH ENDS OF WING WALLS.



STEP 2 OPTION II

1. PLACE RIP RAP, TYPE I IN A LEVEL LAYER ALONG BOTTOM OF CREEK BANK EVEN WITH ENDS OF WING WALLS.
2. 2/3 LENGTH OF RIP RAP APRON SHELL BE STONE GROUTED IN ACCORDANCE WITH SECTION 603 OF THE GEORGIA STANDARD SPECIFICATIONS.



STEP 2 OPTION III

1. PLACE RIP RAP, TYPE I IN A LEVEL LAYER ALONG BOTTOM OF CREEK BANK EVEN WITH ENDS OF WING WALLS.
2. ENTIRE AREA OF RIP RAP APRON SHALL BE STONE GROUTED IN ACCORDANCE WITH SECTION 603 OF THE GEORGIA STANDARD SPECIFICATIONS.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL CULVERT RIP RAP PROTECTION NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 820.03

Activity 825-01 – Helper Bent (Temporary Repair)

Before Repair

After Repairs

General Notes:

Coordinate all work in the stream/river with the District Environmentalist.

This is a temporary repair. Replace or rehabilitate bridge within 5 years of performing this work.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

All steel components shall be galvanized in accordance with ASTM A 123.

Refer to Activity 810.03 – Full Depth Deck Repair – Driving Piles, for additional details.

Material Specifications:

- Structural Steel: Grade 50, f_y = 50,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications

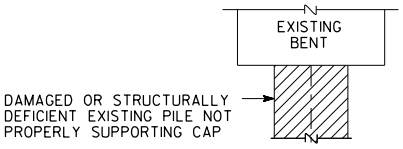
- Section 501 – Steel Structures
- Section 502 – Timber Structures
- Section 520 – Piling
- Section 535 – Painting Structures
- Section 860 – Lumber and Timber
- Section 861 – Piling and Round Tiber
- Section 861 – Preservative Treatment of Timber Products

Georgia Special Provisions & Supplemental Specifications:

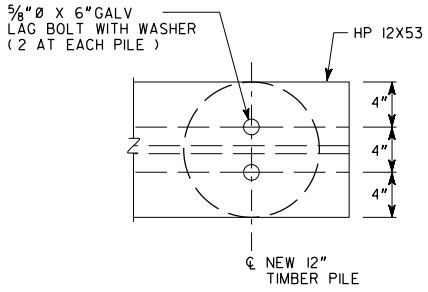
- None

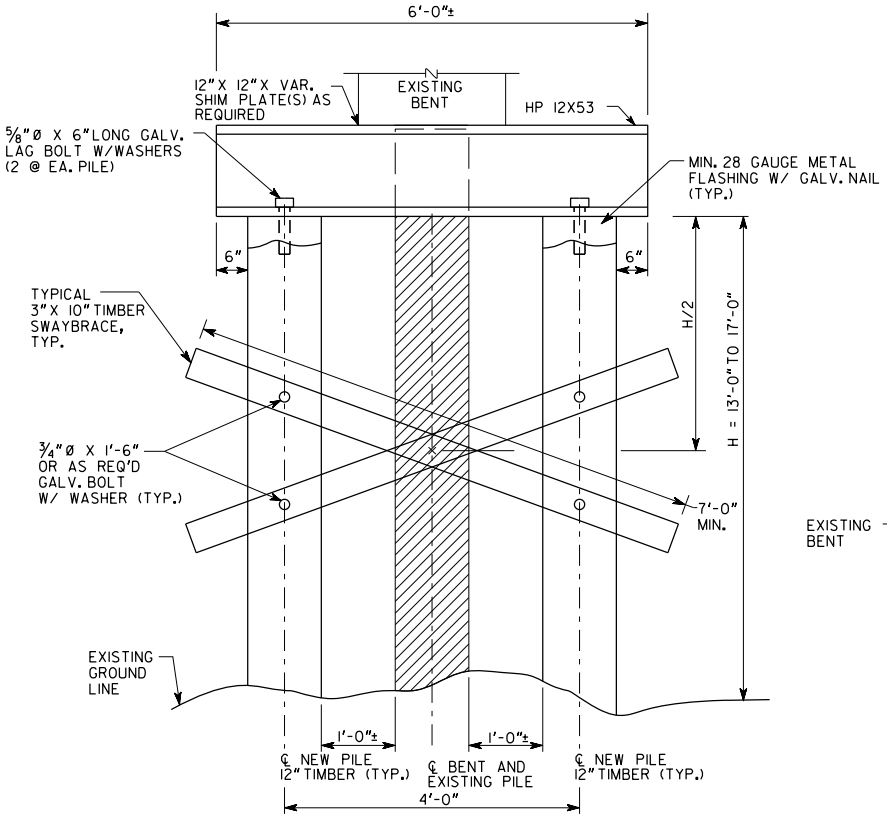
Qualified Products List:

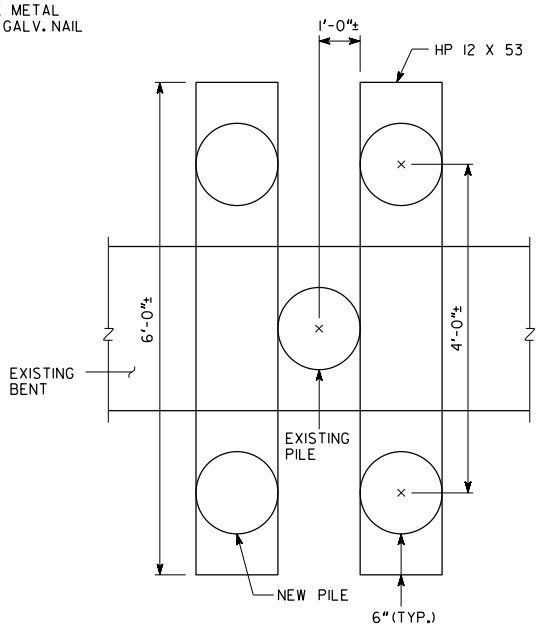
- QPL-50 Wood Preserving Plants
- QPL-53 Galvanizers
- QPL-59 Miscellaneous Metal Fabricators



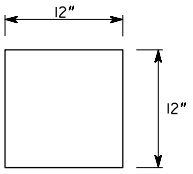
EXISTING CONDITION



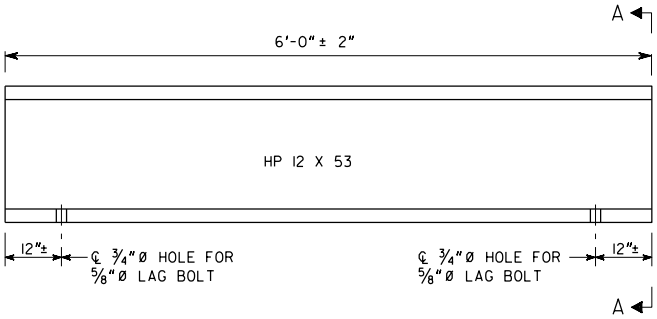


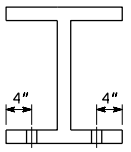


FINAL CONDITION



12"X 12"X VARIABLE
SHIM PLATES AS REQUIRED
(PER TIMBER PILE)





SECTION A-A

EQUIPMENT

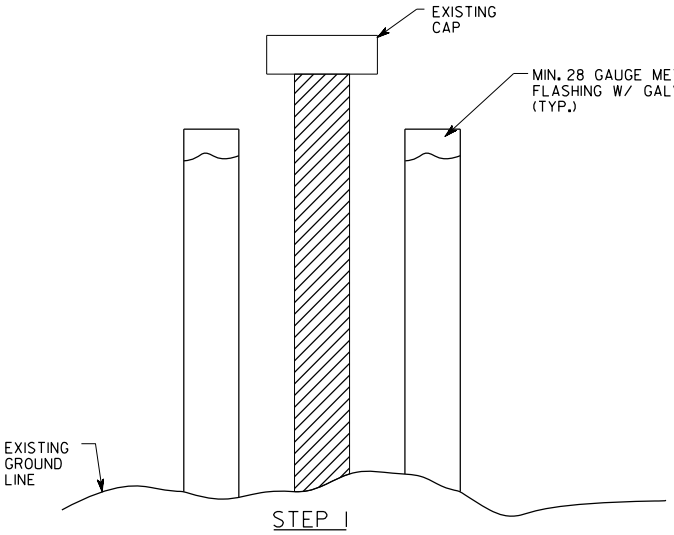
CRANE FOR HP 12X53
PILE DRIVER
WELDER
LADDER
HAMMER

MATERIALS

12" TIMBER PILE (4 PER HELPER BENT)
5/8"Ø 6"GALV. LAG BOLT (2 PER PILE)
3"X 10"X 7' TIMBER BRACE
3/4"Ø, 1'-6"GALV. LAG BOLT
W/ WASHER (1 PER PILE)
WASHER PER LAG BOLT
HP 12 X 53
12"X 12"SHIMS
METAL FLASHING (MIN. 28 GAUGE)
GALV NAILS

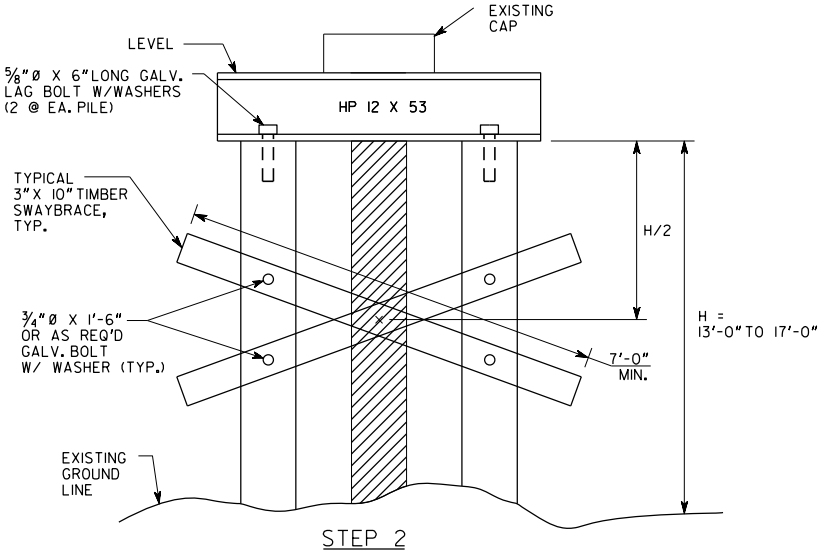
SHEET 1 OF 2

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL HELPER BENT NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 825.01



STEP 1

1. REFER TO ACTIVITY 810.03 FOR DECK REMOVAL FOR PILE INSTILLATION.
2. DRIVE PILES TO A BEARING CAPACITY OF NO LESS THAN 25 TONS ONCE A MINIMUM EMBEDMENT OF 10'-0" HAS BEEN REACHED.
3. CUT PILE OFF TO DESIRED HEIGHT AND INSTALL FLASHING WITH GALVANIZED NAILS.
4. SET STEEL H-PILE CAP AND DRILL ¾" HOLES AS REQUIRED.



STEP 2

1. INSTALL 3" X 10" TIMBER SWAYBRACING AS SHOWN.
2. INSTALL 5/8"Ø X 6" GALVANIZED LAG BOLT AND WASHERS. ALL HARDWARE SHALL BE GALVANIZED.
3. SHIM NEW CAP (12" X 12" X VARIABLE) SHALL BE SNUG UNDER EXISTING BEAMS.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL HELPER BENT NO SCALE JUNE 2012	REVISION DATE	SHEET 2 OF 2 DRAWING NO. 825.01

Activity 830.01 – H-Pile Structural Encasement (Circle)

Before Repair

After Repairs

General Notes:

Coordinate all work in the stream/river with the District Environmentalist.

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Encasement shall be in accordance with Section 547 of the Georgia DOT Specifications.

Clean and paint all existing piles and swaybracing in accordance with sections 520 and 535 of the Georgia DOT Specifications. Paint shall be system 2p except the top coat shall be black, federal standard no. 595 color 27040.

All welding shall be performed by certified welders that have in their possession a current welding certification card issued by the Office of Materials and Research. Use only e70xx (excluding e7014 and e7024) low hydrogen electrodes for manual shielded metal arc welding.

Material Specifications:

- Concrete: Class A, f'_c = 3,000 psi
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Verify presence of lead paint system.
- Use special care near streams and rivers.

Georgia Standard Specifications

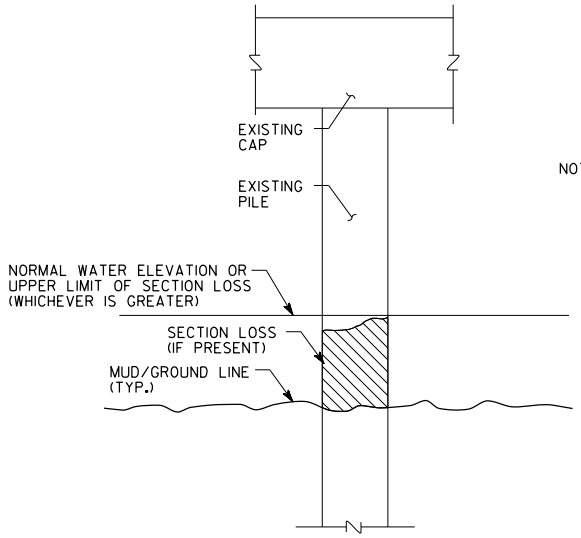
- Section 500 – Concrete Structures
- Section 501 – Steel Structures
- Section 511 – Reinforcement Steel
- Section 535 – Painting Structures

Georgia Special Provisions & Supplemental Specifications:

- None

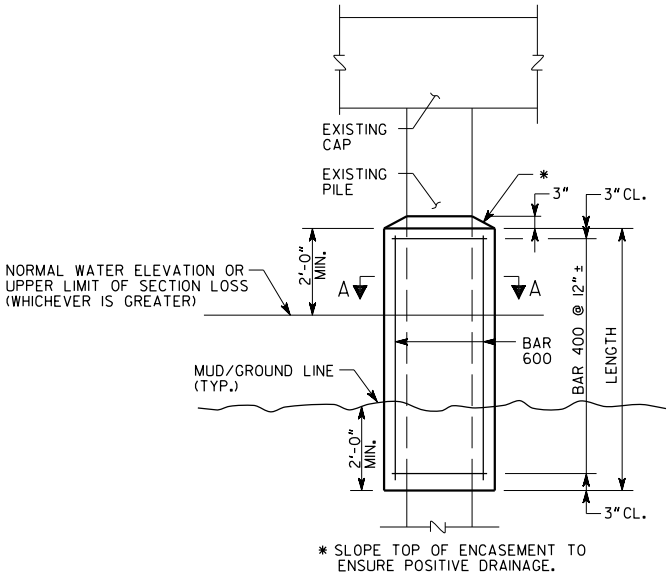
Qualified Products List:

- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-18 Special Protective Coating
- QPL-19 Bar Supports
- QPL-56 Corrugated Metal Pipe

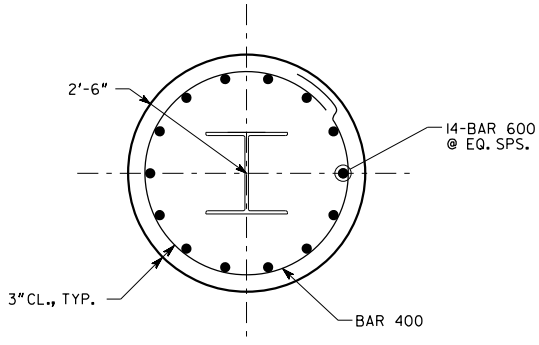


NOTE: NORMAL WATER ELEVATION TO BE FIELD DETERMINED.

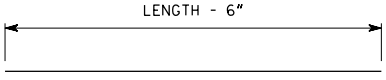
EXISTING CONDITION



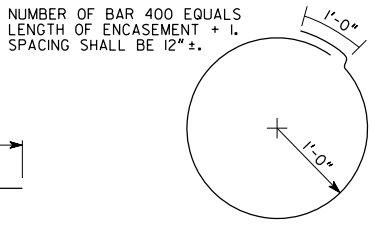
FINAL CONDITION



SECTION A-A



BAR 600



BAR 400

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
SAND BLASTER / AIR GUN
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
MISC. BUCKETS & HAND TOOLS
DIGGING EQUIPMENT
CHOP SAW W/ STEEL BLADES
WELDER / RATCHET STRAPS

MATERIALS

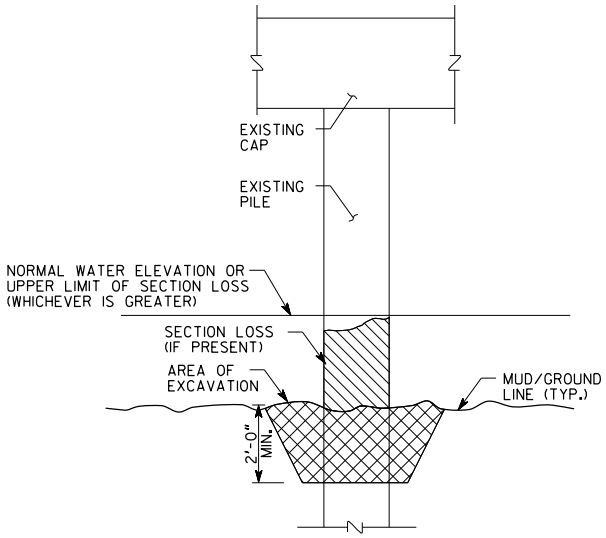
CONCRETE
BAR 400
BAR 600
APPROVED PAINT
SANDBLASTING MEDIA
2'-6"Ø CMP
WELDING ELECTRODES
TIE WIRE

SHEET 1 OF 3

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

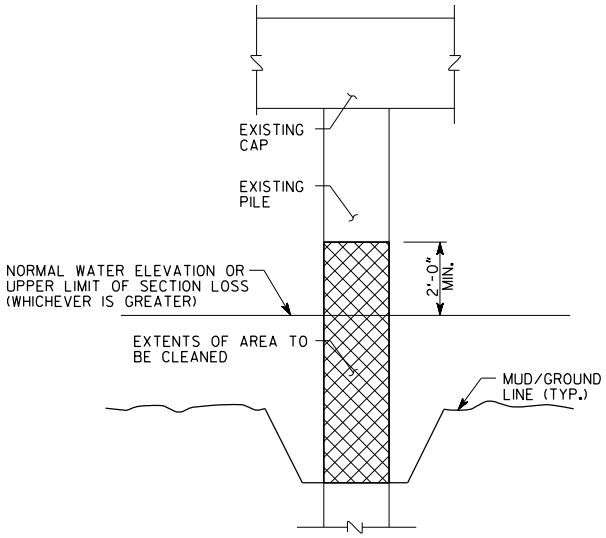
CONSTRUCTION DETAIL
H-PILE STRUCTURAL ENCASEMENT (CIRCLE)
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	830.01



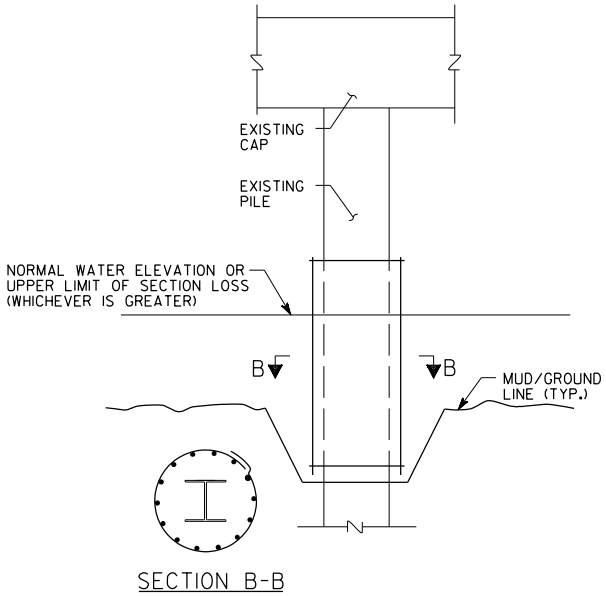
STEP 1

1. DETERMINE LOCATION OF PILING TO BE ENCASED.
2. DETERMINE LENGTH OF ENCASEMENT. (ROUND LENGTH TO NEAREST 1' INCREMENT)



STEP 2

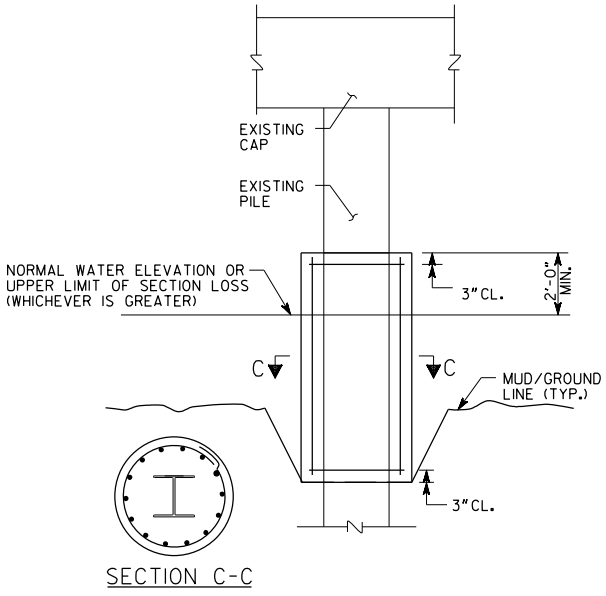
1. DIG OUT 2 FEET BELOW MUD/GROUND LINE.
2. THOROUGHLY CLEAN PILING BY SAND BLASTING. IF REQUIRED, REPAIR SECTION LOSS IN ACCORDANCE WITH ACTIVITY 830.05 OR 830.06 H-PILE PLATING STRUCTURAL REPAIR.
3. PAINT PILE.



SECTION B-B

STEP 3

1. ERECT, TIE & SUPPORT STEEL REINFORCING.

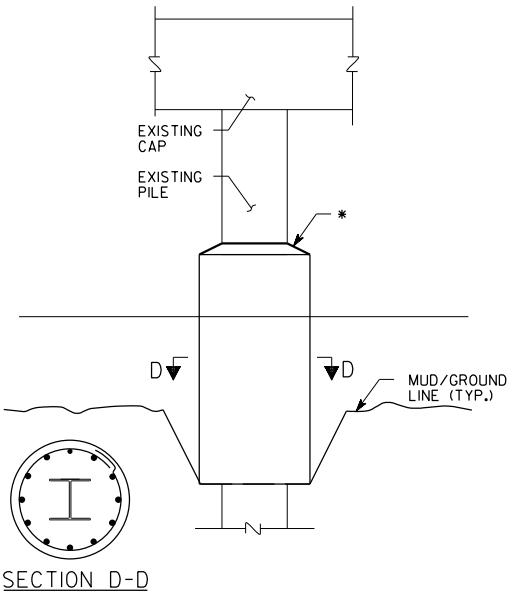


SECTION C-C

STEP 4

1. PLACE AND SECURE FORMS.

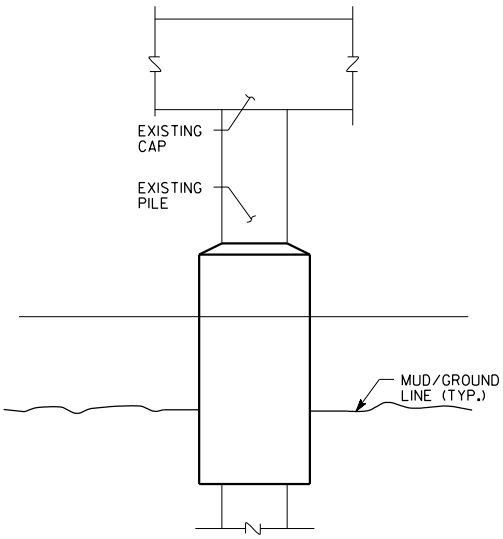
GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL H-PILE STRUCTURAL ENCASEMENT (CIRCLE) NO SCALE JUNE 2012	REVISION DATE	SHEET 2OF 3 DRAWING NO. 830.01



SECTION D-D

STEP 5

1. PLACE CLASS "A" CONCRETE INTO FORMWORK.
2. * SLOPE TOP OF ENCASEMENT TO ENSURE POSITIVE DRAINAGE.



STEP 6

1. ALLOW CONCRETE TO FULLY CURE.
2. BACKFILL WITH SOIL REMOVED DURING ENCASEMENT INSTALLATION, COMPACT IF REQUIRED.
3. REPAIR TO ACTIVITY 845.03 FOR RIP RAP REPLACEMENT.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL H-PILE STRUCTURAL ENCASEMENT (CIRCLE) NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.01

Activity 830.02 – H-Pile Structural Encasement (Square)

Before Repair

After Repairs

General Notes:

Coordinate all work in the stream/river with the District Environmentalist.

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Encasement shall be in accordance with section 547 of the Georgia DOT Specifications.

Clean and paint all existing piles and swaybracing in accordance with sections 520 and 535 of the Georgia DOT Specifications. Paint shall be system 2p except the top coat shall be black, federal standard no. 595 color 27040.

Material Specifications:

- Concrete: Class A, f'_c = 3,000 psi
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Verify presence of lead paint system.
- Use special care near streams and rivers.

Georgia Standard Specifications

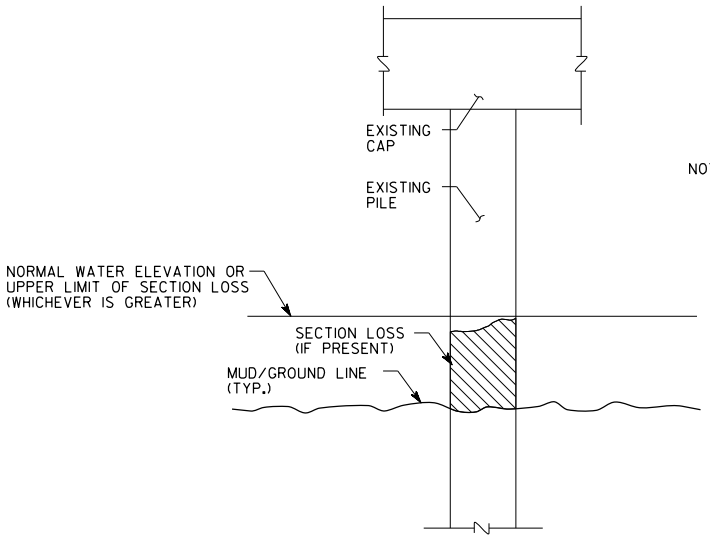
- Section 500 – Concrete Structures
- Section 511 – Reinforcement Steel
- Section 520 - Piling
- Section 535 – Painting Structures

Georgia Special Provisions & Supplemental Specifications:

- None

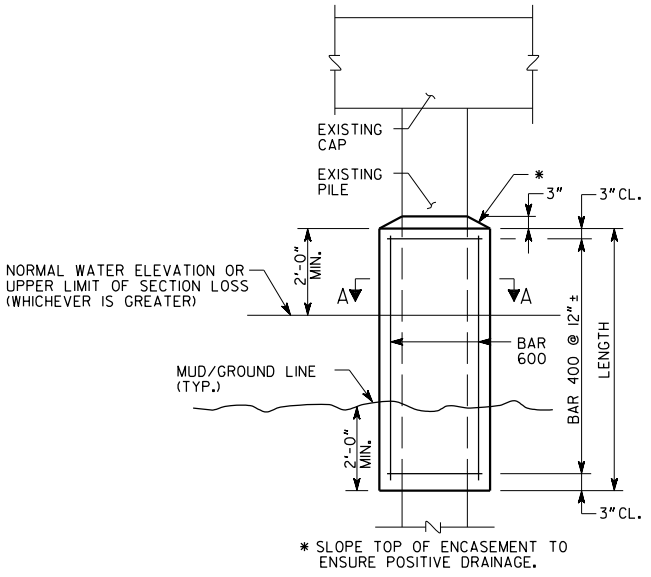
Qualified Products List:

- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-18 Special Protective Coating

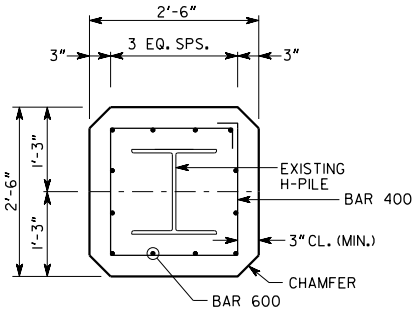


NOTE: NORMAL WATER ELEVATION TO BE FIELD DETERMINED.

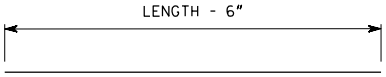
EXISTING CONDITION



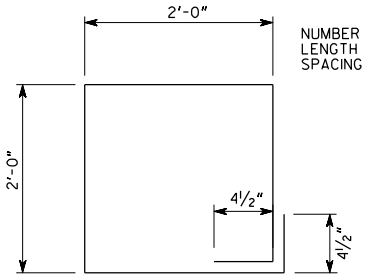
FINAL CONDITION



SECTION A-A



BAR 600



NUMBER OF BAR 400 EQUALS LENGTH OF ENCASEMENT + 1. SPACING SHALL BE 12" ±.

BAR 400

EQUIPMENT

PERSONAL SAFETY EQUIPMENT
AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
SAND BLASTER / AIR GUN
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
MISC. BUCKETS & HAND TOOLS
DIGGING EQUIPMENT
CHOP SAW W/ STEEL BLADES

MATERIALS

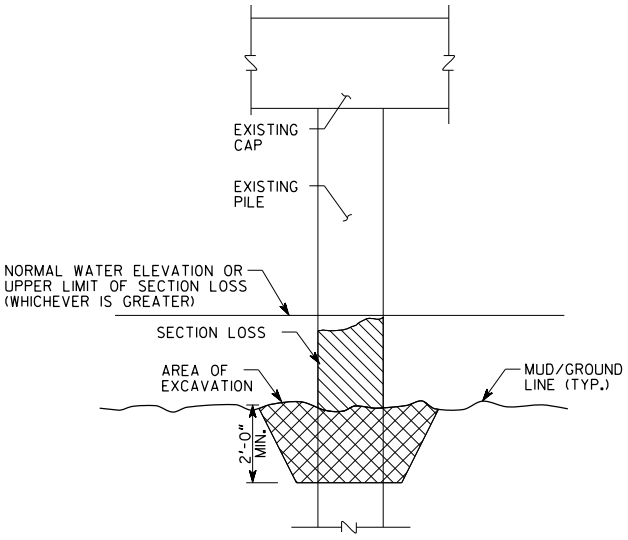
CONCRETE
BAR 400
BAR 600
APPROVED PAINT
MATERIALS FOR FORMWORK
TIE WIRE

SHEET 1 OF 3

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

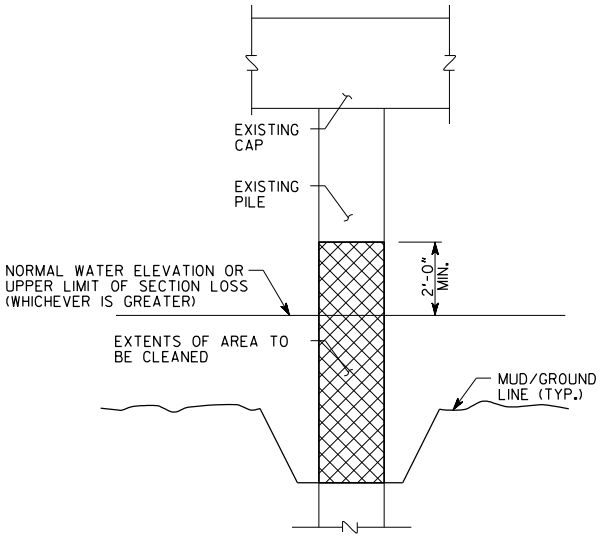
CONSTRUCTION DETAIL
H-PILE STRUCTURAL ENCASEMENT (SQUARE)
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	830.02



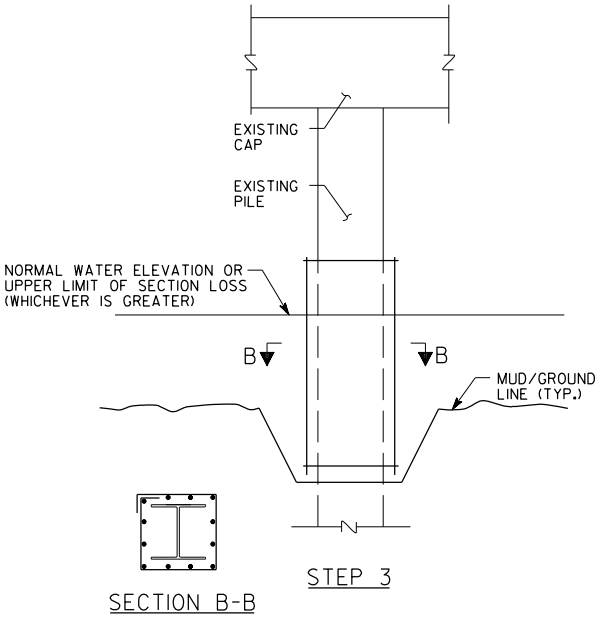
STEP 1

1. DETERMINE LOCATION OF PILING TO BE ENCASED.
2. DETERMINE LENGTH OF ENCASEMENT. (ROUND LENGTH TO NEAREST 1' INCREMENT)



STEP 2

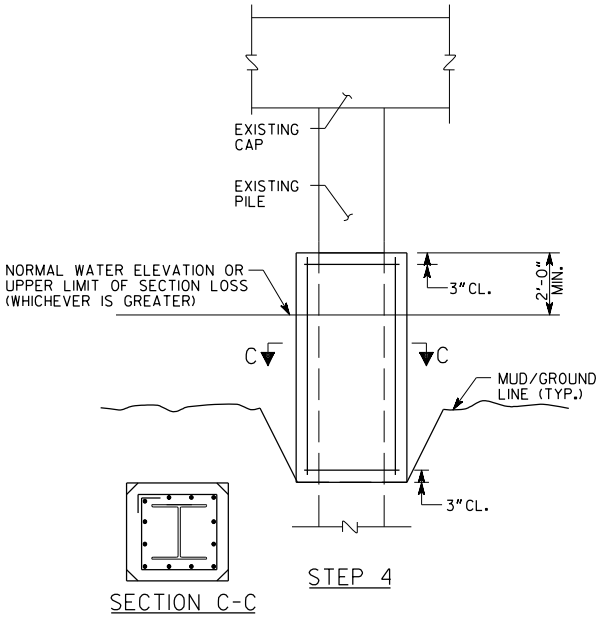
1. DIG OUT 2 FEET BELOW MUD/GROUND LINE.
2. THOROUGHLY CLEAN PILING BY SAND BLASTING. IF REQUIRED, REPAIR SECTION LOSS IN ACCORDANCE WITH ACTIVITY 830.05 OR 830.06 H-PILE PLATING STRUCTURAL REPAIR.
3. PAINT PILE.



SECTION B-B

STEP 3

1. ERECT, TIE & SUPPORT STEEL REINFORCING.

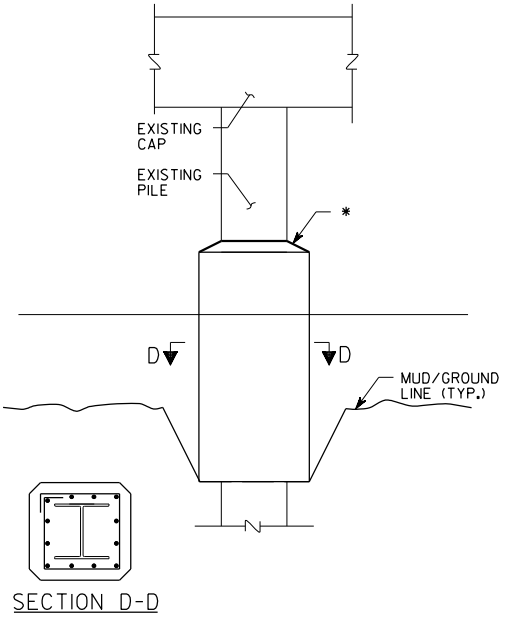


SECTION C-C

STEP 4

1. CONSTRUCT AND PLACE FORMWORK.

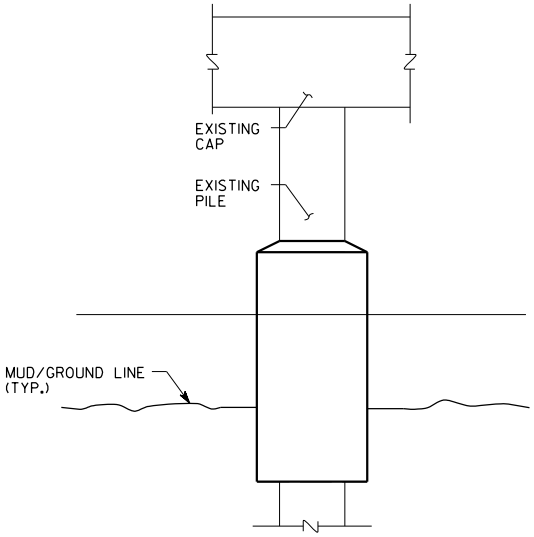
GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL H-PILE STRUCTURAL ENCASEMENT (SQUARE) NO SCALE JUNE 2012	REVISION DATE	SHEET 2 OF 3 DRAWING NO. 830.02



SECTION D-D

STEP 5

1. PLACE CONCRETE INTO FORMWORK.
2. * SLOPE TOP OF ENCASEMENT TO ENSURE POSITIVE DRAINAGE.

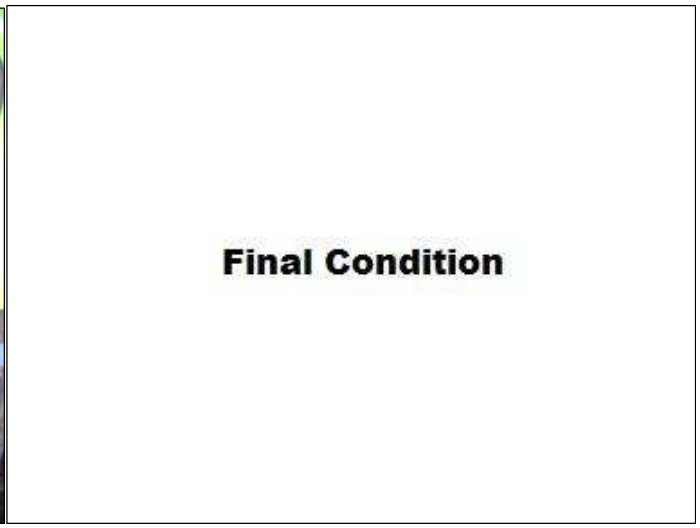


STEP 6

1. ALLOW CONCRETE TO FULLY CURE.
2. REMOVE FORMS.
3. BACKFILL WITH SOIL REMOVED DURING ENCASEMENT INSTALLATION, COMPACT IF REQUIRED.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL H-PILE STRUCTURAL ENCASEMENT NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.02

Activity 830.03 – H-Pile Encasement Extension (Circle)



Before Repair After Repairs

General Notes:

Coordinate all work in the stream/river with the District Environmentalist.

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Encasement shall be in accordance with Section 547 of the Georgia DOT Specifications.

Clean and paint all existing piles and swaybracing in accordance with sections 520 and 535 of the Georgia DOT Specifications. Paint shall be system 2p except the top coat shall be black, federal standard no. 595 color 27040.

All welding shall be performed by certified welders that have in their possession a current welding certification card issued by the Office of Materials and Research. Use only e70xx (excluding e7014 and e7024) low hydrogen electrodes for manual shielded metal arc welding.

Material Specifications:

- Concrete: Class A, f'_c = 3,000 psi
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Verify presence of lead paint system.
- Use special care near streams and rivers.

Georgia Standard Specifications

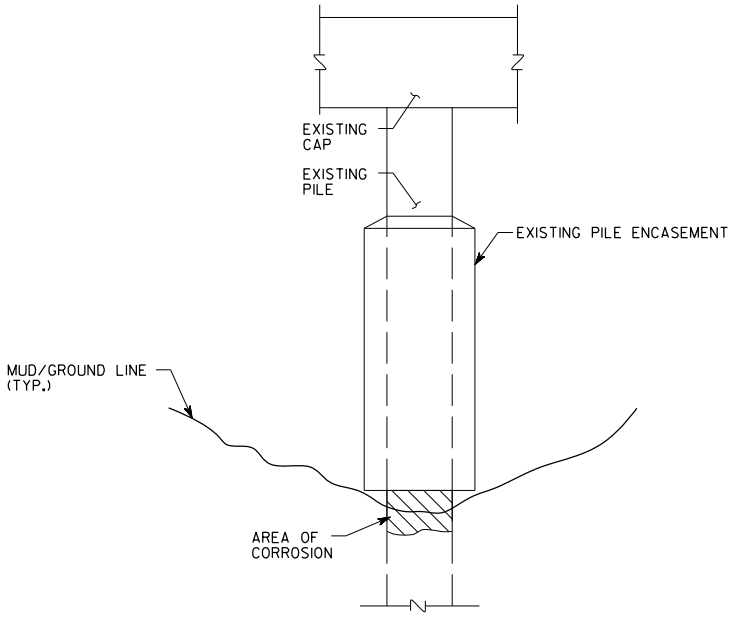
- Section 500 – Concrete Structures
- Section 501 – Steel Structures
- Section 511 – Reinforcement Steel
- Section 535 – Painting Structures

Georgia Special Provisions & Supplemental Specifications:

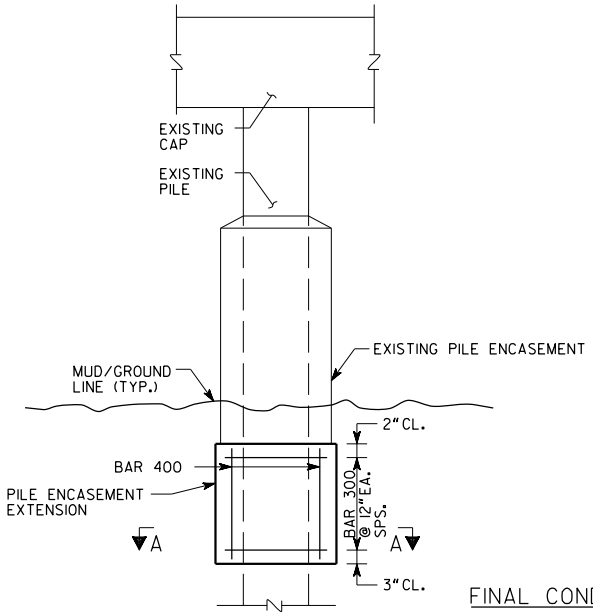
- None

Qualified Products List:

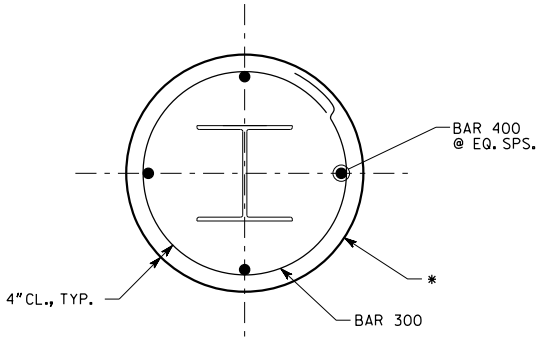
- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-18 Special Protective Coating
- QPL-19 Bar Supports
- QPL-56 Corrugated Metal Pipe



EXISTING CONDITION

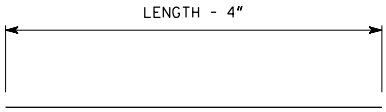


FINAL CONDITION

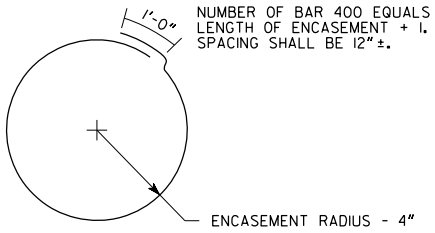


SECTION A-A

* DIMENSIONS OF ENCASEMENT EXTENSION SHALL BE 12" WIDER THAN EXISTING FORMS. FIELD VERIFY DIMENSION AND ADJUST BAR 300 ACCORDINGLY.



BAR 400



BAR 300

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
SAND BLASTER / AIR GUN
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
MISC. BUCKETS & HAND TOOLS
DIGGING EQUIPMENT
CHOP SAW W/ STEEL BLADES
WELDER / RATCHET STRAPS

MATERIALS

CONCRETE
BAR 400
BAR 600
APPROVED PAINT
SANDBLASTING MEDIA
CMP FORMS
WELDING ELECTRODES
TIE WIRE

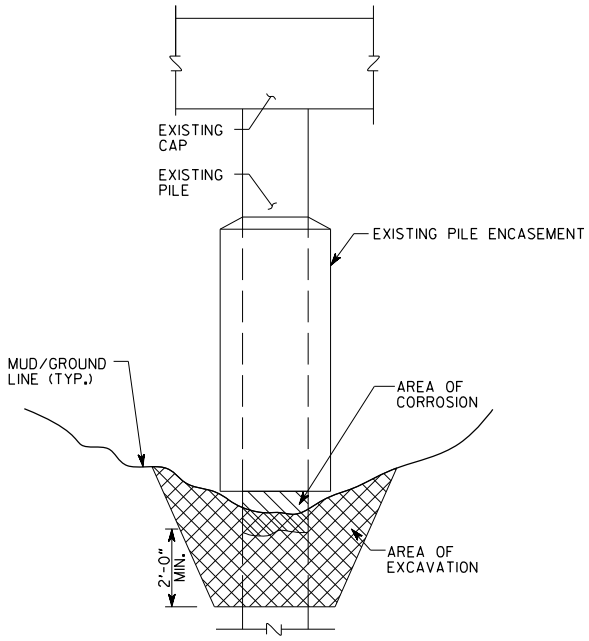
SHEET 1 OF 3

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION DETAIL
H-PILE ENCASEMENT EXTENSION (CIRCULAR)
NO SCALE
JUNE 2012

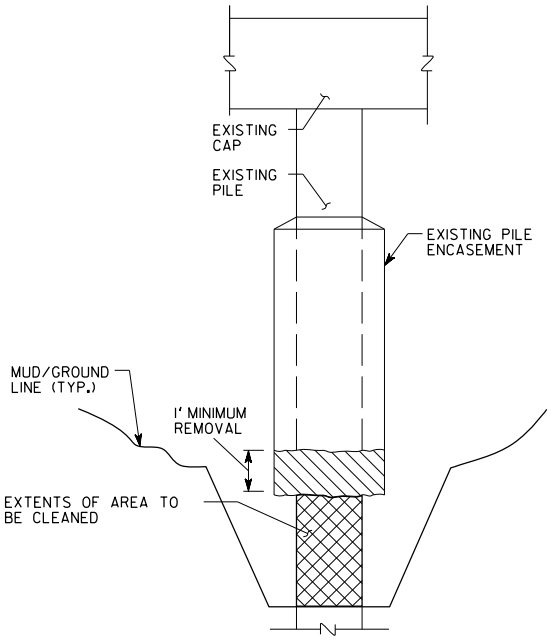
REVISION DATE

DRAWING NO. 830.03



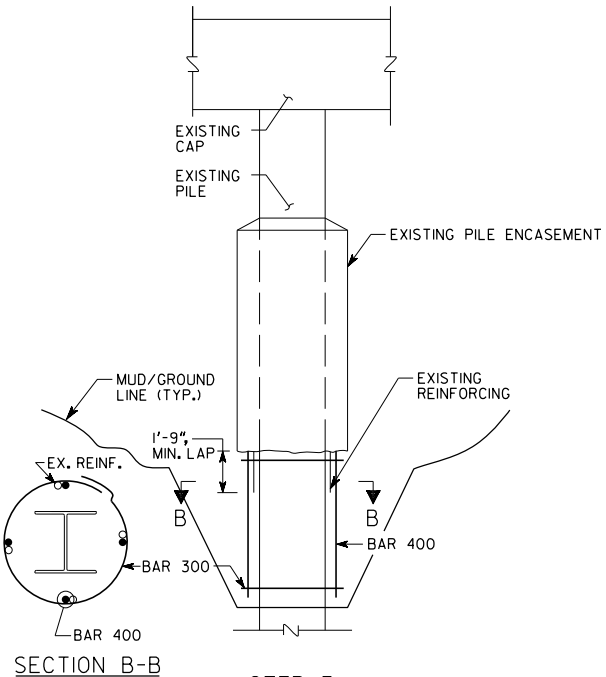
STEP 1

1. DETERMINE LOCATION OF PILING TO BE ENCASED.
2. DETERMINE LENGTH OF ENCASEMENT. (ROUND LENGTH TO NEAREST 1' INCREMENT)



STEP 2

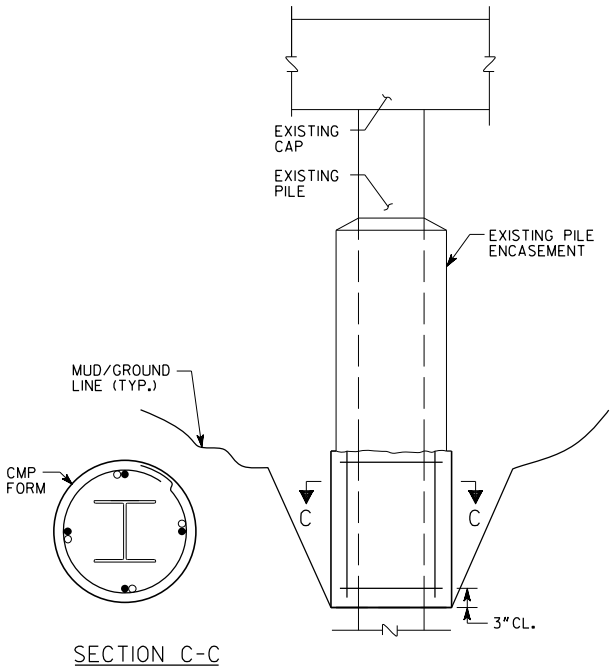
1. DIG OUT 2' MINIMUM BELOW MUD/GROUND LINE.
2. REMOVE BOTTOM OF EXISTING ENCASEMENT TO SOUND CONCRETE (1' MINIMUM). BE CAREFUL NOT TO DAMAGE REINFORCING.
3. THOROUGHLY CLEAN PILING BY SAND BLASTING.
4. PAINT PILE.



SECTION B-B

STEP 3

1. SPLICE NEW REINFORCING WITH EXISTING REINFORCEMENT.

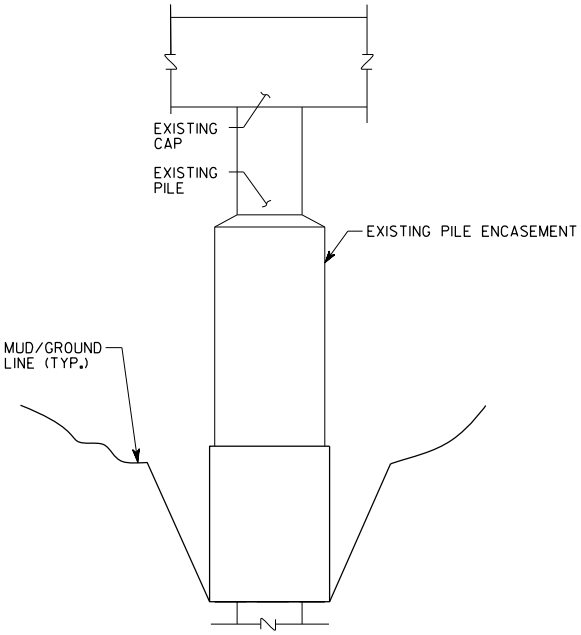


SECTION C-C

STEP 4

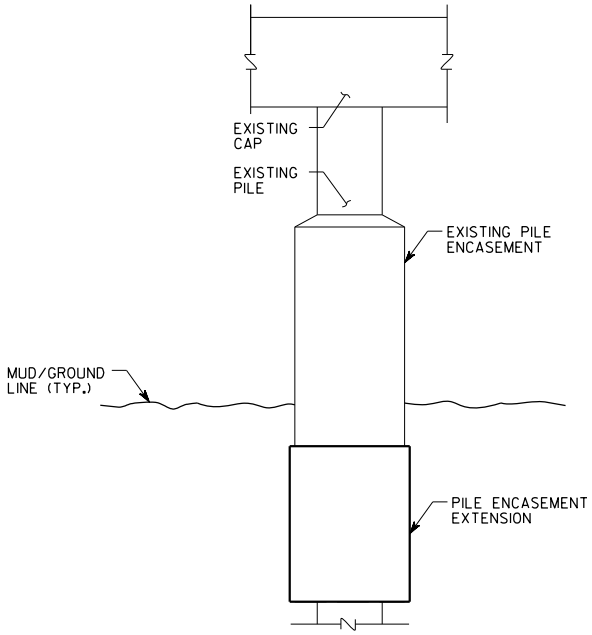
1. INSTALL FORMS.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL H-PILE ENCASEMENT EXTENSION (CIRCULAR) NO SCALE JUNE 2012	REVISION DATE	SHEET 2 OF 3 DRAWING NO. 830.03



STEP 5

1. DEPOSIT CONCRETE INTO FORMWORK.



STEP 6

1. ALLOW CONCRETE TO FULLY CURE.
2. BACKFILL WITH SOIL REMOVED DURING ENCASEMENT INSTALLATION, COMPACT IF REQUIRED.
3. REFER TO ACTIVITY 845.03 FOR RIP RAP PLACEMENT.

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION DETAIL
H-PILE ENCASEMENT EXTENSION (CIRCULAR)
NO SCALE
JUNE 2012

REVISION DATE

DRAWING NO.
830.03

Activity 830.04 – H-Pile Encasement Extension (Square)

Before Repair | After Repairs

General Notes:

Coordinate all work in the stream/river with the District Environmentalist.

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Encasement shall be in accordance with section 547 of the Georgia DOT Specifications.

Clean and paint all existing piles and swaybracing in accordance with sections 520 and 535 of the Georgia DOT Specifications. Paint shall be system 2p except the top coat shall be black, federal standard no. 595 color 27040.

Material Specifications:

- Concrete: Class A, f'_c = 3,000 psi
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Verify presence of lead paint system.
- Use special care near streams and rivers.

Georgia Standard Specifications

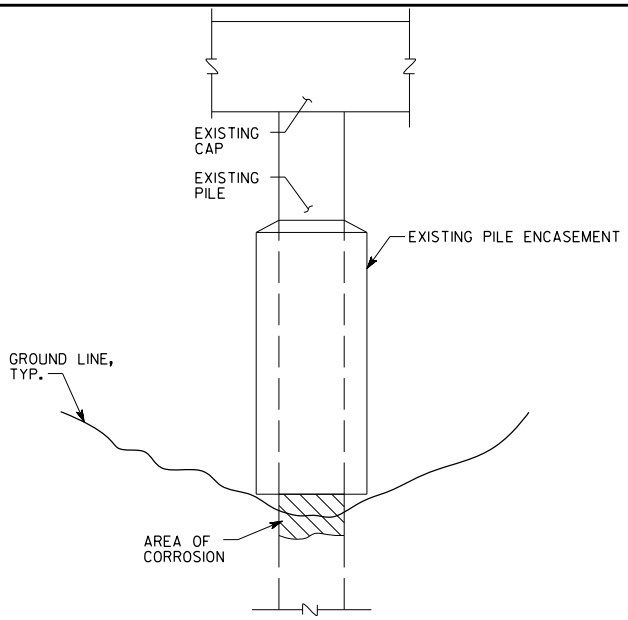
- Section 500 – Concrete Structures
- Section 511 – Reinforcement Steel
- Section 520 - Piling
- Section 535 – Painting Structures

Georgia Special Provisions & Supplemental Specifications:

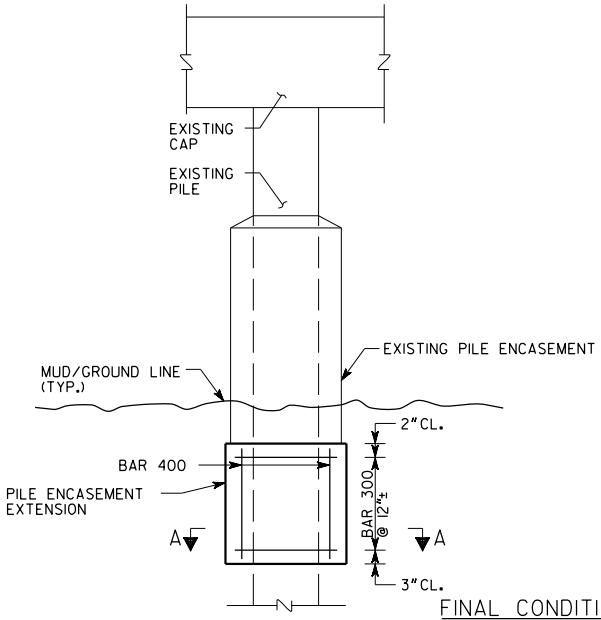
- None

Qualified Products List:

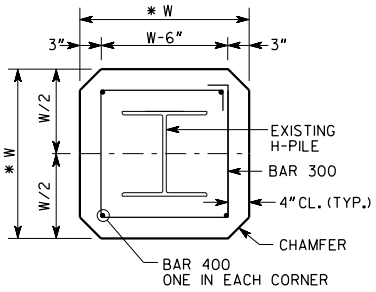
- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-18 Special Protective Coating



EXISTING CONDITION

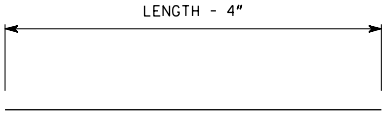


FINAL CONDITION

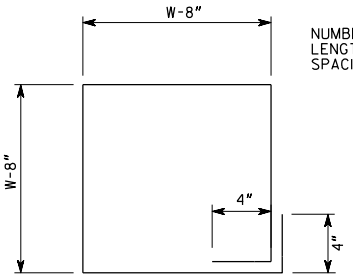


SECTION A-A

* DIMENSIONS OF ENCASEMENT EXTENSION SHALL BE 12" WIDER THAN EXISTING FORMS. FIELD VERIFY DIMENSION AND ADJUST BAR 300 ACCORDINGLY.



BAR 400



BAR 300

NUMBER OF BAR 400 EQUALS LENGTH OF ENCASEMENT + 1. SPACING SHALL BE 12"±.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
SAND BLASTER / AIR GUN
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
MISC. BUCKETS & HAND TOOLS
DIGGING EQUIPMENT
CHOP SAW W/ STEEL BLADES

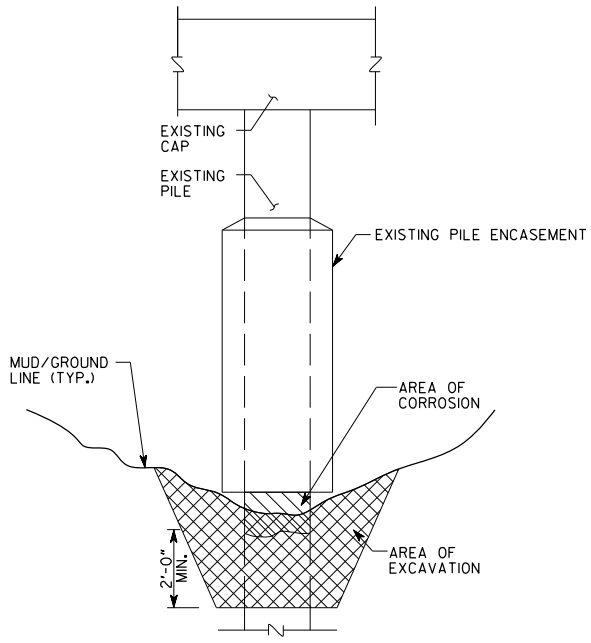
MATERIALS

CONCRETE
BAR 300
BAR 400
APPROVED PAINT
MATERIALS FOR FORMWORK
TIE WIRE

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

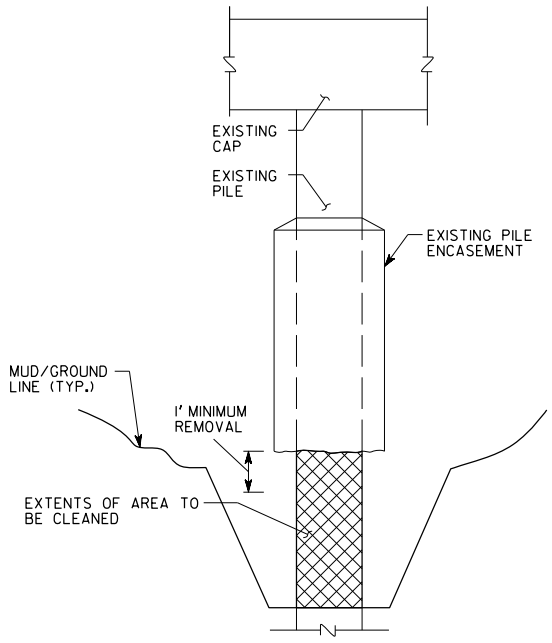
CONSTRUCTION DETAIL
H-PILE ENCASEMENT EXTENSION (SQUARE)
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	830.04



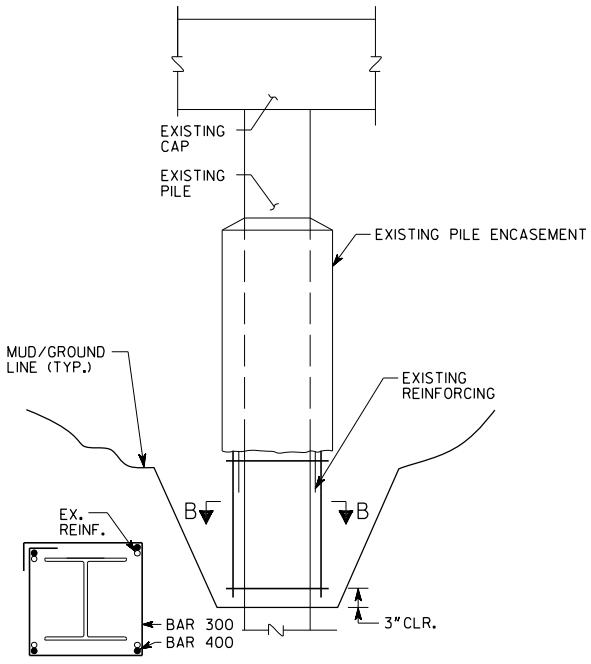
STEP 1

1. DETERMINE LOCATION OF PILING TO BE ENCASED.
2. DETERMINE LENGTH OF ENCASEMENT. (ROUND LENGTH TO THE NEAREST 1' INCREMENT)



STEP 2

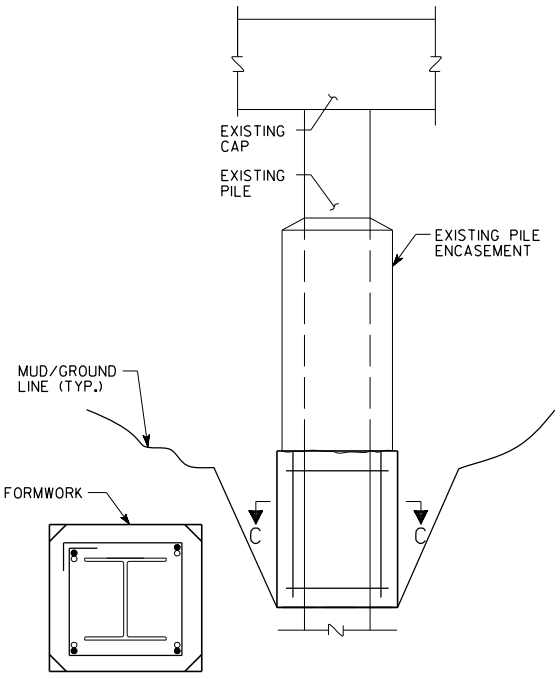
1. DIG OUT 2 FEET MINIMUM BELOW MUD/GROUND LINE.
2. REMOVE BOTTOM OF EXISTING ENCASEMENT TO SOUND CONCRETE (1' MINIMUM). BE CAREFUL NOT TO DAMAGE REINFORCING.
3. THOROUGHLY CLEAN PILING BY SAND BLASTING.
4. PAINT PILE.



SECTION B-B

STEP 3

1. SPLICE NEW REINFORCING WITH EXISTING REINFORCEMENT.

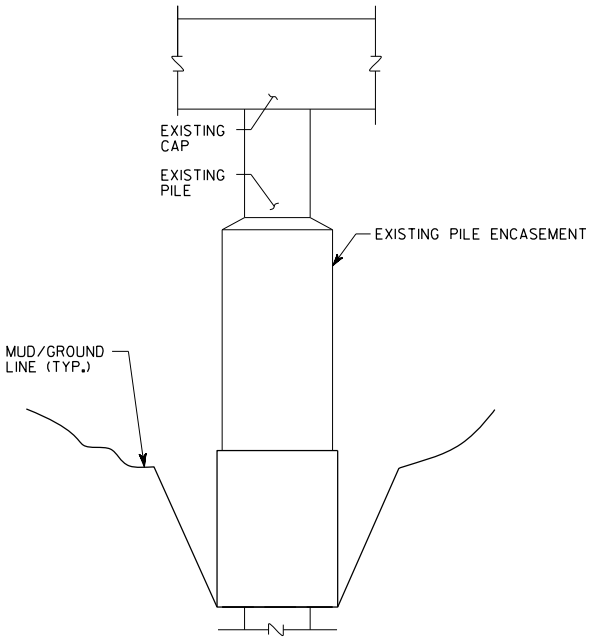


SECTION C-C

STEP 4

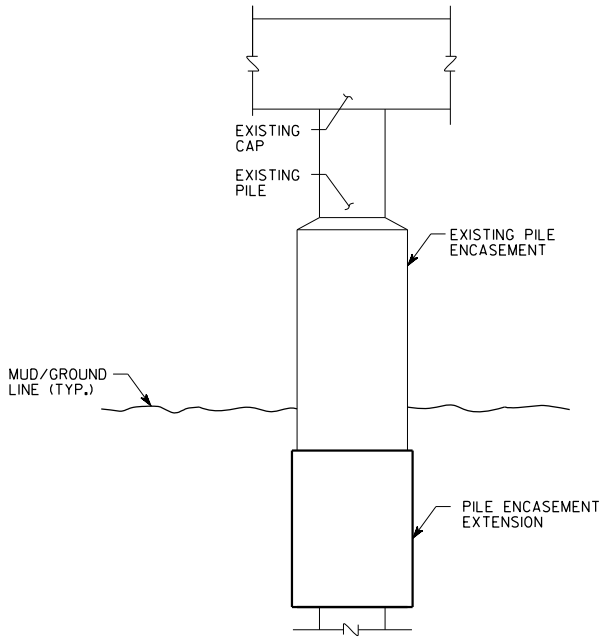
1. INSTALL FORMS.

			SHEET 2OF 3
GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL H-PILE ENCASEMENT EXTENSION (SQUARE) NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.04



STEP 5

1. DEPOSIT CLASS "A" CONCRETE INTO FORMWORK.



STEP 6

1. ALLOW CONCRETE TO FULLY CURE.
2. REMOVE FORMS.
3. BACKFILL WITH SOIL REMOVED DURING ENCASEMENT INSTALLATION, COMPACT IF REQUIRED.
4. REFER TO ACTIVITY 845.03 FOR RIP RAP PLACEMENT.

Activity 830.05 – H-Pile Plating Structural Repair-Bolt

Before Repair | After Repairs

General Notes:

Coordinate all work in the stream/river with the District Environmentalist.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Clean and paint piles and plating in accordance with Sections 520 and 535 of the Georgia DOT Specifications. Paint shall be System 2P except the top coat shall be black, federal standard no. 595 color 27040.

Refer to Activity 830.03 – H-Pile Encasement (Circle) or 830.04 – H-Pile Encasement (Square), for additional details.

All bolts shall meet the requirements of ASTM A325 or ASTM A490.

Material Specifications:

- Structural Steel: Grade 50, f_y = 50,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Verify presence of lead paint system.
- Use special care near streams and rivers.

Georgia Standard Specifications

- Section 501 - Steel Structures
- Section 520 - Piling
- Section 535 - Painting Structures
- Section 852 – Miscellaneous Steel Material

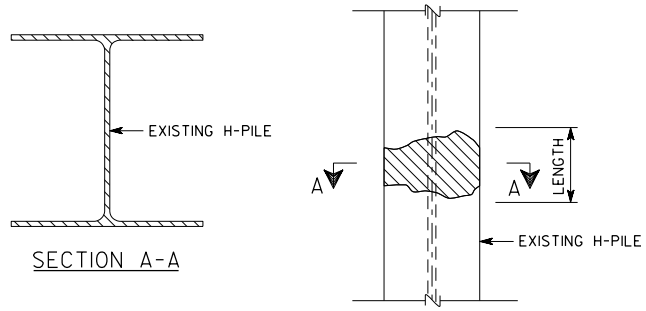
Georgia Special Provisions & Supplemental Specifications:

- None

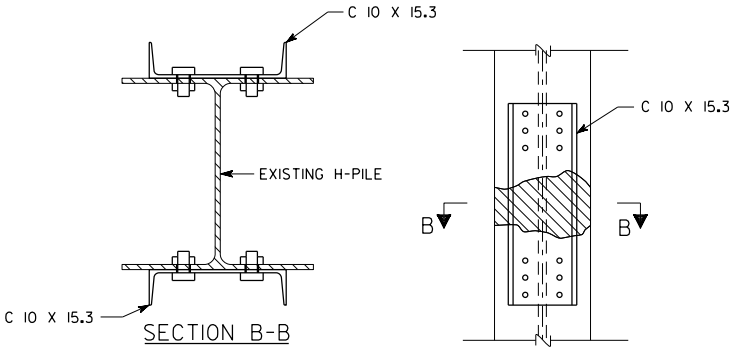
Qualified Products List:

- QPL-18 Special Protective Coating
- QPL-59 Miscellaneous Metal Fabricators

= AREA OF DETERIORATION OR SECTION LOSS



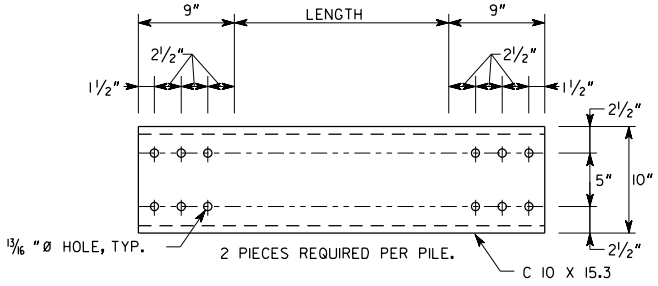
EXISTING CONDITION



FINAL CONDITION

NOTE:

1. ALL COMPONENTS MUST BE FABRICATED AND PAINTED IN SHOP, PRIOR TO PLACEMENT.
2. IF SECTION LOSS IS GREATER THAN 50%, CONTACT STATE BRIDGE MAINTENANCE ENGINEER FOR DIRECTION.
3. IF LENGTH OF DETERIORATION IS GREATER THAN 3'-0", CONTACT STATE BRIDGE MAINTENANCE ENGINEER FOR DIRECTION.
4. THE DESCRIBED METHOD OF REPAIR IS INTENDED FOR USE ON 10", 12" AND 14" H-PILE, CONTACT STATE BRIDGE MAINTENANCE ENGINEER FOR DIRECTION REGARDING OTHER PILE SIZES.



PLATING FABRICATION DETAILS

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
SAND BLASTER / AIR GUN
ANGLE GRINDER W/ ABRA. DISC
MISC. BUCKETS & HAND TOOLS
DRILL & 13/16 "Ø DRILL BITS

MATERIALS

C 10 X 15.3
¾" WASHERS
¾" LOCK WASHERS
¾" NUTS
¾" X 2" BOLTS
APPROVED PAINT (2P SYSTEM)

SHEET 1 OF 2

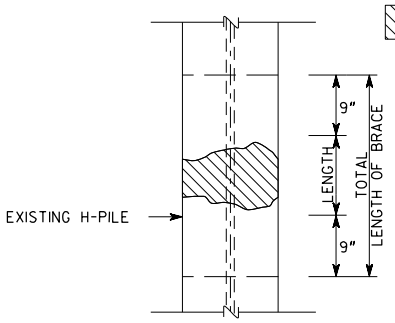
GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION DETAIL
H-PILE PLATING STRUCTURAL REPAIR - BOLT
NO SCALE
JUNE 2012

REVISION DATE

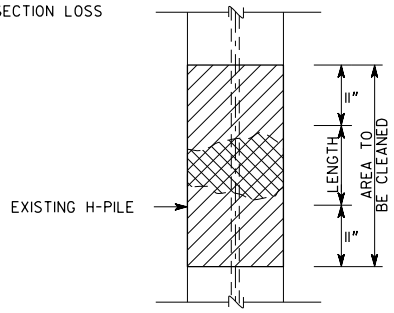
DRAWING NO. 830.05

= AREA OF DETERIORATION OR SECTION LOSS



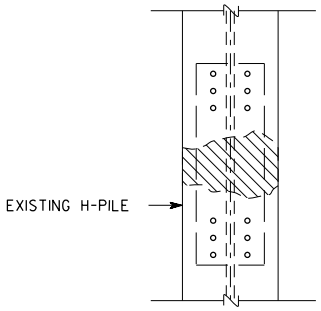
STEP 1

1. USING DIMENSIONS SHOWN ON FABRICATION DETAILS, DETERMINE LENGTH OF CHANNELS TO BE USED AND HAVE FABRICATED IN SHOP. (ALL CHANNELS ARE TO BE MADE IDENTICAL TO EACH OTHER IN LENGTH AND HOLE PLACEMENT.)



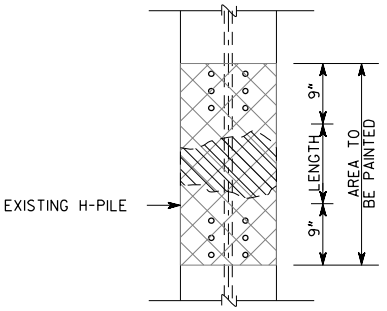
STEP 2

1. BY EITHER GRINDING OR SANDBLASTING, REMOVE ALL LOOSE PAINT, DEBRIS AND CORROSION FROM AREA WHERE PLATING IS TO BE INSTALLED.



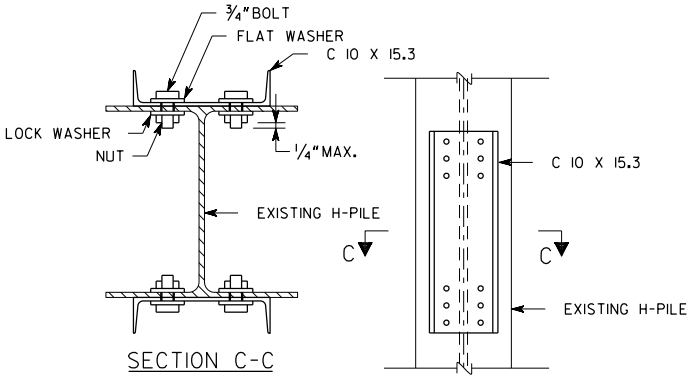
STEP 3

1. USING FABRICATED PLATING AS A TEMPLATE, LOCATE AND DRILL $^{13}/_{16}$ "DIA. HOLES THROUGH FLANGES OF EXISTING PILE. (BE SURE PLATE IS FLAT AND SQUARE AGAINST FLANGE OF EXISTING PILE)



STEP 4

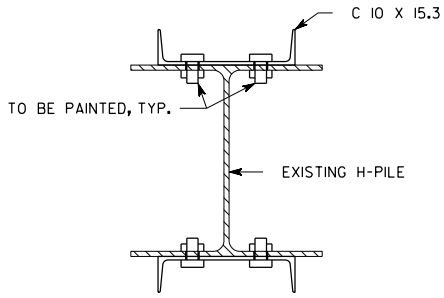
1. PAINT ALL EXPOSED FACES OF EXISTING H-PILE THAT WERE CLEANED IN STEP 2.



STEP 5

1. ATTACH PLATING TO EACH FLANGE USING ¾"Ø BOLTS, FLAT WASHERS, LOCK WASHER AND NUTS.

2. TIGHTEN ALL NUTS TO ACCORDING TO SECTION 501.3.03 OF THE GEORGIA STANDARD SPECIFICATIONS.

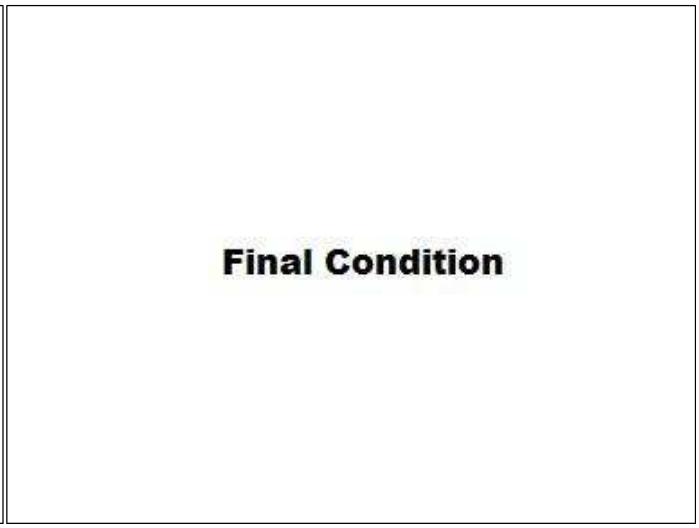


STEP 6

1. PAINT ALL EXPOSED BOLT HEADS AND NUTS TO PREVENT CORROSION.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL H-PILE PLATING STRUCTURAL REPAIR - BOLT NO SCALE JUNE 2012	REVISION DATE	SHEET 2 OF 2 DRAWING NO. 830.05

Activity 830.06 – H-Pile Plating Structural Repair-Weld



Before Repair | After Repairs

General Notes:

Coordinate all work in the stream/river with the District Environmentalist. .

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

All welding shall be performed by certified welders that have in their possession a current welding certification card issued by the Office of Materials and Research. Use only e70xx (excluding e7014 and e7024) low hydrogen electrodes for manual shielded metal arc welding.

Clean and paint piles and plating in accordance with Sections 520 and 535 of the Georgia DOT Specifications. Paint shall be System 2P except the top coat shall be black, federal standard no. 595 color 27040.

Refer to Activity 830.03 – H-Pile Encasement (Circle) or 830.04 – H-Pile Encasement (Square), for additional details.

Material Specifications:

- Structural Steel: Grade 50, f_y = 50,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Verify presence of lead paint system.
- Use special care near streams and rivers.

Georgia Standard Specifications

- Section 501 – Steel Structures
- Section 520 – Piling
- Section 535 – Painting Structures

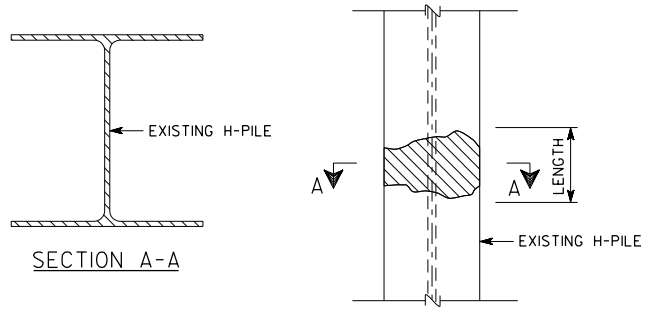
Georgia Special Provisions & Supplemental Specifications:

- None

Qualified Products List:

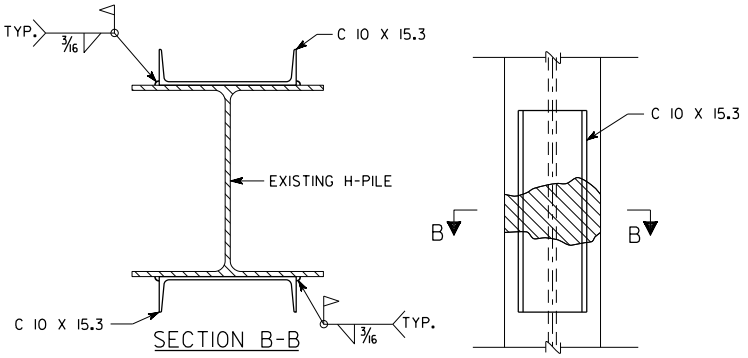
- QPL-18 Special Protective Coating
- QPL-59 Miscellaneous Metal Fabricators

= AREA OF DETERIORATION OR SECTION LOSS



SECTION A-A

EXISTING CONDITION

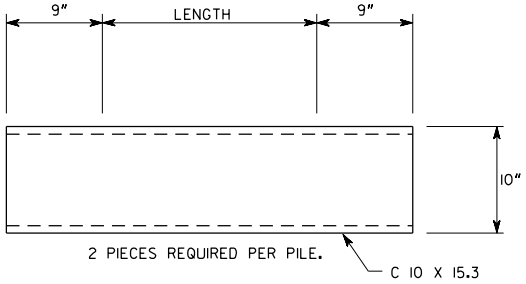


SECTION B-B

FINAL CONDITION

NOTE:

1. IF SECTION LOSS IS GREATER THAN 50%, CONTACT STATE BRIDGE MAINTENANCE ENGINEER FOR DIRECTION.
2. IF LENGTH OF DETERIORATION IS GREATER THAN 3'-0", CONTACT STATE BRIDGE MAINTENANCE ENGINEER FOR DIRECTION.
3. THE DESCRIBED METHOD OF REPAIR IS INTENDED FOR USE ON 10", 12" AND 14" H-PILE, CONTACT STATE BRIDGE MAINTENANCE ENGINEER FOR DIRECTION REGARDING OTHER PILE SIZES.



PLATING FABRICATION DETAILS

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
SAND BLASTER / AIR GUN
ANGLE GRINDER W/ ABRA. DISC
MISC. BUCKETS & HAND TOOLS
WELDER
C-CLAMPS

MATERIALS

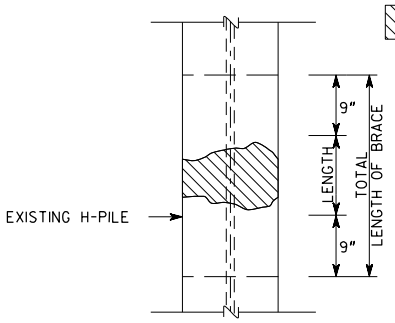
SANDBLASTING MEDIA
WELDING ELECTRODES
APPROVED PAINT (2P SYSTEM)

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION DETAIL
H-PILE PLATING STRUCTURAL REPAIR - WELD
NO SCALE
JUNE 2012

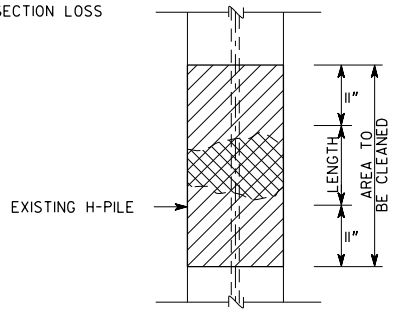
REVISION DATE	DRAWING NO.
	830.06

= AREA OF DETERIORATION OR SECTION LOSS



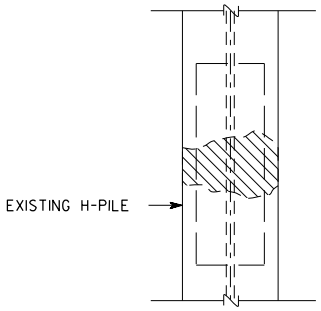
STEP 1

1. USING DIMENSIONS SHOWN ON FABRICATION DETAILS, DETERMINE LENGTH OF CHANNELS TO BE USED AND HAVE FABRICATED IN SHOP. (ALL CHANNELS ARE TO BE MADE IDENTICAL TO EACH OTHER IN MATERIAL AND LENGTH.)



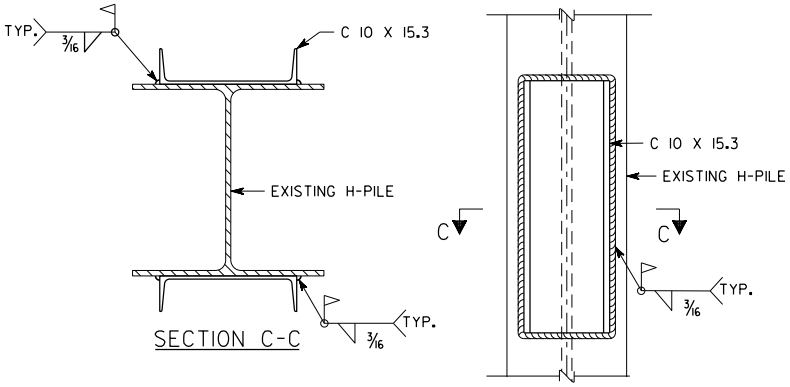
STEP 2

1. BY EITHER GRINDING OR SANDBLASTING, REMOVE ALL LOOSE PAINT, DEBRIS AND CORROSION FROM AREA WHERE PLATING IS TO BE INSTALLED.



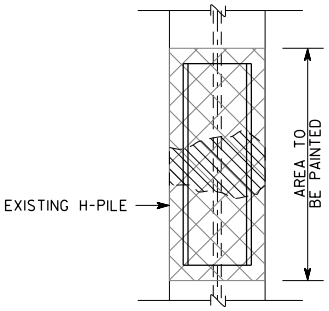
STEP 3

1. POSITION BRACE AGAINST FACE OF PILE AND CLAMP INTO PLACE. (BE SURE PLATE IS FLAT AND SQUARE AGAINST FLANGE OF EXISTING PILE)



STEP 4

1. WELD PLATE IN PLACE



STEP 4

1. PAINT ALL EXPOSED FACES OF EXISTING H-PILE.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL H-PILE PLATING STRUCTURAL REPAIR - WELD NO SCALE JUNE 2012	REVISION DATE	SHEET 2 OF 2 DRAWING NO. 830.06

Activity 830.07 – H-Pile Swaybracing

Before Repair

After Repairs

General Notes:

Coordinate all work in the stream/river with the District Environmentalist.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Clean and paint all existing piles and swaybracing in accordance with sections 520 and 535 of the Georgia DOT Specifications. Paint shall be system 2p except the top coat shall be black, federal standard no. 595 color 27040.

All welding shall be performed by certified welders that have in their possession a current welding certification card issued by the Office of Materials and Research. Use only e70xx (excluding e7014 and e7024) low hydrogen electrodes for manual shielded metal arc welding.

Material Specifications:

- Structural Steel: Grade 50, f_y = 50,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Verify presence of lead paint system.
- Use special care near streams and rivers.

Georgia Standard Specifications

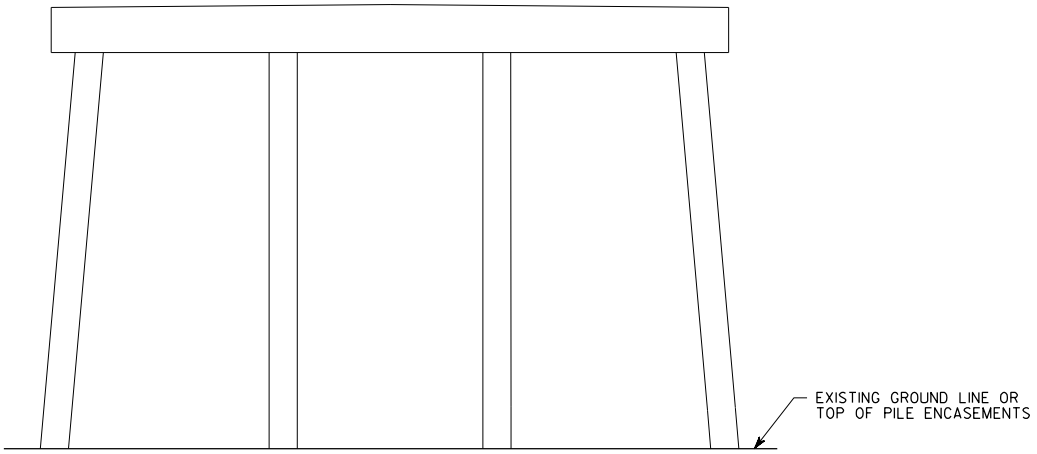
- Section 501 – Steel Structures
- Section 520 - Piling
- Section 535 – Painting Structures

Georgia Special Provisions & Supplemental Specifications:

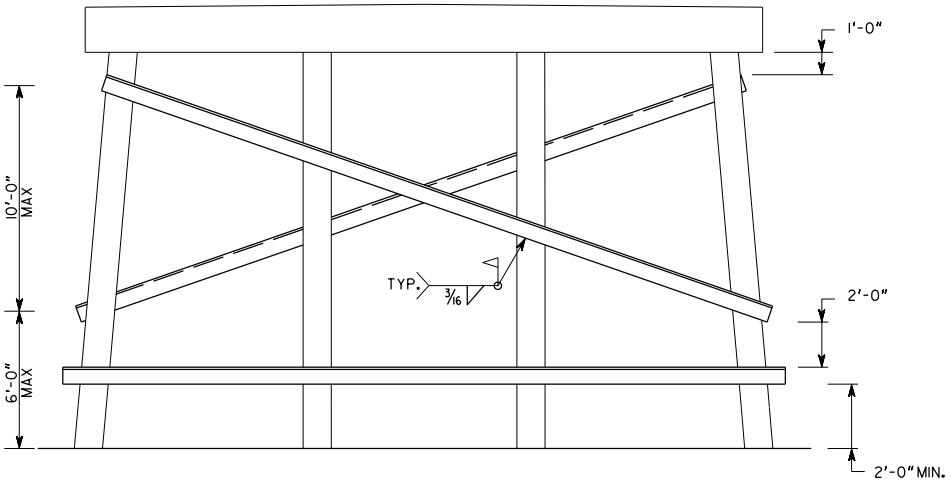
- None

Qualified Products List:

- QPL-18 Special Protective Coating
- QPL-59 Miscellaneous Metal Fabricators



EXISTING CONDITION



FINAL CONDITION

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
SAND BLASTER / AIR GUN
WELDER
ANGLE GRINDER W/ ABRA. DISC
MISC. BUCKETS & HAND TOOLS
DIGGING EQUIPMENT
CHOP SAW W/ STEEL BLADES
CUTTING TORCH
C-CLAMPS

MATERIALS

3-∠ 4"X 4"X ½"
APPROVED PAINT OR SEALANT
SANDBLASTING MEDIA
WELDING ELECTRODES

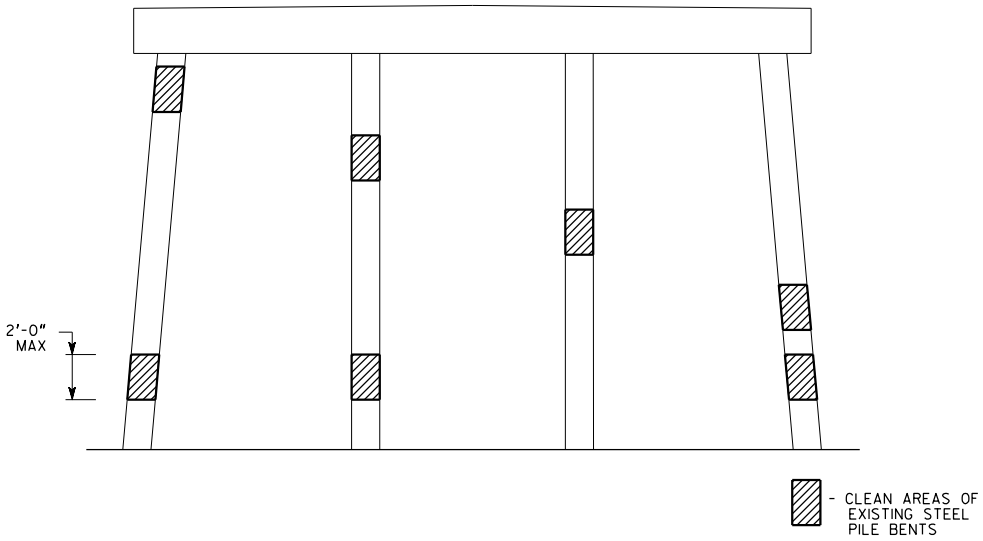
GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION DETAIL
H-PILE SWAYBRACING

NO SCALE

JUNE 2012

REVISION DATE	DRAWING NO.
	830.07

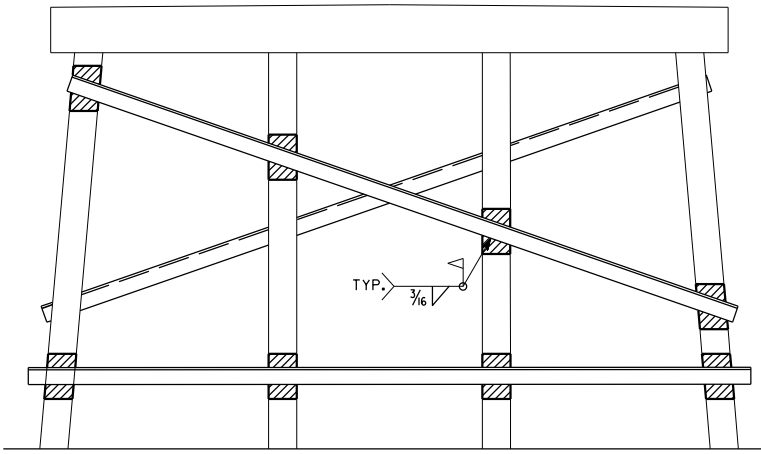


STEP 1

1) FIELD VERIFY AND MARK LOCATIONS OF SWAWBRACING ON FRONT AND BACK OF PILES.

2) SANDBLAST AND CLEAN AREAS OF STEEL PILES WHERE SWAYBRACING WILL BE ATTACHED.

3) MEASURE THE SWAYBRACING TO BE CUT IN THE FIELD OR IN MANUFACTURER'S SHOP FOR THE 4"X 4"X 3/8" ANGLES.



STEP 2

1) PLACE STEEL SWAYBRACING AT AREAS PREVIOUS MARKED.

2) WELD IN PLACE.

3) PRIME AND PAINT SWAYBRACING AND AREAS CLEANED.

			SHEET 2 OF 2
GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL H-PILE SWAYBRACING NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.07

Activity 830.08 – PSC Pile Section Loss Repair

Before Repair

After Repairs

General Notes:

Coordinate all work in the stream/river with the District Environmentalist.

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Encasement shall be in accordance with Section 547 of the Georgia DOT Specifications.

All welding shall be performed by certified welders that have in their possession a current welding certification card issued by the Office of Materials and Research. Use only e70xx (excluding e7014 and e7024) low hydrogen electrodes for manual shielded metal arc welding.

Material Specifications:

- Concrete: Class A, f'_c = 3,000 psi
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications

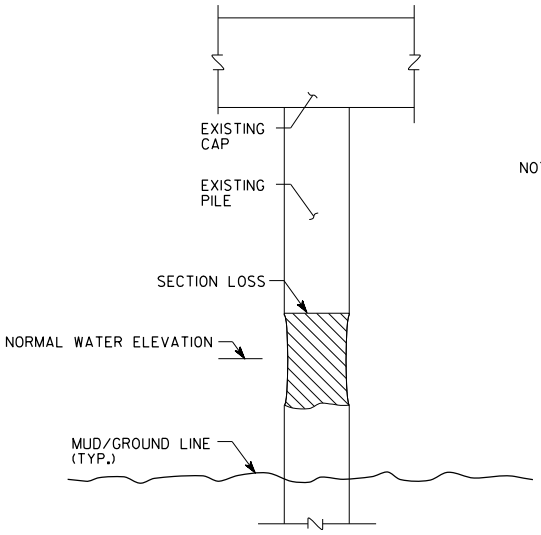
- Section 500 – Concrete Structures
- Section 511 – Reinforcement Steel

Georgia Special Provisions & Supplemental Specifications:

- None

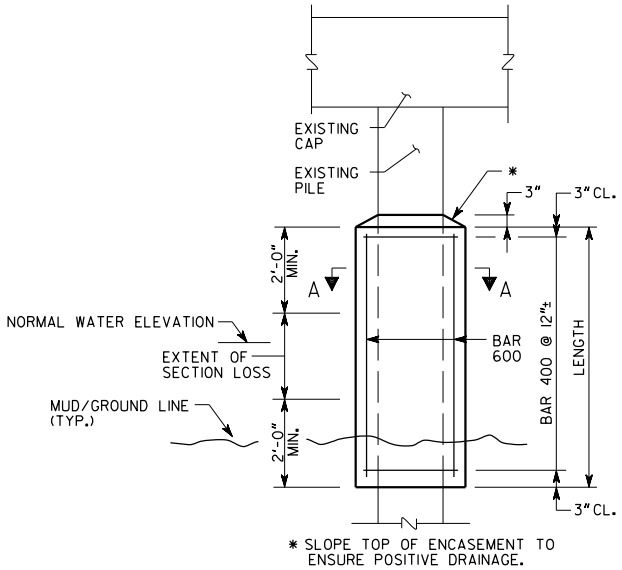
Qualified Products List:

- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-18 Special Protective Coating
- QPL-19 Bar Supports
- QPL-56 Corrugated Metal Pipe



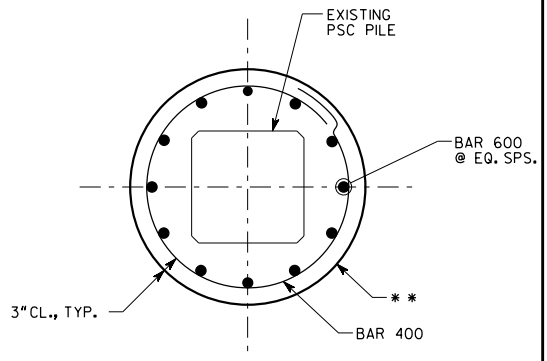
NOTE: NORMAL WATER ELEVATION TO BE FIELD DETERMINED.

EXISTING CONDITION



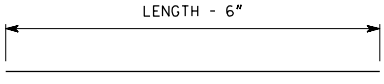
* SLOPE TOP OF ENCASEMENT TO ENSURE POSITIVE DRAINAGE.

FINAL CONDITION

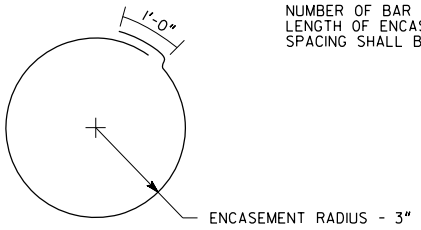


SECTION A-A

* * DIMENSIONS OF ENCASEMENT SHALL BE 1'-0" WIDER THAN EXISTING PSC PILE. FIELD VERIFY DIMENSION AND ADJUST BAR 400 ACCORDINGLY.



BAR 600



BAR 400

NUMBER OF BAR 400 EQUALS LENGTH OF ENCASEMENT + 1. SPACING SHALL BE 12" ±.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
SAND BLASTER / AIR GUN
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
MISC. BUCKETS & HAND TOOLS
DIGGING EQUIPMENT
CHOP SAW W/ STEEL BLADES
WELDER / RATCHET STRAPS

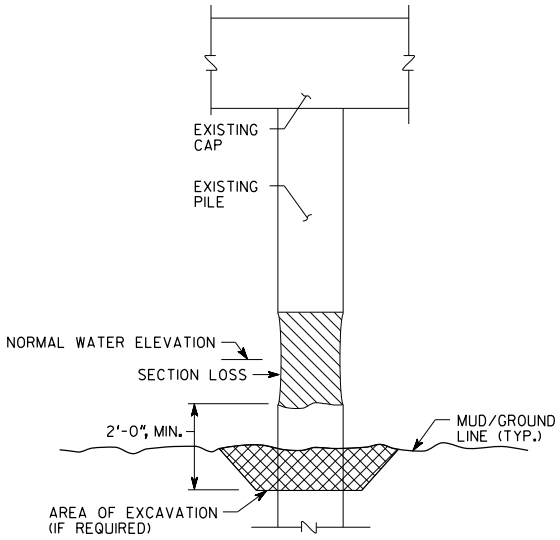
MATERIALS

CONCRETE
BAR 400
BAR 600
SANDBLASTING MEDIA
FORMING MATERIAL
TIE WIRE

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

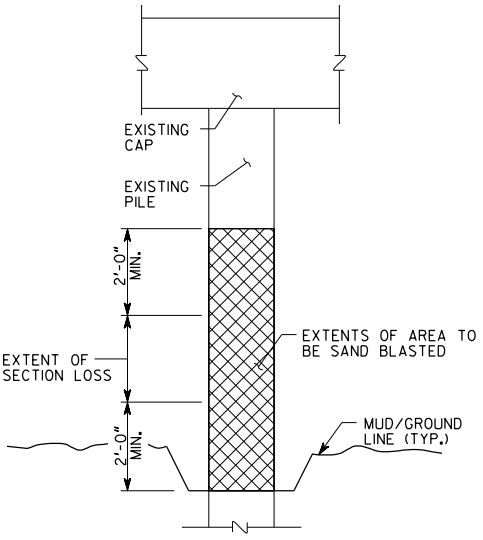
CONSTRUCTION DETAIL
PSC PILE SECTION LOSS REPAIR
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	830.08



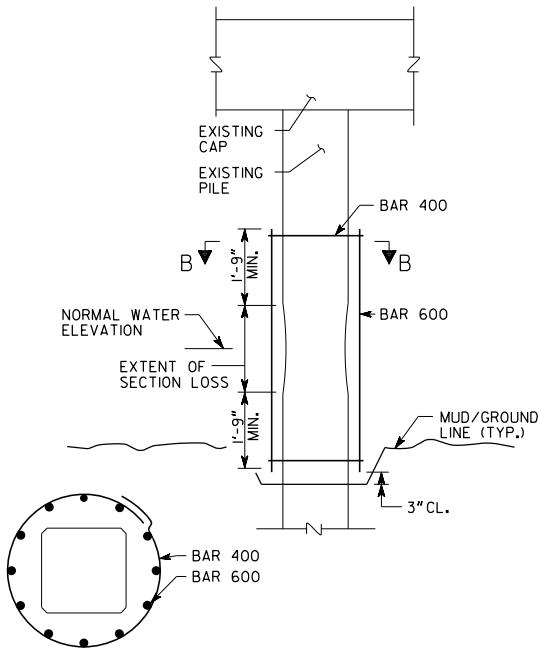
STEP 1

1. DETERMINE LOCATION OF PILE TO BE ENCASED.
2. DETERMINE LENGTH OF ENCASEMENT. (ROUND LENGTH TO NEAREST 1' INCREMENT)



STEP 2

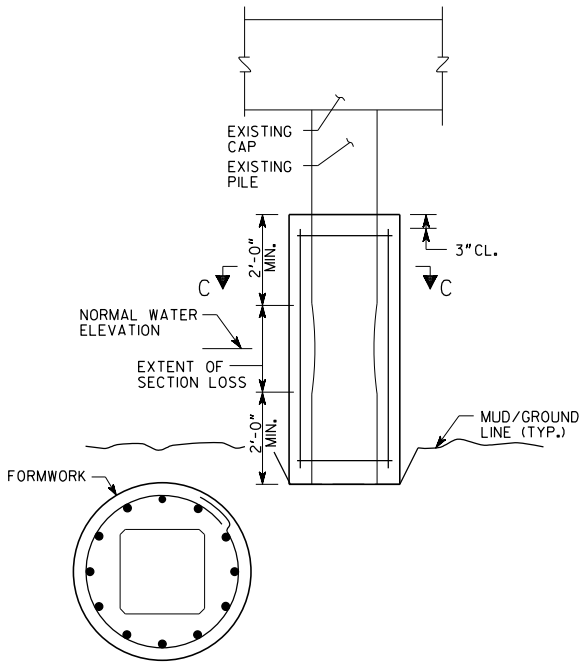
1. EXCAVATE BELOW MUD/GROUND LINE A MINIMUM OF 2'-0" BEYOND EXTENT OF SECTION LOSS. (IF REQUIRED)
2. SANDBLAST THE EXISTING PSC PILE AS SHOWN.



SECTION B-B

STEP 3

1. ERECT, TIE & SUPPORT STEEL REINFORCING.

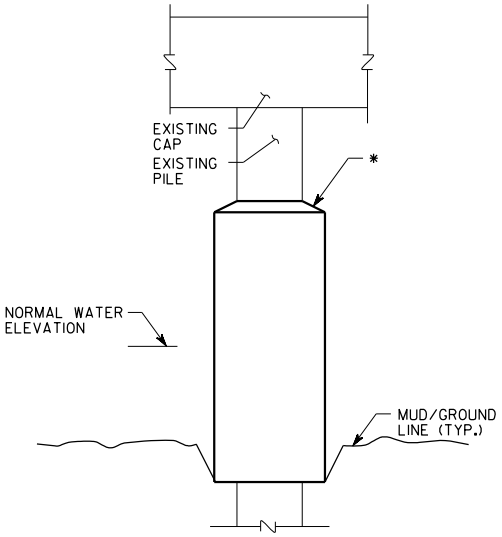


SECTION C-C

STEP 4

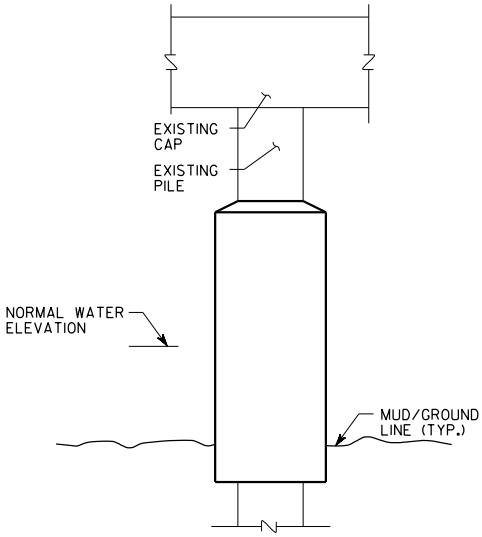
1. PLACE AND SECURE FORMS.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL PSC PILE SECTION LOSS REPAIR NO SCALE JUNE 2012	REVISION DATE	SHEET 2OF 3 DRAWING NO. 830.08



STEP 5

1. PLACE CLASS "A" CONCRETE INTO FORMWORK.
2. * SLOPE TOP OF ENCASEMENT TO ENSURE POSITIVE DRAINAGE.



STEP 6

1. ALLOW CONCRETE TO FULLY CURE.
2. BACKFILL WITH SOIL REMOVED DURING ENCASEMENT INSTALLATION, COMPACT IF REQUIRED.

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION DETAIL
PSC PILE SECTION LOSS REPAIR
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	830.08

Activity 830.09 – Timber Pile Section Loss Repair

Before Repair

After Repairs

General Notes:

Coordinate all work in the stream/river with the District Environmentalist.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Material Specifications:

- None

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications

- Section 502 – Timber Structures
- Section 520 - Piling
- Section 860 – Lumber and Timber
- Section 861 – Piling and Round Tiber
- Section 861 – Preservative Treatment of Timber Products

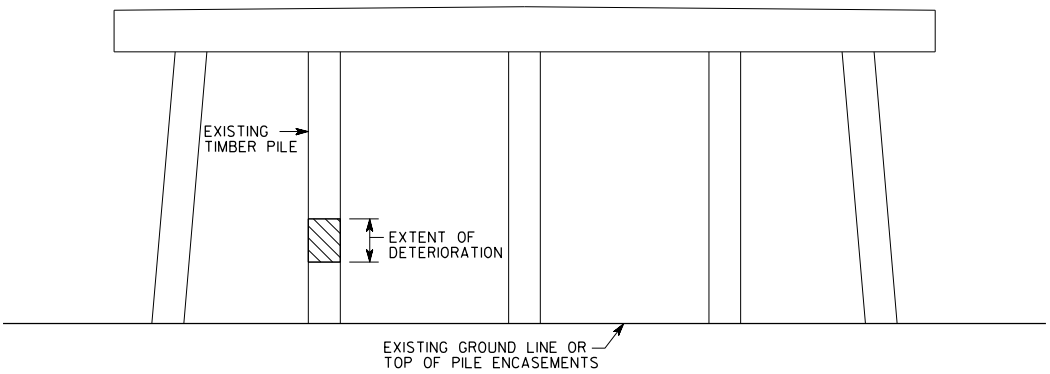
Georgia Special Provisions & Supplemental Specifications:

- None

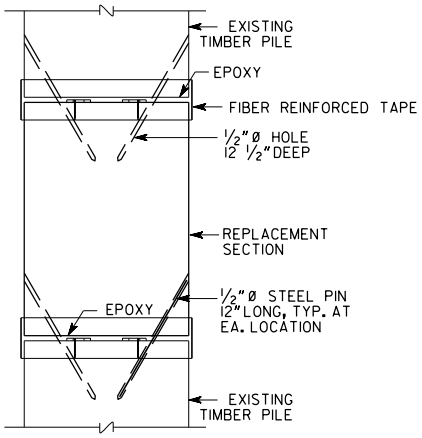
Qualified Products List:

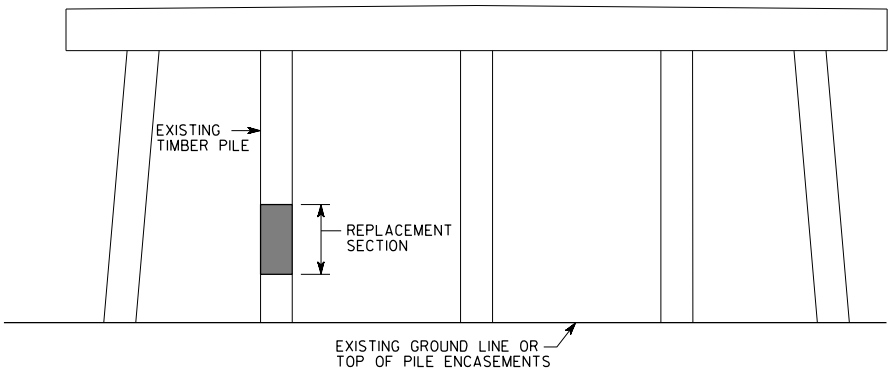
- QPL-50 Wood Preserving Plants

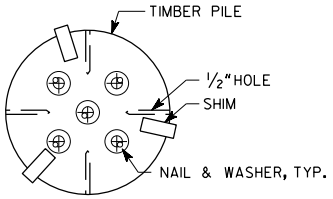
= AREA OF DETERIORATION OR SECTION LOSS



EXISTING CONDITION







FINAL CONDITION

NOTE:

1. THIS REPAIR METHOD IS NOT TO BE USED FOR BATTERED PILES.
2. REMOVE TRAFFIC FROM BRIDGE DURING REPAIR OPERATIONS.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
CHAIN SAW
PORTABLE ELECTRIC GENERATOR
AIR GUN
CIRCULAR SAW W/ WOOD BLADE
MISC. BUCKETS & HAND TOOLS
ACCESS EQUIPMENT
20 TON JACK

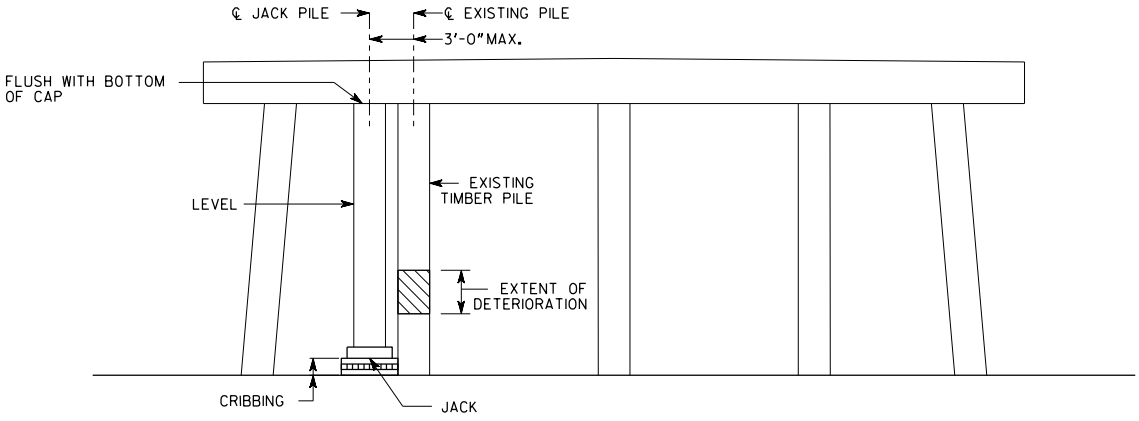
MATERIALS

1"Ø WASHERS
10^d STANDARD NAILS
TREATED TIMBER PILE
12"X ½"Ø STEEL PINS
APPROVED EPOXY
WOOD SHIMS
3"FIBER REINFORCED TAPE
JACKING PILE (TIMBER OR STEEL)
4"X 4"TIMBER FOR CRIBBING

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

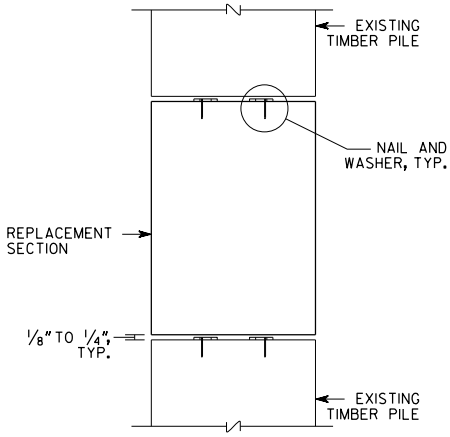
CONSTRUCTION DETAIL
TIMBER PILE SECTION LOSS REPAIR
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	830.09

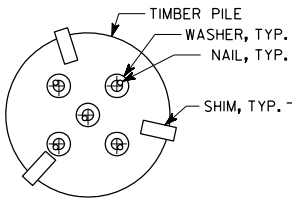


STEP 1

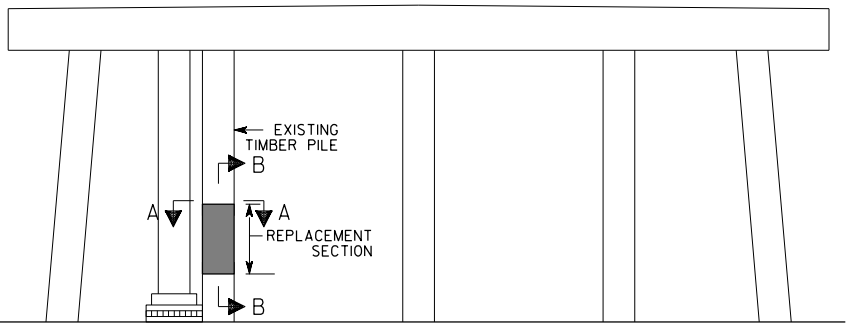
1. DETERMINE DETERIORATED SECTION OF PILE.
2. MARK THE PILE 1 FOOT BEYOND EXTENT OF DETERIORATION TOP AND BOTTOM.
3. REMOVE SWAYBRACING IF PRESENT AND OTHER SECONDARY STRUCTURAL MEMBERS ONLY AS REQUIRED TO PERFORM PILE REPAIR.
4. SUPPORT UPPER SECTION OF EXISTING PILE BY EITHER ADDING TIMBER CRUTCHING OR LAG LASHING PILE TO CAP. CONTACT ASSISTANT STATE BRIDGE MAINTENANCE ENGINEER WITH QUESTIONS.
5. PLACE A JACK PILE (STIFF LEG) BESIDE PILE TO BE REPAIRED USING CRIBBING METHOD AS SHOWN.
6. JACK PIER CAP UNTIL ALL LOAD IS REMOVED FROM PILE TO BE REPAIRED.



SECTION B-B



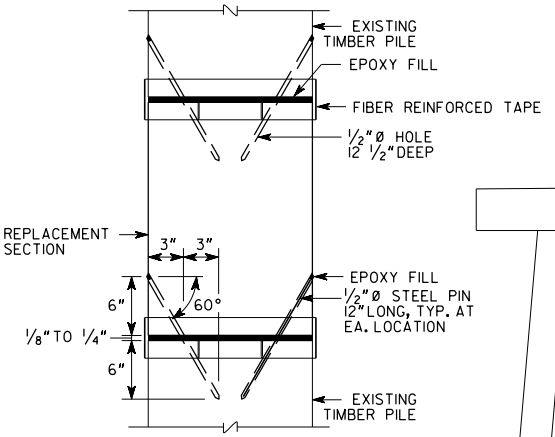
SECTION A-A



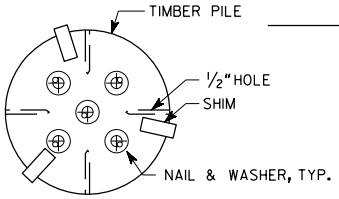
STEP 2

1. USING A CHAINSAW, MAKE CLEAN SQUARE CUTS ON PREVIOUSLY MARKED LOCATIONS.
2. REMOVE DETERIORATED SECTION OF PILE.
3. IF THERE IS STILL ROT OR OTHER DETERIORATION PRESENT ON REMAINING PILE, CONTINUE CUTTING SECTIONS OFF OF EXISTING PILE UNTIL ALL EVIDENCE OF DETERIORATION IS REMOVED.
4. CUT REPLACEMENT PILE TO MATCH GAP LEFT IN EXISTING PILE ALLOWING FOR 1/4" TO 1/2" GAP.
5. ATTACH 5 1" STANDARD WASHERS TO EACH CUT FACE OF EXISTING PILE, AT EQUAL SPACING AS SHOWN, SECURE WITH ANY SUITABLE LARGE DIAMETER HEAD BOX NAIL.
6. INSERT REPLACEMENT PILE SECTION INTO GAP AND SHIM AS REQUIRED TO OBTAIN A FLUSH TIGHT FIT ALONG ALL EDGES.

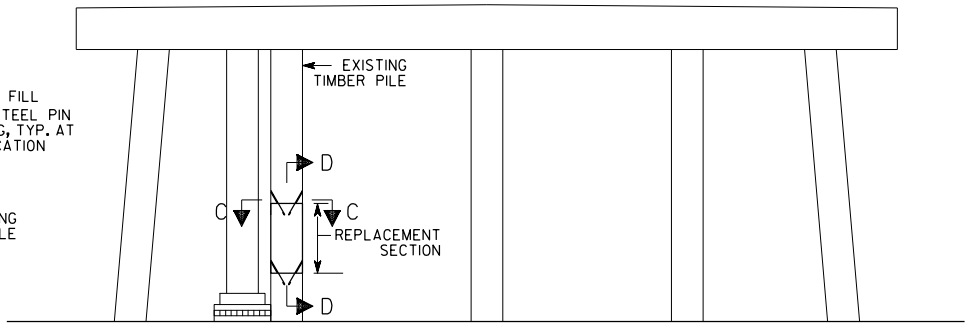
GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL TIMBER PILE SECTION LOSS REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.09



SECTION D-D

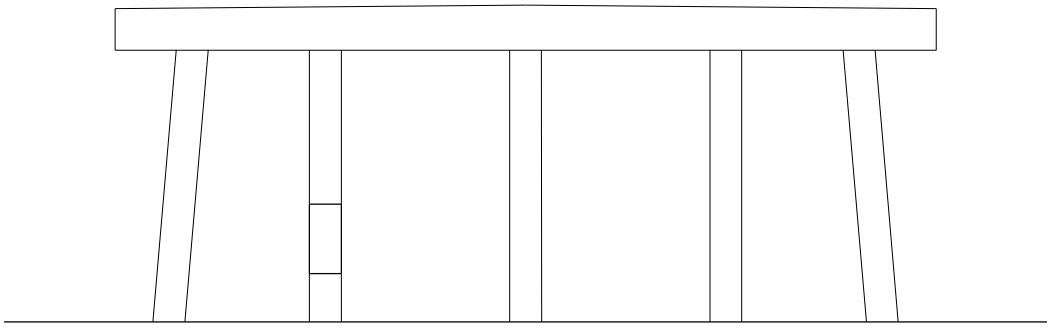


SECTION C-C



STEP 3

1. DRILL 4- ½"Ø HOLES AT 60° ∠ INTO PILE AS SHOWN.
2. DRIVE 4- ½"Ø SPIKES INTO HOLES AND RECESS HEAD AS FAR AS POSSIBLE INTO PILE.
3. WRAP JOINTS WITH FIBER REINFORCED TAPE TO FORM A SEAL CAPABLE OF CONTAINING UN-CURED EPOXY MIXTURE.
4. INJECT EPOXY THROUGH TAPE INTO GAP PROVIDED BY WASHERS IN A MANNER THAT WILL MINIMIZE INCIDENTAL AIR GAPS IN EPOXY.
5. APPLY EPOXY TO TOPS OF SPIKES TO COMPLETELY FILL RECESS IN PILE.



STEP 4

1. REMOVE SUPPORT FOR UPPER SECTION OF PILE.
2. LOWER AND REMOVE JACK PILE (STIFF LEG) AND ALL INCIDENTAL CRIBBING.
3. REINSTALL SWAYBRACING IF PRESENT AND OTHER SECONDARY STRUCTURAL MEMBERS THAT WERE REMOVED IN ORDER TO PERFORM PILE REPAIR.
4. IF WARRANTED, INSTALL SWAYBRACING ACCORDING TO ACTIVITY 830.12 - TIMBER PILE SWAYBRACING.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL TIMBER PILE SECTION LOSS REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.09

Activity 830.10 – Timber Pile Section Loss Repair (Collar)

Before Repair

After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

All bolts shall meet the requirements of ASTM A325 or ASTM A490.

All steel components shall be galvanized in accordance with ASTM A123.

Material Specifications:

- Structural Steel: Grade 36, f_y = 36,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications

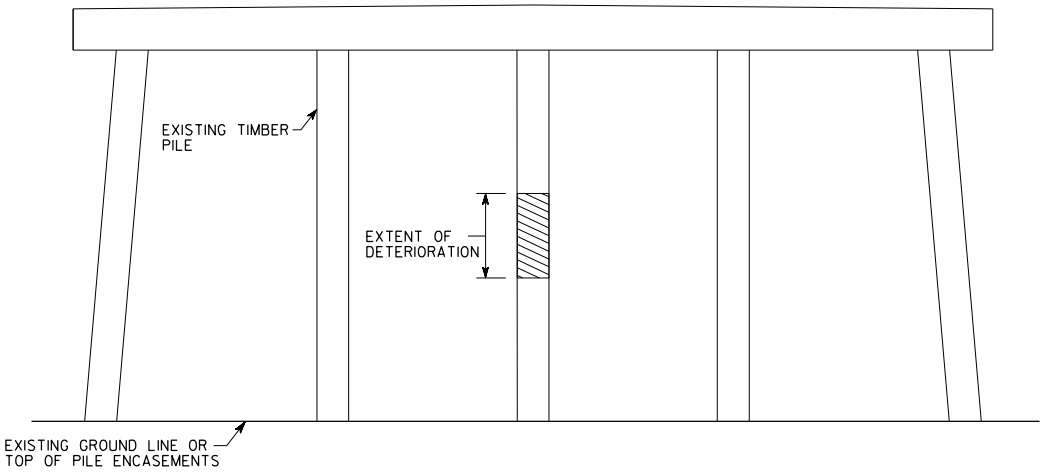
- Section 501 – Steel Structures
- Section 502 – Timber Structures
- Section 520 – Piling
- Section 860 – Lumber and Timber
- Section 861 – Piling and Round Tiber
- Section 861 – Preservative Treatment of Timber Products

Georgia Special Provisions & Supplemental Specifications:

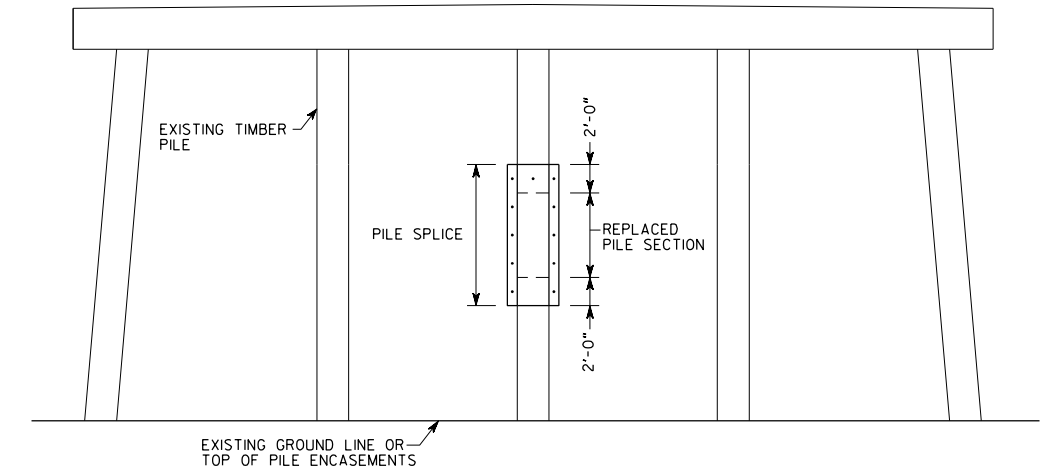
- None

Qualified Products List:

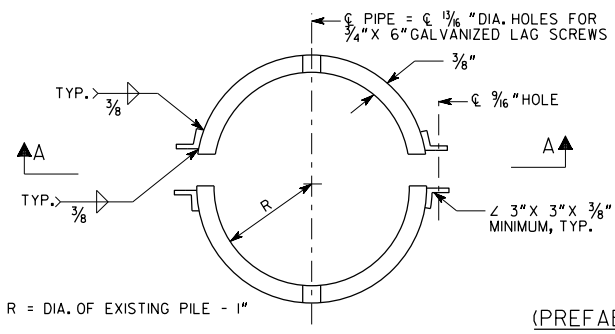
- QPL-50 Wood Preserving Plants
- QPL-53 Galvanizers
- QPL-59 Miscellaneous Metal Fabricators



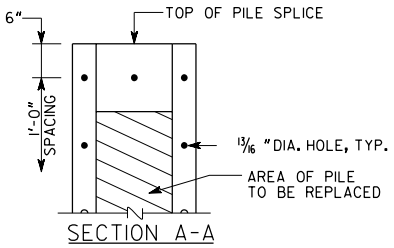
EXISTING CONDITION



FINAL CONDITION



COLLAR DETAIL
(PREFABRICATE COLLARS IN SHOP)



SECTION A-A

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
AIR GUN
CHAIN SAW
CIRCULAR SAW W/ WOOD BLADE
IMPACT WRENCH W/ SOCKETS
MISC. BUCKETS & HAND TOOLS
ACCESS EQUIPMENT
20 TON JACK

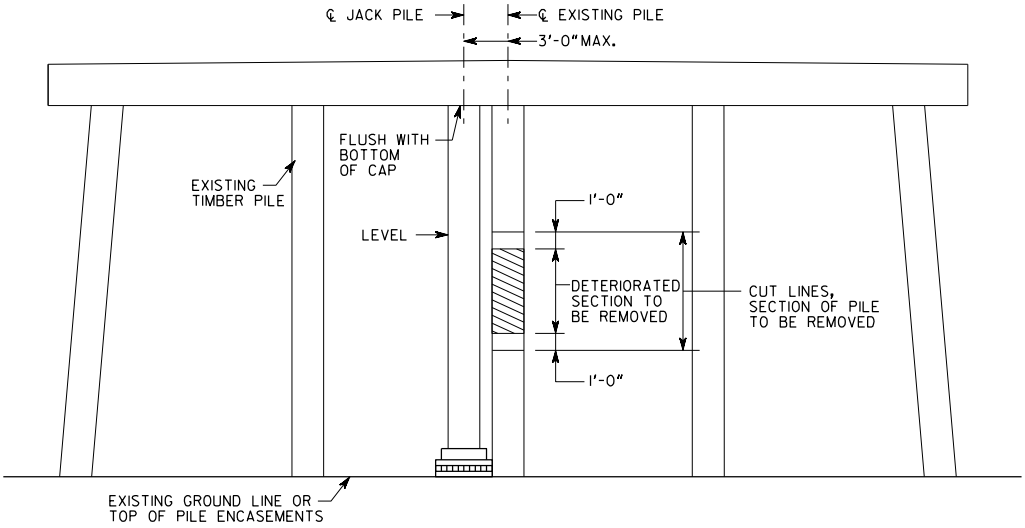
MATERIALS

PILE COLLAR
1/2"NUTS, BOLTS & WASHERS
3/4"X 6"LAG SCREWS
TREATED TIMBER PILE

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

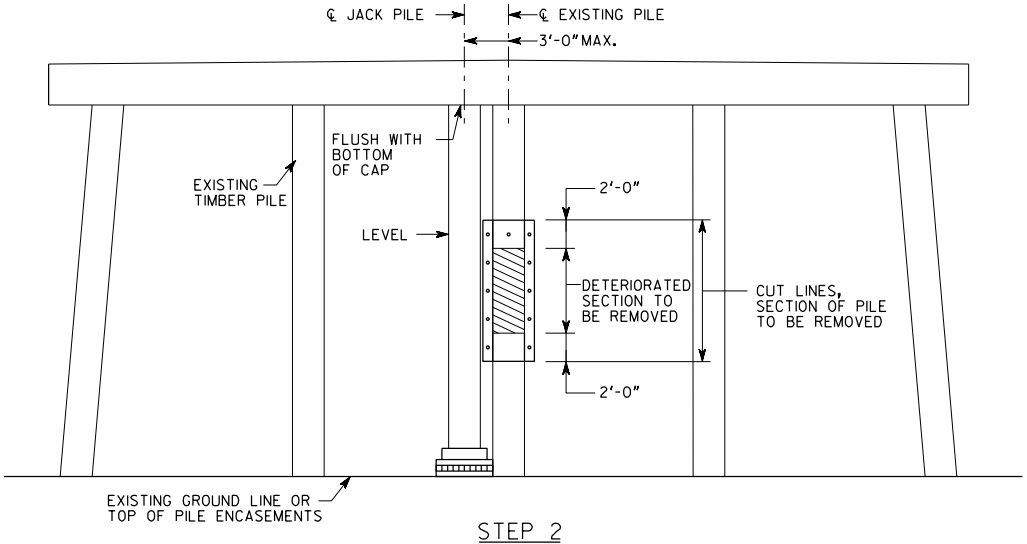
CONSTRUCTION DETAIL
TIMBER PILE SECTION LOSS REPAIR (COLLAR)
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	830.10



STEP 1

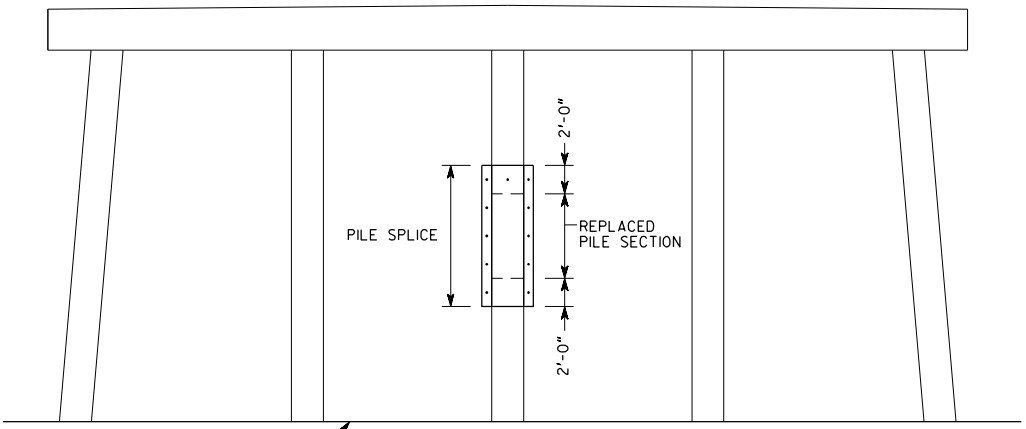
1. CORE TO DETERMINE THE EXTENT OF THE DETERIORATED SECTION OF PILE.
2. MARK THE PILE 1FOOT ABOVE AND BELOW THE DETERIORATED SECTION.
3. DETERMINE LENGTH AND DIAMETER OF COLLAR, FABRICATED AND GALVANIZE.
4. PLACE A JACK PILE (STIFF LEG) BESIDE PILE WITH DETERIORATED SECTION USING CRIBBING METHOD AS SHOWN.
5. JACK PIER CAP UNTIL CAP UNTIL ALL LOAD IS REMOVED FROM PILE TO BE REPAIRED.



STEP 2

1. REMOVE DETERIORATED SECTION OF PILE AND INSPECT ENDS TO CONFIRM NO ROT/DECAY. IF THERE IS ROT/DECAY, CONTINUE CUTTING OUT 6" SECTIONS OF THE PILE UNTIL DECAY/ROT IS REMOVED.
2. DETERMINE DIMENSIONS FOR REPLACEMENT PILE SECTION (DIAMETER AND LENGTH) SHIM AS NEEDED.
3. INSTALL COLLAR AND TIGHTEN ALL CONNECTIONS.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL TIMBER PILE SECTION LOSS REPAIR (COLLAR) NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.10



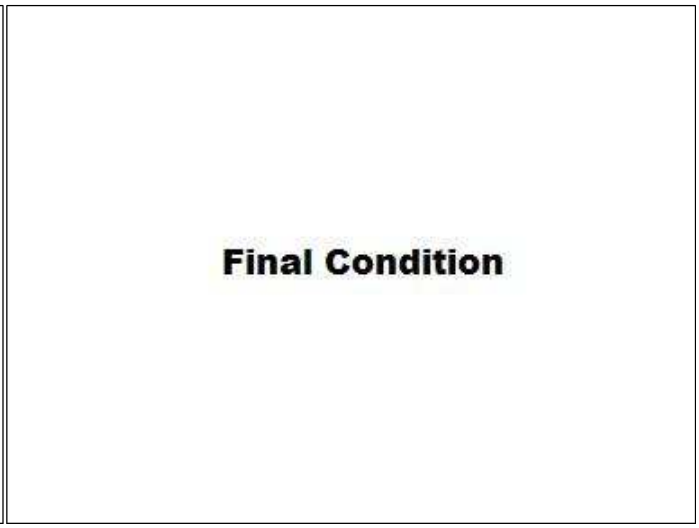
STEP 3

1. REMOVE JACK PILE (STIFF LEG).

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL TIMBER PILE SECTION LOSS REPAIR (COLLAR) NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.10

Activity 830.11 – Timber Pile Section Loss Repair (Encasement)

Before Repair



After Repairs

General Notes:

Timber Pile Encasement is to be used only as a temporary repair and not shall exceed five years of service.

Coordinate all work in the stream/river with the District Environmentalist.

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Encasement shall be in accordance with Section 547 of the Georgia DOT Specifications.

All welding shall be performed by certified welders that have in their possession a current welding certification card issued by the Office of Materials and Research. Use only e70xx (excluding e7014 and e7024) low hydrogen electrodes for manual shielded metal arc welding.

Material Specifications:

- Concrete: Class A, f'_c = 3,000 psi
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications

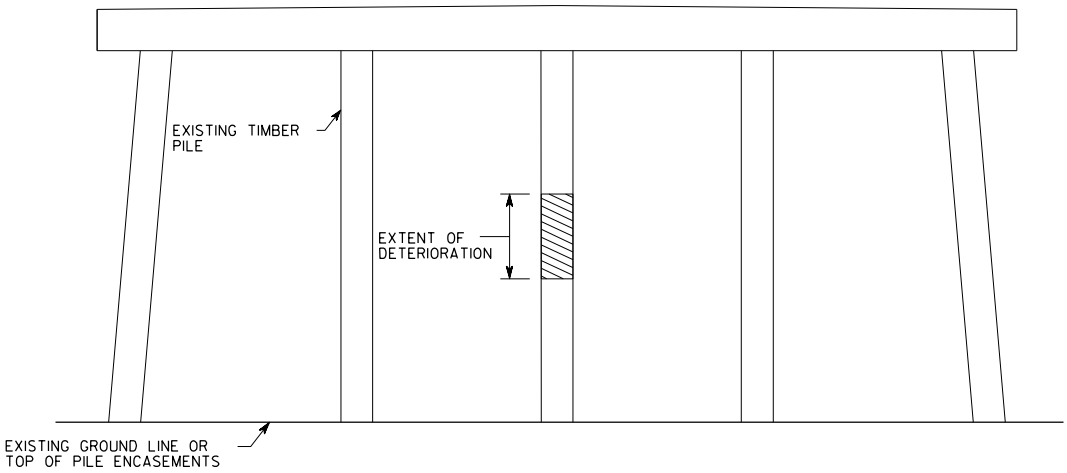
- Section 500 – Concrete Structures
- Section 511 – Reinforcement Steel

Georgia Special Provisions & Supplemental Specifications:

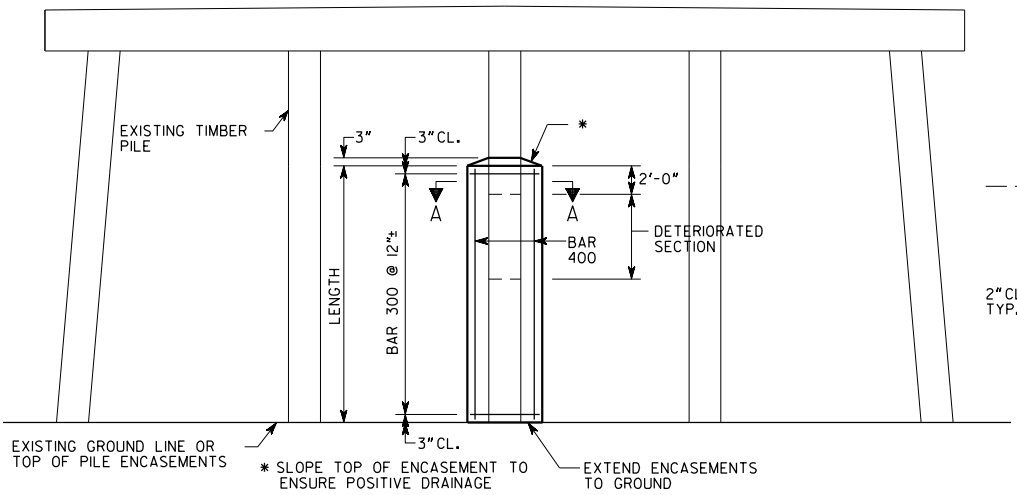
- None

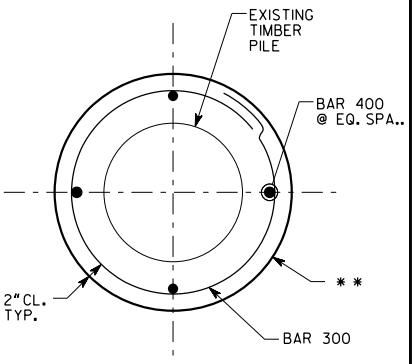
Qualified Products List:

- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-18 Special Protective Coating
- QPL-19 Bar Supports
- QPL-56 Corrugated Metal Pipe



EXISTING CONDITION



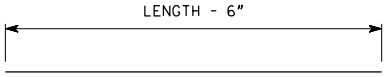


SECTION A-A

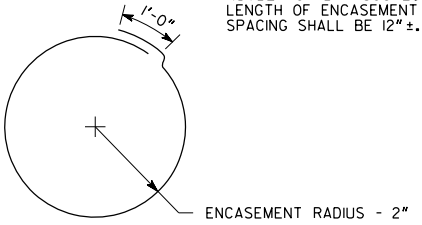
FINAL CONDITION

* * RADIUS OF ENCASEMENT SHALL BE 6" WIDER THAN EXISTING TIMBER PILE. FIELD VERIFY DIMENSION AND ADJUST BAR 300 ACCORDINGLY.

NUMBER OF BAR 300 EQUALS LENGTH OF ENCASEMENT + 1. SPACING SHALL BE 12" ±.



BAR 400



BAR 300

NOTE:
TIMBER PILE ENCASEMENT IS TO BE USED ONLY AS A TEMPORARY REPAIR AND SHALL NOT EXCEED FIVE YEARS OF SERVICE.

EQUIPMENT

- PERSONAL SAFETY EQUIPMENT AS NEEDED
- PORTABLE AIR COMPRESSOR
- PORTABLE ELECTRIC GENERATOR
- SAND BLASTER / AIR GUN
- MOBILE CONCRETE MIXER
- CONCRETE HAND TOOLS
- MISC. BUCKETS & HAND TOOLS
- DIGGING EQUIPMENT
- ACCESS EQUIPMENT
- CHOP SAW W/ STEEL BLADES
- WELDER / RATCHET STRAPS

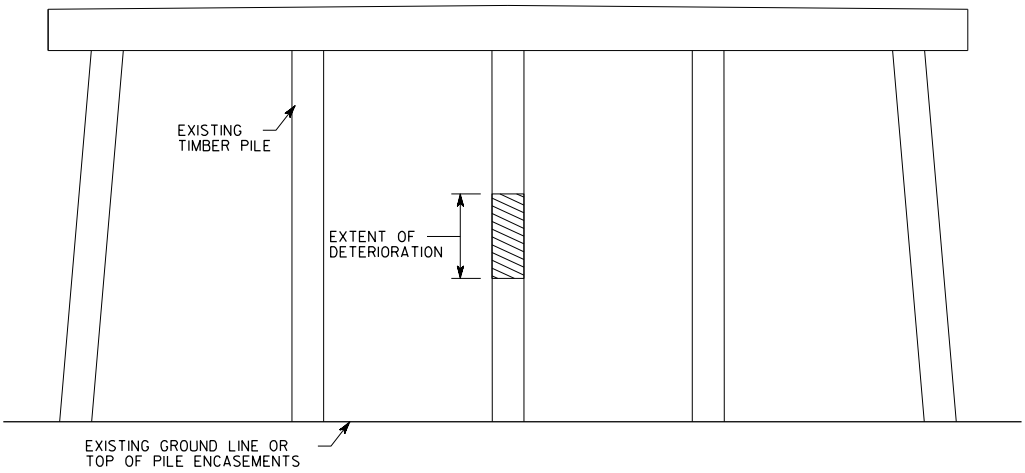
MATERIALS

- CONCRETE
- BAR 300
- BAR 400
- 2'-0"Ø CMP
- TIE WIRE

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION DETAIL
TIMBER PILE SECTION LOSS REPAIR (ENCASEMENT)
NO SCALE
JUNE 2012

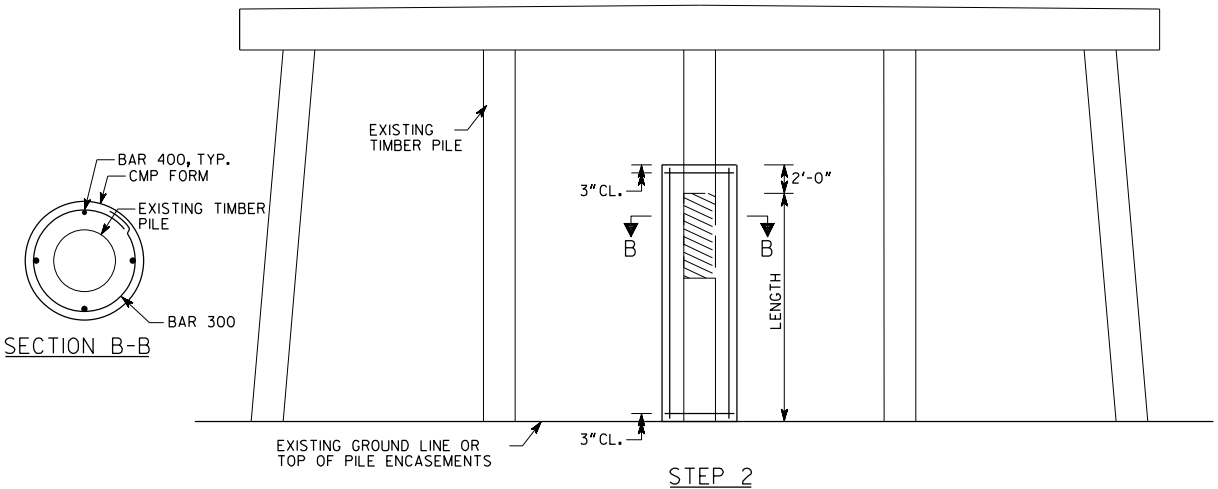
REVISION DATE	DRAWING NO.
	830.11



STEP 1

1. DETERMINE THE DETERIORATED SECTION.

2. DETERMINE LENGTH OF ENCASEMENT.
(ROUND LENGTH TO NEAREST 1' INCREMENT)



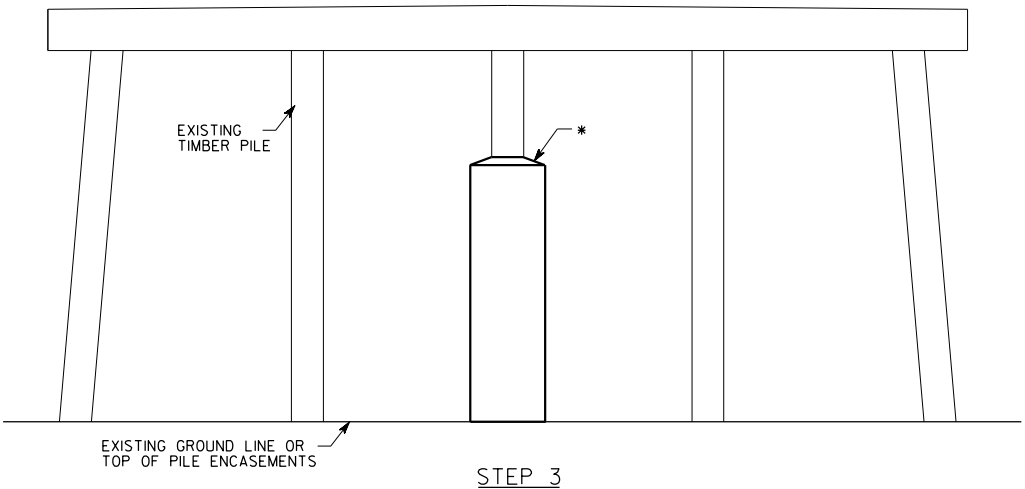
STEP 2

1. SPLICE NEW REINFORCING WITH EXISTING REINFORCEMENT.

2. INSTALL CMP FORMS.

NOTE:
TIMBER PILE ENCASEMENT IS TO BE USED ONLY AS A TEMPORARY REPAIR AND SHALL NOT EXCEED FIVE YEARS OF SERVICE.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL TIMBER PILE SECTION LOSS REPAIR (ENCASEMENT) NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.11



STEP 3

1. PLACE CLASS "A" CONCRETE INTO FORMWORK.
2. * SLOPE TOP OF ENCASEMENT TO ENSURE POSITIVE DRAINAGE.
3. ALLOW CONCRETE TO FULLY CURE.

NOTE:
TIMBER PILE ENCASEMENT IS TO BE USED ONLY AS A TEMPORARY REPAIR AND SHALL NOT EXCEED FIVE YEARS OF SERVICE.

			SHEET 3 OF 3
GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL TIMBER PILE SECTION LOSS REPAIR (ENCASEMENT) NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.11

Activity 830.12 – Timber Pile Swaybracing

Before Repair

After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Material Specifications:

- None

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications

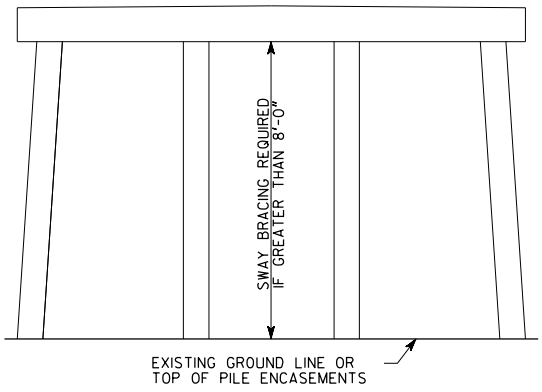
- Section 502 – Timber Structures
- Section 520 – Piling
- Section 860 – Lumber and Timber
- Section 861 – Piling and Round Timber
- Section 861 – Preservative Treatment of Timber Products
- Section 934 – Rapid Setting Patching Material for Portland Cement Concrete

Georgia Special Provisions & Supplemental Specifications:

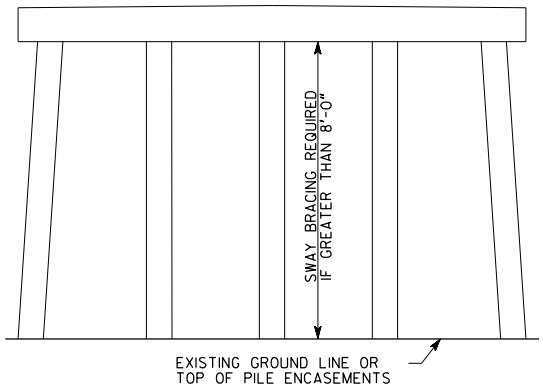
- None

Qualified Products List:

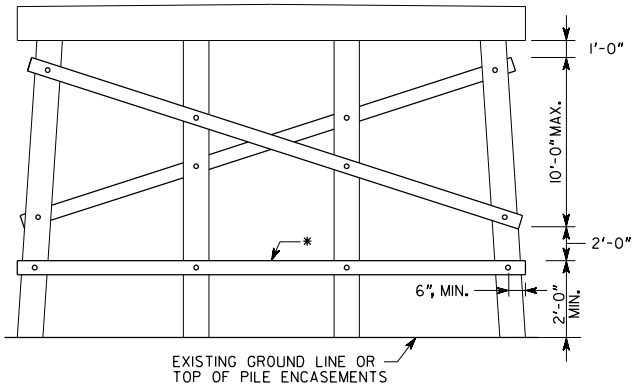
- QPL-50 Wood Preserving Plants



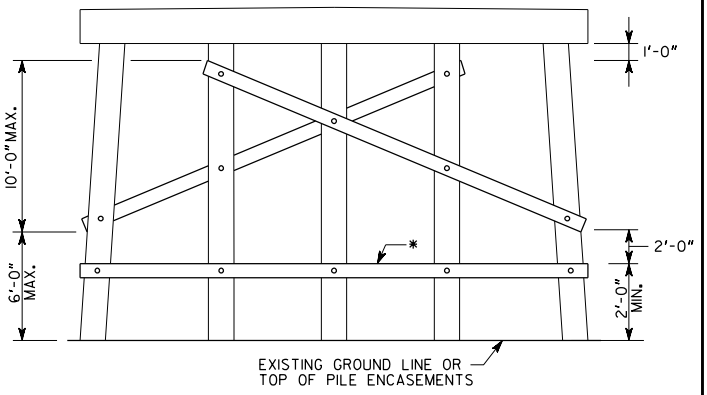
4-PILE BENT
EXISTING CONDITION



5-PILE BENT
EXISTING CONDITION



4-PILE BENT
FINAL CONDITION



5-PILE BENT
FINAL CONDITION

NOTES:
* HORIZONTAL BRACE MAY BE OMITTED IF SWAYBRACE IS WITHIN 6' OF THE GROUNDLINE.

1. 5/8" Ø X 1' - 6" ALL THREAD MAY BE USED IN LIEU OF 5/8" Ø X 1' - 6" BOLT. ADJUST WASHER AND NUT QUANTITY ACCORDINGLY.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
IMPACT DRIVER W/ SOCKETS
ACCESS EQUIPMENT
CIRCULAR SAW W/ WOOD BLADE
MISC. BUCKETS & HAND TOOLS
1/2" ELEC. DRILL W/ 1/2" & 5/8" AUGER BITS
CHAINSAW

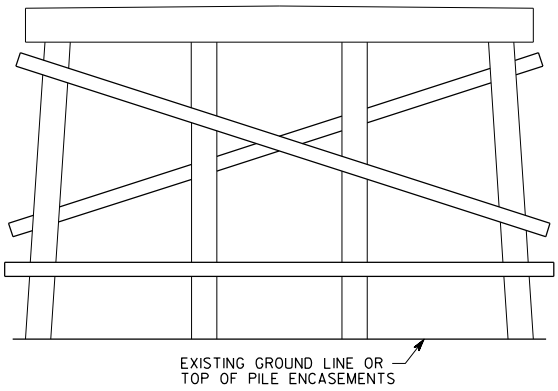
MATERIALS

TREATED 3"X 10" TIMBER
GALVANIZED 5/8"Ø X 1'-6"BOLT
GALVANIZED 5/8"WASHERS
GALVANIZED 5/8"NUTS
HOT MIX OF 60% CREOSOTE MIX WITH 40% ROOFING PITCH
GALVANIZED COLD SPRAY
60d GALVANIZED NAILS
LIQUID NAIL

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

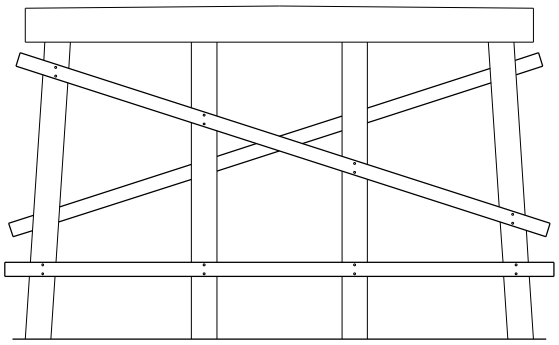
CONSTRUCTION DETAIL
TIMBER PILE SWAYBRACING
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	830.12



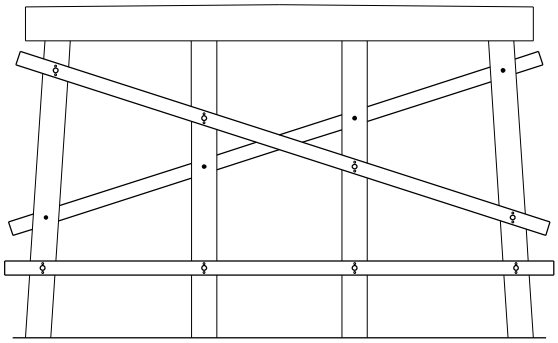
STEP 1

1. DETERMINE LENGTH OF REQUIRED SWAY BRACING.



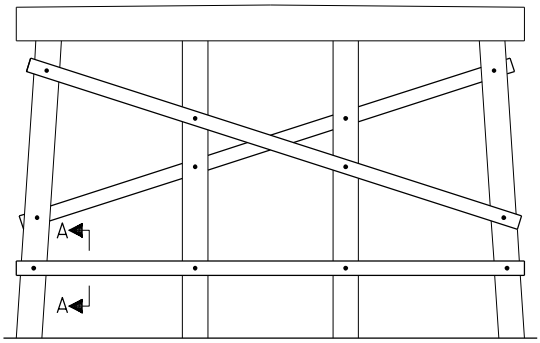
STEP 2

1. USE 2-60 GALVANIZED NAILS AT EACH LOCATION TO SECURE SWAY BRACING FOR INSTALLATION.



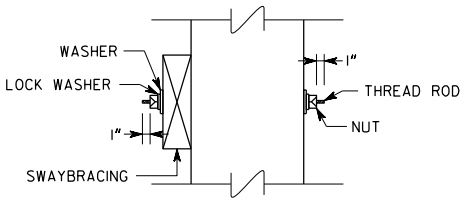
STEP 3

1. DRILL 1" Ø HOLE THROUGH CENTER OF PILE AND BOARD AS REQUIRED.
2. TREAT ALL DRILLED HOLES WITH CREOSOTE OIL.

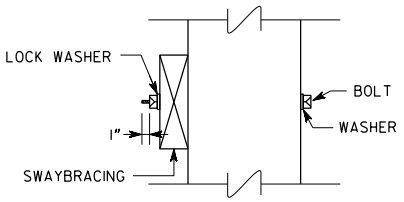


STEP 4

1. ATTACH BRACING WITH 5/8" Ø X 1'-6" BOLT, NUTS & WASHERS.
2. CUT SWAYBRACING FLUSH WITH OUTSIDE OF PILES.
3. CUT BOLT 1" FROM FACE OF NUT. TREAT CUT SECTION OF BOLT WITH GALVANIZING COLD SPRAY.
4. PLUG AND REPAIR ANY REMAINING HOLES OR DAMAGE TO PILE AND SWAY BRACING WITH LIQUID NAIL.



SECTION A-A
OPTION 1



SECTION A-A
(OPTION 2)

NOTE: THESE DETAILS ARE FOR A 4 PILE DETAIL.
5 PILE DETAILS ARE SIMILAR.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL TIMBER PILE SWAYBRACING NO SCALE JUNE 2012	REVISION DATE	SHEET 2 OF 2 DRAWING NO. 830.12

Activity 830.13 – Epoxy Injection (Cap and Columns)

Before Repair

After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Material Specifications:

- None

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

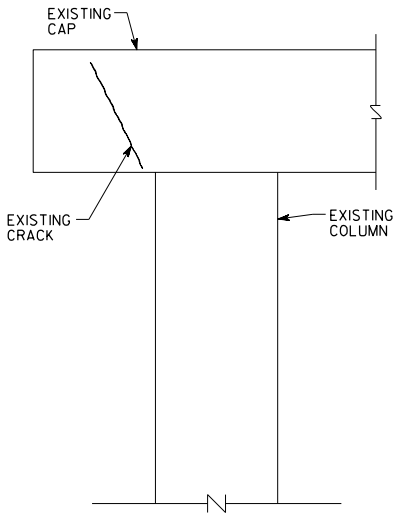
- Section 528 – Epoxy Pressure Injection of Cracks

Georgia Special Provisions & Supplemental Specifications:

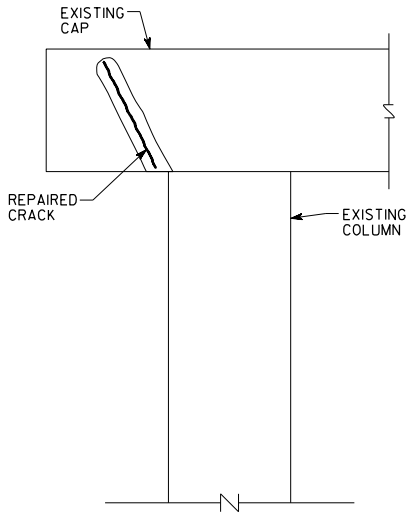
- Section 528 – Epoxy Pressure Injection of Concrete Cracks

Qualified Products List:

- None



EXISTING CONDITION



FINAL CONDITION

NOTE: EPOXY REPAIR ALL CRACKS THAT ARE WIDER THAN 0.013".

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
CONCRETE SAW
SAND BLASTER / AIR GUN
ANGLE GRINDER / ROUTER
WIRE BRUSH
EPOXY INJECTION GUN
DISPOSABLE GLOVES
ACCESS EQUIPMENT
MISC. BUCKETS & HAND TOOLS

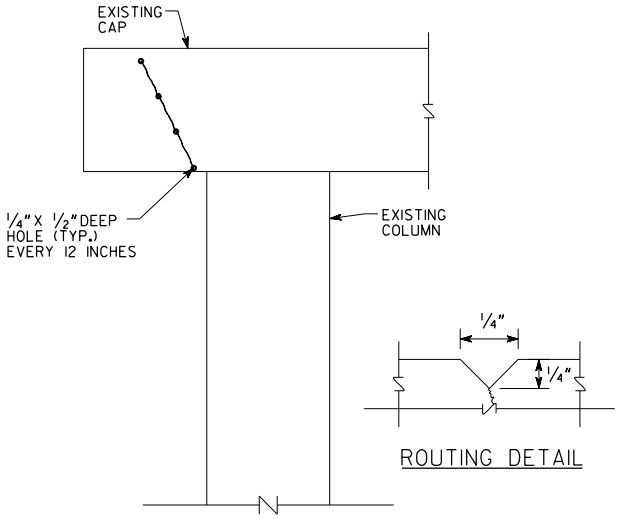
MATERIALS

APPROVED EPOXY
APPROVED MORTAR/PASTE
EPOXY INJECTION TIPS

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION DETAIL
EPOXY INJECTION (CAP AND COLUMNS)
NO SCALE JUNE 2012

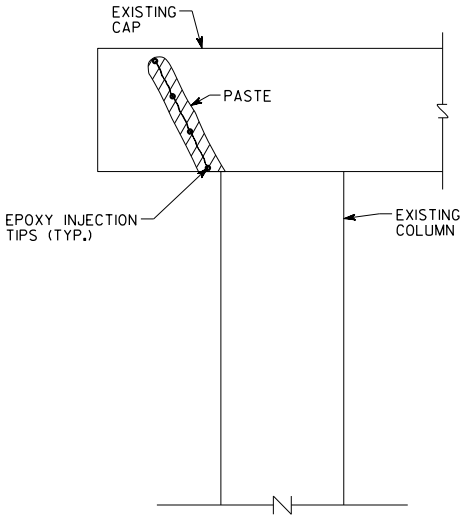
REVISION DATE	DRAWING NO.
	830.13



ROUTING DETAIL

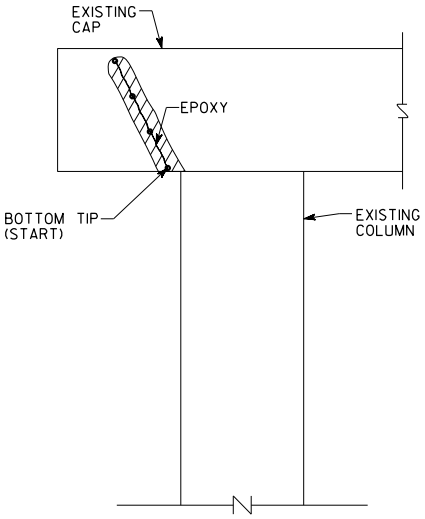
STEP 1

1. DEFINE LOCATION AND LENGTH OF CRACKS THAT ARE WIDER THAN 0.013" IN THE COLUMNS AND CAPS.
2. USE ROUTER ON ENTIRE LENGTH OF CRACKS TO BE EPOXY INJECTED. CLEAN AREA WITH WIRE BRUSH AND COMPRESSED AIR.
3. LOCATE CRACKS THAT EXTEND INTO THE CONCRETE BEYOND ROUTED DEPTH AND MARK HOLES FOR EPOXY INJECTION.
4. DRILL 1/4" X 1/2" DEEP HOLES IN CRACKS FOR EPOXY INJECTION TIPS. (DRILL HOLES APPROXIMATELY EVERY 12 INCHES)



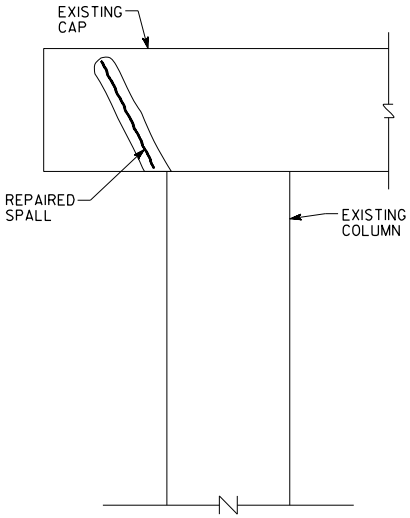
STEP 2

1. INSTALL EPOXY INJECTION TIPS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. OVERLAY ROUTED CRACKS WITH PASTE.
3. ALLOW TO FULLY CURE.



STEP 3

1. STARTING AT THE BOTTOM TIP, PRESSURE INJECT CRACK UNTIL EPOXY COMES OUT OF THE NEXT TIP.
2. IF EPOXY LEAKS OUT OF PASTE OVER AREA, STOP PROCEDURE AND REAPPLY ADDITIONAL PASTE.
3. CONTINUE THIS PROCEDURE UNTIL EPOXY COMES OUT OF LAST TIP.



STEP 4

1. REMOVE TIPS FLUSH WITH THE EXISTING CONCRETE.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL EPOXY INJECTION (CAP AND COLUMNS) NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.13

Activity 830.14 – Cap-Column Spall Repair – Full Depth

Before Repair

After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Thoroughly clean existing reinforcement of concrete scale and rust by sand blasting before bonding into new construction.

Material Specifications:

- Concrete: Class AA, f'_c = 3,500 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

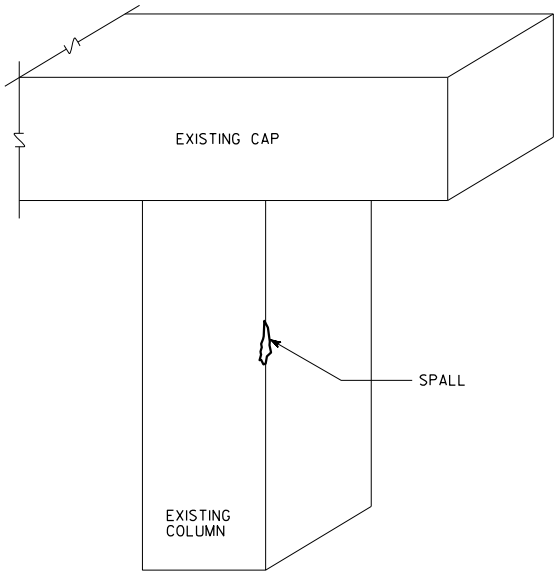
- Section 500 – Concrete Structures
- Section 504 – Twenty-Four Hour Accelerated Strength Concrete
- Section 886 – Epoxy Resin Adhesive
- Section 934 – Rapid Setting Patching Material for Portland Cement Concrete

Georgia Special Provisions & Supplemental Specifications:

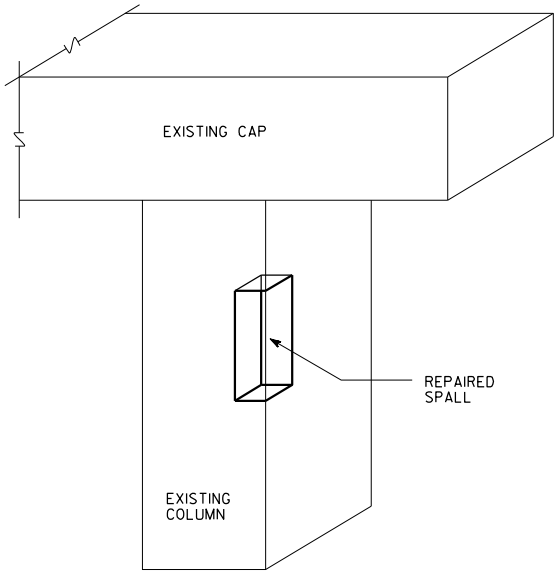
- Section 521 – Patching Concrete Bridge

Qualified Products List:

- QPL-10 List of Approved Concrete Plants
- QPL-15 Epoxy Resin Adhesives
- QPL-27 Rapid Setting Patching Material



EXISTING CONDITION



FINAL CONDITION

NOTE:

1. ALL DAMAGE TO EXISTING REINFORCEMENT MUST BE REPAIRED BY REPLACING DAMAGED AREA OF REINFORCEMENT WITH APPROPRIATE SIZE OF BAR LONG ENOUGH TO OVERLAP UNDAMAGED REINFORCEMENT BY 18" IN BOTH DIRECTIONS.

2. REMOVE ALL DAMAGED MATERIAL TO SOUND SOLID CONCRETE.

3. IF EXISTING REINFORCEMENT IS NOT EXPOSED AFTER REMOVAL TO SOUND CONCRETE, REPAIR SPALL IN ACCORDANCE TO ACTIVITY 830.15.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
CONCRETE SAW
SAND BLASTER / AIR GUN
PNEUMATIC CHIPPING HAMMER
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
MISC. BUCKETS & HAND TOOLS
CHOP SAW W/ STEEL BLADES

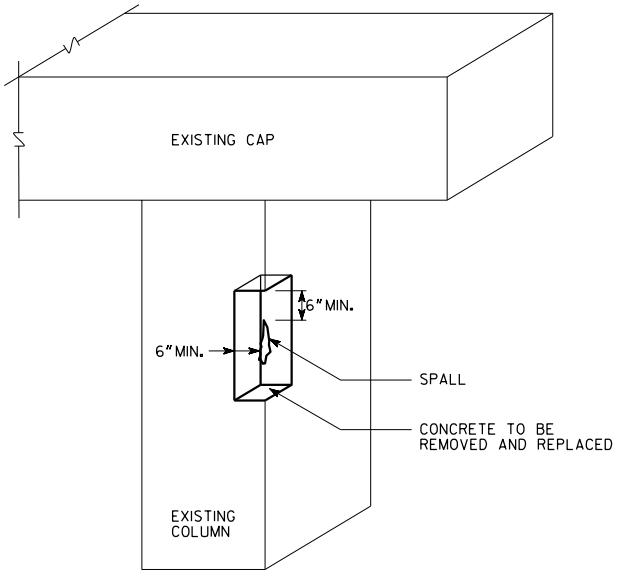
MATERIALS

RAPID SET PATCHING MATERIAL
TYPE II EPOXY RESIN ADHESIVE, IF REQUIRED
SANDBLAST MEDIA
FORMWORK AS NEEDED

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

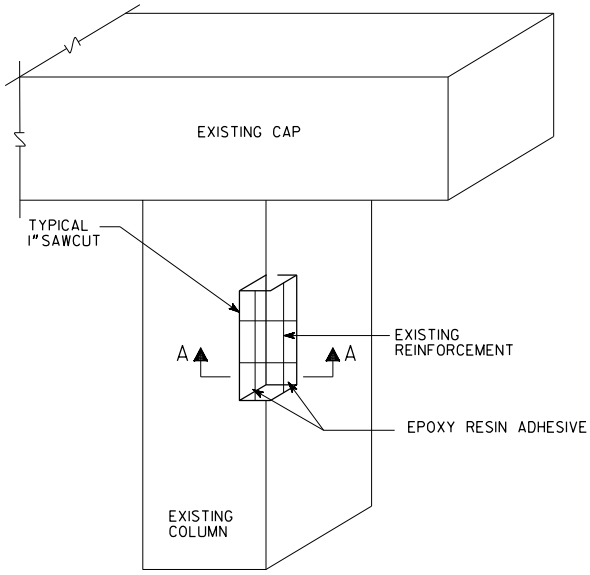
CONSTRUCTION DETAIL
CAP-COLUMN SPALL REPAIR - FULL DEPTH
NO SCALE
JUNE 2012

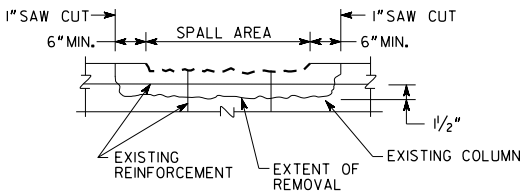
REVISION DATE	DRAWING NO.
	830.14



STEP 1

1. DEFINE LIMITS OF AREA TO BE REPAIRED PLUS 6" ON ALL SIDES.

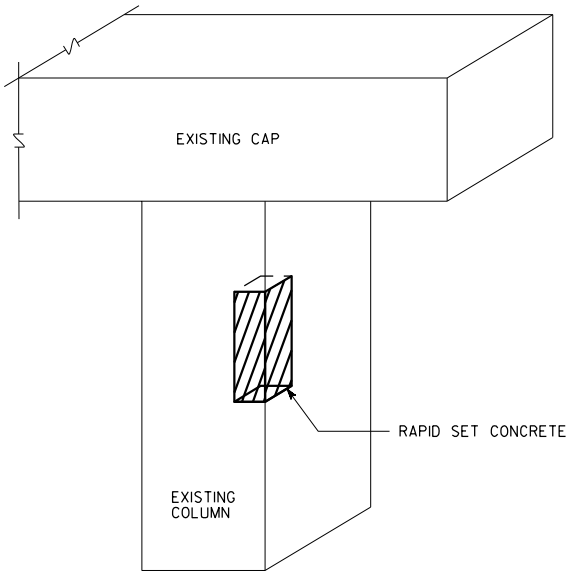




SECTION A-A

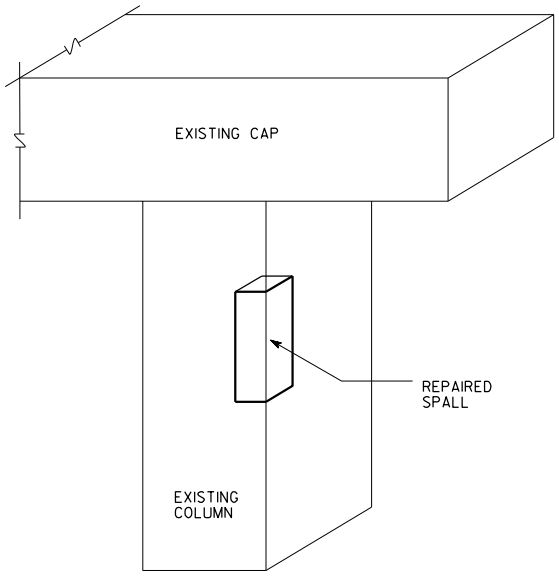
STEP 2

1. SQUARE AND SAW-CUT THE AREA 1"DEEP AROUND THE SPALL PERIMETER REMOVE TO SOUND CONCRETE.
2. CLEAN ANY CORRODED REINFORCING BY SANDBLASTING.
3. USE COMPRESSED AIR TO REMOVE LOOSE CONCRETE DEBRIS.
4. APPLY EPOXY RESIN ADHESIVE TO CONCRETE SURFACE.



STEP 3

1. FILL DAMAGED AREA WITH RAPID SET CONCRETE WHILE EPOXY IS STILL TACKY.
2. FINISH FLUSH WITH THE EXISTING CONCRETE.



STEP 4

1. ALLOW TO FULLY CURE PER MANUFACTURER'S RECOMMENDATIONS.

			SHEET 2 OF 2
GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL CAP-COLUMN SPALL REPAIR - FULL DEPTH NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.14

Activity 830.15 – Cap-Column Spall Repair – Surface

Before Repair

After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Thoroughly clean existing reinforcement of concrete scale and rust by sand blasting before bonding into new construction.

Material Specifications:

- Concrete: Class AA, f'_c = 3,500 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

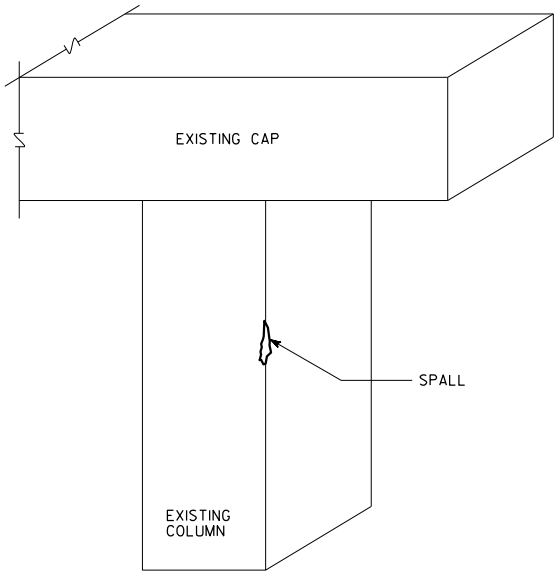
- Section 500 – Concrete Structures
- Section 504 – Twenty-Four Hour Accelerated Strength Concrete
- Section 886 – Epoxy Resin Adhesive
- Section 934 – Rapid Setting Patching Material for Portland Cement Concrete

Georgia Special Provisions & Supplemental Specifications:

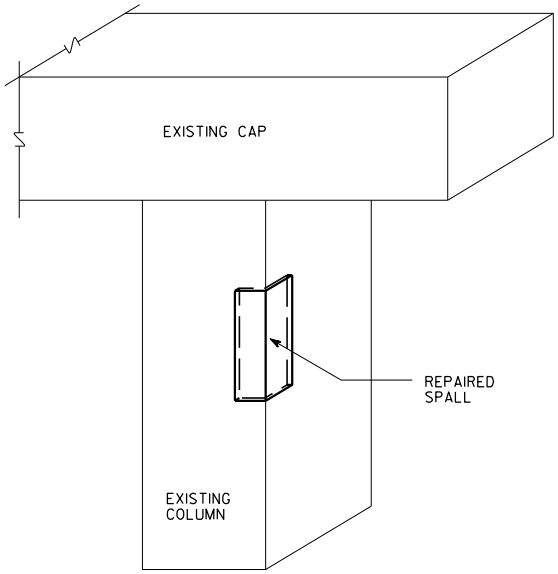
- Section 521 – Patching Concrete Bridge

Qualified Products List:

- QPL-10 List of Approved Concrete Plants
- QPL-15 Epoxy Resin Adhesives
- QPL-27 Rapid Setting Patching Material



EXISTING CONDITION



FINAL CONDITION

NOTE:

1. REMOVE ALL DAMAGED MATERIAL TO SOUND SOLID CONCRETE.

2. IF EXISTING REINFORCEMENT IS EXPOSED AFTER REMOVAL TO SOUND CONCRETE, REPAIR SPALL IN ACCORDANCE TO ACTIVITY 830.14 CAP-COLUMN SPALL REPAIR - FULL DEPTH.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
CONCRETE SAW
SAND BLASTER / AIR GUN
PNEUMATIC CHIPPING HAMMER
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
MISC. BUCKETS & HAND TOOLS

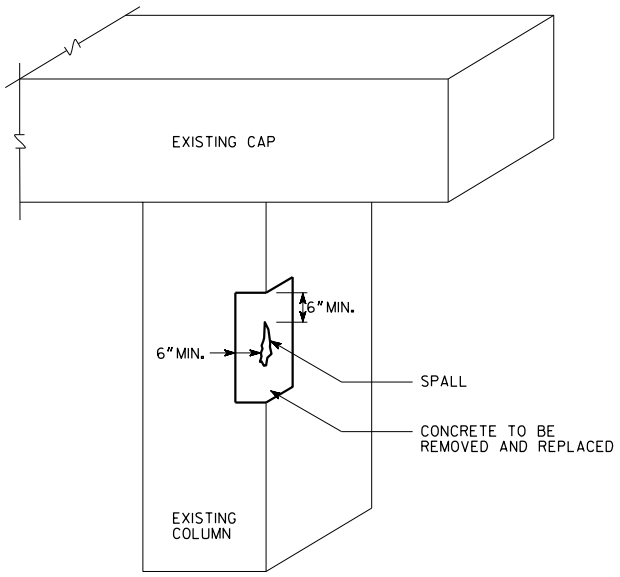
MATERIALS

RAPID SET PATCHING MATERIAL
TYPE II EPOXY RESIN ADHESIVE, IF REQUIRED
SANDBLAST MEDIA
FORMWORK AS NEEDED

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

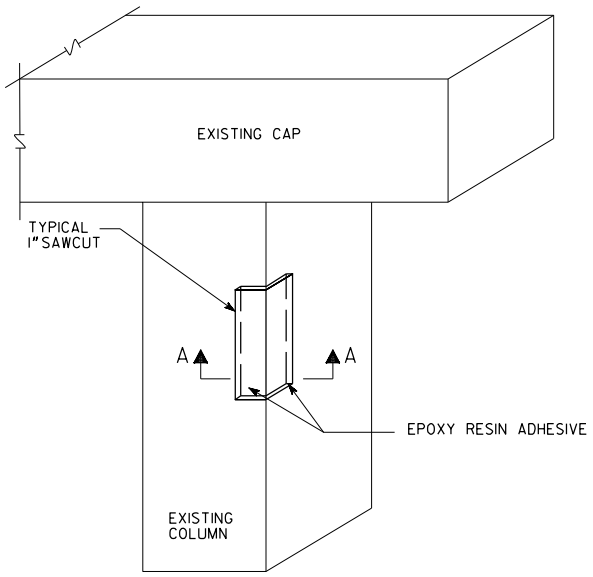
CONSTRUCTION DETAIL
CAP-COLUMN SPALL REPAIR - SURFACE
NO SCALE
JUNE 2012

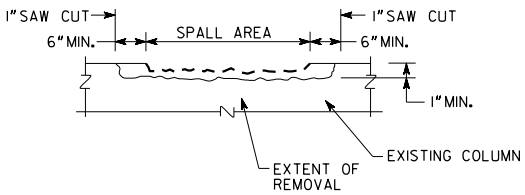
REVISION DATE	DRAWING NO.
	830.15



STEP 1

1. DEFINE LIMITS OF AREA TO BE REPAIRED PLUS 6" ON ALL SIDES.

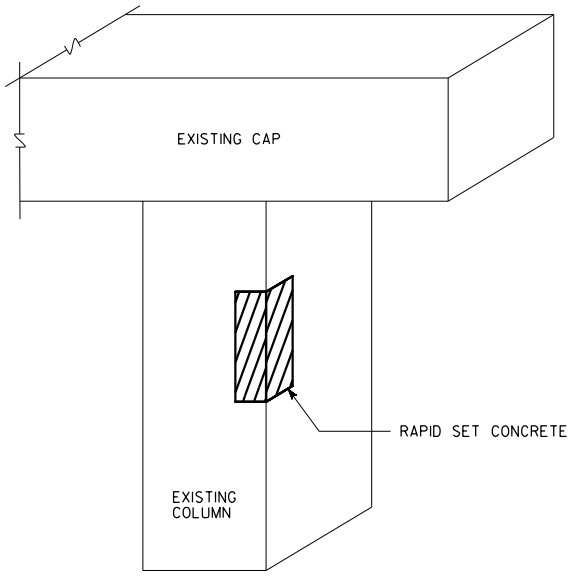




SECTION A-A

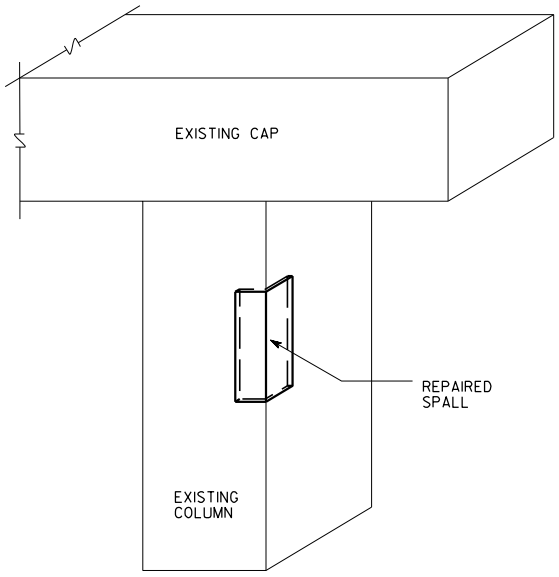
STEP 2

1. SQUARE AND SAW-CUT THE AREA 1"DEEP AROUND THE SPALL PERIMETER REMOVE TO SOUND CONCRETE.
2. USE COMPRESSED AIR TO REMOVE LOOSE CONCRETE DEBRIS.
3. APPLY EPOXY RESIN ADHESIVE TO CONCRETE SURFACE.



STEP 3

1. FILL DAMAGED AREA WITH RAPID SET PATCHING MATERIAL WHILE EPOXY IS STILL TACKY.
2. FINISH FLUSH WITH THE EXISTING CONCRETE.



STEP 4

1. ALLOW TO FULLY CURE PER MANUFACTURER'S RECOMMENDATIONS.

			SHEET 2 OF 2
GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL CAP-COLUMN SPALL REPAIR - SURFACE NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.15

Activity 830.16 - Cap Extension - Widening

Before Repair

After Repairs

General Notes:

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Material Specifications:

- Concrete: Class A, f'_c = 3,000 psi
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications

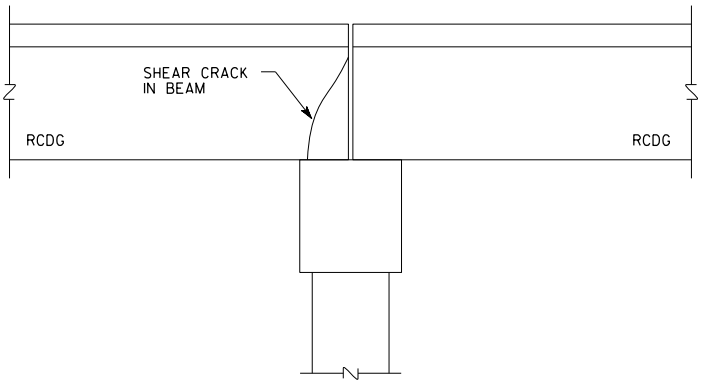
- Section 500 – Concrete Structures
- Section 511 – Reinforcement Steel

Georgia Special Provisions & Supplemental Specifications:

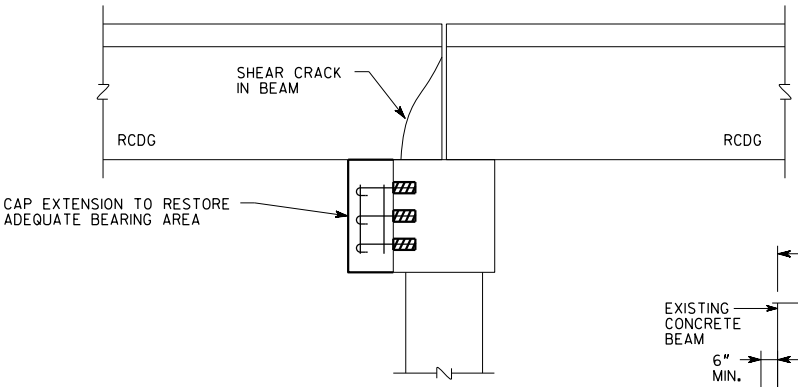
- None

Qualified Products List:

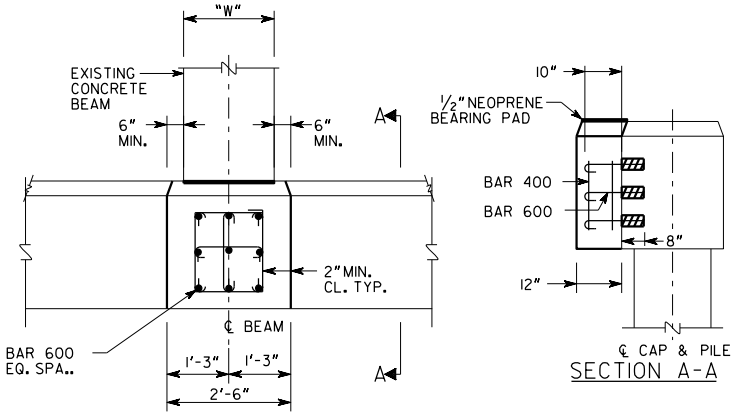
- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-15 Epoxy Resin Adhesives



EXISTING CONDITION



FINAL CONDITION



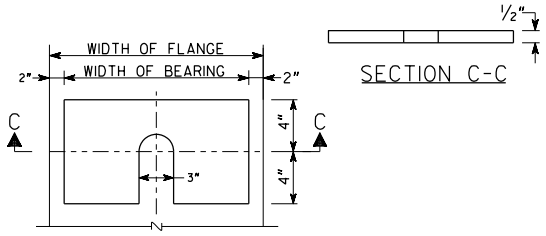
SECTION A-A

CAP EXTENSION DETAILS

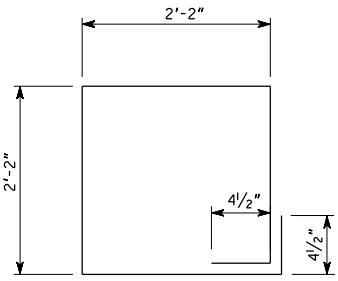
NOTES:

1) BEARING PAD SHALL BE FURNISHED IN ACCORDANCE WITH AASHTO SPECIFICATIONS DIVISION II, SECTION 18, ELASTOMERIC BEARINGS.

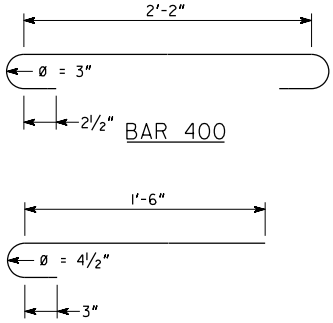
2) BEARING PADS SHALL BE MADE OF 60 DURIMETER HARDNESS NEOPRENE, GRADE 60 OR HARDER.



BEARING PAD



BAR 401



BAR 400

BAR 600

EQUIPMENT

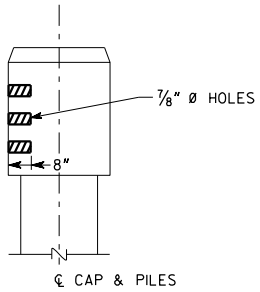
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
CONCRETE SAW
SAND BLASTER / AIR GUN
PNEUMATIC CHIPPING HAMMER
HAMMER DRILL W/ ½" CONC. BIT
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
ACCESS EQUIPMENT
MISC. BUCKETS & HAND TOOLS

MATERIALS

RAPID SET CONCRETE OR CLASS "A" CONCRETE
BAR 400
BAR 401
BAR 600
TYPE II EPOXY RESIN ADHESIVE, IF REQUIRED
TYPE VIII EPOXY
NEOPRENE BEARING PAD
MATERIALS FOR FORMWORK
EPOXY REPAIR MATERIAL

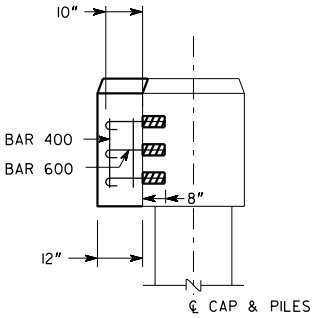
SHEET 1 OF 2

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL CAP EXTENSION - WIDENING NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.16



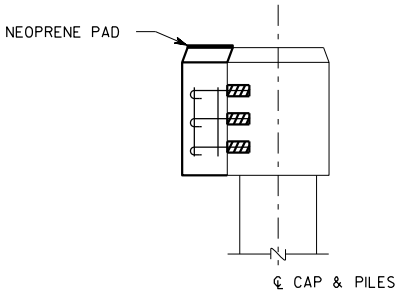
STEP 1

1. DETERMINE THE CAP TO BE WIDENING.
2. DRILL NINE 7/8" Ø HOLES IN CAP FOR #6 REBAR (8" MIN. EMBED) TO BE INSTALLED USING TYPE VIII EPOXY.



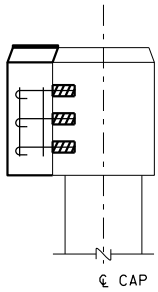
STEP 2

1. CONSTRUCT FORM WORK FROM THE GIVEN DIMENSIONS.
2. PLACE #4 REINFORCING STIRRUPS AROUND BAR 600.



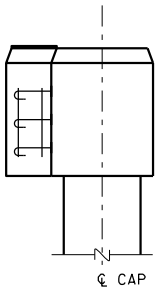
STEP 3

1. JACK BEAM 1/8" OFF EXISTING CAP.
2. USING EPOXY, ATTACH NEOPRENE PAD TO UNDERSIDE OF BEAM OVER NEW CAP EXTENSION. (BEARING PAD SIZE = WIDTH OF BEAM X 10" X 1/2" THICK)
3. APPLY EPOXY RESIN ADHESIVE TO SIDE OF EXISTING CONCRETE CAP.



STEP 4

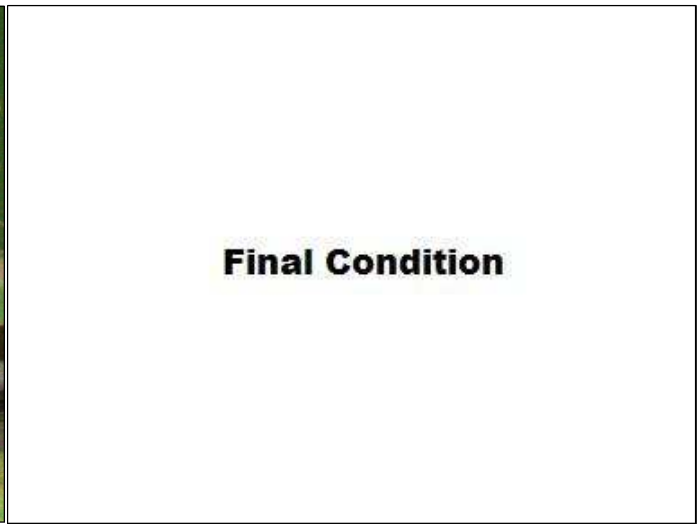
1. POUR RAPID-SET OR CLASS A CONCRETE UP TO BOTTOM OF NEOPRENE PAD WHILE EPOXY IS STILL TACKY.
2. VIBRATE CONCRETE TO REMOVE AIR VOIDS AND CONSOLIDATE CONCRETE AROUND REINFORCING.



STEP 5

1. ALLOW TO FULLY CURE FOLLOWING MANUFACTURER'S RECOMMENDATIONS.
2. REMOVE FORMS.

Activity 830.17 – Anchor Bolt Repair



Before Repair After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Clean and paint all structural steel as shown in the construction details. Work shall be done in accordance with Section 535 of the Georgia DOT Specifications.

Material Specifications:

- Structural Steel: Grade 50, f_y = 50,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Verify presence of lead paint system.

Georgia Standard Specifications

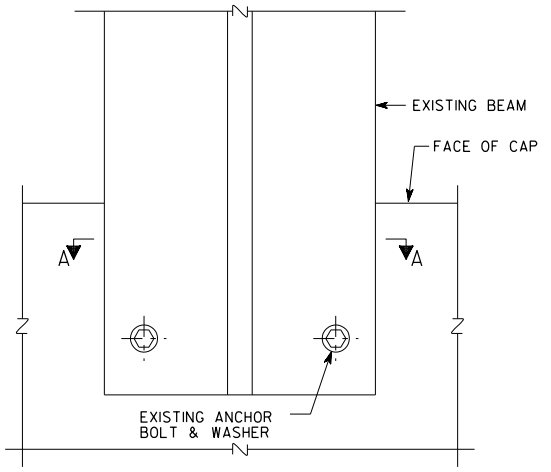
- Section 501 – Steel Structures
- Section 535 – Painting Structures

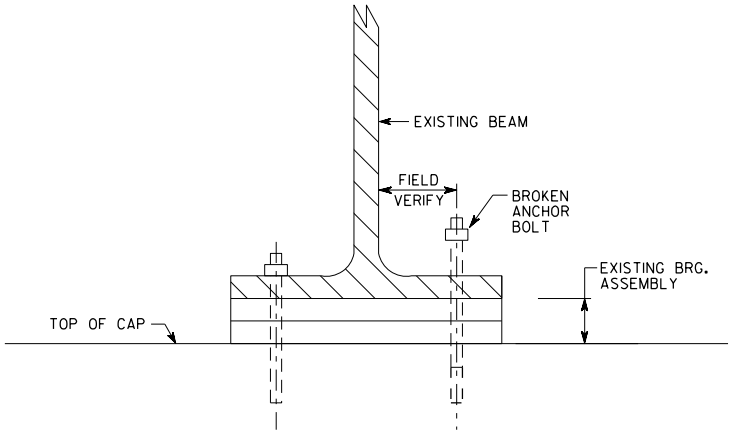
Georgia Special Provisions & Supplemental Specifications:

- None

Qualified Products List:

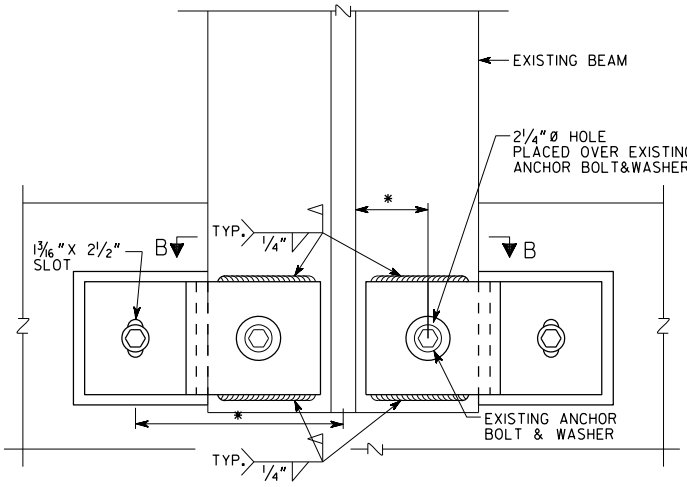
- QPL-59 Miscellaneous Metal Fabricators
- QPL-73 Bridge Paint Systems

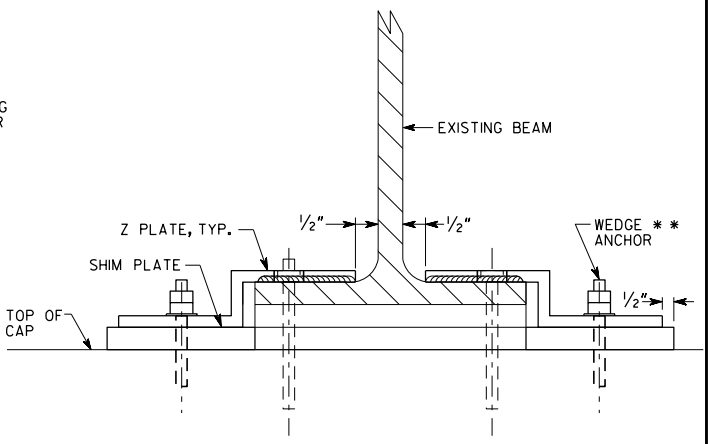




SECTION A-A

EXISTING CONDITION

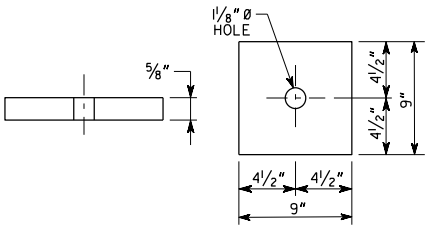




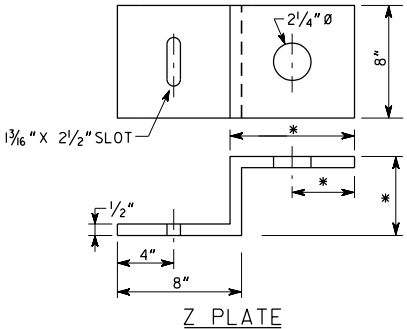
SECTION B-B

* * - LEAVE 1/16" - ⅛" GAP
FOR MOVEMENT

FINAL CONDITION



SHIM PLATE



Z PLATE

NOTE: * DENOTED DIMENSIONS TO BE FIELD VERIFIED PRIOR TO WORK. SHOP PAINT PLATES.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
SAND BLASTER / AIR GUN
HAMMER DRILL W/ 1" CONC. BIT
ANGLE GRINDER
WELDER
ACCESS EQUIPMENT
MISC. BUCKETS & HAND TOOLS

MATERIALS

1"Ø STAINLESS STEEL WEDGE ANCHORS
ADDITIONAL NUT PER ANCHOR
⅝" X 8" X 8" PLATES
FABRICATED Z PLATES
WELDING ELECTRODES
APPROVED PAINT OR SEALANT

SHEET 1 OF 2

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

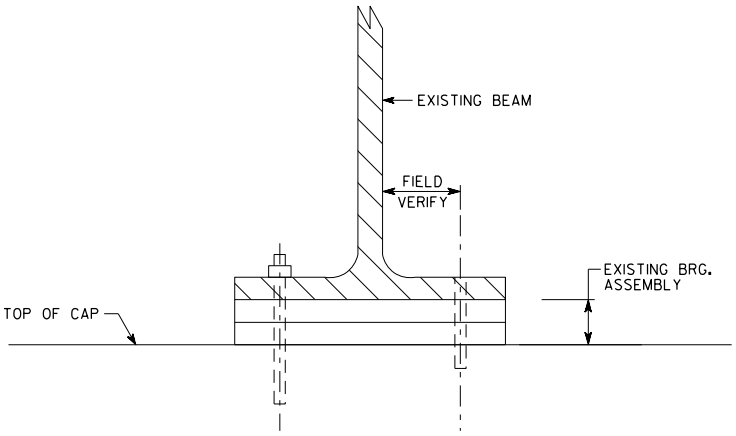
CONSTRUCTION DETAIL
ANCHOR BOLT REPAIR

NO SCALE

JUNE 2012

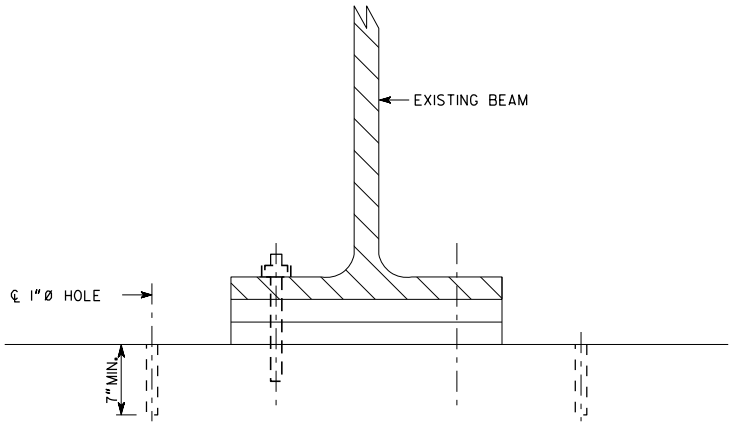
REVISION DATE

DRAWING NO.
830.17



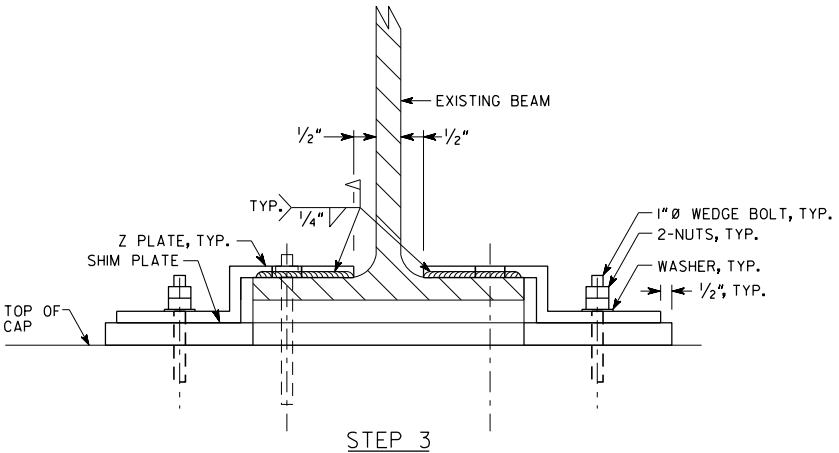
STEP 1

1. DETERMINE IF SINGLE OR DOUBLE ANCHOR BOLT REPLACEMENT.
2. IF SINGLE, EXTERIOR SIDE SHALL BE REPAIRED.
3. FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATING PLATES.



STEP 2

1. OVERLAY PLATES TO LOCATE POSITION OF 1"Ø HOLE.
2. DRILL 1"Ø HOLE MIN. 7" DEEP AND CLEAN OUT WITH COMPRESSED AIR.



STEP 3

1. PLACE PLATES AND INSTALL 1"Ø CONCRETE WEDGE BOLT, WASHER & NUT PER MANUFACTURER'S SPECIFICATIONS. LEAVE 1/16" TO 1/8" GAP FOR MOVEMENT.
2. CLEAN WITH GRINDER AND WELD Z-PLATE TO EXISTING BEAM.
3. APPLY TOUCH UP PAINT.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL ANCHOR BOLT REPAIR NO SCALE JUNE 2012	REVISION DATE	SHEET 2 OF 2 DRAWING NO. 830.17

Activity 830.18 – Endwall Spalls – Full Depth

Before Repair

After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Material Specifications:

- Concrete: Class AA, f'_c = 3,500 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

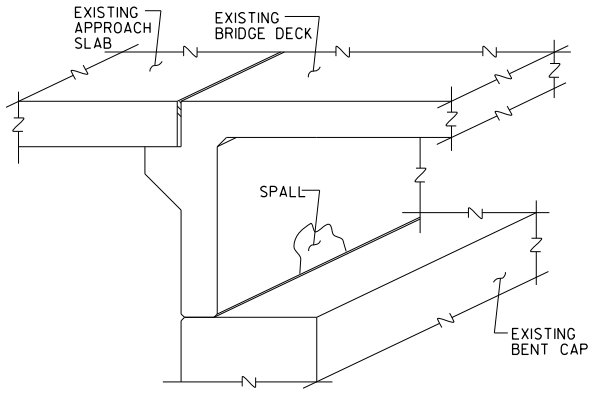
- Section 500 – Concrete Structures
- Section 886 – Epoxy Resin Adhesive
- Section 934 – Rapid Setting Patching Material for Portland Cement Concrete

Georgia Special Provisions & Supplemental Specifications:

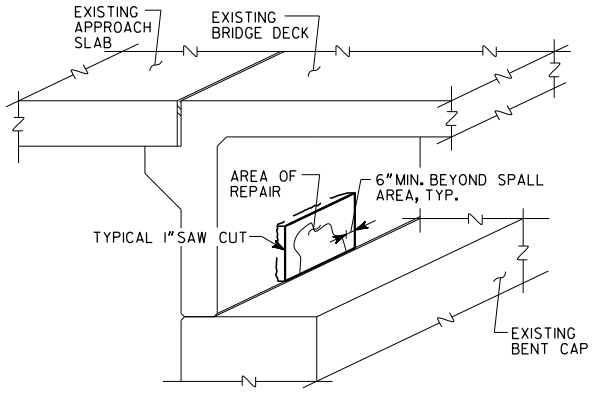
- Section 521 – Patching Concrete Bridge

Qualified Products List:

- QPL-10 List of Approved Concrete Plants
- QPL-15 Epoxy Resin Adhesives
- QPL-27 Rapid Setting Patching Material



EXISTING CONDITION



FINAL CONDITION

EQUIPMENT

PERSONAL SAFETY EQUIPMENT
AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
CONCRETE SAW
SAND BLASTER / AIR GUN
PNEUMATIC CHIPPING HAMMER
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
ACCESS EQUIPMENT
MISC. BUCKETS & HAND TOOLS

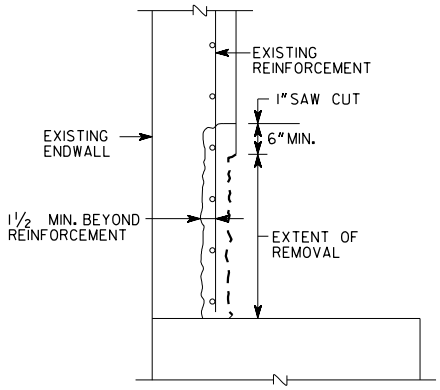
MATERIALS

RAPID SET PATCHING MATERIAL
TYPE II EPOXY RESIN ADHESIVE, IF REQUIRED
MATERIALS FOR FORMWORK

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

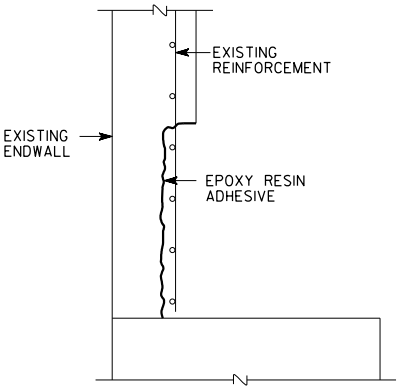
CONSTRUCTION DETAIL
ENDWALL SPALLS - FULL DEPTH
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	830.18



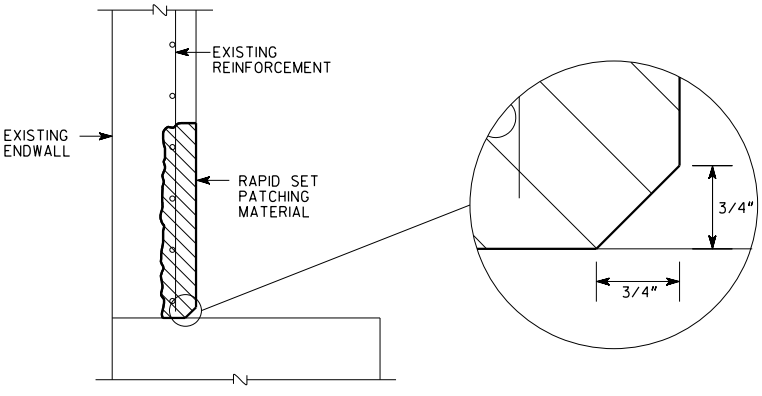
STEP 1

1. DEFINE LIMITS OF REMOVAL THAT WILL ENCOMPASS THE SPALL AREA PLUS 6"MIN. ON ALL SIDES.
2. * * SAW-CUT THE FACE OF ENDWALL 1"DEEP ALONG DETERMINED LIMITS OF REMOVAL. ALL SAW-CUTS SHALL BE RECTANGLE SHAPE.
3. REMOVE ALL CONCRETE WITHIN LIMITS OF REMOVAL DOWN TO A MINIMUM DEPTH OF 1½"BEYOND FIRST MAT OF REINFORCING STEEL TAKE CARE NOT TO DAMAGE EXISTING REINFORCING BARS.
4. CLEAN ANY CORRODED REINFORCING BY SANDBLASTING.
5. USE COMPRESSED AIR REMOVE DUST AND LOOSE CONCRETE DEBRIS.



STEP 2

1. APPLY EPOXY RESIN ADHESIVE TO CONCRETE SURFACE.



STEP 3

1. FILL DAMAGED AREA WITH RAPID SET PATCHING MATERIAL WHILE EPOXY IS STILL TACKY.
2. FINISH FLUSH TO EXISTING ENDWALL.
3. ALLOW TO FULLY CURE FOLLOWING MANUFACTURER'S RECOMMENDATIONS.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL ENDWALL SPALLS - FULL DEPTH NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.18

Activity 830.19 – Endwall Spalls – Surface

Before Repair

After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Material Specifications:

- Concrete: Class AA, f'_c = 3,500 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

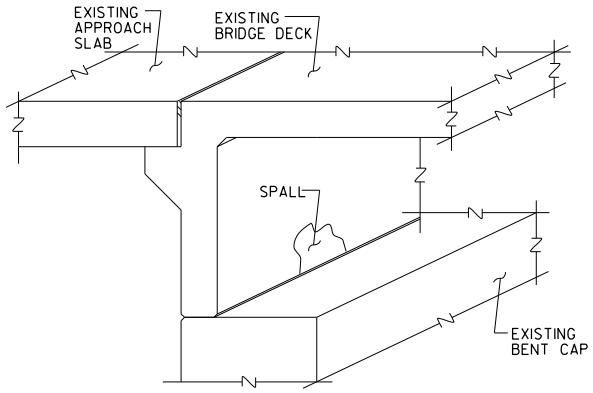
- Section 500 – Concrete Structures
- Section 886 – Epoxy Resin Adhesive
- Section 934 – Rapid Setting Patching Material for Portland Cement Concrete

Department of Transportation State of Georgia Special Provisions & Supplemental Specifications:

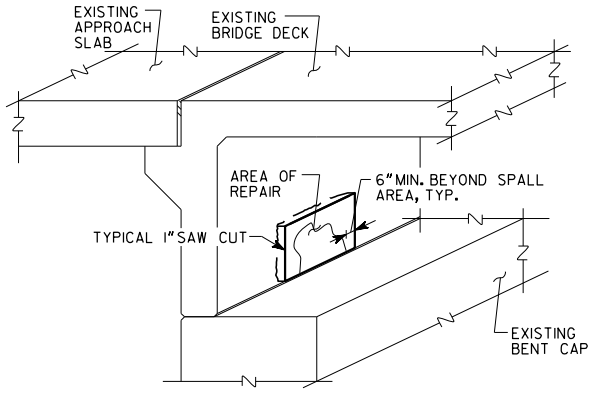
- Section 521 – Patching Concrete Bridge

Qualified Products List:

- QPL-10 List of Approved Concrete Plants
- QPL-15 Epoxy Resin Adhesives
- QPL-27 Rapid Setting Patching Material



EXISTING CONDITION



FINAL CONDITION

EQUIPMENT

PERSONAL SAFETY EQUIPMENT
AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
CONCRETE SAW
SAND BLASTER / AIR GUN
PNEUMATIC CHIPPING HAMMER
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
ACCESS EQUIPMENT
MISC. BUCKETS & HAND TOOLS

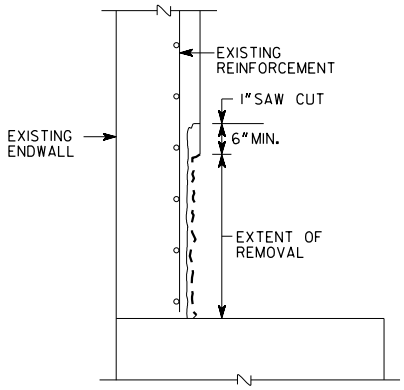
MATERIALS

RAPID SET PATCHING MATERIAL
TYPE II EPOXY RESIN ADHESIVE, IF REQUIRED
MATERIALS FOR FORMWORK

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

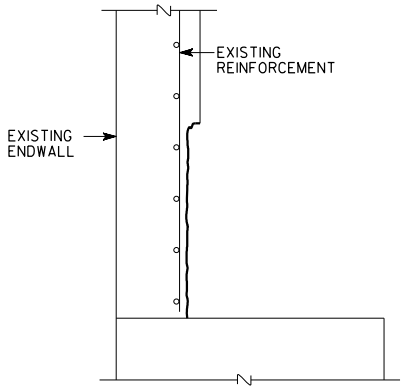
CONSTRUCTION DETAIL
ENDWALL SPALLS - SURFACE
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	830.19



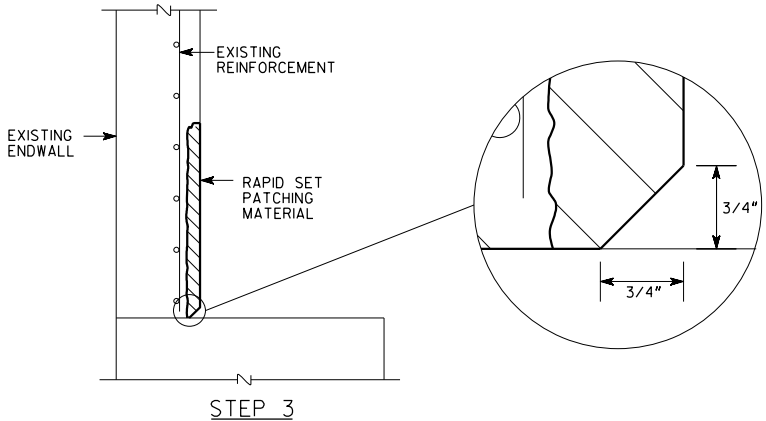
STEP 1

1. DEFINE LIMITS OF REMOVAL THAT WILL ENCOMPASS THE SPALL AREA PLUS 6"MIN. ON ALL SIDES.
2. SAW-CUT THE FACE OF ENDWALL 1"DEEP ALONG DETERMINED LIMITS OF REMOVAL. ALL SAW-CUTS SHALL BE RECTANGLE SHAPE.
3. REMOVE ALL CONCRETE WITHIN LIMITS OF REMOVAL DOWN TO SOUND CONCRETE.
4. USE COMPRESSED AIR REMOVE DUST AND LOOSE CONCRETE DEBRIS.



STEP 2

1. APPLY EPOXY RESIN ADHESIVE TO CONCRETE SURFACE.



STEP 3

1. FILL DAMAGED AREA WITH RAPID SET PATCHING MATERIAL WHILE EPOXY IS STILL TACKY.
2. FINISH FLUSH TO EXISTING ENDWALL.
3. ALLOW TO FULLY CURE FOLLOWING MANUFACTURER'S RECOMMENDATIONS.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL ENDWALL SPALLS - SURFACE NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.19

Activity 830.20 – Beam Web Section Loss Repair

Before Repair

After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

All welding shall be performed by certified welders that have in their possession a current welding certification card issued by the Office of Materials and Research. Use only e70xx (excluding e7014 and e7024) low hydrogen electrodes for manual shielded metal arc welding.

Clean and paint all structural steel as shown in the construction details. Work shall be done in accordance with Section 535 of the Georgia DOT Specifications.

Do not use this detail for weathering steel.

Material Specifications:

- Structural Steel: Grade 50, f_y = 50,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Verify presence of lead paint system.

Georgia Standard Specifications

- Section 501 – Steel Structures
- Section 535 – Painting Structures

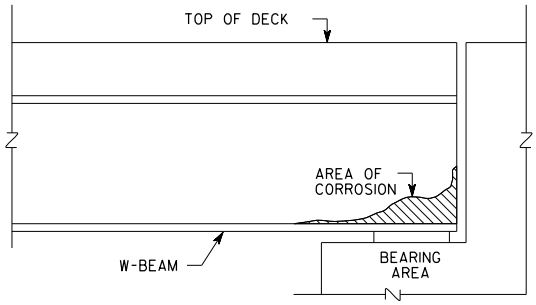
Georgia Special Provisions & Supplemental Specifications:

- None

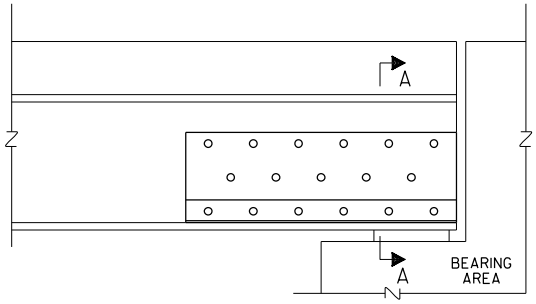
Qualified Products List:

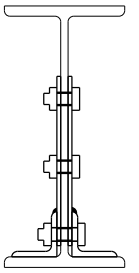
- QPL-59 Miscellaneous Metal Fabricators
- QPL-73 Bridge Paint Systems

= AREA OF DETERIORATION OR SECTION LOSS



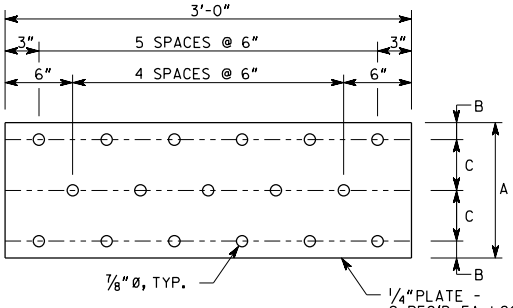
EXISTING CONDITION

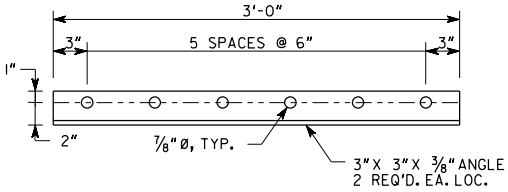




SECTION A-A

FINAL CONDITION





X	A	B	C
21"-24"	20"	1 1/2"	8 1/2"
24"-30"	24"	1 1/2"	10 1/2"
30"-34"	30"	1 1/2"	13 1/2"

NOTE:

1. IF SECTION LOSS IS GREATER THAN 50%, CONTACT THE STATE BRIDGE MAINTENANCE ENGINEER FOR DIRECTION.
2. IF LENGTH OF DETERIORATION IS GREATER THAN 3'-0", CONTACT THE STATE BRIDGE MAINTENANCE ENGINEER FOR DIRECTION.

FABRICATION DETAILS

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
SAND BLASTER / AIR GUN
ANGLE GRINDER W/ ABRA. DISC
IMPACT WRENCH W/ SOCKETS
ACCESS EQUIPMENT
MISC. BUCKETS & HAND TOOLS
DRILL & 13/16 "Ø DRILL BITS

MATERIALS

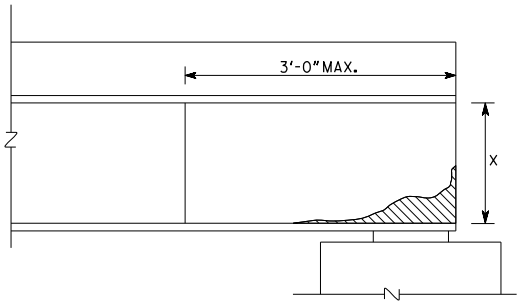
FABRICATED 1/4"PLATES
FABRICATED 3"X 3"X 3/8"ANGLES
3/4"WASHERS
3/4"LOCK WASHERS
3/4"NUTS
3/4"X 2 1/2"BOLTS
APPROVED PAINT OR SEALANT
WELDING ELECTRODES

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION DETAIL
BEAM WEB SECTION LOSS REPAIR
NO SCALE
JUNE 2012

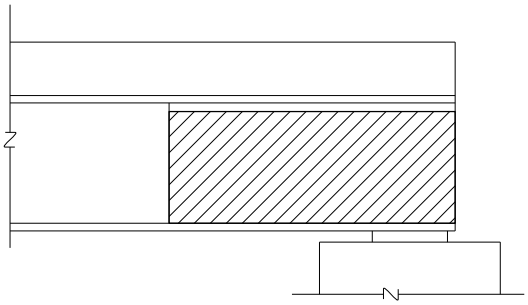
REVISION DATE

DRAWING NO.
830.20



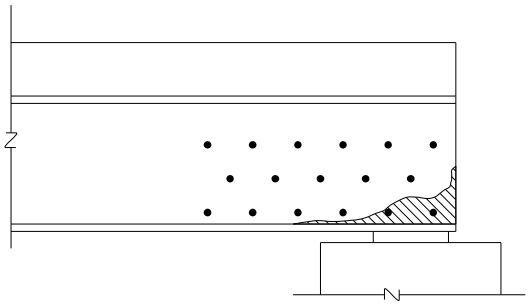
STEP 1

1. USING DIMENSION TABLE SHOWN ON FABRICATION DETAILS, DETERMINE DIMENSIONS OF PLATES TO BE USED AND HAVE PLATES PREFABRICATED.
2. FABRICATE ANGLE AS DESCRIBED IN FABRICATION DETAILS.
3. SHOP PAINT ALL FABRICATED PIECES.



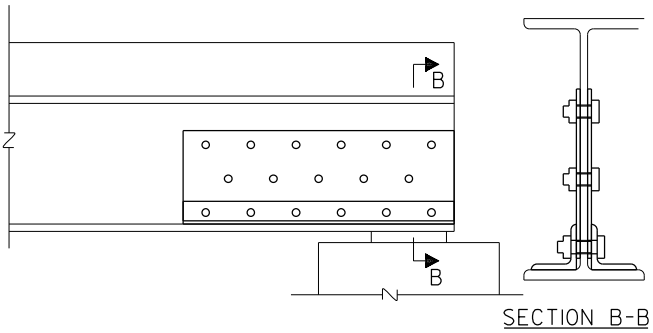
STEP 2

1. BY EITHER GRINDING OR SANDBLASTING, REMOVE ALL LOOSE PAINT, DEBRIS AND CORROSION FROM AREA WHERE COVERPLATE IS TO BE INSTALLED.



STEP 3

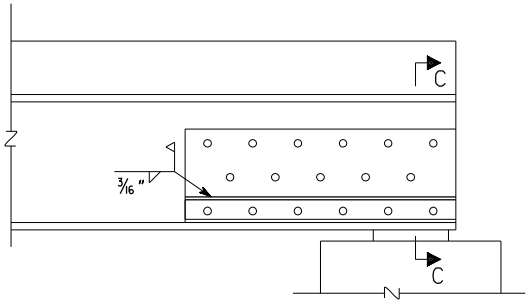
1. USING FABRICATED PLATE AS A TEMPLATE, LOCATE AND DRILL $\frac{7}{8}$"Ø HOLES IN WEB OF EXISTING BEAM DO NOT USE CUTTING TORCH. (BE SURE PLATE IS FLAT AND SQUARE AGAINST WEB OF EXISTING BEAM)
2. PAINT ENTIRE CLEANED AREA OF BEAM.

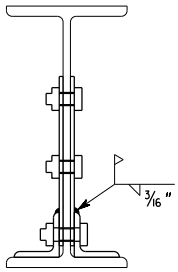


SECTION B-B

STEP 4

1. ATTACH COVERPLATES AND ANGLES USING $\frac{3}{4}$"Ø BOLTS, FLAT WASHERS, LOCK WASHER AND NUTS. (BOTTOM LEG OF ANGLE SHOULD BE IN FULL CONTACT WITH THE TOP FACE OF BEAMS BOTTOM FLANGE)
2. TIGHTEN ALL BOLTS IN ACCORDANCE WITH SECTION 501.3.03 "INSTALLATION METHOD TESTING FOR BOLTED CONSTRUCTION" OF THE GEORGIA STANDARD SPECIFICATIONS.

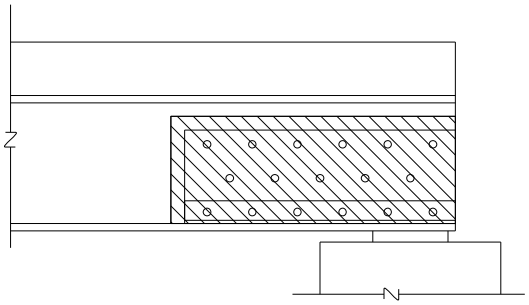




SECTION C-C

STEP 5

1. WELD TOP LEGS OF BOTH ANGLES TO FACE OF PLATE.
2. WELD FULL LENGTH OF PLATE AND ANGLE.



STEP 6

1. PAINT ALL PLATES ANGLES AND BOLTS.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL BEAM WEB SECTION LOSS REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.20

Activity 830.21 – Prestressed Beam Hits

Before Repair

After Repairs

General Notes:
None.

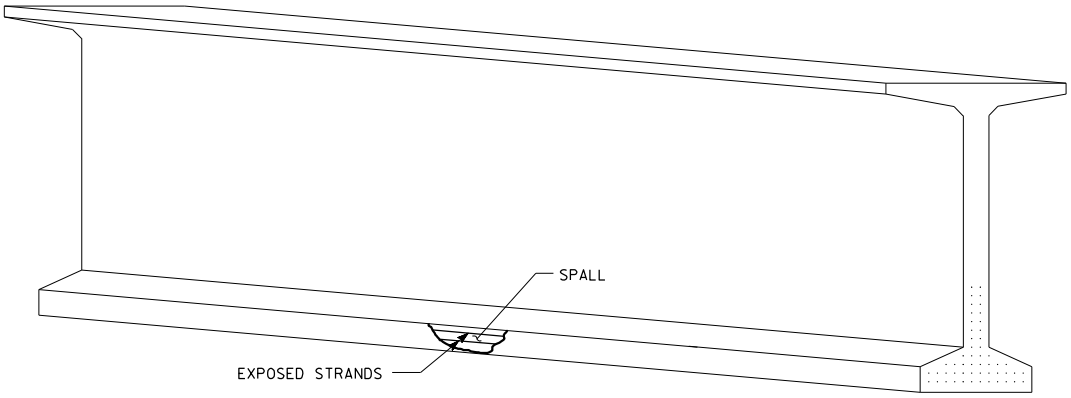
Material Specifications:
- None

Safety
- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

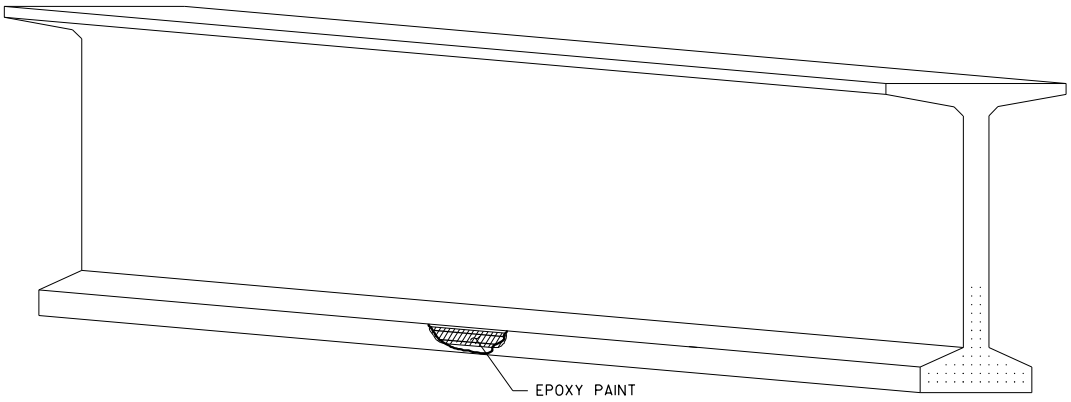
Georgia Standard Specifications
- None

Georgia Special Provisions & Supplemental Specifications:
- None

Qualified Products List:
- None



EXISTING CONDITION



FINAL CONDITION

NOTES: 1. IF STRANDS ARE FULLY EXPOSED AND/OR DAMAGED, CONTACT THE STATE BRIDGE MAINTENANCE ENGINEER IMMEDIATELY.

2. IF STRANDS ARE PARTIALLY EXPOSED AND NOT DAMAGED, CLEAN STRANDS WITH WIRE BRUSH TO REMOVE ANY RUST ON THE STRANDS, USE COMPRESSED AIR TO REMOVE ALL DEBRIS AND COAT THE DAMAGED AREA WITH EPOXY PAINT.

3. IF BEAM HAS BEEN HIT, AND NO STRANDS ARE VISIBLE, DO NOTHING.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
WIRE BRUSH / AIR GUN
MISC. BUCKETS & HAND TOOLS
ACCESS EQUIPMENT
ANGLE GRINDER W/ ABRA. DISC
MISC. BUCKETS & HAND TOOLS

MATERIALS

EPOXY PAINT

SHEET 1 OF 1

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION DETAIL
PRESTRESSED BEAM HITS

NO SCALE

JUNE 2012

REVISION	DATE

DRAWING NO. 830.21

Activity 830.22 – Spall Repair of RCDG

Before Repair After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Thoroughly clean existing reinforcement of concrete scale and rust by sand blasting before bonding into new construction.

Material Specifications:

- Concrete: Class AA, f'_c = 3,500 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

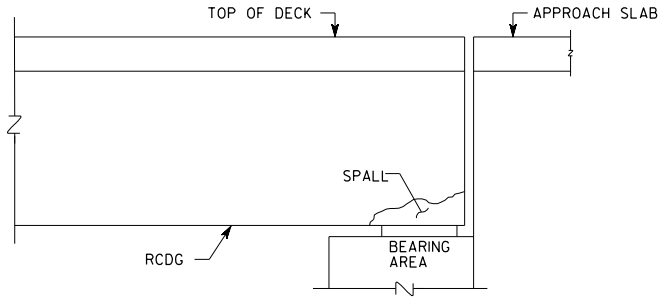
- Section 500 – Concrete Structures
- Section 504 – Twenty-Four Hour Accelerated Strength Concrete
- Section 886 – Epoxy Resin Adhesive
- Section 934 – Rapid Setting Patching Material for Portland Cement Concrete

Georgia Special Provisions & Supplemental Specifications:

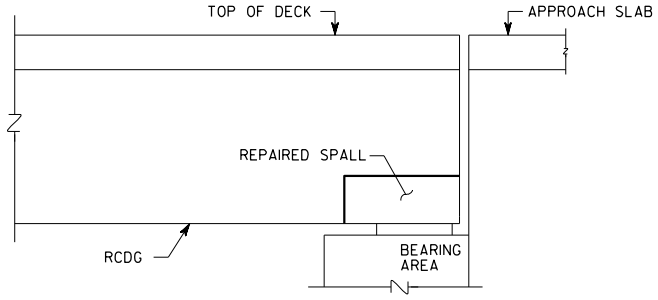
- Section 521 – Patching Concrete Bridge

Qualified Products List:

- QPL-10 List of Approved Concrete Plants
- QPL-15 Epoxy Resin Adhesives
- QPL-27 Rapid Setting Patching Material



EXISTING CONDITION



FINAL CONDITION

NOTE:

1. IF AREA OF DETERIORATION IS GREATER THAN 3 SF, CONTACT STATE BRIDGE MAINTENANCE ENGINEER FOR DIRECTION.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
CONCRETE SAW
SAND BLASTER / AIR GUN
PNEUMATIC CHIPPING HAMMER
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
ACCESS EQUIPMENT
MISC. BUCKETS & HAND TOOLS

MATERIALS

RAPID SET PATCHING MATERIAL
TYPE II EPOXY RESIN ADHESIVE, IF REQUIRED
SANDBLAST MEDIA

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

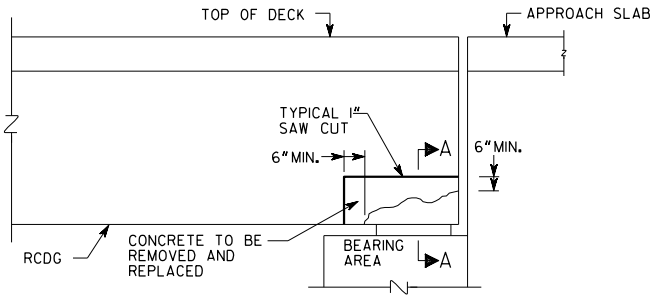
NO SCALE

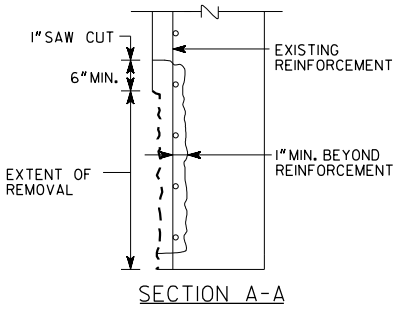
CONSTRUCTION DETAIL
SPALL REPAIR OF RCDG

JUNE 2012

REVISION DATE

DRAWING NO. 830.22

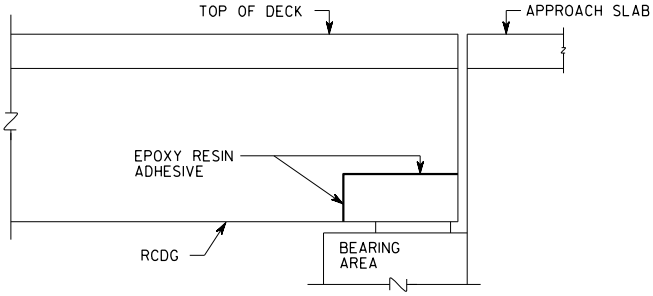




SECTION A-A

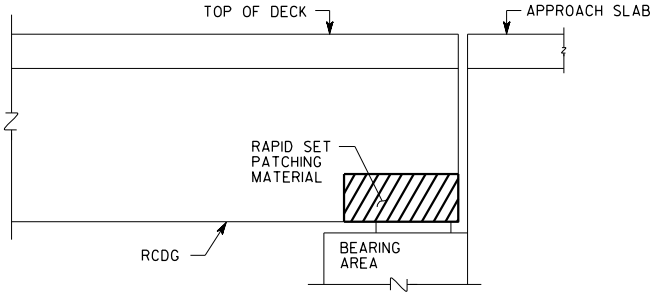
STEP 1

1. DEFINE LIMITS OF AREA TO BE REPAIRED PLUS 6" ON ALL SIDES.
2. SAW-CUT THE AREA 1" DEEP AROUND THE SPALL PERIMETER. ALL SAW-CUTS SHALL BE RECTANGLE SHAPE.
3. REMOVE ALL DETERIORATED CONCRETE TO SOUND CONCRETE.
4. CLEAN ANY CORRODED REINFORCING BY SANDBLASTING.
5. USE COMPRESSED AIR TO REMOVE LOOSE CONCRETE DEBRIS.



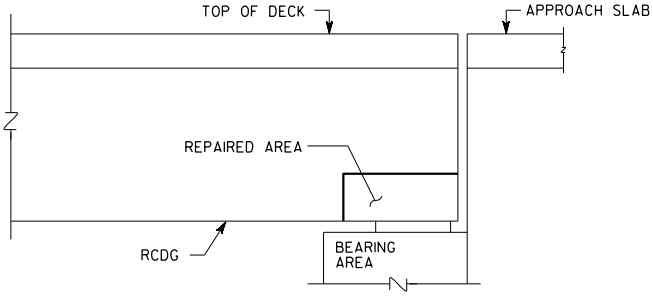
STEP 2

1. APPLY EPOXY RESIN ADHESIVE TO ALL OF THE CONCRETE SURFACE BEING REPAIRED.



STEP 3

1. FILL DAMAGED AREA WITH RAPID SET PATCHING MATERIAL WHILE EPOXY IS STILL TACKY.
2. FINISH FLUSH WITH THE EXISTING BEAM.

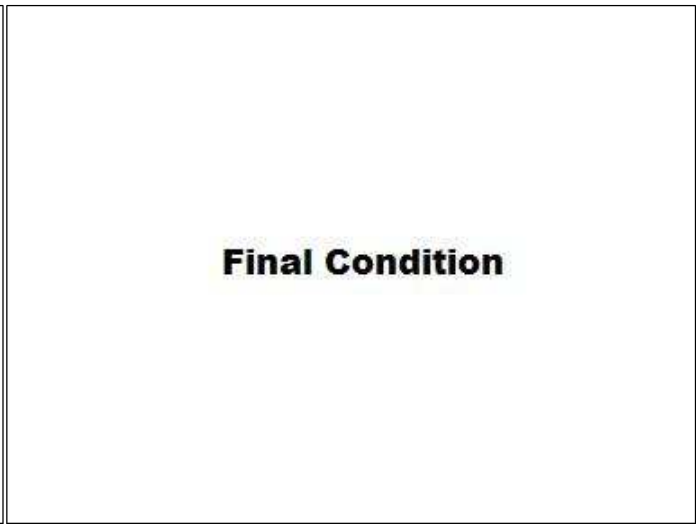


STEP 4

1. ALLOW TO FULLY CURE FOLLOWING MANUFACTURER'S RECOMMENDATIONS.

Activity 830.23 – Bearing Failure Repair Under RCDG

Before Repair



After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Material Specifications:

- None

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

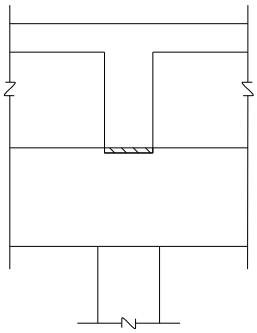
- Section 500 – Concrete Structures
- Section 885 – Elastomeric Bearing Pads
- Section 886 – Epoxy Resin Adhesive

Georgia Special Provisions & Supplemental Specifications:

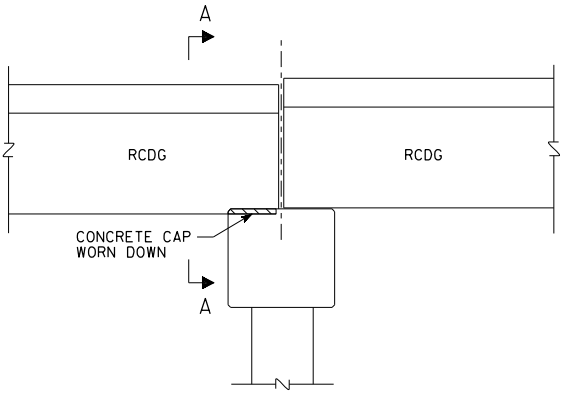
- None

Qualified Products List:

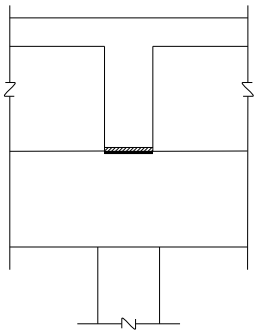
- None



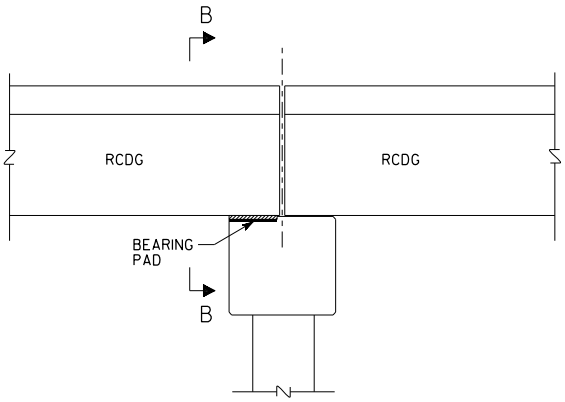
SECTION A-A



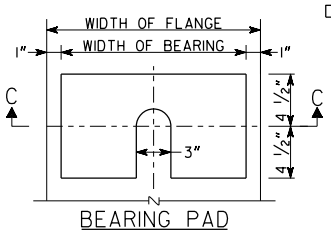
EXISTING CONDITION



SECTION B-B

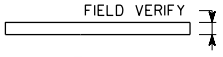


FINAL CONDITION



BEARING PAD

SECTION C-C



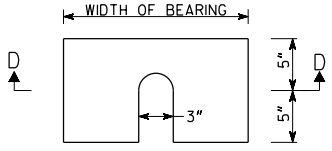
SECTION D-D

NOTES:

1) BEARING PAD SHALL BE FURNISHED IN ACCORDANCE WITH AASHTO SPECIFICATIONS DIVISION II, SECTION 18, ELASTOMERIC BEARINGS.

2) BEARING PADS SHALL BE MADE OF 60 DURIMETER HARDNESS NEOPRENE, GRADE 60 OR HARDER.

3) BEVELED SHIM PLATES SHALL BE ASTM A 709 GRADE 36 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 123.



SHIM PLATE

EQUIPMENT

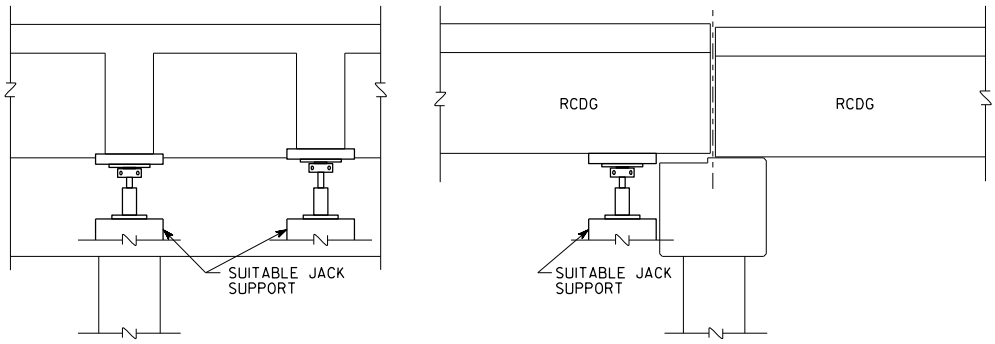
PERSONAL SAFETY EQUIPMENT
AS NEEDED
PORTABLE AIR COMPRESSOR
WIRE BRUSH / AIR GUN
ACCESS EQUIPMENT
MISC. BUCKETS & HAND TOOLS
20 TON JACKS

MATERIALS

BEARING PADS
SHIM PLATES

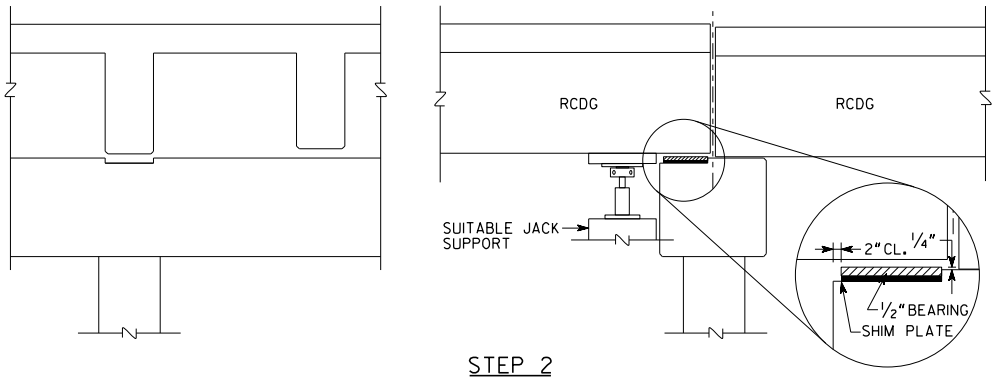
SHEET 1 OF 2

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL BEARING FAILURE REPAIR UNDER RCDG NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.23



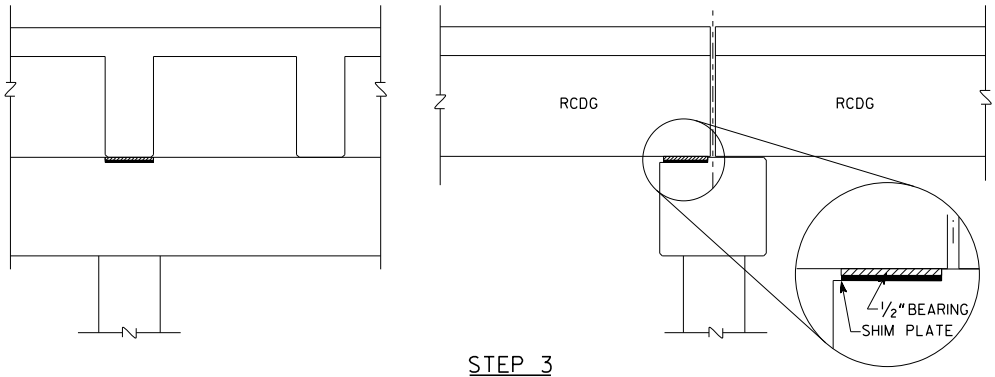
STEP 1

1. DETERMINE THE BEAM ENDS THAT REQUIRE BEARING AREA REPAIR.
2. INSTALL JACKS UNDER BOTTOM FLANGE AND POSITION AS CLOSE AS POSSIBLE TO THE BEARING AREA OF REQUIRED BEAM END, JACKS ARE ALSO THE REQUIRED UNDER ADJACENT BEAMS.
3. BRIDGE SHALL REMAIN CLOSED WHILE SUPPORTED ON JACKS.
4. LIFT BEAM 3/8" AND ADJACENT BEAMS 1/4".
5. REMOVE ALL LOOSE CONCRETE AND DEBRIS FROM CAP BEARING AREA.



STEP 2

1. PLACE 1/2" NEOPRENE PAD UNDER BEAMS AT BEARING AREAS.
2. SHIM AS REQUIRED TO ACHIEVE A TOTAL HEIGHT OF 1/4" ABOVE TOP OF CAP INCLUDING 1/2" BEARING MATERIAL.

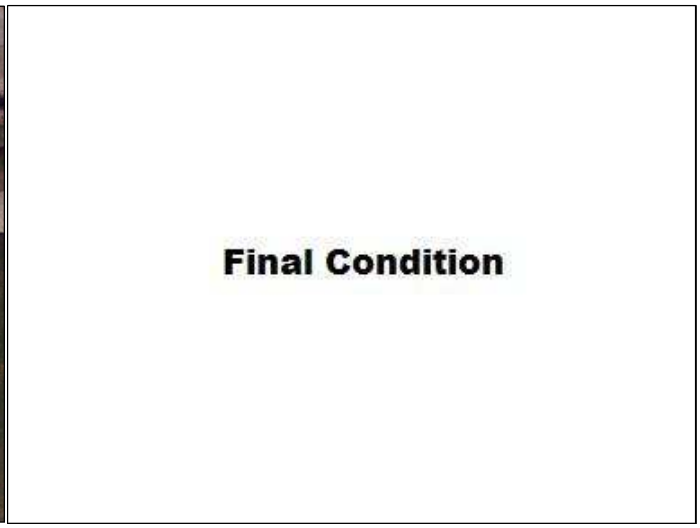


STEP 3

1. LOWER JACKS AND CHECK THAT DECK EDGE MATCHES ADJACENT SPAN OR APPROACH SLAB. IF HEIGHT DIFFERENCE IS GREATER THAN 1/8" REJACK THE BEAMS AND REPLACE SHIMS AS REQUIRED.
2. ONCE DECK EDGES HAVE BEEN ADJUSTED TO PROVIDE A SMOOTH RIDING SURFACE, REMOVE JACKS AND SUPPORTS FROM UNDER BRIDGE.
2. OPEN BRIDGE TO TRAFFIC.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL BEARING FAILURE REPAIR UNDER RCDG NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.23

Activity 830.24 – Edge Beam Replacement



Before Repair

After Repairs

General Notes:

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Bend existing reinforcement to be utilized in new construction in a manner to provide the maximum lap possible or as shown on the plans. Thoroughly clean existing reinforcement of concrete scale and rust by sand blasting before bonding into new construction.

All welding shall be performed by certified welders that have in their possession a current welding certification card issued by the Office of Materials and Research. Use only e70xx (excluding e7014 and e7024) low hydrogen electrodes for manual shielded metal arc welding.

Clean and paint all structural steel as shown in the construction details. Work shall be done in accordance with Section 535 of the Georgia DOT Specifications.

Material Specifications:

- Concrete: Class AA, f'_c = 3,500 psi
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Verify presence of lead paint system.
- Use special care near streams and rivers.

Georgia Standard Specifications

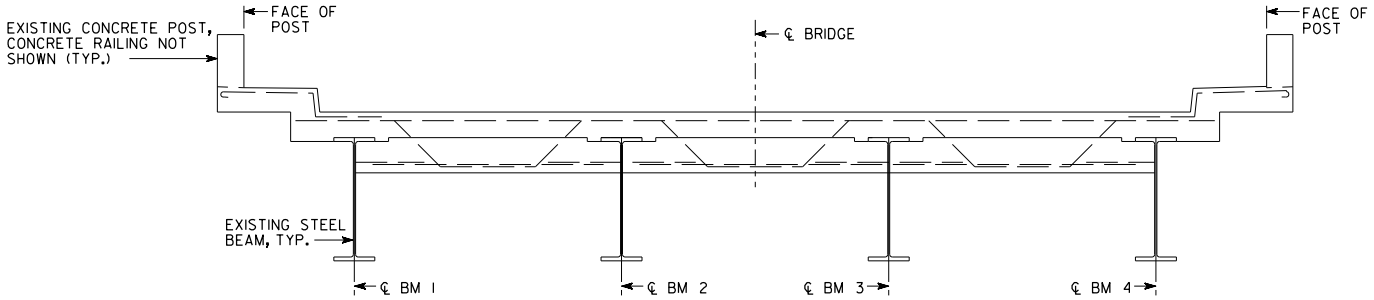
- Section 500 – Concrete Structures
- Section 504 – Twenty-Four Hour Accelerated Strength Concrete
- Section 511 – Reinforcement Steel
- Section 535 – Painting Structures
- Section 886 – Epoxy Resin Adhesive

Georgia Special Provisions & Supplemental Specifications:

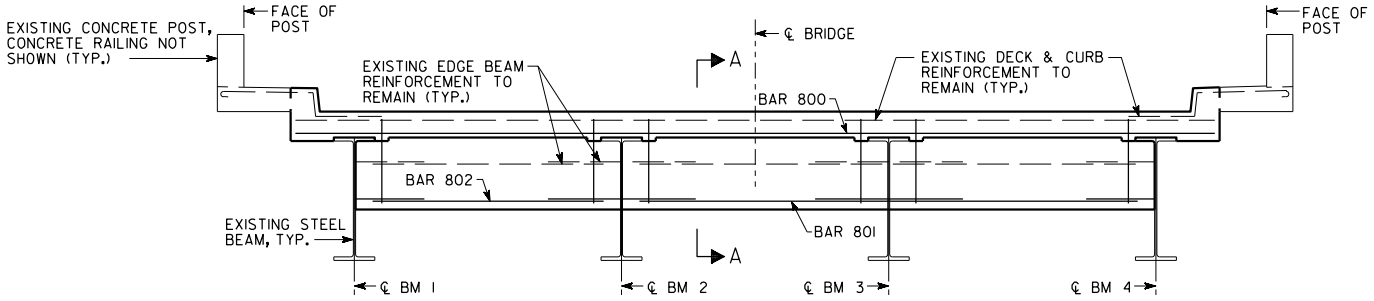
- None

Qualified Products List:

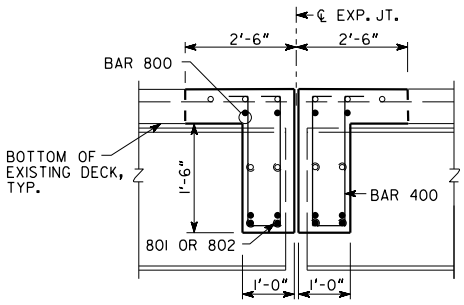
- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-15 Epoxy Resin Adhesives
- QPL-73 Bridge Paint Systems



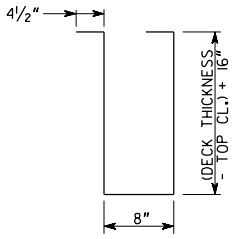
EXISTING CONDITION



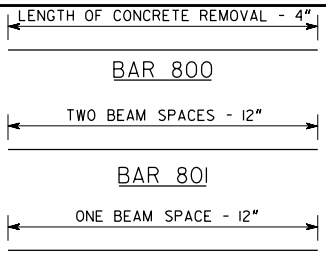
FINAL CONDITION



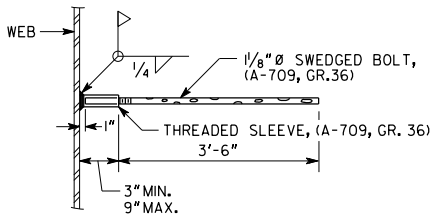
SECTION A-A



BAR 400



NOTE: BAR 802 BECOMES BAR 801 IN ODD NUMBERED BEAM CONFIGURATION. ALSO, TWO INTERMEDIATE BEAMS RECEIVE HOLE/SLOTS IN AN ODD NUMBERED BEAM CONFIGURATION.



EDGEBEAM BAR LAP DETAIL

EQUIPMENT

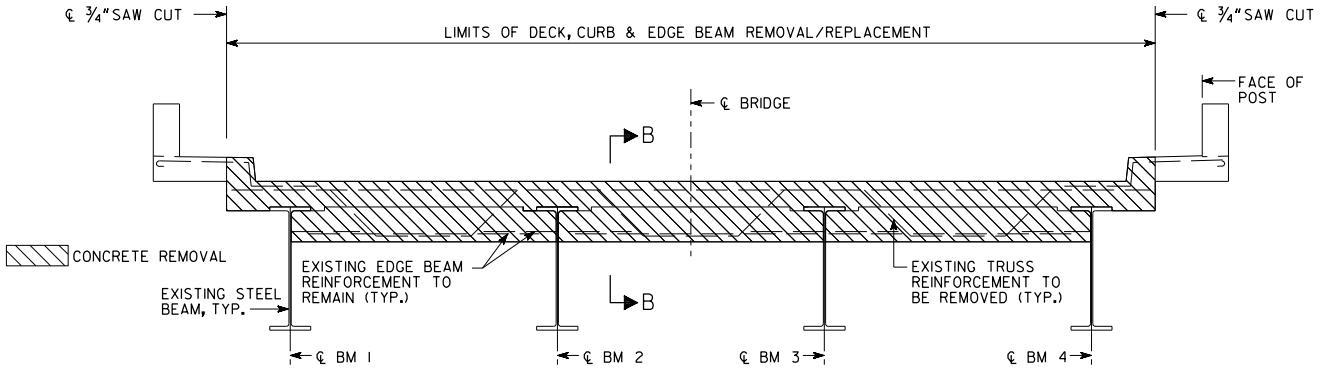
- PERSONAL SAFETY EQUIPMENT AS NEEDED
- PORTABLE AIR COMPRESSOR
- PORTABLE ELECTRIC GENERATOR
- CONCRETE SAW
- SAND BLASTER / AIR GUN
- WELDER
- CUTTING TORCH
- PNEUMATIC CHIPPING HAMMER
- MOBILE CONCRETE MIXER
- CONCRETE HAND TOOLS
- HAMMER DRILL W/ 1" CONC. BIT
- CHOP SAW W/ STEEL BLADES
- CIRCULAR SAW W/ WOOD BLADE
- MISC. BUCKETS & HAND TOOLS
- DRILL W/ 1½" STEEL BIT

MATERIALS

- BAR 400
- BAR 800
- BAR 801
- BAR 802
- 1⅛"Ø SWEDGED BOLTS
- RAPID SET CONCRETE
- TYPE II EPOXY RESIN ADHESIVE
- MATERIALS FOR FORMWORK
- TIE WIRE
- WELDING ELECTRODES

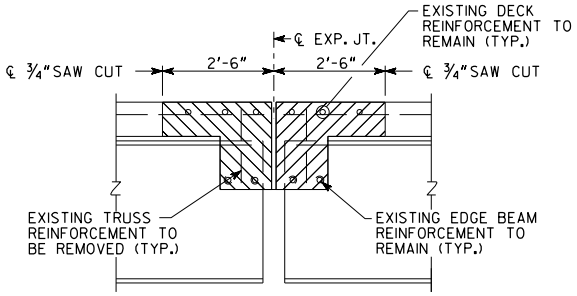
SHEET 1 OF 3

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL EDGEBEAM REPLACEMENT NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.24

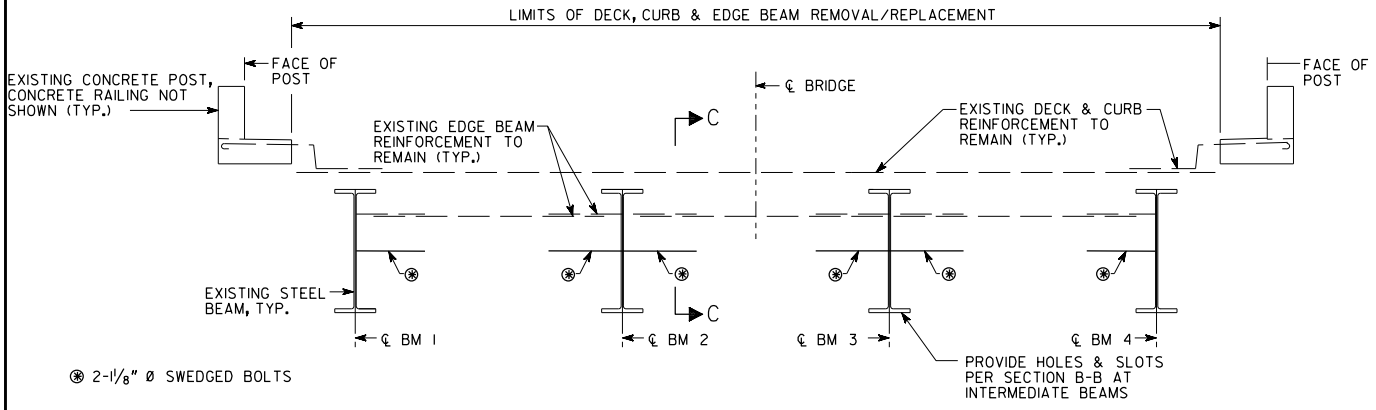


STEP 1

1. DEFINE AND MARK LIMITS OF AREA TO BE REMOVED
2. SAW CUT FULL DEPTH OF CURB.
3. REMOVE CONCRETE USING HAND TOOLS AND CHIPPING HAMMER TAKING CARE NOT TO DAMAGE EXISTING REINFORCING STEEL.
4. REMOVE TRUSS REINFORCEMENT (IF PRESENT).

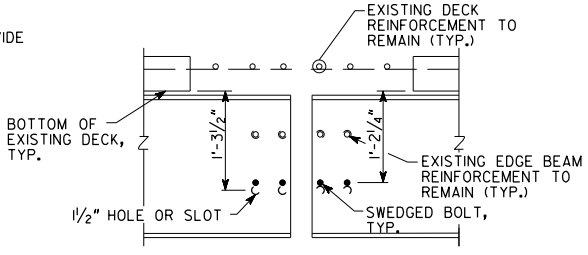


SECTION B-B



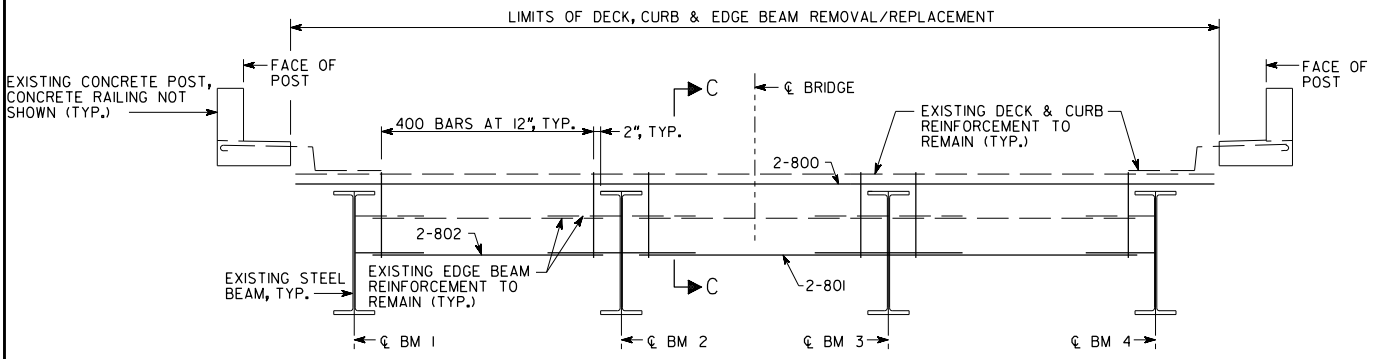
STEP 2

1. DRILL/CUT 1½" HOLES/SLOTS IN INTERMEDIATE BEAM TO PROVIDE ACCESS FOR NEW REINFORCING BARS.
2. WELD NEW 1⅛" DIAMETER SWEDGED BOLTS TO BEAM WEB (SEE EDGE BEAM BAR LAP DETAIL).



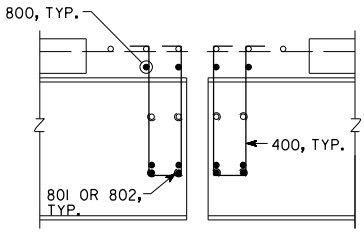
SECTION C-C

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL EDGEBEAM REPLACEMENT NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.24

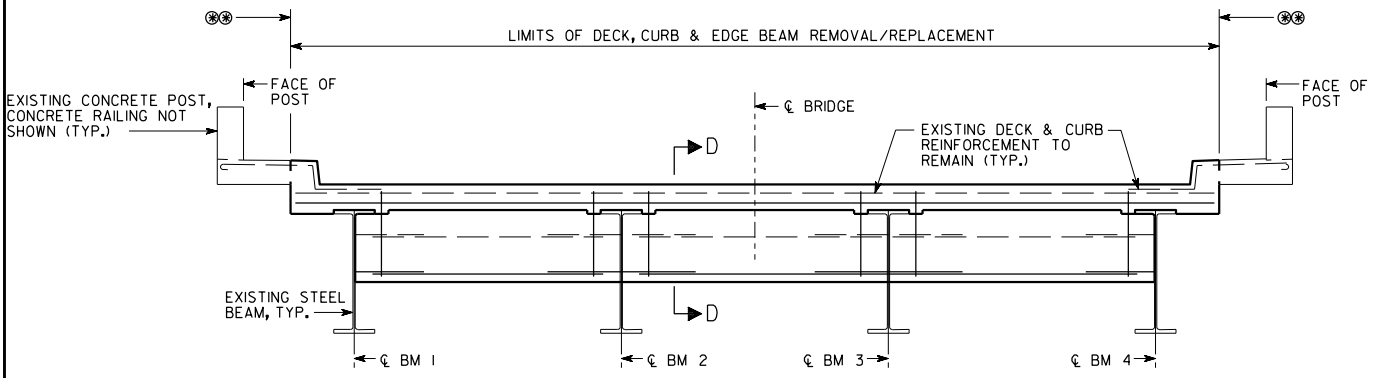


STEP 3

1. PLACE NEW 802 REINFORCING BARS AND LAP WITH NEW SWEDGED BOLTS.
2. PLACE NEW 801 REINFORCING BARS BY THREADING BAR THROUGH DRILLED HOLES/SLOTS AND LAP WITH NEW SWEDGED BOLTS.
3. PLACE NEW 400 & 800 REINFORCING BARS.
4. SANDBLAST AND USE COMPRESSED AIR TO CLEAN CONCRETE SURFACES AND REINFORCING STEEL.
5. PLACE FORMWORK.
6. APPLY EPOXY RESIN ADHESIVE TO THE EXPOSED CONCRETE SURFACES.

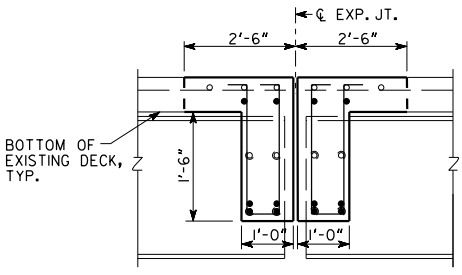


SECTION C-C



STEP 4

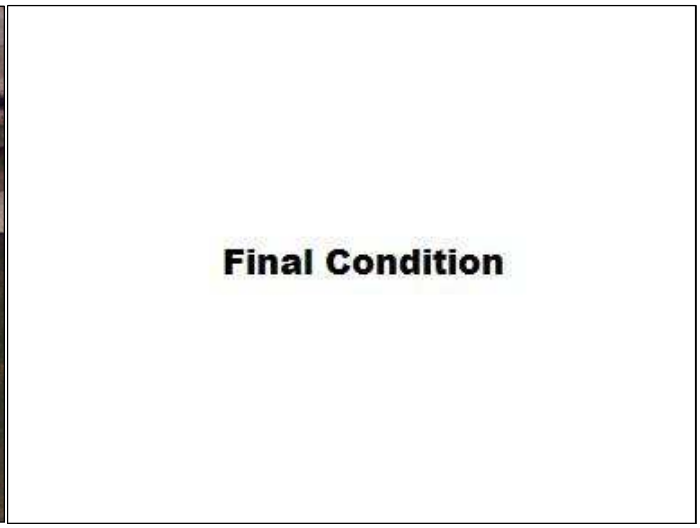
1. POUR RAPID SET CONCRETE WHILE EPOXY RESIN ADHESIVE IS STILL TACKY.
2. FINISH FLUSH TO EXISTING DECK.
3. ALLOW TO FULLY CURE.
4. REMOVE ALL FORMWORK.



SECTION D-D

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL EDGEBEAM REPLACEMENT NO SCALE JUNE 2012	REVISION DATE	SHEET 3 OF 3 DRAWING NO. 830.24

Activity 830.25 – Staged Edge Beam Replacement



Before Repair

After Repairs

General Notes:

Place and tie all reinforcing steel in accordance with the Georgia DOT Specifications. Do not weld reinforcing steel.

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Apply epoxy resin adhesive Type II to all hardened concrete surfaces just prior to pouring the concrete, see section 886 of the Georgia DOT Specifications.

Bend existing reinforcement to be utilized in new construction in a manner to provide the maximum lap possible or as shown on the plans. Thoroughly clean existing reinforcement of concrete scale and rust by sand blasting before bonding into new construction.

All welding shall be performed by certified welders that have in their possession a current welding certification card issued by the Office of Materials and Research. Use only e70xx (excluding e7014 and e7024) low hydrogen electrodes for manual shielded metal arc welding.

Clean and paint all structural steel as shown in the construction details. Work shall be done in accordance with Section 535 of the Georgia DOT Specifications.

Material Specifications:

- Concrete: Class AA, f'_c = 3,500 psi
- Reinforcing Steel: Grade 60, f_y = 60,000 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Verify presence of lead paint system.
- Use special care near streams and rivers.

Georgia Standard Specifications

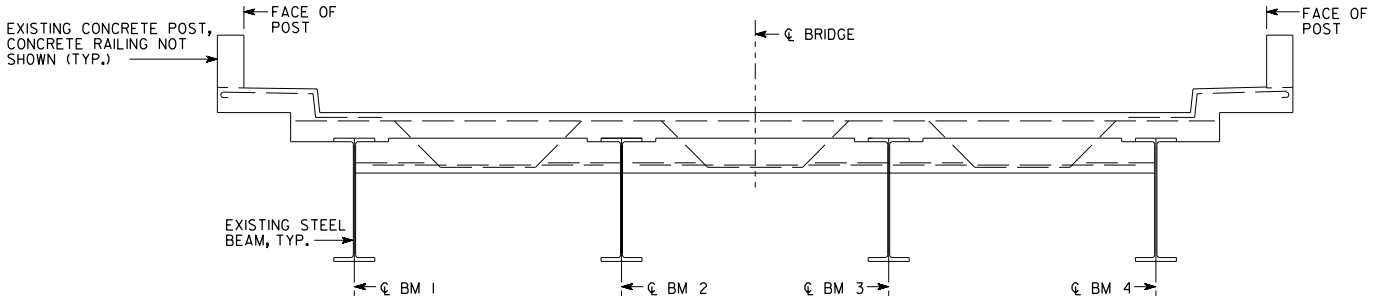
- Section 500 – Concrete Structures
- Section 504 – Twenty-Four Hour Accelerated Strength Concrete
- Section 511 – Reinforcement Steel
- Section 535 – Painting Structures
- Section 886 – Epoxy Resin Adhesive

Georgia Special Provisions & Supplemental Specifications:

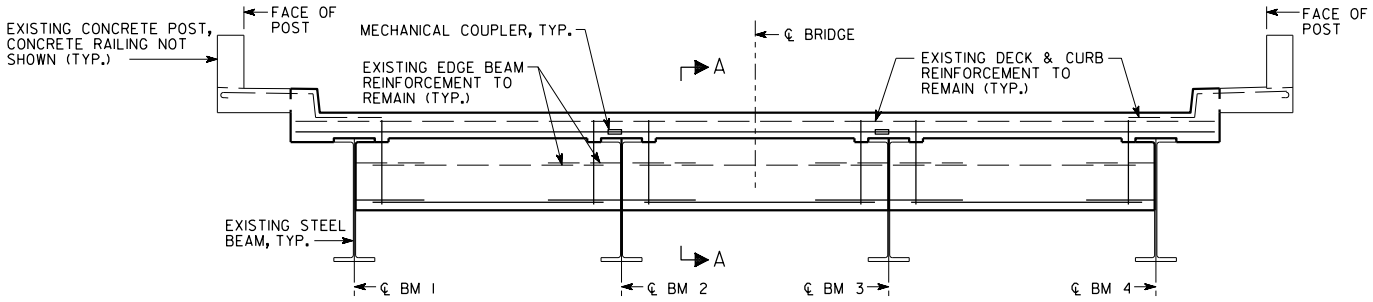
- None

Qualified Products List:

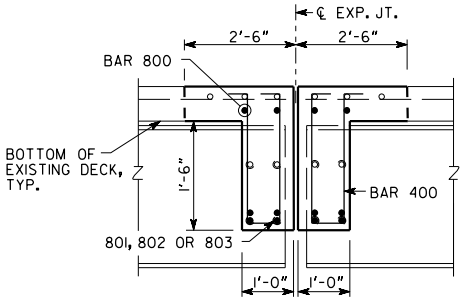
- QPL-10 List of Approved Concrete Plants
- QPL-12 Reinforcement Steel Fabricators
- QPL-15 Epoxy Resin Adhesives
- QPL-73 Bridge Paint Systems



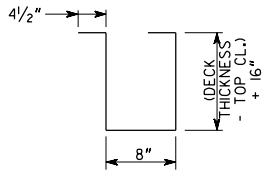
EXISTING CONDITION



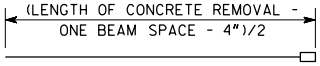
FINAL CONDITION



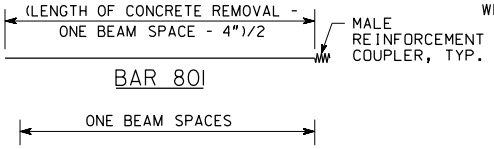
SECTION A-A



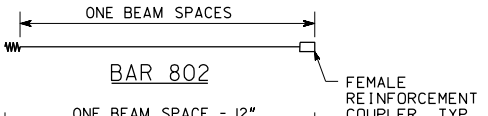
BAR 400



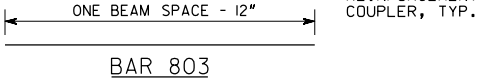
BAR 800



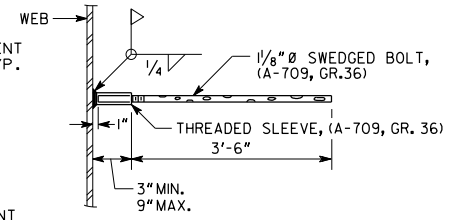
BAR 801



BAR 802



BAR 803



EDGEBEAM BAR LAP DETAIL

NOTES:
1. REINFORCEMENT STEEL COUPLERS SHALL BE IN ACCORDANCE WITH SPECIAL PROVISION SECTION 511 - REINFORCEMENT STEEL.
2. REPEAT STAGE 2 CONSTRUCTION FOR ALL INTERIOR BAYS.

EQUIPMENT

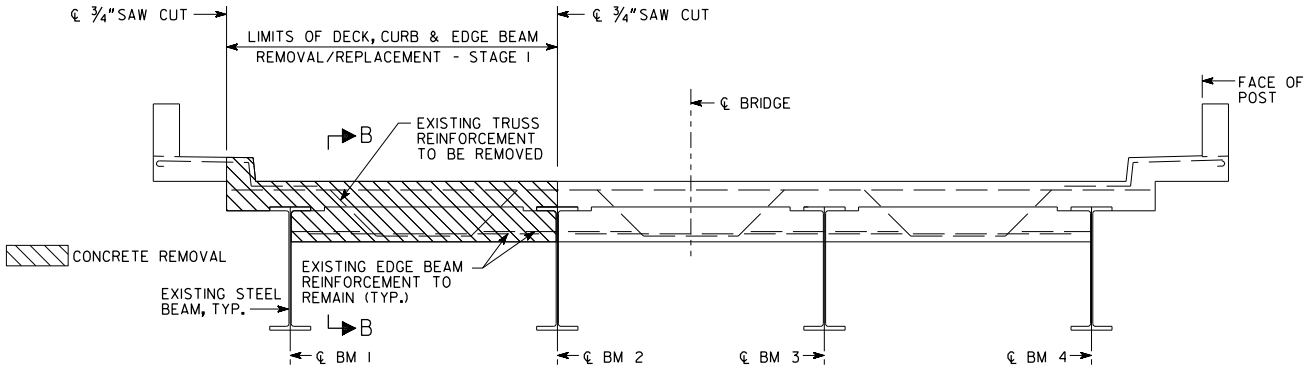
- PERSONAL SAFETY EQUIPMENT AS NEEDED
- PORTABLE AIR COMPRESSOR
- PORTABLE ELECTRIC GENERATOR
- CONCRETE SAW
- SAND BLASTER / AIR GUN
- WELDER
- CUTTING TORCH
- PNEUMATIC CHIPPING HAMMER
- MOBILE CONCRETE MIXER
- CONCRETE HAND TOOLS
- HAMMER DRILL W/ 1" CONC. BIT
- CHOP SAW W/ STEEL BLADES
- CIRCULAR SAW W/ WOOD BLADE
- MISC. BUCKETS & HAND TOOLS
- DRILL W/ 1½"STEEL BIT

MATERIALS

- BAR 400
- BAR 800
- BAR 801
- BAR 802
- BAR 803
- 1⅛"Ø SWEDGED BOLTS
- RAPID SET CONCRETE
- TYPE II EPOXY RESIN ADHESIVE
- MATERIALS FOR FORMWORK
- TIE WIRE
- WELDING ELECTRODES

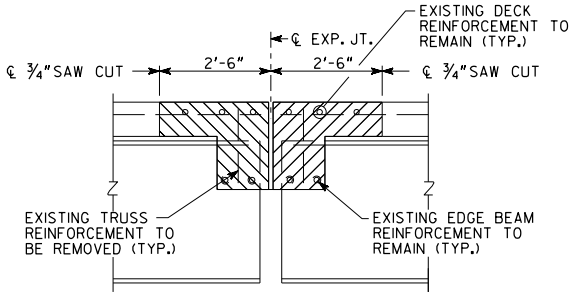
SHEET 1 OF 7

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL STAGED EDGEBEAM REPLACEMENT NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.25

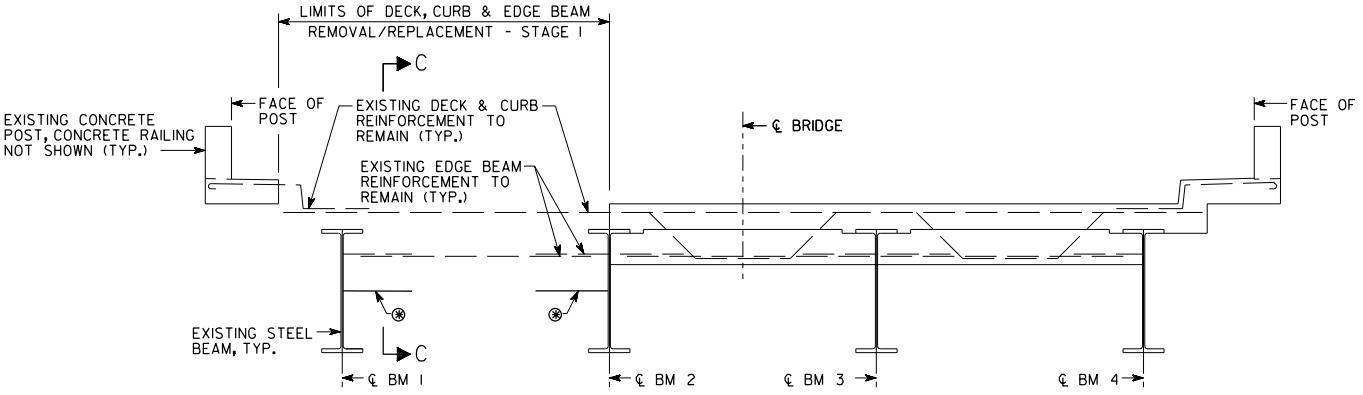


STAGE 1- STEP 1

1. DEFINE AND MARK LIMITS OF AREA TO BE REMOVED.
2. SAW CUT FULL DEPTH OF CURB.
3. REMOVE CONCRETE USING HAND TOOLS AND CHIPPING HAMMER TAKING CARE NOT TO DAMAGE EXISTING REINFORCING STEEL.
4. REMOVE TRUSS REINFORCEMENT (IF PRESENT).



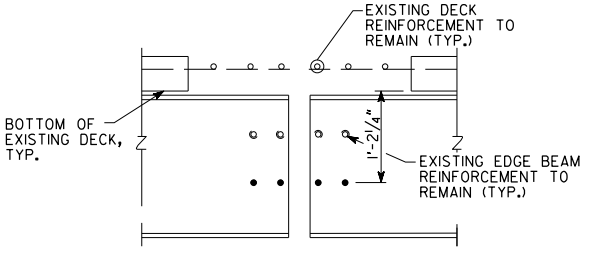
SECTION B-B



⊛ 2-1⅛" Ø SWEDGED BOLTS

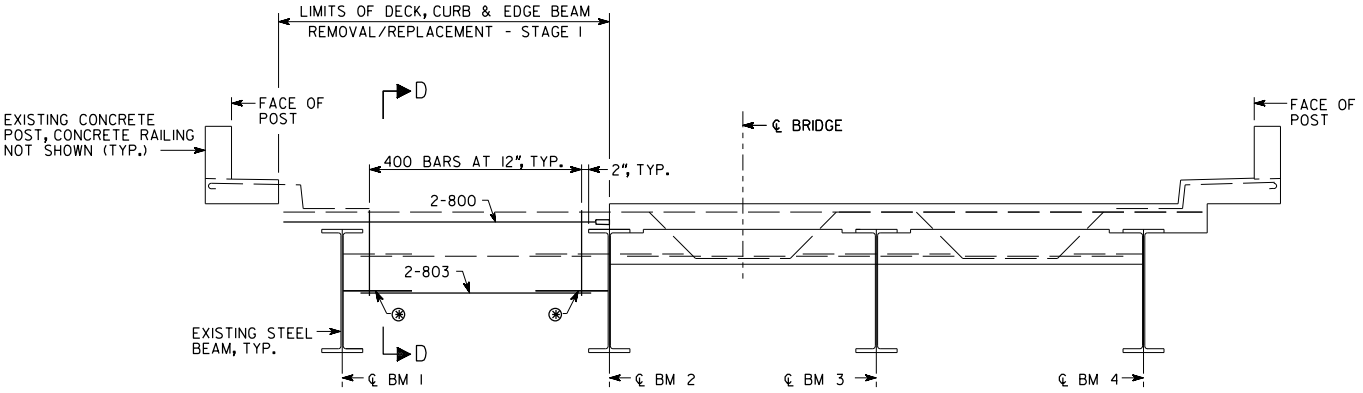
STAGE 1- STEP 2

1. WELD NEW 1⅛" DIAMETER SWEDGED BOLTS TO BEAM WEB (SEE EDGE BEAM BAR LAP DETAIL).



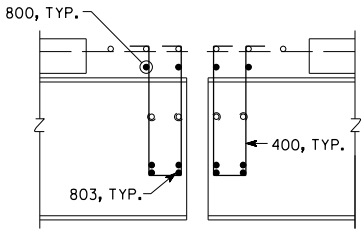
SECTION C-C

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL STAGED EDGEBEAM REPLACEMENT NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 830.25

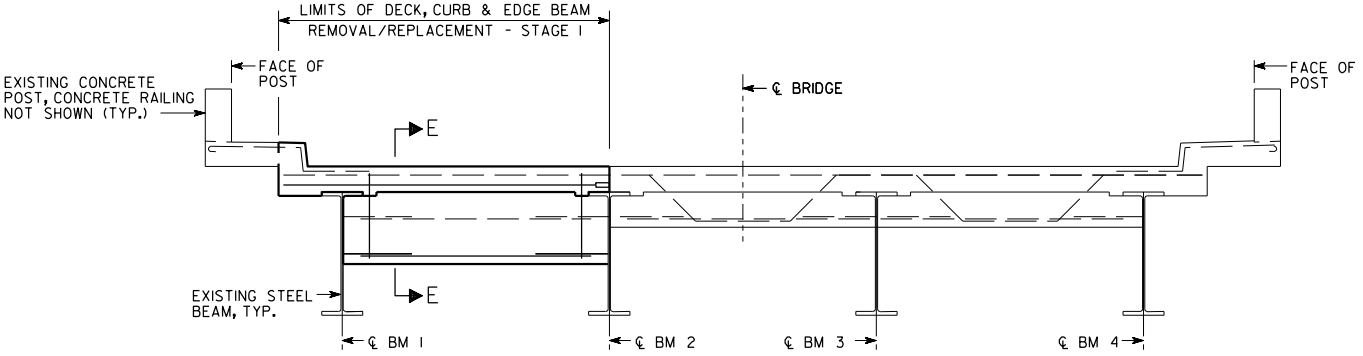


STAGE 1- STEP 3

1. PLACE NEW 803 REINFORCING BARS AND LAP WITH NEW SWEDGED BOLTS.
2. PLACE NEW 400 & 800 REINFORCING BARS.
3. SANDBLAST AND USE COMPRESSED AIR TO CLEAN CONCRETE SURFACES AND REINFORCING STEEL.
4. PLACE FORMWORK.
5. APPLY EPOXY RESIN ADHESIVE TO THE EXPOSED CONCRETE SURFACES.

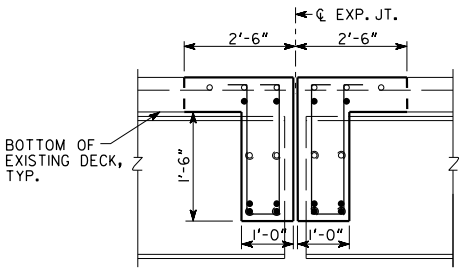


SECTION D-D



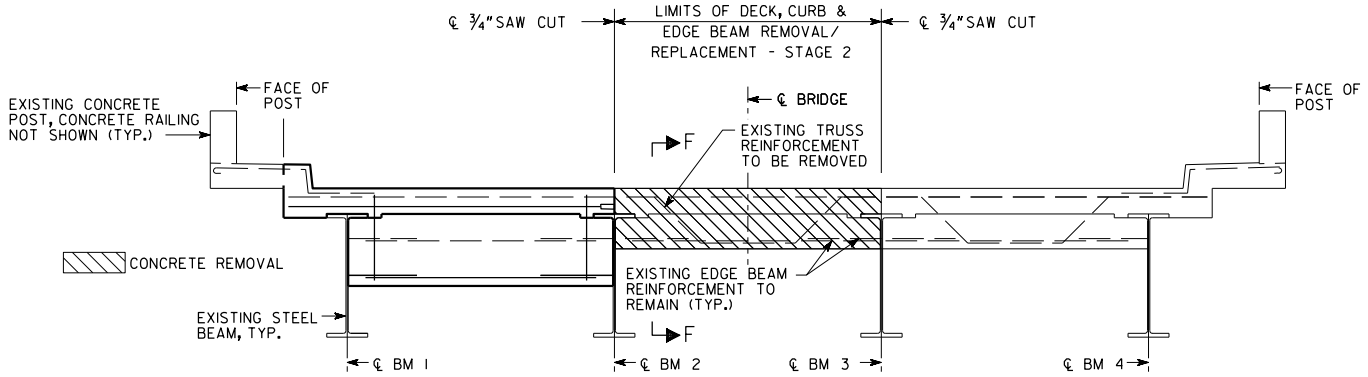
STAGE 1- STEP 4

1. POUR RAPID SET CONCRETE WHILE EPOXY RESIN ADHESIVE IS STILL TACKY.
2. FINISH FLUSH TO EXISTING DECK.
3. ALLOW TO FULLY CURE.
4. REMOVE ALL FORMWORK.



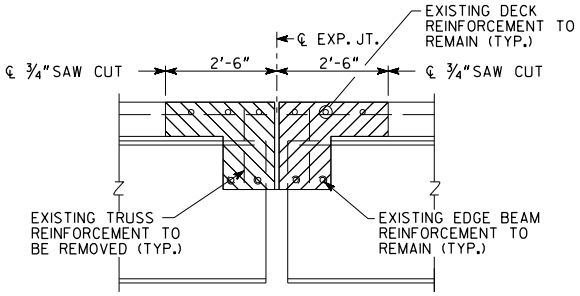
SECTION E-E

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL STAGED EDGEBEAM REPLACEMENT NO SCALE JUNE 2012	REVISION DATE	SHEET 3 OF 7 DRAWING NO. 830.25

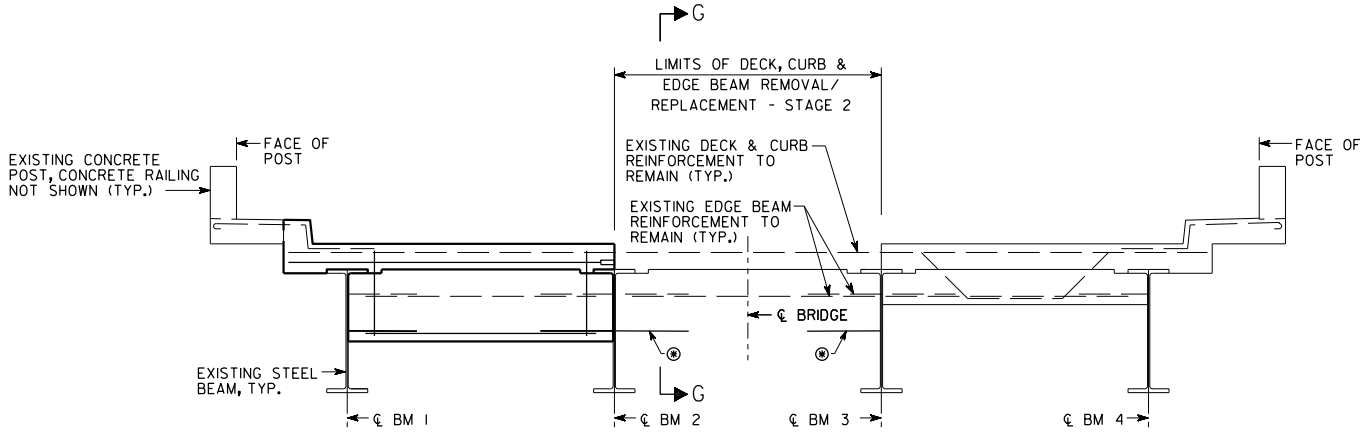


STAGE 2 - STEP 1

1. DEFINE AND MARK LIMITS OF AREA TO BE REMOVED.
2. SAW CUT FULL DEPTH OF DECK.
3. REMOVE CONCRETE USING HAND TOOLS AND CHIPPING HAMMER TAKING CARE NOT TO DAMAGE EXISTING REINFORCING STEEL.
4. REMOVE TRUSS REINFORCEMENT (IF PRESENT).



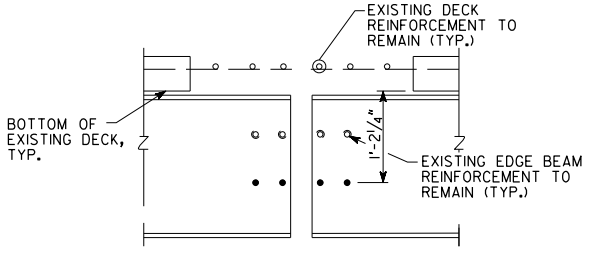
SECTION F-F



⊛ 2-1⅛" Ø SWEDGED BOLTS

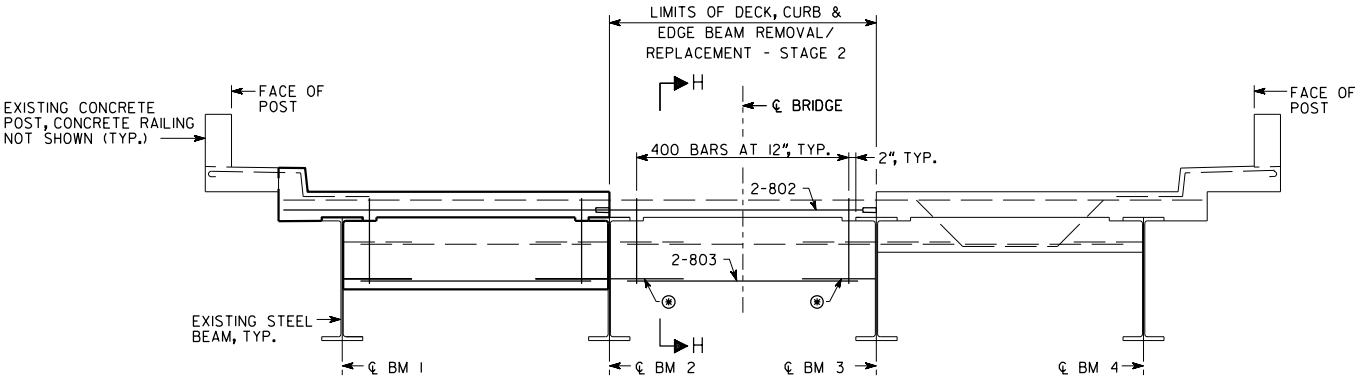
STAGE 2 - STEP 2

1. WELD NEW 1⅛" DIAMETER SWEDGED BOLTS TO BEAM WEB (SEE EDGE BEAM BAR LAP DETAIL).



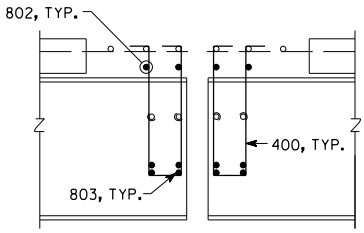
SECTION G-G

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL STAGED EDGEBEAM REPLACEMENT NO SCALE JUNE 2012	REVISION DATE	SHEET 4 OF 7 DRAWING NO. 830.25

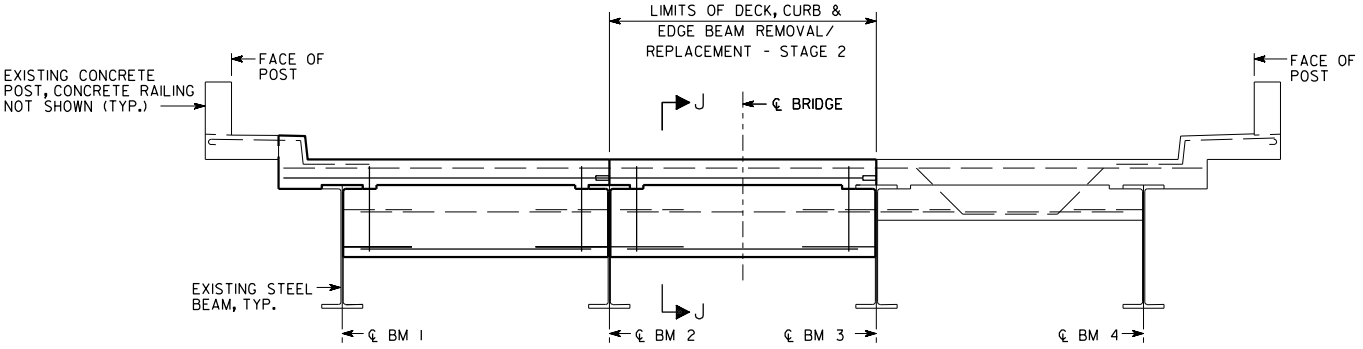


STAGE 2 - STEP 3

1. PLACE NEW 803 REINFORCING BARS AND LAP WITH NEW SWEDGED BOLTS.
2. PLACE NEW 400 & 802 REINFORCING BARS.
3. SANDBLAST AND USE COMPRESSED AIR TO CLEAN CONCRETE SURFACES AND REINFORCING STEEL.
4. PLACE FORMWORK.
5. APPLY EPOXY RESIN ADHESIVE TO THE EXPOSED CONCRETE SURFACES.

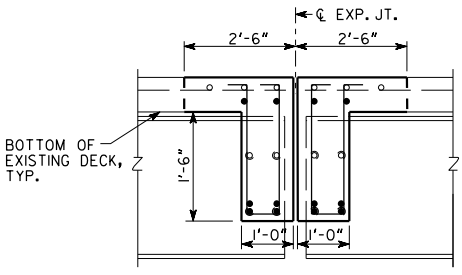


SECTION H-H



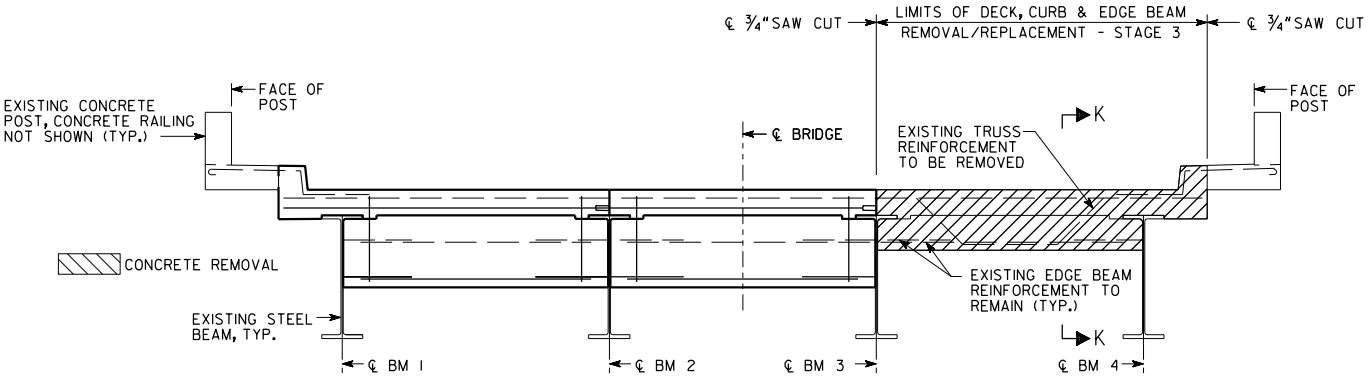
STAGE 2 - STEP 4

1. POUR RAPID SET CONCRETE WHILE EPOXY RESIN ADHESIVE IS STILL TACKY.
2. FINISH FLUSH TO EXISTING DECK.
3. ALLOW TO FULLY CURE.
4. REMOVE ALL FORMWORK.
5. REPEAT STAGE 2 FOR EACH ADDITIONAL INTERIOR BAY.



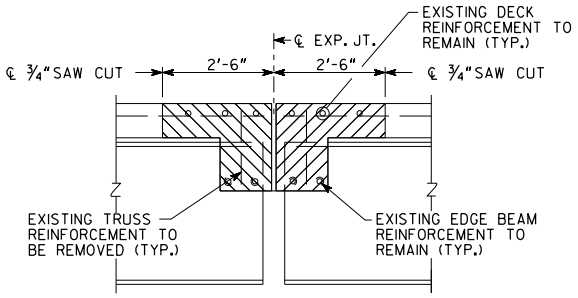
SECTION J-J

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL STAGED EDGEBEAM REPLACEMENT NO SCALE JUNE 2012	REVISION DATE	SHEET 5 OF 7 DRAWING NO. 830.25

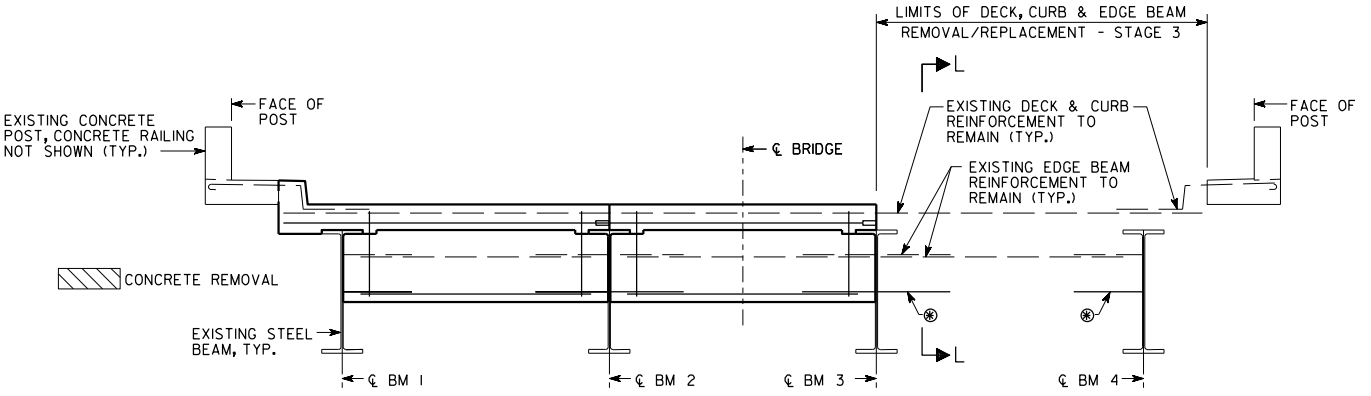


STAGE 3 - STEP 1

1. DEFINE AND MARK LIMITS OF AREA TO BE REMOVED.
2. SAW CUT FULL DEPTH OF CURB.
3. REMOVE CONCRETE USING HAND TOOLS AND CHIPPING HAMMER TAKING CARE NOT TO DAMAGE EXISTING REINFORCING STEEL.
4. REMOVE TRUSS REINFORCEMENT (IF PRESENT).



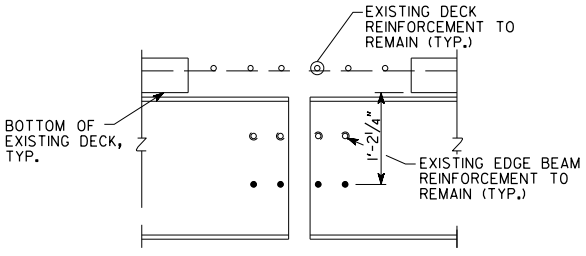
SECTION K-K



⊛ 2-1⅛" Ø SWEDGED BOLTS

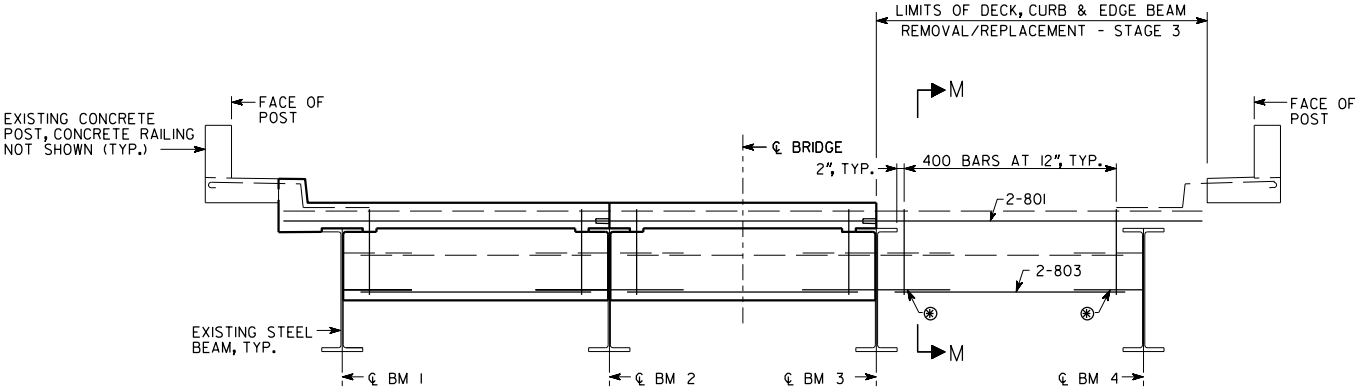
STAGE 3 - STEP 2

1. WELD NEW 1⅛" DIAMETER SWEDGED BOLTS TO BEAM WEB (SEE EDGE BEAM BAR LAP DETAIL).



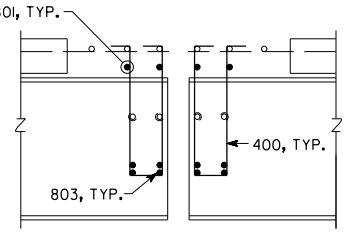
SECTION L-L

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL STAGED EDGEBEAM REPLACEMENT NO SCALE JUNE 2012	REVISION DATE	SHEET 6 OF 7 DRAWING NO. 830.25

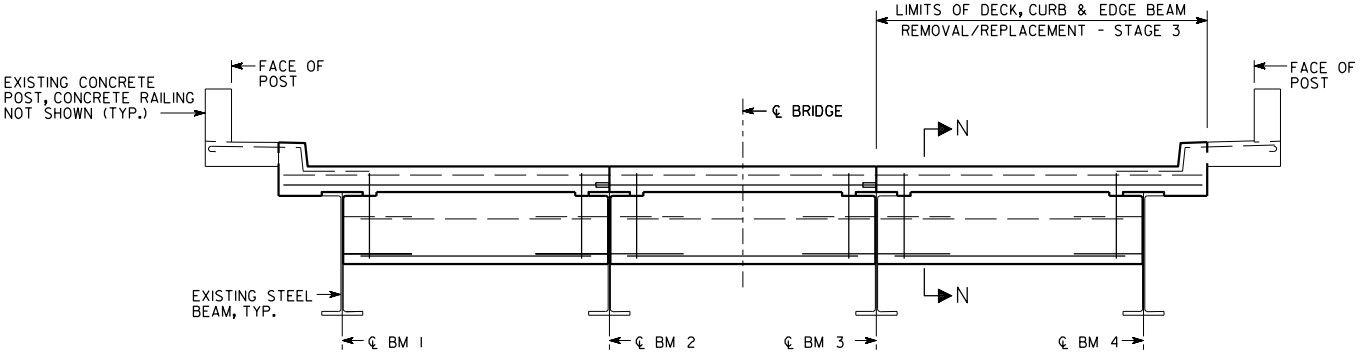


STAGE 3 - STEP 3

1. PLACE NEW 803 REINFORCING BARS AND LAP WITH NEW SWEDGED BOLTS.
2. PLACE NEW 400 & 801 REINFORCING BARS.
3. SANDBLAST AND USE COMPRESSED AIR TO CLEAN CONCRETE SURFACES AND REINFORCING STEEL.
4. PLACE FORMWORK.
5. APPLY EPOXY RESIN ADHESIVE TO THE EXPOSED CONCRETE SURFACES.

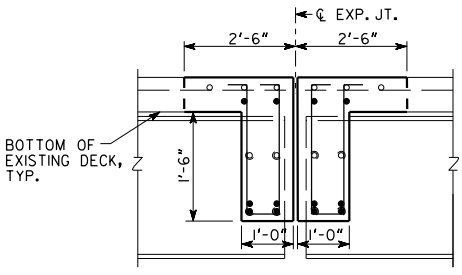


SECTION M-M



STAGE 3 - STEP 4

1. POUR RAPID SET CONCRETE WHILE EPOXY RESIN ADHESIVE IS STILL TACKY.
2. FINISH FLUSH TO EXISTING DECK.
3. ALLOW TO FULLY CURE.
4. REMOVE ALL FORMWORK.



SECTION N-N

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL STAGED EDGEBEAM REPLACEMENT NO SCALE JUNE 2012	REVISION DATE	SHEET 7 OF 7 DRAWING NO. 830.25

Activity 845.01 – Rip Rap Placement

Before Repair

After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering material.

Material Specifications:

- None

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications:

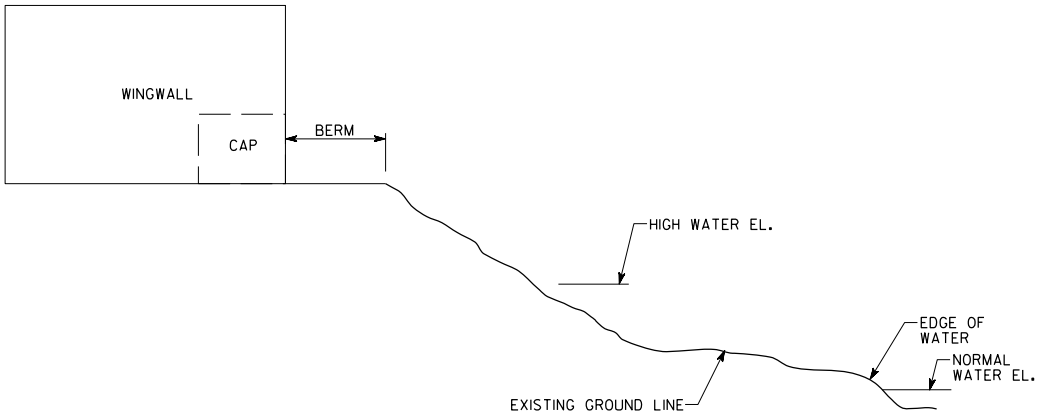
- Section 603 – Rip Rap
- Section 805 – Rip Rap and Curbing Stone
- Section 881 – Fabrics

Georgia Special Provisions & Supplemental Specifications:

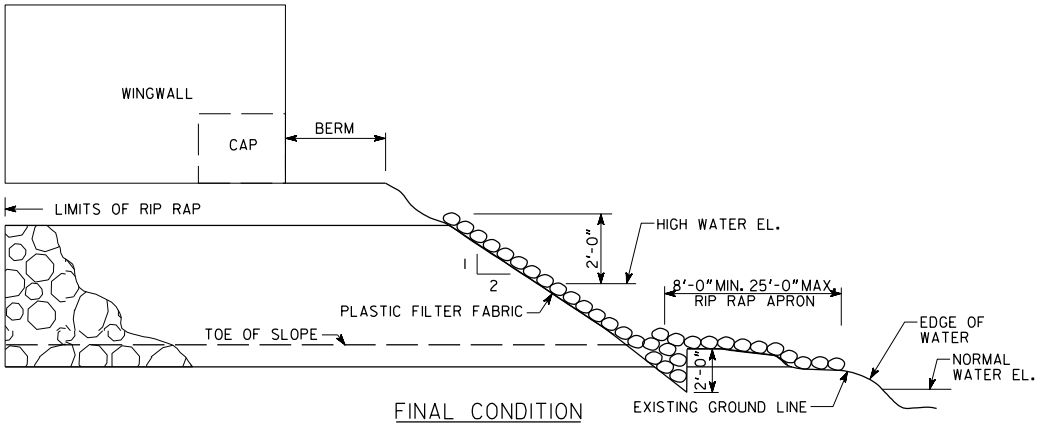
- None

Qualified Products List:

- QPL-28 Filter Fabric



EXISTING CONDITION



FINAL CONDITION

NOTE.

1. CARE MUST BE EXERCISED WHEN DUMPING RIP RAP AROUND EXISTING STRUCTURAL UNITS.
2. IF NO OBSERVED HIGH WATER ELEVATION IS AVAILABLE, EXTEND RIP RAP TO BERM ELEVATION.
3. RIP RAP APRON SHALL EXTEND A MAXIMUM OF 25'-0" FROM TOE OF SLOPE. IF DISTANCE FROM TOE OF SLOPE TO WATER BANK IS LESS THAN 8'-0" THEN PLACE RIP RAP UP TO WATER BANK.

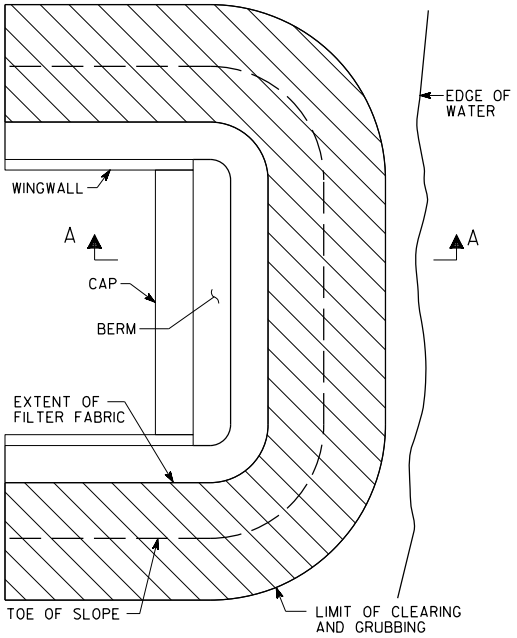
EQUIPMENT

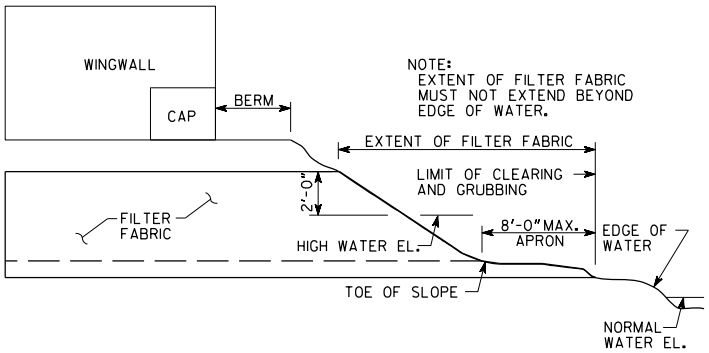
PERSONAL SAFETY EQUIPMENT
AS NEEDED
CHAINSAW & MISC. CLEARING
EQUIPMENT
SKID STEER
MISC. BUCKETS & HAND TOOLS
DIGGING EQUIPMENT

MATERIALS

RIP RAP, TYPE I, 24 IN
PLASTIC FILTER FABRIC

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL RIP RAP PLACEMENT NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 845.01

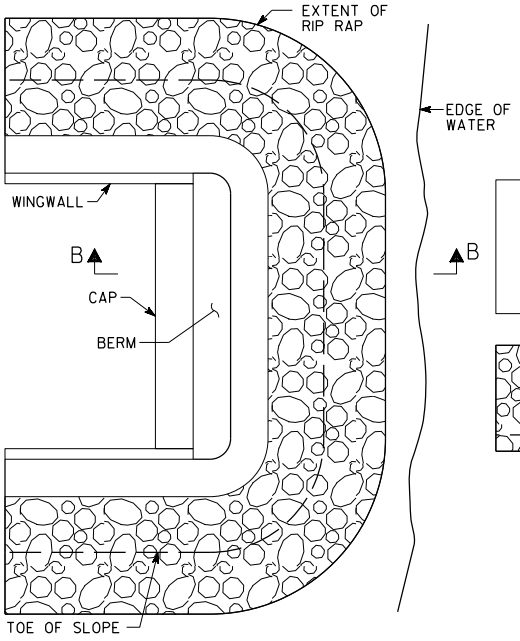


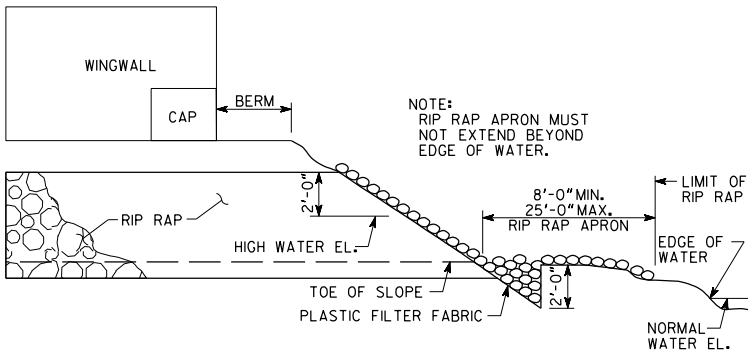


SECTION A-A

STEP 1

1. CLEAR AND GRUB ENTIRE AREA THAT IS TO BE PROTECTED.
2. COVER ENTIRE AREA WITH FILTER FABRIC.





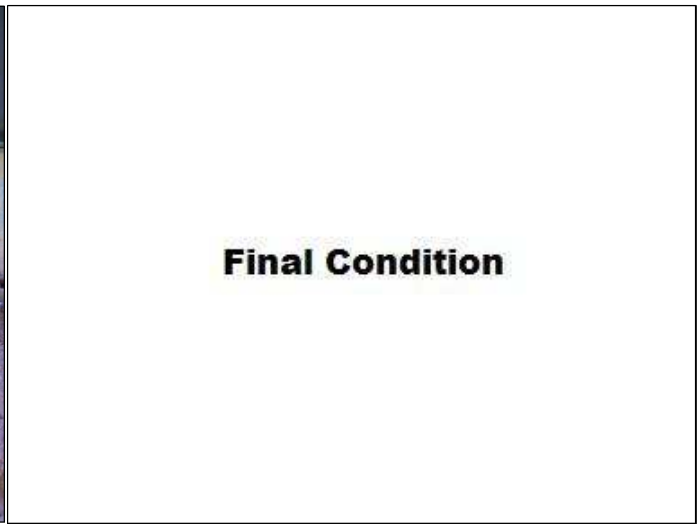
SECTION B-B

STEP 2

1. PLACE RIP RAP.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL RIP RAP PLACEMENT NO SCALE JUNE 2012	REVISION DATE	SHEET 2 OF 2 DRAWING NO. 845.01

Activity 845.02 – Erosion Repair at Abutments



Before Repair After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms.

Material Specifications:

- Concrete: Class B, f'_c = 2,200 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

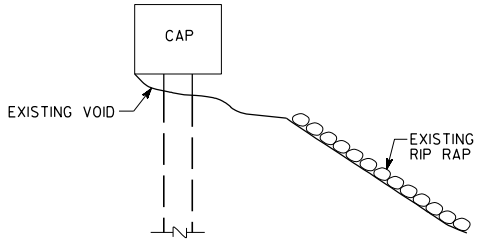
- Section 600 – Controlled Low Strength Flowable Fill
- Section 603 – Rip Rap

Georgia Special Provisions & Supplemental Specifications:

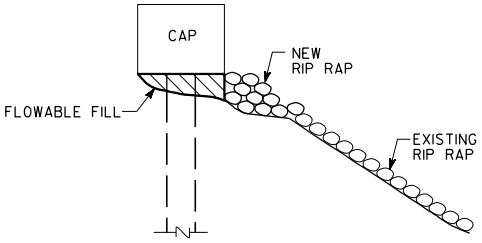
- None

Qualified Products List:

- QPL-28 Filter Fabric



EXISTING CONDITION



FINAL CONDITION

NOTE.

1. CARE MUST BE EXERCISED WHEN DUMPING RIP RAP AROUND EXISTING STRUCTURAL UNITS.

2. IF NO RIP RAP PRESENT, REFER TO ACTIVITY 845.01. RIP RAP PLACEMENT FOR LIMITS AND DETAILS.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
CONCRETE PUMP
MISC. BUCKETS & HAND TOOLS
DIGGING EQUIPMENT
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
DRILL W/ 4"Ø HOLE SAW
CIRCULAR SAW W/ WOOD BLADE
MISC. BUCKETS & HAND TOOLS
DIGGING EQUIPMENT

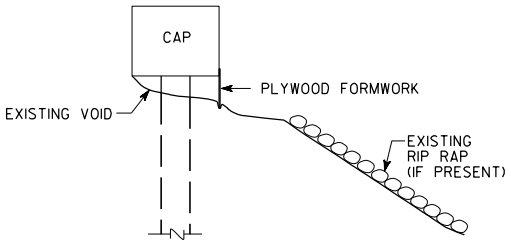
MATERIALS

MATERIALS FOR FORMWORK
CONCRETE
RIP RAP, TYPE II, 12 IN
PLASTIC FILTER FABRIC

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

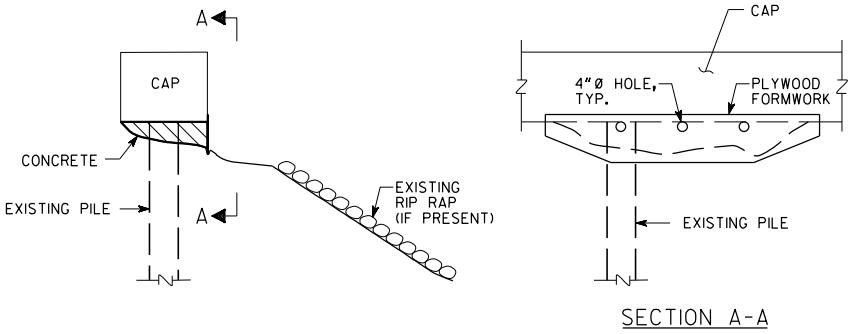
CONSTRUCTION DETAIL
EROSION REPAIR AT ABUTMENTS
NO SCALE
JUNE 2012

REVISION DATE	DRAWING NO.
	845.02



STEP 1

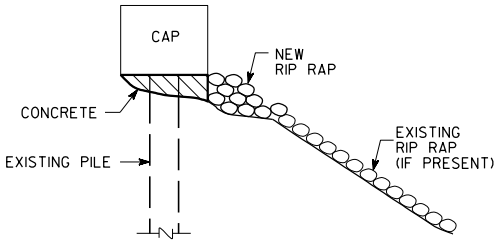
1. REMOVE ANY LOOSE DEBRIS, VEGETATION AND SOIL FROM VOID UNDER CAP.
2. CUT AND PLACE FORMWORK AGAINST FACE OF CAP AND TRENCH IN SOIL AS REQUIRED IN ORDER TO FORM A SEAL ALONG THE BOTTOM EDGE.



SECTION A-A

STEP 2

1. DRILL 4"Ø HOLES AT 24" SPACING THROUGH THE FORMWORK JUST BELOW THE BOTTOM OF CAP.
2. FILL VOID WITH FLOWABLE FILL THROUGH 4"Ø HOLES
3. ALLOW TO FULLY CURE.

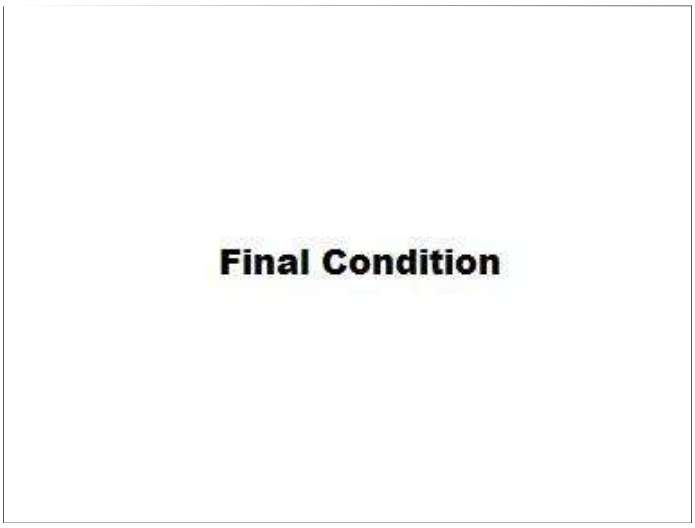


STEP 3

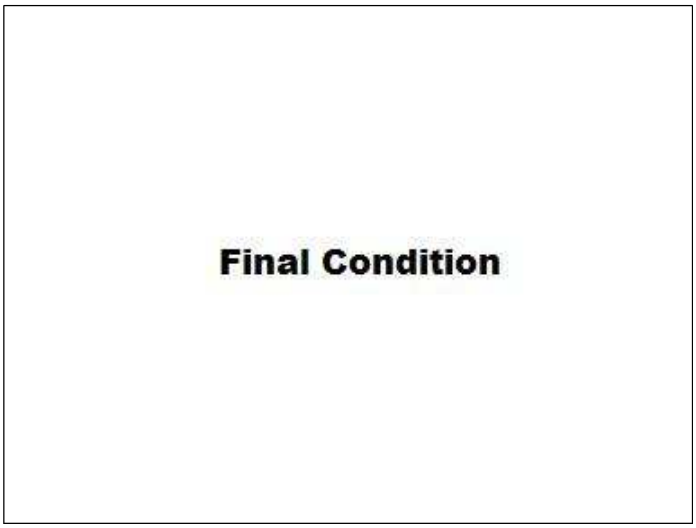
1. REMOVE ALL FORMWORK AND RESTORE RIP RAP AS SHOWN ON ACTIVITY 845.01 - RIP RAP PLACEMENT.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL EROSION REPAIR AT ABUTMENTS NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 845.02

Activity 845.03 – Pile Bent Scour Repair



Before Repair



After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering material.

Material Specifications:

- None

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Georgia Standard Specifications

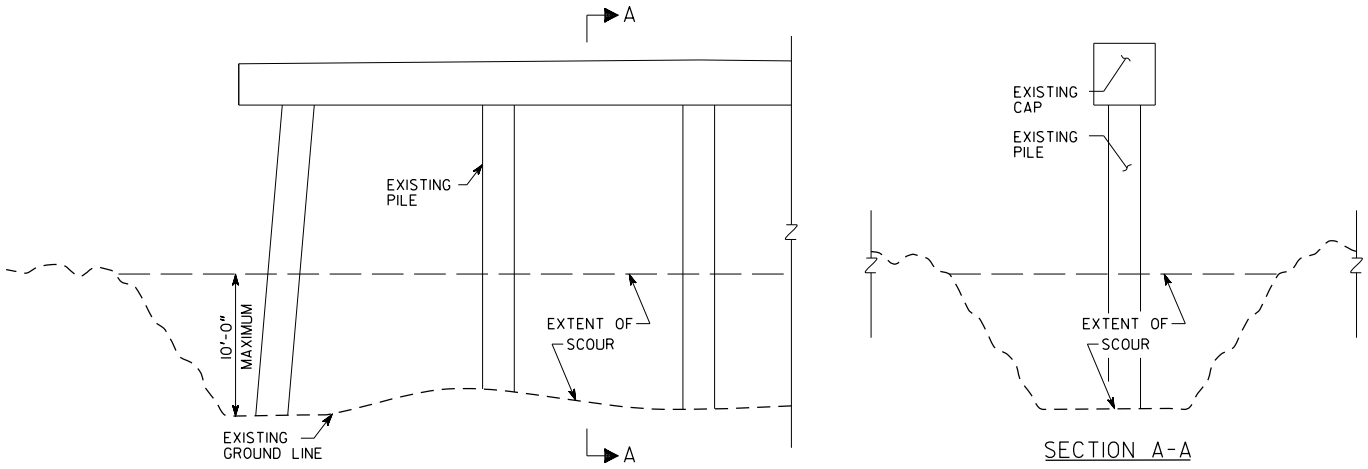
- Section 211 – Bridge Excavation and Backfill
- Section 603 – Rip Rap
- Section 805 – Rip Rap and Curbing Stone
- Section 810 – Roadway
- Section 812 – Backfill Materials
- Section 881 – Fabrics

Georgia Special Provisions & Supplemental Specifications:

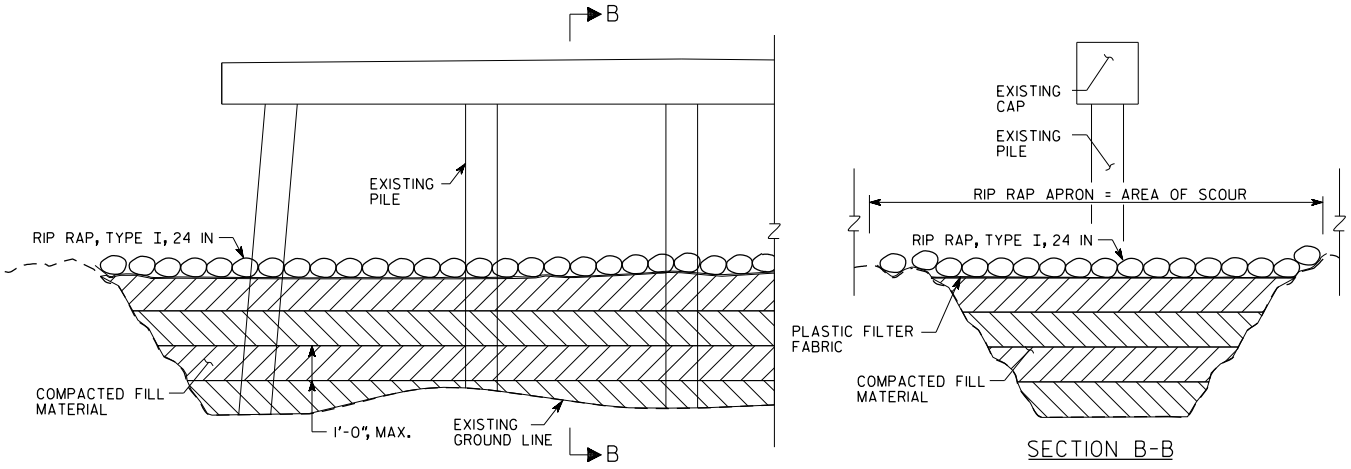
- None

Qualified Products List:

- None



EXISTING CONDITION



FINAL CONDITION

NOTE.

1. IF SCOUR HOLE EXCEEDS 10'-0", CONTACT THE STATE BRIDGE MAINTENANCE ENGINEER FOR GUIDANCE.
2. CARE MUST BE EXERCISED WHEN DUMPING RIP RAP AROUND EXISTING STRUCTURAL UNITS.
3. DO NOT PLACE APRON IN WATERS OF THE US.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
CHAINSAW & MISC. CLEARING EQUIPMENT
MISC. BUCKETS & HAND TOOLS
SOIL TAMPING EQUIPMENT
DIGGING EQUIPMENT

MATERIALS

RIP RAP, TYPE I, 24 IN
PLASTIC FILTER FABRIC
FILL MATERIAL

GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

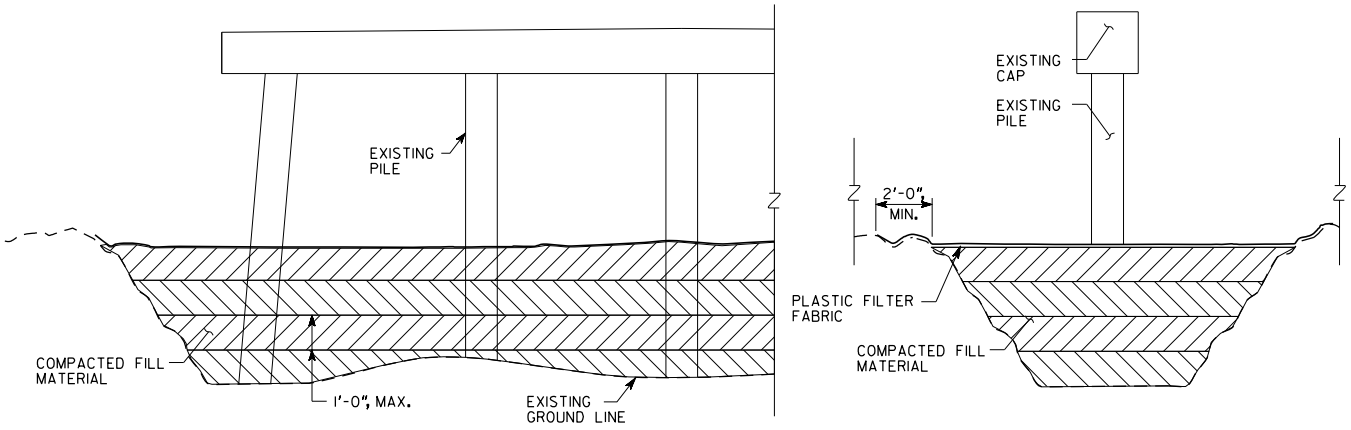
CONSTRUCTION DETAIL
PILE BENT SCOUR REPAIR

NO SCALE

JUNE 2012

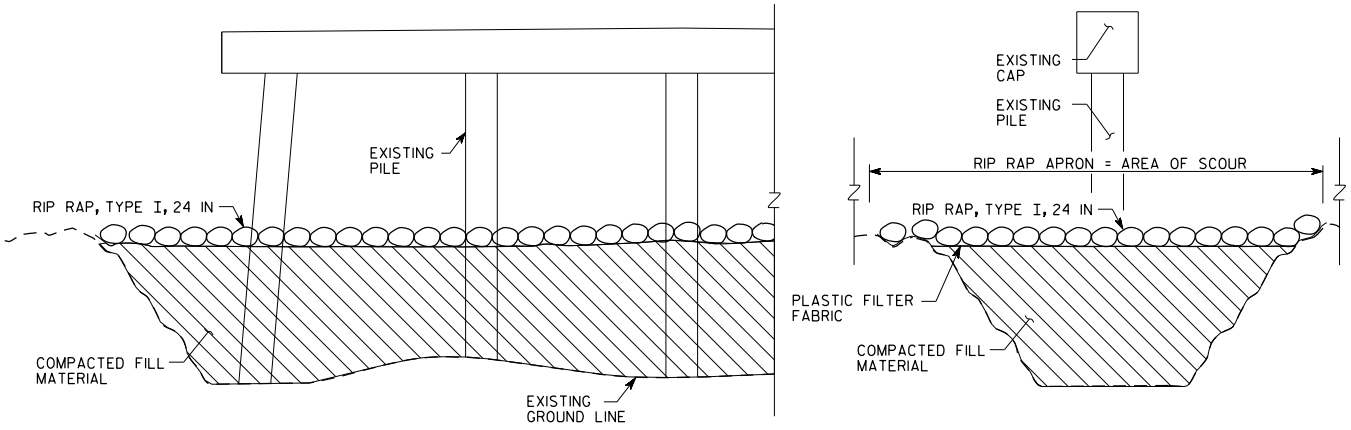
REVISION DATE

DRAWING NO.
845.03



STEP 1

1. REMOVE WATER, DEBRIS AND LOOSE SOIL FROM SCOUR AREA.
2. FILL AND COMPACT VOID AREA WITH SUITABLE FILL MATERIAL IN 1'-0" MAXIMUM LIFTS.
2. COVER COMPACTED FILL AREA WITH PLASTIC FILTER FABRIC AND EXTEND FABRIC BEYOND LIMITS OF FILL AREA BY 2'-0", MINIMUM ON ALL SIDES.



STEP 2

1. PLACE TYPE I RIP RAP AS SHOWN.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL PILE BENT SCOUR REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 845.03

Activity 845.04 – Slope Paving Repair

Before Repair

After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

Material Specifications:

- Concrete: Class B, f'_c = 2,200 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

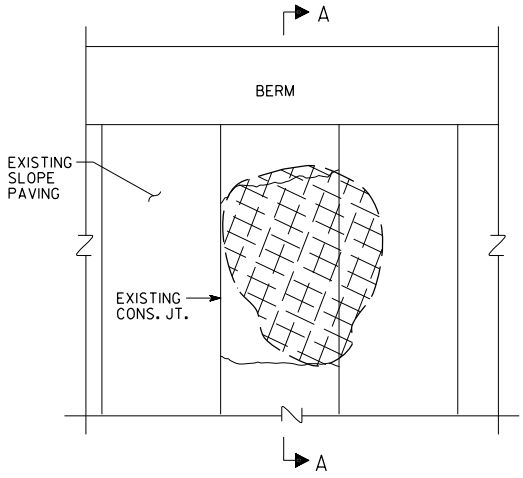
- Section 441 – Miscellaneous Concrete
- Section 812 – Backfill Material

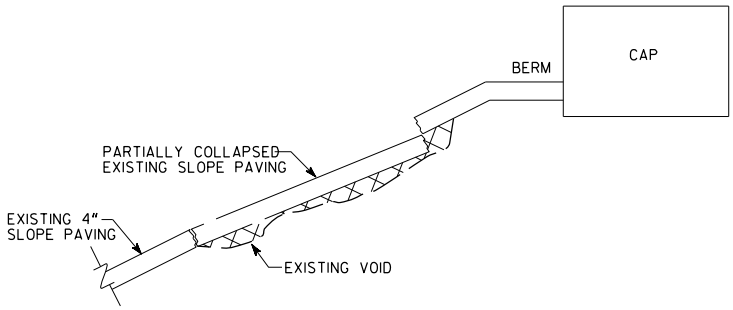
Georgia Special Provisions & Supplemental Specifications:

- None

Qualified Products List:

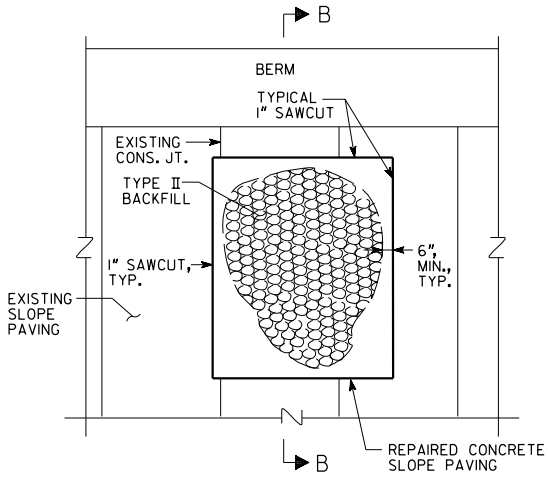
- None

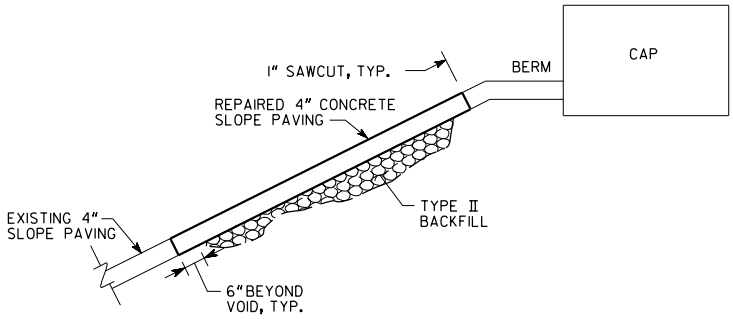




SECTION A-A

EXISTING CONDITION



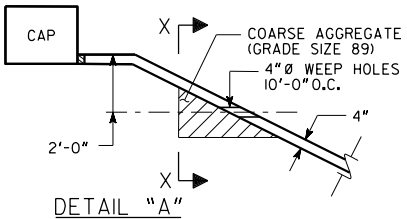


SECTION B-B

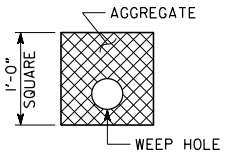
FINAL CONDITION

NOTE:

REPLACE ALL WEEP HOLES THAT HAVE BEEN REMOVED DURING CONSTRUCTION USING DETAIL "A".



DETAIL "A"



SECTION X-X

EQUIPMENT

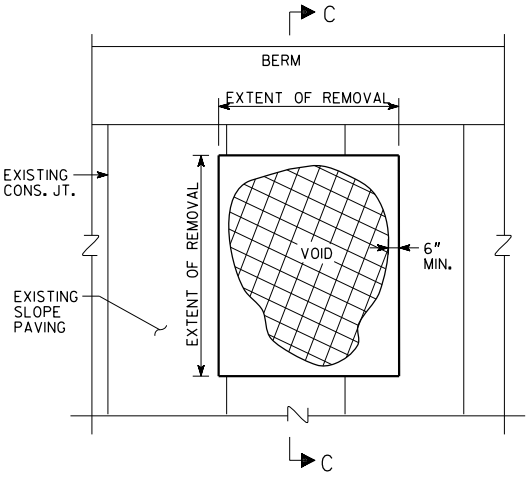
PERSONAL SAFETY EQUIPMENT AS NEEDED	PNEUMATIC CHIPPING HAMMER
PORTABLE AIR COMPRESSOR	SOIL TAMPER / COMPACTOR
PORTABLE ELECTRIC GENERATOR	MOBILE CONCRETE MIXER
CONCRETE SAW	CONCRETE HAND TOOLS
	MISC. BUCKETS & HAND TOOLS

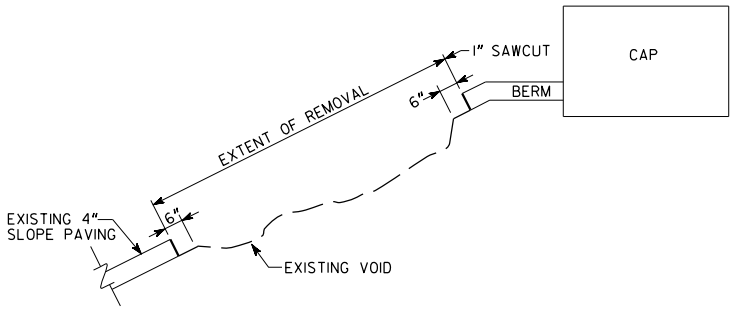
MATERIALS

CONCRETE
FOUND BKFILL MATL, TPII
PVC PIPE
GRADE SIZE 89 COARSE AGGREGATE

SHEET 1OF 2

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL SLOPE PAVING REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 845.04

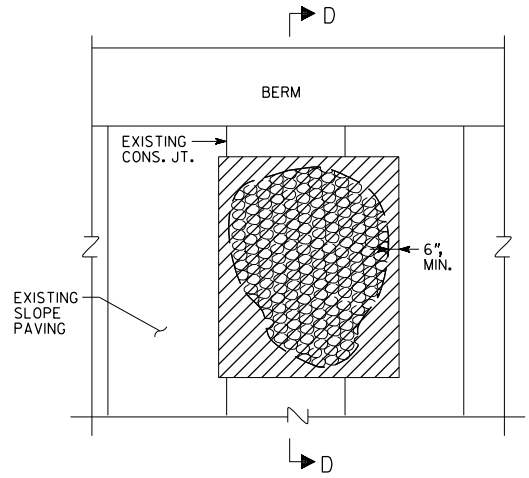


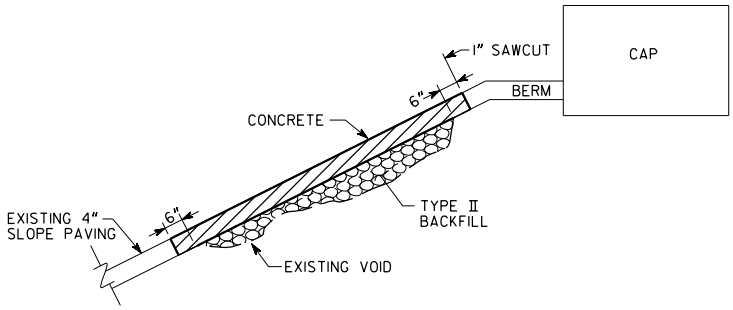


SECTION C-C

STEP 1

1. REMOVE ANY COLLAPSED SECTIONS OF SLOPE PAVE TO GAIN ACCESS TO VOID.
2. MEASURE VOID UNDER REMAINING SLOPE PAVE AND MARK EXTENTS.
3. SAWCUT 1" DEEP AT 6" BEYOND MARKED AREA AND REMOVE EXISTING SLOPE PAVING AFFECTED BY VOID. ALL SAWCUTS SHALL BE RECTANGULAR SHAPE.





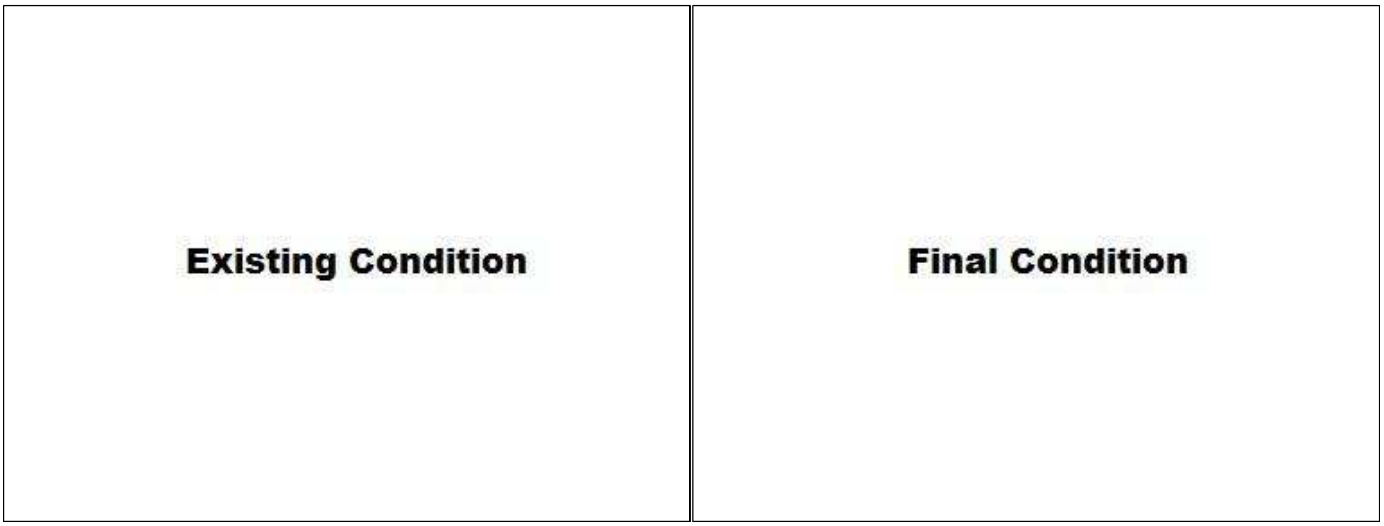
SECTION D-D

STEP 2

1. INSTALL REPLACEMENT WEEP HOLE OPENING AND COURSE AGGREGATE POCKET IF REQUIRED.
2. FILL VOID WITH FOUNDATION BACKFILL MATERIAL, TYPE II AND COMPACT.
3. THOROUGHLY WET BACKFILL AND SURROUNDING SLOPE PAVE, STANDING WATER OR MUD MUST BE REMOVED PRIOR TO CONCRETE PLACEMENT.
4. FILL OPENING WITH CONCRETE
5. FINISH FLUSH TO EXISTING SLOPE PAVE, BROOM FINISH CONCRETE SURFACE.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL SLOPE PAVING REPAIR NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 845.04

Activity 845.05 – Approach Slab Settling



Before Repair | After Repairs

General Notes:

Verify all dimensions and elevations in the field prior to ordering materials or building forms. Light lines indicate the existing structure and heavy lines indicate the new structure.

This repair can only be used on bridges with integral backwalls.

Material Specifications:

- Concrete: Flowable Fill, f'_c = 125 psi

Safety

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Georgia Standard Specifications

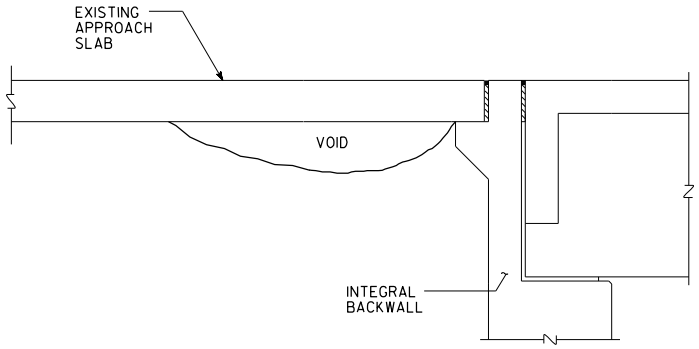
- Section 600 – Controlled Low Strength Flowable Fill

Georgia Special Provisions & Supplemental Specifications:

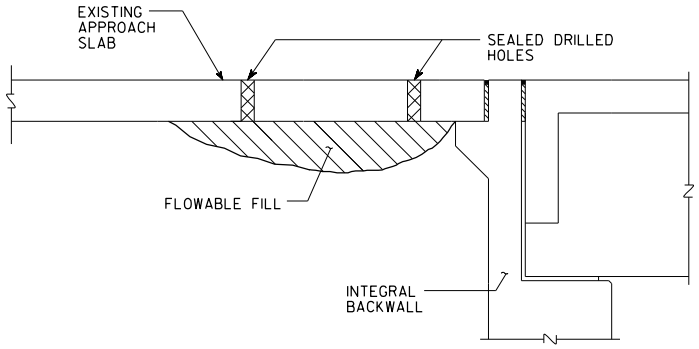
- None

Qualified Products List:

- None



EXISTING CONDITION



FINAL CONDITION

NOTES:

1. APPROACH SLAB SETTLING REPAIR ONLY APPLIES WHEN THE BACKWALL IS INTEGRAL. THIS APPLICATION SHALL NOT BE USED WITH A NON INTEGRAL ABUTMENT. IF UNSURE CONTACT THE STATE BRIDGE MAINTENANCE ENGINEER.
2. IF THE APPROACH SLAB IS SEVERELY CRACKED, IT SHOULD BE REPLACED.

EQUIPMENT

PERSONAL SAFETY EQUIPMENT AS NEEDED
PORTABLE AIR COMPRESSOR
PORTABLE ELECTRIC GENERATOR
CONCRETE CORE DRILL W/ STAND AND BITS
MOBILE CONCRETE MIXER
CONCRETE HAND TOOLS
CONCRETE PUMP
MISC. BUCKETS & HAND TOOLS

MATERIALS

FLOWABLE FILL
NONSHRINK GROUT
WOODEN PLUGS

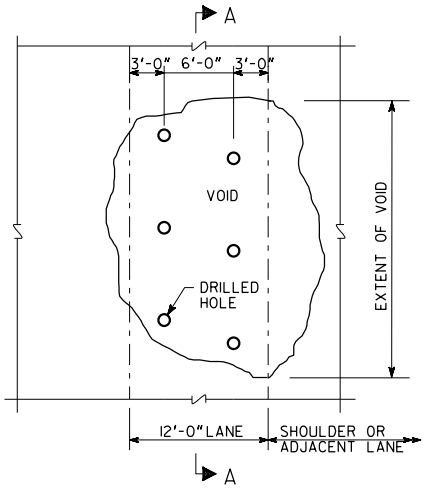
GEORGIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

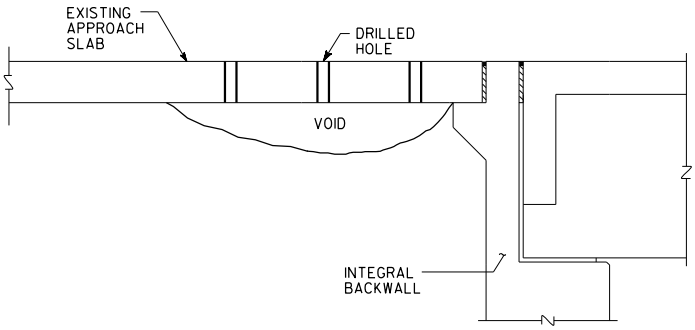
CONSTRUCTION DETAIL
APPROACH SLAB SETTLING

NO SCALE

JUNE 2012

REVISION DATE	DRAWING NO.
	845.05





SECTION A-A

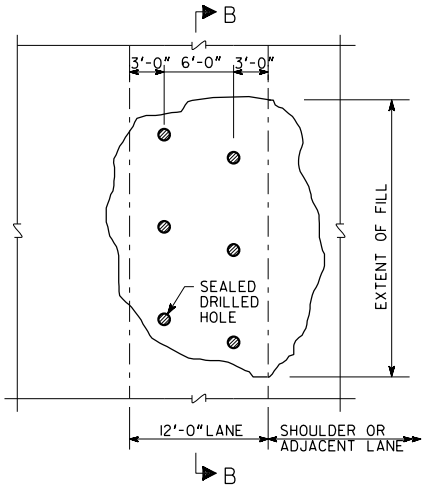
STEP 1

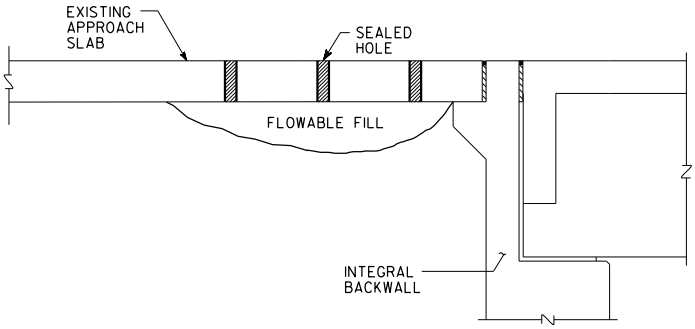
1. DETERMINE IF VOIDS ARE PRESENT UNDER APPROACH SLAB BY TEST ROLLING (0.030" MOVEMENT CRITERIA).

2. DRILL HOLES THROUGH THE SLAB. THE DIAMETER OF THE HOLE SHOULD FIT THE NOZZLE ON THE MUDPUMP (MAX 4" DIA. HOLE) SPACING OF THE HOLES DEPENDS ON THE CONDITION OF THE CONCRETE APPROACH SLAB.

   A TYPICAL PATTERN CONSISTS OF TWO ROWS OF HOLES, EACH 3 FEET FROM THE EDGE OF A 12-FOOT TRAFFIC LANE WITH THE HOLES 6 FEET APART ALONG THE LANE AND EQUALLY STAGGERED FROM THE HOLES IN THE OTHER ROW. WHEN ADJACENT LANES ARE DRILLED, THE HOLES ARE STAGGERED FROM THOSE IN THE NEAREST ROW OF THE OTHER LANE.

3. DRILL HOLES UNTIL VOID IS NO LONGER DETECTED.





SECTION B-B

STEP 2

1. ALL EXCEPT TWO HOLES ARE SEALED WITH WOODEN PLUGS.

2. PUMP THE FLOWABLE FILL INTO THE VOID THROUGH ONE HOLE UNTIL IT IS VISIBLE IN THE SECOND HOLE.

3. ONE OF THE TWO OPEN HOLES IS THEN PLUGGED.

4. THE FLOWABLE FILL IS THEN PUMPED INTO THE THIRD HOLE THAT HAS BEEN OPENED.

5. THE OPERATION IS CONTINUED UNTIL FLOWABLE FILL HAS BEEN PUMPED INTO EACH HOLE AND THE ENTIRE AREA HAS BEEN SEALED.

6. CARE SHOULD BE TAKEN TO GUARD AGAINST OVER CHARGING AT ANY LOCATION SINCE THIS MAY CAUSE ADDITIONAL CRACKING. A NUMBER OF SMALL CHARGES WILL PRODUCE A BETTER RESULT.

7. WHEN PUMPING IS COMPLETE ALL DRILLED HOLES SHOULD BE FILLED WITH NON-SHRINK GROUT.
   (DO NOT USE THE FLOWABLE FILL TO CAP THE HOLES)

8. TEST ROLL SLAB AFTER 24 HOURS MINIMUM CURING TIME TO DETERMINE IF MOVEMENT IS LESS THAN 0.030 INCHES.
   (LOADED DUMP TRUCK- 9 TONS)

9. REPEAT PROCESS, IF NECESSARY.

GEORGIA DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES	CONSTRUCTION DETAIL APPROACH SLAB SETTLING NO SCALE JUNE 2012	REVISION DATE	DRAWING NO. 845.05

3 Preventive Maintenance

A rigorous and constant program of preventative maintenance can extend the service life of a bridge ensure that the maximum value is realized from the initial capital investment. Additionally regular maintenance proves more cost effective that occasional major repair.

Preventive maintenance is defined as activities that will maintain components of the bridge and forestall development of a structural deficiency. Preventive maintenance activities can be classified into two groups: scheduled and response.

- Scheduled - Typical activities that are conducted on a scheduled interval basis include:
  - cleaning decks, seats, caps, and salt splash zones;
  - cleaning bridge drainage systems;
  - cleaning joints;
  - sealing concrete decks or substructure elements.
- Response – Activities identified through the inspection process. Typically these activities are performed on an as-needed basis and include:
  - painting structural steel members
  - removing debris from waterway channels;
  - removing brush;
  - maintain spillways in approach slab adjacent to the bridge.
  - replacing joints

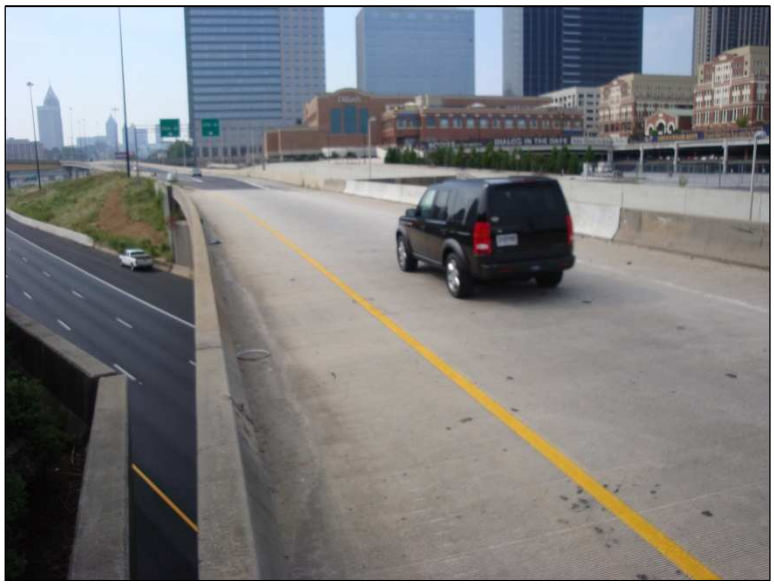
A program of preventive maintenance is most effective when applied to bridge elements on structures with significant remaining service life. The concept of preventive bridge maintenance is built on the understanding that a program of multiple relatively small repairs and activities will keep the bridge in good condition and thereby avoid the large expense of major rehabilitation or replacement.

Activity Schedule

Task	Frequency
Deck	
Clean Deck and Gutters	2 Years
Clean Deck Drains/Scuppers	2 Years
Clean Joints	Yearly
Seal Deck	6 Years
Superstructure	
Spot Paint Steel Members	As Needed
Substructure	
Clean Abutments/Caps	As Needed
Redress Rip Rap	As Needed
Site	
Remove Brush	Yearly
Remove Debris from Channel	As Needed
Maintain Spillway	As Needed

Figure 3.1 - Activity Schedule for Preventive Maintenance

Clean Deck and Gutters



Procedure:

Coordinate work with District Environmentalist for required permits for washing.

Collect and remove trash, dirt, and other debris from deck and gutters by sweeping, shoveling, vacuuming, or other suitable methods. Loosen dirt and debris with scrapers and stiff brushes, as necessary.

Pressure or Flood wash the structure, generally beginning at the highest point and working downward, using clean, fresh water. If bridge is located in a sag vertical curve, verify proper drainage before commencing work. Avoid direct discharge of water into streams or waterways.

Safety:

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Equipment:

- Traffic Control, as needed.
- Personal safety equipment.
- Water trailer.
- High-pressure water pump w/ hoses.
- Brooms/Shovels.
- Wheel Barrow

Materials:

- Non-Potable Water

Clean Deck Drains and Scuppers

Procedure:

Coordinate work with District Environmentalist for required permits for washing.

Flush scuppers and drainage system, but prevent sediment and debris from discharging into streams or waterways.

Remove scupper gratings and downspout clean-out plugs to flush and snake trapped debris, as necessary.

Use caution to control water pressure used in flushing drainage systems.

Safety:

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Equipment:

- Traffic Control, as needed.
- Personal safety equipment.
- Water trailer.
- Wheel Barrow
- High-pressure water pump w/ hoses.
- Sewer snake.
- Brooms/Shovels.

Materials:

- Non-Potable Water

Clean Expansion Joints

Procedure:

Use brooms and shovels to remove excess debris near the joint. Remove debris build up in the expansion joint, exercising care as not to damage the expansion joint material.

Safety:

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Equipment:

- Traffic Control, as needed.
- Personal safety equipment.
- Brooms/Shovels.
- Wheel Barrow

Materials:

- None

Sealing Deck

Procedure:

Prior to work, patch deck spalls in accordance with Activity 810.01 – Deck Spall Repair and Georgia DOT Special Provision 521 – Patching Concrete Bridge Deck.

Work shall be performed in accordance with Special Provision 519 – Two-Part Polymer Bridge Deck Overlay.

Safety:

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Equipment:

- Traffic Control, as needed.
- Personal safety equipment.
- Bucket and rollers.
- Shot Blaster.
- Sand Blaster/Air Gun.
- Spreader for aggregate.
- See Activity 810.01 for add. mat'l.

Materials:

- Deck overlay Material
- Aggregate

Clean Abutment/Caps

Procedure:

Coordinate work with District Environmentalist for required permits for washing.

Collect and remove trash, dirt, and other debris from deck and gutters by sweeping, shoveling, vacuuming, or other suitable methods. Loosen dirt and debris with scrapers and stiff brushes, as necessary.

Pressure wash the structure using clean, fresh water. Avoid direct discharge of water into streams or waterways.

Safety:

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Verify presence of lead paint system.

Equipment:

- Traffic Control, as needed.
- Personal safety equipment.
- Water trailer.
- High-pressure water pump w/ hoses.
- Brooms/Shovels.

Materials:

- Non-Potable Water

Redress Rip Rap

Procedure:

Clear the area of debris and vegetation. Layout filter fabric and overlay with a layer of rip rap from 18" to 24" thick.

Safety:

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Equipment:

- Traffic Control, as needed.
- Personal safety equipment.

Materials:

- Rip Rap, Type I
- Filter Fabric

Brush/Tree Removal

Procedure:

Cut and remove vegetation from around substructures and approaches (5' from outside edge of bridge opening), minimizing removal to limit habitat loss, erosion, and sedimentation.

Cut and remove trees to the groundline. Apply approved herbicide to kill the trees root system.

Safety:

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Equipment:

- Traffic Control, as needed.
- Personal safety equipment.
- Chainsaw

Materials:

- Herbicide

Debris Removal

Procedure:

Coordinate work with District Environmentalist for required permits.

Cut and remove debris from the river channel and overbank area.

Safety:

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control
- Use special care near streams and rivers.

Equipment:

- Traffic Control, as needed.
- Personal safety equipment.
- Chainsaw
- Gradall/Boom Truck
- Truck (Dump)

Materials:

- None

Maintain Spillways

Procedure:

Collect and remove trash, dirt, and other debris from spillways by sweeping, shoveling, vacuuming, or other suitable methods. Loosen dirt and debris with scrapers and stiff brushes, as necessary.

Pressure or Flood wash spillways, but prevent sediment and debris from discharging into streams or waterways.

Safety:

- Traffic Control
  - GDOT Operations Work Zone Traffic Control, or
  - GDOT Standard Drawings 9100 thru 9107 and MUTCD Part 6 – Temporary Traffic Control

Equipment:

- Traffic Control, as needed.
- Personal safety equipment.
- Water trailer.
- High-pressure water pump w/ hoses.
- Sewer snake.

Materials:

- Non-Potable Water

APPENDIX A – GENERAL REFERENCED DOCUMENTS

AASHTO Standard Specifications for Highway Bridges, 17th Edition

AASHTO Manual for Bridge Evaluation, 2nd Edition, with 2011 Interim Revisions

AASHTO/AWS D1.5M/D1.5:2010 Bridge Welding Code, 6th Edition, with 2011 AASHTO Interim Revisions

HEC-23 Bridge Scour and Stream Instability Countermeasures Experience, Selection, and Design Guidance

Manual on Uniform Traffic Control Devices, 2009 Edition

APPENDIX B – SPECIAL PROVISIONS

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION
P.I. No: XXXXXXX , XXXXX County

SECTION 519—TWO-PART POLYMER BRIDGE DECK OVERLAY

Add the following:

519.1 General Description

This work includes preparation of the bridge deck and furnishing and placing of a two-part polymer bridge deck overlay at the location and thickness as indicated on the plans. This bridge deck overlay system consists of a minimum 3/8 inch (9.5mm) thick application to provide complete waterproofing as well as providing a non-skid surface that withstands continuous heavy traffic and extreme changes in weather conditions.

519.1.01 Definitions

A. Standard Specifications

General Provision 101 through 150.

Section 107 – Legal Regulations and Responsibility to the Public

Section 504—Twenty-Four Hour Accelerated Strength Concrete

Section 886—Epoxy Resin Adhesives

Section 934—Rapid Setting Patching Materials for Portland Cement Concrete

519.2 Materials

A. Submittals: Submit the bridge deck overlay materials to the Office of Materials and Research for approval. The Office of Materials and Research will grant approval based on laboratory test results and on the system's performance during a 2 year field evaluation.

B. Pre-treatment: Use pre-treatment only when recommended by the overlay manufacturer. Use pre-treatment consisting of a two-part hybrid polymer that is free of any fillers or volatile solvents and formulated to provide simple volumetric ratio of two components such as one to one or two to one by volume. Formulate the two-part hybrid polymer to provide a unique combination of extremely low viscosity and low surface tension coupled with an affinity for concrete and steel. Use two-part hybrid polymer pre-treatment having the following physical requirements when cured:

PHYSICAL PROPERTIES FOR CURED PRE-TREATMENT SYSTEM		
TEST	**REQUIREMENTS**	**TEST METHOD**
Compressive Strength	5,500 PSI (38MPa) min.	ASTM C 109

Tensile Strength	3,100 PSI (21MPa) min.	ASTM D 638
Tensile Elongation	30% min.	ASTM D 638
Water Adsorption	0.10% max.	ASTM D 570
Shore "D" Hardness	65 min.	ASTM D 2240
Pot Life	40-70 minutes	GDT-58
Adhesion to Concrete	100% failure in concrete	ACI-503-R (Pull Out Test)

C. Bridge Deck Overlay: Use a bridge deck overlay consisting of a two-part polymer that is free of any fillers or volatile solvents and formulated to provide simple volumetric mixing ratio of two components such as one to one or two to one by volume. Use a two-part polymer system formulated to provide flexibility in the system without any sacrifice of the hardness, chemical resistance or strength of the system. Do not use external or conventional plasticizers. Introduce flexibility by interaction of elastomers to chemically link in the process of curing so that the flexibility of the molecule is minimally affected during the low temperature conditions that are confronted in actual use. Use a two-part polymer overlay system having the following physical properties when cured:

PHYSICAL PROPERTIES FOR CURED TWO PART POLYMER OVERLAY SYSTEM		
TEST	**REQUIREMENTS**	**TEST METHOD**
Compressive Strength	7,000 PSI (48MPa) min.	ASTM C 109
Tensile Strength	2,500 PSI (17MPa) min.	ASTM D 638
Tensile Elongation	30% min.	ASTM D 638
Water Adsorption	0.20% max.	ASTM D 570
Shore "D" Hardness	60 min.	ASTM D 2240
Pot Life	15-40 minutes	GDT-58
Flexural Creep	0.0065" (0.17mm) in 7 days	California Method 419
Adhesion to Concrete	100% failure in concrete	ACI-503-R (Pull Out Test)

D. Aggregate: Use bauxite, crushed porphyry, aluminum oxide or other similarly hard durable aggregates as recommended by the manufacturer and approved by the Engineer. Use embedded exposed aggregate conforming to the following gradation.

FINE AGGREGATE GRADATION	
SIEVE SIZE	**% PASSING BY WEIGHT**
No. 4	100
No. 20	0 – 5

No. 200	0 –1.0

Broadcast coarse aggregate conforming to the following gradation over the first layer of polymer, immediately prior to broadcasting fine aggregate.

COARSE AGGREGATE GRADATION	
SIZE	**% PASSING BY WEIGHT**
5/8”	98 - 100
½”	55 – 60
3/8”	12 – 14
¼”	0 - 1

519.2.01 Delivery, Storage and Handling

Deliver all materials in their original containers, bearing the manufacturer’s label, specifying date of manufacture, batch number, trade name brand, quantity and mixing ratio.

Store all materials to prevent damage from the elements and to insure the preservation of its quality and fitness for the work. Avoid contact with flame.

Inspect all stored materials, although accepted before storage, prior to their use in the work. Ensure that all stored materials meet the requirements of the Contract at the time of use.

Remove from the site of the work immediately, any material rejected because of failure to meet the required tests or rejected because of damage. Replace all removed material at no additional cost to the Department.

519.3 Construction Requirements

519.3.01 Preparation

A. Removal and Preparation of Repair Area

Sound all visual bridge deck defects of greater than 1” X 6” (25mm X 150mm) to determine the limits of the damaged areas. Strike the deck surface around the defect with a hammer, chain drag, or other similar tool to detect unsound concrete having a “flat” or “hollow” sound. Mark the limits of the defective areas on the deck by making a rectangular area 2 inches (50mm) beyond the outer limits of the unsound concrete area to serve as a guide for sawing. Mark spalled areas within less than 6 inches (150mm) of each other as one spall area.

Saw the rectangular marked areas with near vertical faces not less than one inch (25mm) in depth. Exercise extreme care not to saw or damage the reinforcing steel. Remove all unsound material within the sawed areas. Remove concrete to a minimum depth of $^1/_2$ inch (13mm) below the top mat of reinforcing steel by power chipping or hand tools. Do not use pneumatic hammers heavier than a 15 lb. class (nominal). Do not operate pneumatic hammers and chipping tools at an angle exceeding 60 degrees relative to the surface of the deck slab. Such tools may be started in the vertical position but must be immediately tilted to a 60 degree operation angle. Clean all exposed reinforcing steel of all rust, corrosion products, oil, dirt, concrete fragments, loose scale and any other coating of any character that would destroy or inhibit the bond with the patching material. Exercise utmost care not to damage or fracture the sound concrete substrate left on the bottom of the spall repair area. Do not use sharp pointed bits.

Hold "over-cutting" of the bridge deck beyond marked areas to the minimum amount possible. Thoroughly clean all "over-cutting" of "saw slurry" and other contaminants. Then repair by filling full-depth with an approved Type II epoxy adhesive as specified in Section 886. Make such repairs as soon as possible.

Just prior to placing the patching material, thoroughly clean the surfaces within the repair areas by abrasive blasting and air blasting to remove any oil, dust, dirt, slurry from saw operation, and other contaminants. Remove abrasives from the blasting operation from the bridge deck. During blasting, protect traffic in adjacent lanes.

B. Placement of Patching Material

The Contractor shall use Repair Method No. 1 or Method No. 2 as described below. For both repair methods, ensure the surface within the repair areas is dry and thoroughly cleaned of all contaminants immediately before placement. Use air compressors equipped with suitable traps capable of removing all surplus water and oil in the compressed air for cleaning repair areas. Do not use contaminated air. Use air compressors capable of delivering compressed air at a continuous pressure of 90 psi (620kPa).

Ensure the finished surface meets a surface tolerance of $^{1}/_{16}$ inch (1.6mm). Utilize such approved measures as necessary to keep the deck surface adjacent to the patching operation reasonably clean of excess grout and other materials at all times. Unless otherwise specified, complete all patching operations and open all lanes to traffic before sunset each day.

1. **Repair Method No. 1 (24 Hour Accelerated Strength Concrete)**

   After the repair area preparation is complete, completely coat all concrete surfaces within the repair area with a film of Type II epoxy at a thickness of 10 to 20 mils (0.25 to 0.50mm).

   Use concrete meeting the requirements of Section 504. Mix the concrete on site. Use a mix design and mixing method approved by the Laboratory. Deposit concrete in the repair area while the epoxy is still tacky and vibrate sufficiently to form a dense, homogeneous mass of concrete, completely filling the area of the patch. Screed the concrete to the proper grade and allow to remain undisturbed until the water sheen disappears from the surface. Then cover the concrete with wet burlap or membrane curing compound. Continue curing for a minimum of 3 hours. The Engineer may require a longer curing time to ensure sufficient strength development of the concrete prior to opening to traffic.

2. **Repair Method No. 2 (Rapid Setting Patching Material)**

   Follow the above requirements for Repair Method No. 1. Additionally, prepare the surfaces in the repair areas in accordance with the manufacturer's written recommendations. Handle, mix, place, consolidate, screed, and cure the patching material in accordance with the manufacturer's written instructions as approved by the Laboratory. Continue curing for at least one hour and until the section is opened to traffic.

519.3.02 Construction

A. Surface Preparation: Clean the bridge deck by shotblasting to remove any oil, dirt, rubber or any other potentially detrimental material such as curing compound and laitance which may prevent proper bonding and curing of the material.

The Contractor is directed to Section 107 of the Standard Specifications giving the Contractor responsibility for the work site, and requiring conformance to all federal, state, and local laws relating to pollution control and worker protection. In particular, ensure that the Contractor is familiar with and in full compliance with the provisions of the laws concerning the management of waste and worker protection.

Do not allow construction traffic on any portion of the deck that has been shotblasted or on the overlay without specific approval of the Engineer. Overlay the deck surface within 24 hours of the surface preparation operation.

Ensure all surfaces to be overlaid are dry at the time of application. Immediately before applying the overlay system, clean all prepared surfaces with compressed air (or vacuum) to remove dust and debris. Use air compressors equipped with a filter to prevent oil in the air supply. Do not apply the overlay system when rain

is forecast to occur within 24 hours of application. Do not apply the overlay system unless the minimum ambient temperature is 50° and rising.

If, in the opinion of the Engineer, the surface has become soiled or contaminated prior to the application of the overlay, re-clean the surface to the satisfaction of the Engineer at no additional cost to the Department.

B. Field Test: Prior to commencing the overlay operation, place a test area of overlay on the bridge deck. Prepare the area for the test overlay as described above. Ensure the test is large enough so the cleaning equipment and methods to be employed in the full-scale operation can be used for the field test. Ensure the degree of cleaning used on the test area is the minimum used on the remainder of the structure. Use the application of the overlay system to the test area to establish proper procedures and techniques for applying the overlay to the full structure.

After the test area has cured for 72 hours, check adhesion in accordance with ACI 503R-1980. Test a minimum of three sample areas. Ensure no adhesion test has an adhesive strength less than 250 psi (1725kPa) and the minimum average value for the 3 tests is greater than 300 psi (2070kPa).

If the test of a sample area fails to meet the above requirements due to a cohesive failure of the concrete substrate, the adhesive strength of the sample area will be considered acceptable. Successful completion of the adhesive strength tests will be required before the full-scale overlay operation is to begin.

C. Application: Provide suitable coverings, such as heavy duty drop cloths, to protect all exposed areas not to be overlaid, such as curbs, railings, parapets, deck drains, locations of expansion joints that are to receive expansion joint membranes, etc. Clean or repair any damage or defacement resulting from the application, at the Contractor's expense, to the satisfaction of the Engineer.

Ensure the application of the overlay system is done by the supplier, or by a factory trained or licensed applicator, with written approval from the manufacturer of the overlay system.

Ensure each component of the two-part polymer is metered, mixed together, and distributed onto the deck by machine. Use a dispensing machine capable of ratio check verification at the pump outlets as well as cycle counting to monitor output. Ensure the in line mixing is motionless so as not to overly shear the material. Ensure the machine makes maximum use of the working time of the polymer by mixing it immediately prior to dispensing onto the deck.

Provide the number of layers and the application rates of the materials in the various layers as recommended by the manufacturer in order to achieve a minimum $^{3}/_{8}$ inch (9.5mm) and maximum ½ inch (13mm) overlay thickness when measured from the top of the concrete substrate to the top of the polymer (not the peaks of the aggregate). Ensure the application of the overlay system is as follows:

1. APPLICATION OF POLYMER: After mixing of the components, evenly distribute the polymer on the clean, dry deck surface at the rate recommended by the manufacturer.
2. APPLICATION OF AGGREGATE: After application of each layer of polymer, allow a minimum lapse period as required by the manufacturer's instructions before broadcasting the aggregate. Ensure the method and rate of aggregate application is in accordance with the manufacturer's recommendations.
3. CONSOLIDATION: If required by the manufacturer, use a hand operated roller as approved by the Engineer and the manufacturer within 10 minutes of the aggregate application to evenly consolidate the aggregate into the polymer.
4. REMOVAL OF EXCESS AGGREGATE: After initial cure, remove excess aggregate by a power vacuum or other Engineer approved method prior to the application of subsequent layers of polymer.
5. APPLICATION OF ADDITIONAL LAYERS: Additional layers may be applied immediately after the initial set of the preceding layer (as determined by the Manufacturer and Engineer) and removal of all excess aggregate. The maximum time allowed between each layer shall be at the discretion of the Engineer and the Manufacturer and may vary depending on the temperature and circumstances of the project. Ensure joints are staggered and overlapped between successive layers so that no ridges will appear.

6. TRAFFIC CONSIDERATIONS: Traffic may be allowed on the final layer after the polymer has reached its final cure (as determined by the Manufacturer) and after removal of all excess, loose aggregate.
7. OVERLAY SURFACE: Ensure the finished surface consists of a uniform coat of imbedded exposed aggregate.

519.3.03 Quality Acceptance

A. Thickness Verification

Ensure the overlay is at least $^{3}/_{8}$" (9.5mm) thick as measured from the concrete substrate to the top of the polymer at three random locations for every 1000 yd^2 (830 m^2) of surface area. Recoat thin areas as described above and re-verify thickness at no additional cost to the Department. This verification may consist of cores, holes, etc., but in all cases repair any areas tested to destruction before final acceptance.

In thin areas that have been recoated to obtain the required minimum thickness, the Engineer may require additional adhesion strength tests in accordance with ACI 503R-29 to verify the Contractor's procedure for recoating existing overlay.

519.3.04 Contractor Warranty and Maintenance

The polymer manufacturer and the Contractor, by acceptance of the work described in this Specification, shall jointly agree to guarantee the wearing surface against all defects incurred during normal traffic use for a period of ten years. Submit this agreement in writing to the Engineer signed by both the polymer manufacturer and the Contractor. Commence the ten year period on the date of acceptance of the work. The guarantee shall cover all labor and materials required by the Department to satisfactorily repair and replace the wearing surface.

519.4 Measurement

519.4.01 Surface Preparation:

Measure the area of the deck acceptably repaired and blast cleaned prior to installation of the overlay in square yards (meters) computed from surface measurements taken to the nearest 0.1 foot (30mm). Do not measure the blast cleaning of any longitudinal or transverse construction joints or vertical surfaces for payment.

519.4.02 Polymer Overlay:

Measure the area of the deck acceptably overlaid with polymer and broadcast spread crushed aggregate in square yards (meters) computed from surface measurements taken to the nearest 0.1 foot (30mm).

519.5 Payment

519.5.01 Surface Preparation:

Surface preparation is paid for by the square yard (meter) of the deck acceptably repaired and blast cleaned prior to installation of the overlay. Payment includes all expenses associated with removal of existing concrete, repair and blast cleaning operations.

519.5.02 Polymer Overlay:

Polymer overlay is paid for by the square yard (meter) of the deck overlaid, complete in place and accepted, provided, however, that the specified minimum overlay thickness requirement is met. The individual layers necessary to attain the specified thickness will not be paid for individually. Payment includes all labor and material cost, procurement, handling, hauling and processing, coring for thickness verification, guarantee, and includes all equipment, tools, labor, and incidentals necessary to complete the work.

Payment will be made under:

Item No. 519	Surface Preparation	Per square yard (meter)
Item No. 519	Polymer Overlay	Per square yard (meter)

Item No. 519-0515 Surface Preparation per Square Yard (Meter)

Item No. 519-0530 Polymer Overlay per Square Yard (Meter)

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION
P.I. No: XXXXXXX , XXXXX County

SECTION 521 – PATCHING CONCRETE BRIDGE DECK

521.1 General Description

This work includes partial depth patching of spalls in a concrete bridge deck by removing the broken, damaged, or disintegrated concrete. This work also includes removing any patches from spalled or damaged areas of the bridge deck surface and patching them with approved patching materials according to this Specification.

521.1.01 Definitions

General Provisions 101 through 150.

521.1.02 Related References

A. Standard Specifications

Section 504—Twenty-Four Hour Accelerated Strength Concrete

Section 886—Epoxy Resin Adhesives

Section 934—Rapid Setting Patching Materials for Portland Cement Concrete

B. Referenced Documents

QPL 27

521.1.03 Submittals

General Provisions 101 through 150.

521.2 Materials

Ensure that the materials used to repair and patch concrete bridge deck conform to the rapid setting patching material requirements.

521.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

521.3 Construction Requirements

521.3.01 Personnel

General Provisions 101 through 150.

521.3.02 Equipment

To clean the repair areas, use air compressors equipped with traps that can remove surplus water and oil in the compressed air. Ensure that the compressor can deliver compressed air at a continuous pressure of at least 90 psi (620 kPa).

The Engineer will check the compressed air daily for contamination. Do not use contaminated air.

521.3.03 Preparation

A. Removing and Preparing the Repair Area

Prepare to perform partial patching of spalled areas as follows:

a. "Sound" bridge deck with visual defects to determine the limits of the damaged areas. Strike the deck surface with a hammer, chain drag, or similar tool to detect unsound concrete that sounds flat or hollow.

   Omit any defect for repair that is less than 1 in. by 6 in. by 0.5 in. (25 by 150 by 12 mm) deep.

b. Mark the limits of the defective areas on the deck by making a rectangle 6 in. (150 mm) beyond the outer limits of the unsound concrete area as a guide for sawing.

c. Mark spalled areas less than 6 in. (150 mm) from each other as one spall area.

d. Saw the rectangular marked areas with near vertical faces at least 1 in. (25 mm) deep. Exercise extreme care not to saw or damage the reinforcing steel.

e. Remove unsound material within the sawed area to a minimum depth of 1 in (25 mm) below the top mat of reinforcing steel with power chipping or hand tools. Pneumatic hammers heavier than 15 lb. class nominal (30 lb. maximum) are not permitted.

f. Operate pneumatic hammers and chipping tools at an angle not to exceed 60 degrees relative to the surface of the deck. After starting tool in the vertical position, immediately tilt the tool to a 60 degree operating angle.

g. Do not damage or fracture the sound concrete substrate to be left on the bottom of the spall area. Do not use sharp pointed bits.

h. Clean all exposed reinforcing steel of all rust and corrosive products including oil, dirt, concrete fragments, loose scale and any other coating of any character that would destroy or inhibit the bond with the patching material.

i. Immediately before placing the patching material, thoroughly clean the surfaces within the repair areas by sandblasting and air blasting to remove oil, dust, dirt, slurry from saw operation, and other contaminants.

521.3.04 Fabrication

General Provisions 101 through 150.

521.3.05 Construction

A. Concrete Patching

Patch concrete safely and rapidly to minimize inconvenience to the traveling public.

1. Accomplish this work with other operations in progress within an area if possible.
2. Remove and replace completed patches that contain cracks, shrinkage, compression failures, or are damaged by construction or traffic before Final Acceptance at no cost to the Department.

B. Placing Patching Material

Use Repair Method 1 unless the Engineer gives written approval to use Repair Method 2. Use Repair Method 1 when the average daily temperature is 50 °F (10 °C) or above. Use of Repair Method 2, if approved, is limited to the manufacturer's written recommendations.

For the following repair methods, begin the placement when the surface within the repair area is dry and thoroughly free of contaminants.

Ensure that the finished surface meets a surface tolerance of 1/16 in. (1.5 mm).

Use approved measures as necessary to keep the deck surface adjacent to this operation free of excess grout and other materials. Unless otherwise specified, complete the patching operations and open to traffic before sunset each day.

1. Repair Method 1: Twenty-four Hour Accelerated Strength Concrete

   Use this method as follows:

   a. Completely coat the concrete surface areas within the repair area with a film of Type II epoxy approximately 10 to 20 mils (0.25 to 0.50 mm) thick.

   b. Mix the concrete on site in a portable mixer. Obtain approval for the mix design and mixing method from the laboratory. The material must meet a slump range of 1.0 in. (25 mm) to 3.0 in. (75 mm).

   c. Deposit the concrete in the repair area while the epoxy is still tacky. Vibrate it to form a dense, homogeneous mass of concrete that completely fills the patch area.

   d. Screed the concrete to the proper grade and do not disturb it until the water sheen disappears from the surface.

   e. Cover the concrete with wet burlap or membrane curing compound. Allow the curing to continue for at least three hours. The Engineer may require longer curing to ensure sufficient concrete strength development before opening to traffic.

2. Repair Method 2: Rapid Setting Patching Material

   a. In addition to the requirements outlined in Subsection 451.3.03.A, "Removing and Preparing the Repair Area," prepare the surfaces in the repair areas according to the manufacturer's written recommendations.

   b. Perform the patching material handling, mixing, placing, consolidating, screeding, and curing according to the manufacturer's written recommendations as approved by the laboratory.

   c. Continue curing for at least one hour and until opening the section to traffic.

C. Special Requirements

The following special requirements apply to this work:

1. During sandblasting, protect traffic in the adjacent lanes.
2. After the sandblasting operations:
   a. Thoroughly clean the area to be repaired with compressed air.
   b. Remove sand from the sandblasting operation from the bridge deck.
3. Do not "over-cut" the bridge deck beyond marked areas whenever possible.
4. Remove saw slurry and other contaminates from the over-cutting.
5. Repair the over-cuts by filling full-depth with an approved low-viscosity epoxy compound using a Type II epoxy adhesive specified in Section 886. Make these repairs as soon as possible.

521.3.06 Quality Acceptance

General Provisions 101 through 150.

521.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

521.4 Measurement

The area measured for payment is the number of square feet (meters) of patching complete in place and accepted.

521.4.01 Limits

General Provisions 101 through 150.

521.5 Payment

The area measured as specified above will be paid for at the Contract Unit Price per square foot (meter). Payment is full compensation for equipment, tools, labor, incidentals to complete the work, including but not limited to:

- Removing existing patching material or the spalled, broken, or damaged concrete
- Cleaning the open area by sandblasting
- Furnishing, placing, finishing, and curing the patching material

Payment will be made under:

Item No. 521	Patching concrete bridge deck	Per square foot (meter)

521.5.01 Adjustments

General Provisions 101 through 150.

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION
P.I. No: XXXXXXX , XXXXX County

SECTION 521 – PATCHING CONCRETE BRIDGE

Add the following:

521.1 General Description

This work includes patching of substructure or superstructure concrete bridge components by removing the concrete, cleaning existing reinforcement, adding supplemental reinforcement when required, and patching with approved conventional or accelerated Portland cement concrete or rapid setting patching materials according to this Specification and as shown on the Plans.

521.1.01 Definitions

General Provisions 101 through 150.

"Sound" – the act of striking a concrete surface with a chipping hammer or similar tools to detect unsound concrete.

521.1.02 Related References

A. Standard Specifications

Section 500—Concrete Structures

Section 504—Twenty-Four Hour Accelerated Strength Concrete

Section 511—Reinforcement Steel

Section 853—Reinforcement and Tensioning Steel

Section 886—Epoxy Resin Adhesives

Section 934—Rapid Setting Patching Materials for Portland Cement Concrete

B. Referenced Documents

QPL 10

QPL 27

521.1.03 Submittals

General Provisions 101 through 150.

521.2 Materials

Ensure that the materials used to repair and patch bridge components meet the following requirements:

A. Portland Cement Concrete Patching Materials

1. Conventional Portland Cement Concrete (Repair Method 1)
    a. Use Class "A" or Class "AA" concrete or as indicated on the Plans.

b. Meets the requirements of Section 500 of the Specifications.

c. Use concrete manufactured at plants that qualify as approved sources according to the Standard Operating Procedure for Ready Mix Concrete. See QPL 10 for a list of approved plants.

2. Twenty-Four Hour Accelerated Strength Concrete (Repair Method 2)

a. Meets the requirements of Section 504 of the Specifications, except that the use of a portable concrete mixer is required.

B. Rapid Setting Patching Materials (Repair Method 3)

1. Use rapid setting patching materials meeting the requirements of Section 934. See QPL 27 for a list of approved patching materials. Patching materials not listed on QPL 27 will require testing and approval by the Office of Materials and Research before use.

2. When shown on the Plans, use Type III rapid setting patching material to patch vertical and overhead repair areas.

521.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

521.3 Construction Requirements

521.3.01 Personnel

General Provisions 101 through 150.

521.3.02 Equipment

To clean the repair areas, use air compressors equipped with traps that can remove surplus water and oil in the compressed air. Ensure that the compressor can deliver compressed air at a continuous pressure of at least 90 psi (620 kPa).

The Engineer will check the compressed air daily for contamination. Do not use contaminated air.

521.3.03 Preparation

A. Limits of Repair

Repair all patches as shown on the Plans and as directed by the Engineer.

B. Concrete Removal

1. Remove concrete to a minimum depth of 3¾" inches or as shown on the Plans with power chipping or hand tools. Pneumatic hammers heavier than 15 lb. class nominal (30 lb. maximum) are not permitted. Exercise extreme care not to saw or damage the reinforcing steel.

2. Operate pneumatic hammers and chipping tools at an angle not to exceed 60 degrees relative to the surface of the concrete. After starting the tool in the vertical position, immediately tilt the tool to a 60 degree operating angle.

3. Do not damage or fracture the sound concrete substrate to be left on the bottom of the patch area. Do not use sharp pointed bits.

C. Surface Preparation

1. Clean all exposed reinforcing steel of all rust and corrosive products including oil, dirt, concrete fragments, loose scale and any other coating of any character that would destroy or inhibit the bond with the patching material.

2. Immediately before placing the patching material, thoroughly clean the surfaces within the repair areas by sandblasting and air blasting to remove oil, dust, dirt, slurry from saw operation, and other contaminants.

3. Place formwork as required to complete patch repair. Provide access in formwork for placement of patch material.

4. Ensure that the finished surface meets a surface tolerance of 1/16 in. (1.5 mm).

5. Use approved measures as necessary to keep the adjacent concrete surfaces free of excess grout and other materials.

521.3.04 Fabrication

General Provisions 101 through 150.

521.3.05 Construction

A. Concrete Patching

Patch concrete safely and rapidly to minimize inconvenience to the traveling public.

1. Accomplish this work with other operations in progress within an area if possible.

2. Remove and replace completed patches that contain cracks, shrinkage, compression failures, or are damaged by construction or traffic before Final Acceptance at no cost to the Department.

B. Placing Patching Material

Only use Repair Method 1 with the class of concrete on bridge components designated on the Plans.

Use Repair Method 2 unless the Engineer gives written approval to use Repair Method 3. Use Repair Method 1 and 2 when the average daily temperature is 50 °F (10 °C) or above. Use of Repair Method 3, if approved, is limited to the manufacturer's written recommendations.

For the following repair methods, begin the placement when the surface within the repair area is dry and thoroughly free of contaminants.

1. Repair Method 1: Conventional Portland Cement Concrete

    a. Completely coat the concrete surface areas within the repair area with a film of Type II epoxy adhesive as specified in Section 886 approximately 10 to 20 mils (0.25 to 0.50 mm) thick or according to the manufacturer's written recommendations.

    b. Deposit the concrete in the repair area while the epoxy is still tacky. Vibrate it to form a dense, homogeneous mass of concrete that completely fills the patch area.

    c. Screed the concrete to the proper grade and do not disturb it until the water sheen disappears from the surface.

    d. Cover the concrete with wet burlap or membrane curing compound. Allow the curing to continue until the required minimum design compressive strength is achieved as designated by the class of concrete used or as shown on the Plans. Complete curing prior to transferring load to the repaired section.

2. Repair Method 2: Twenty-Four Hour Accelerated Strength Concrete

    a. Prepare, remove and place as outlined in Subsections 521.3.03 and 521.3.05.B and 521.3.05.B.1.

    b. Mix the concrete on site in a portable mixer of adequate capacity. Obtain approval for the mix design and mixing method from the Office of Materials and Research.

    c. The material must meet a slump range of 1.0 to 3.0 in. (25 to 75 mm).

3. Repair Method 3: Rapid-Setting Patching Material

    a. In addition to the requirements outlined in Subsection 521.3.03, prepare the surfaces in the repair areas according to the manufacturer's written recommendations.

    b. Perform the patching material handling, mixing, placing, consolidating, finishing, and curing according to the manufacturer's written recommendations as approved by the Office of Materials and Research.

c. Continue curing until a minimum design compressive strength of 3,500 psi (20 MPa) or as shown on the Plans is achieved. Complete curing prior to transferring load to the repaired section.

C. Special Requirements

The following special requirements apply to this work:

1. During sandblasting, protect traffic in adjacent travel lanes.
2. After the sandblasting operations:
   a. Thoroughly clean the area to be repaired with compressed air.
   b. Remove sand from the sandblasting operation from adjacent concrete surfaces.
3. Do not "over-cut" concrete surfaces beyond marked areas whenever possible.
4. Remove saw slurry and other contaminates from the over-cutting.
5. Repair the over-cuts by filling full-depth with an approved low-viscosity epoxy compound using a Type II epoxy adhesive specified in Section 886. Make these repairs as soon as possible.

521.3.06 Quality Acceptance

General Provisions 101 through 150.

521.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

521.4 Measurement

The area measured for payment is the number of square feet (meters) of patching complete in place and accepted.

521.4.01 Limits

General Provisions 101 through 150.

521.5 Payment

The area measured as specified above will be paid for at the Contract Unit Price per square foot (meter). Payment is full compensation for equipment, tools, labor, incidentals to complete the work, including but not limited to:

- Removing existing patching material or the spalled, broken, or damaged concrete
- Cleaning the open area by sandblasting
- Furnishing, placing, finishing, and curing the patching material
- Supplemental reinforcement

Payment will be made under:

Item No. 521	Patching concrete bridge	Per square foot (meter)

521.5.01 Adjustments

General Provisions 101 through 150.

Bridge Management Unit

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION
P.I. No: XXXXXXX , XXXXX County

SECTION 527 – MISCELLANEOUS CONCRETE REPAIR

Add the following:

527.1 General Description

This work consists of repairing concrete by locating existing reinforcing steel and miscellaneous concrete embedments within the vicinity of the repair; saw cutting concrete; removing deteriorated concrete and/or existing patch material and installing concrete patch material.

All work will be in accordance with this Specification, the Plans and as directed by the Engineer.

527.1.01 Definitions

General Provisions 101 through 150

"Sound" – the act of striking a concrete surface with a chipping hammer or similar tools to detect unsound concrete.

527.1.02 Related References

A. Standard Specifications

Section 500 – Concrete Structures

Section 511 – Reinforcement Steel

Section 853 – Reinforcement and Tensioning Steel

Section 886 – Epoxy Resin Adhesive

Section 934 – Rapid Setting Patching Materials for Portland Cement Concrete

B. Referenced Documents

QPL 15

QPL 27

527.1.03 Submittals

Submit Working Drawings and Material Specifications that describe the details and materials required to adequately complete the repair work including concrete patch material. Include written procedures required to complete the repair work.

527.1.04 Repair of Damage Caused by Contractor's Operations

Repair any damage caused by construction operations and procedures to any part of the existing structure to the satisfaction of the Engineer, at the expense of the Contractor. If required, provide design computations and

drawings to repair the damage caused by construction operations and procedures. Computations will be made by a Professional Engineer, registered in the State of Georgia, in the employ of the Contractor.

527.2 Materials

Ensure that the materials used to repair and patch bridge components meet the following requirements:

A. Rapid Setting Patching Materials

Use rapid setting patching materials meeting the requirements of Section 934. See QPL 27 for a list of approved patching materials. Patching materials not listed on QPL 27 will require testing and approval by the Office of Materials and Research before use.

Use Type I Class A rapid setting patching material to patch vertical and overhead repair areas.

527.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

527.3 Construction Requirements

527.3.01 Personnel

General Provisions 101 through 150.

527.3.02 Equipment

To clean the repair areas, use air compressors equipped with traps that can remove surplus water and oil in the compressed air. Ensure that the compressor can deliver compressed air at a continuous pressure of at least 90 psi (620 kPa).

The Engineer will check the compressed air daily for contamination. Do not use contaminated air.

527.3.03 Preparation

A. Limits of Repair

Repair all damaged concrete as shown on the Plans and as directed by the Engineer. Determine limits of repairs as follows:

1. "Sound" concrete surface with visual defects to determine the limits of the damaged areas. Strike the surface with a chipping hammer or similar tools to detect unsound concrete. Concrete that is loose or exhibits a flat or hollow sound is considered unsound.
2. Mark the limits of the defective areas on the concrete surface by making a rectangle 2 in. (50 mm) beyond the outer limits of the unsound concrete area as a guide for saw cuts.
3. Obtain approval from the Engineer on the limits of each repair prior to saw cutting.

B. Concrete Removal

1. Prior to any concrete work, utilize a Profometer 3 Rebar Locator (by Proceq) or an approved equivalent to locate existing reinforcing steel and prestressing strands in the concrete.
2. Saw the rectangular marked areas a minimum of 1/2 in. (12 mm) deep or as shown on the plans. Exercise extreme care not to saw or damage the reinforcing steel or prestressing strands.
3. Remove unsound material within the sawed area to a minimum depth of 2 inches for unreinforced concrete or 0.5 in. (12 mm) below the reinforcing steel or prestressing stands, or as shown on the Plans with power chipping or hand tools. Pneumatic hammers heavier than 13.5 lb. class nominal (30 lb. maximum) are not permitted. Exercise extreme care not to saw or damage the reinforcing steel or prestressing strands.
4. Operate pneumatic hammers and chipping tools at an angle not to exceed 60 degrees relative to the surface of the concrete. After starting the tool in the vertical position, immediately tilt the tool to a 60 degree operating angle.

5. Do not damage or fracture the sound concrete substrate to be left on the bottom of repair area. Do not use sharp pointed bits.

C. Surface Preparation

1. Clean all exposed reinforcing steel of all rust and corrosive products including oil, dirt, concrete fragments, loose scale and any other coating of any character that would destroy or inhibit the bond with the patching material.
2. Immediately before placing the patching material, thoroughly clean the surfaces within the repair areas by sandblasting and air blasting to remove oil, dust, dirt, slurry from saw operation, and other contaminants.
3. Place formwork as required to complete patch repair. Provide access in formwork for placement of patch material.
4. Ensure that the finished surface meets a surface tolerance of 1/16 in. (1.5 mm).
5. Use approved measures as necessary to keep the adjacent concrete surfaces free of excess grout and other materials.

527.3.04 Fabrication

General Provisions 101 through 150.

527.3.05 Construction

A. Concrete Patching

Patch concrete safely and rapidly to minimize inconvenience to the traveling public.

1. Accomplish this work with other operations in progress within an area if possible.
2. Remove and replace completed patches that contain cracks, shrinkage, compression failures, or are damaged by construction or traffic before Final Acceptance at no cost to the Department.

B. Placing Patching Material

For the following repair method, begin the placement when the surface within the repair area is dry and thoroughly free of contaminants.

1. Rapid-Setting Patching Material
    a. In addition to the requirements outlined in Subsection 521.3.03, prepare the surfaces in the repair areas according to the manufacturer's written recommendations.
    b. Perform the patching material handling, mixing, placing, consolidating, finishing, and curing according to the manufacturer's written recommendations as approved by the Office of Materials and Research.
    c. Continue curing until a minimum design compressive strength of 5,000 psi (34.5 MPa) or as shown on the Plans is achieved. Complete curing prior to transferring load to the repaired section.

C. Special Requirements

The following special requirements apply to this work:

1. During sandblasting, protect traffic in adjacent travel lanes.
2. After the sandblasting operations:
    a. Thoroughly clean the area to be repaired with compressed air.
    b. Remove sand from the sandblasting operation from adjacent concrete surfaces.
3. Do not "over-cut" concrete surfaces beyond marked areas whenever possible.
4. Remove saw slurry and other contaminates from the over-cutting.

5. Repair the over-cuts by filling full-depth with an approved low-viscosity epoxy compound using a Type II epoxy adhesive specified in Section 886. Make these repairs as soon as possible.

527.3.06 Quality Acceptance

General Provisions 101 through 150.

527.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

527.4 Measurement

The area measured for payment is the number of square feet (meters) of concrete repaired and accepted.

527.4.01 Limits

General Provisions 101 through 150.

527.5 Payment

The quantities as measured above will be paid for at the Contract Unit Price complete, in place, and accepted. Payment is full compensation for all equipment, tools, labor, supplies, testing, incidentals and direct and indirect cost to complete the work, including but not limited to:

- Removing spalled, broken, or damaged concrete
- Cleaning the open area by sandblasting
- Furnishing, placing, finishing, and curing the patching material
- Supplemental reinforcement

Payment will be made under:

Item No. 527	Miscellaneous Concrete Repair	Per square foot (meter)

527.5.01 Adjustments

General Provisions 101 through 150.

Bridge Management Unit

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION
P.I. No: XXXXXXX , XXXXX County

Section 528 – Epoxy Pressure Injection of Concrete Cracks

Add the following:

Epoxy Sealing of Concrete Cracks

528.1 General Description

This work consists of labor, material, equipment, and services necessary for repairing cracks greater than 0.02 inches (0.25 mm) in the concrete deck overlay surface using gravity means. The Engineer will determine the extent of repair. The work shall comply with the Specifications including Special Provisions where applicable.

528.1.01 Definitions

General Provisions 101 through 150.

528.1.02 Related References

A. Standard Specifications

Section 886-Epoxy Resin Adhesives

B. Referenced Documents

General Provisions 101 through 150.

528.1.03 Submittals

General Provisions 101 through 150.

Submit product handling and use specifications from manufacturer of epoxy adhesive.

528.2 Materials

Ensure epoxy used for crack repair complies with the requirements of Section 886, Type V epoxy adhesive.

Ensure epoxy used for sealing cracks is a low viscosity, high modulus epoxy adhesive. Ensure the viscosity of epoxy adhesive is no greater than 175 cps.

528.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

Follow manufacturer's recommendations for storage and handling of epoxy adhesive.

528.3 Construction Requirements

528.3.01 Personnel

General Provisions 101 through 150.

528.3.02 Equipment

For routing cracks, use hand held grinders with a masonry disc small enough to follow the line of the cracks.

528.3.03 Preparation

Perform grinding of the deck as required for riding quality requirements prior to repairing cracks.

Clean concrete surfaces using mechanical means to remove all dust, oil, grease, laitance, curing compounds, and any other contaminants prior to placing epoxy adhesive.

528.3.04 Fabrication

General Provisions 101 through 150.

528.3.05 Construction

1. Seal concrete cracks as follows:
    a. Route a ¼ in (6 mm) deep vee-notch in the crack using a hand held grinder following closely the line of the crack.
    b. Clean concrete surfaces using mechanical means.
    c. Prepare epoxy adhesive in accordance with the manufacturer's specifications.
    d. Pour neat epoxy adhesive into vee-notched crack using gravity means. Continue placement until the crack is completely filled.
    e. After crack filling is complete, clean the sealed cracks to the original concrete surface.
2. Perform grooving of deck after crack repair is complete and accepted by the Engineer.

528.3.06 Quality Acceptance

General Provisions 101 through 150.

528.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

528.4 Measurement

Repair of concrete cracks is measured for payment by linear foot (meter) of concrete crack repired, and includes all materials, equipment and labor necessary to complete the work.

528.4.01 Limits

General Provisions 101 through 150.

528.5 Payment

Payment for repair of concrete cracks as specified above is paid for at the Contract Unit price bid per linear foot. Such payment is full compensation for furnishing all equipment, labor and materials and performing the work in accordance with the Plans and Specifications. Payment will be made under:

Item No. 528	Epoxy Sealing of Concrete Cracks	Per linear foot (meter)

APPENDIX C – QUALITY PRODUCTS LIST

QPL Number	Description
QPL-10	List of Approved Concrete Plants
QPL-12	Reinforcement Steel Fabricators
QPL-15	Epoxy Resin Adhesives
QPL-17	Special Surface Coating for Concrete
QPL-18	Special Protective Coating
QPL-19	Bar Supports
QPL-20	(A) Preformed Joint Filler and (B) Preformed Foam Joint Filler
QPL-27	Rapid Setting Patching Material
QPL-28	Filter Fabrics
QPL-38	Epoxy Powders for Coating Steel Reinforcing Bars & Coated Tie Wires for Epoxy Coated Reinforcing Bars
QPL-50	Wood Preserving Plants
QPL-53	Galvanizers
QPL-55	Steel Welded Wire for Concrete Reinforcement
QPL-56	Corrugated Metal Pipe
QPL-59	Miscellaneous Metal Fabricators
QPL-66	Silicone Joint Sealants
QPL-73	Bridge Paint Systems

Refer to the latest Qualified Products List from the Georgia Department of Transportation's website (http://www.dot.ga.gov/doingbusiness/Materials/qpl/Pages/default.aspx) for qualified sources.