Barrier units mechanically anchored to the underlying support by means of bolting shall be grouted into place in accordance with the following:

- Grout shall be prepared in accordance with the grout manufacturer’s written instructions. Two copies of the manufacturer’s instructions shall be delivered to the Engineer a minimum of two weeks prior to the beginning of barrier installation work.
- Grout shall be placed only if the ambient air temperature is at least 10°C and is predicted to rise. No grout shall be placed if the ambient air temperature falls below 7°C, unless external heat has been provided in the manner required by §555-3.06A, and §555-3.06B. The underlying support may be used as the floor of the enclosure if the Engineer approves.
- External heat shall be maintained for a minimum of seven curing days. A curing day is defined by §555-3.09. After seven curing days have passed, or the grout has reached a minimum compressive strength of 25 MPa, whichever occurs last, the enclosure may be removed. All work of providing external heat shall be done at no additional cost.

569-4 METHOD OF MEASUREMENT. The work will be measured as the number of meters of concrete traffic barrier installed. Measurement will be taken along the centerline of the top of the barrier. No deduction will be made for joints.

569-5 BASIS OF PAYMENT

A. The unit price bid per meter shall include the cost of all labor, materials and equipment necessary to complete the work. This price shall also include the cost of bar reinforcement, drilling, and testing.

B. In the case of barrier constructed by cast-in-place methods, 40% of the quantity will be paid for after all of the bar reinforcement has been placed and approved by the Engineer. This payment shall include the cost of chairs, supports, fastenings, connections and any splices not specifically indicated on the plans. If the Engineer permits the substitution of larger bars than those specified, or the D.C.E.S. permits splices not indicated on the plans, the payment will not be increased nor will any extra compensation be considered.

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item</th>
<th>Pay Unit</th>
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<tbody>
<tr>
<td>569.01 M</td>
<td>Permanent Concrete Traffic Barrier for Structures (Full Section)</td>
<td>Meter</td>
</tr>
<tr>
<td>569.02 M</td>
<td>Permanent Concrete Traffic Barrier for Structures (Half Section)</td>
<td>Meter</td>
</tr>
<tr>
<td>569.03 M</td>
<td>Vertical Faced Concrete Parapet</td>
<td>Meter</td>
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<tr>
<td>569.04 M</td>
<td>Single Slope (Half-Section) Concrete Bridge Barrier</td>
<td>Meter</td>
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<td>569.05 M</td>
<td>Single Slope (Full-Section) Concrete Bridge Barrier</td>
<td>Meter</td>
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<td>569.06 M</td>
<td>F-Shaped (Half-Section) Concrete Bridge Barrier</td>
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</tr>
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<td>569.07 M</td>
<td>F-Shaped (Full-Section) Concrete Bridge Barrier</td>
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</tr>
<tr>
<td>569.08 M</td>
<td>Texas Aesthetic Concrete Bridge Barrier</td>
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</tr>
</tbody>
</table>

SECTION 570 - ENVIRONMENTAL GROUND AND WATER PROTECTION

570-1 DESCRIPTION. This work shall consist of providing environmental protection for cleaning operations as specified by the contract documents.

570-1.01 Definition - Environmental Protection. Environmental protection shall be defined as the collection and removal of old paint chips, corrosion residues, spent abrasives and newly applied paint (hereafter referred to as waste materials) that result from cleaning and painting operations performed in the field.
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570-2 MATERIALS. All material and equipment used for environmental protection shall be approved by the Engineer. All material or equipment that is determined to be deficient or that becomes damaged to the extent that it no longer fulfills the requirements of this specification shall be replaced or repaired as directed by the Engineer, at no additional cost.

570-3 CONSTRUCTION DETAILS

570-3.01 Environmental Ground Protection. Coverage shall be provided on or over the ground under all structures that are to be cleaned and painted in the field.

NOTE: Whenever a structure spans over a railroad, covers shall be placed and maintained in accordance with §105-09, Work Affecting Railroads.

Depositing or dropping waste materials into water and onto the ground or roadways below the structure outside the specified collection areas will not be permitted.

Cleaning or painting operations shall not be performed when the direction or velocity of prevailing winds causes waste materials to fall outside the collection area. If wind or other factors prevent collection acceptable to the Engineer the Contractor may, with the Engineers permission, use drapes or other means to prevent drift beyond all specified collection areas.

All waste materials shall be removed from the ground protection by vacuuming. Sweeping, shoveling, or other mechanical means to remove the waste materials from the ground protection shall not be permitted.

Air exhausted from vacuuming equipment shall pass through a HEPA filtering system. A HEPA filter shall be defined as a filter that is at least 99.97% efficient against particles that are 0.39μ in diameter.

Ground Protection shall consist of the following:

A. Covers or other material capable of catching and holding waste materials shall be provided on or over the ground under the structure in the work area. A bridge deck or a highway pavement and paved shoulder under a structure from which wastes may be collected and removed by vacuuming may be used in place of a cover providing that within that area such usage is confined to lanes and shoulders closed to traffic.

B. The cover provided shall include all areas beneath the structure. The length of the cover shall be determined by the length of the work location, and the width shall be at least three meters beyond each side of the area directly being worked on. The cover shall be positioned in such a manner as to contain and prevent the loss of waste materials.

C. Covers on or over roadways or railroads or sidewalks or other similar areas shall not present a hazard of any kind, as determined by the Engineer, and no cover shall remain in place overnight unless otherwise authorized by the Engineer.

D. All waste materials that collect on a bridge deck, or on a highway pavement and paved shoulder under a structure or on covers shall be removed at least once a day or more frequently if directed by the Engineer. No waste material shall remain on the bridge deck, pavement or containment covers overnight.

E. All waste materials shall be removed from the project site and disposed of in accordance with all applicable Local, State or Federal law, regulation or codes.

F. If approved by the Engineer, the Contractor may use other methods or modifications for ground protection that will accomplish the results required by this specification.
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570-3.02 Environmental Waterway Protection. Collectors shall be provided under all structures that span bodies of water, waterways, and stream beds, and that are to be cleaned and painted in the field.

NOTE: Structures that span a navigable waterway may be subject to regulation by the U.S. Coast Guard, the U.S. Army-Corps of Engineers, the New York State Canal Corporation and the NYS Dept. of Environmental Conservation. If there is conflict between the regulations of the cited agencies and this specification, the regulations of the agencies shall govern. However, the Contractor shall be required to conform with the requirements of this specification and shall submit his proposal for conformance, for approval by the Engineer, at least fourteen (14) days prior to commencing work. No work shall begin until written approval by the Engineer is granted.

The applicable requirements of §570-3.01, Environmental Ground Protection, shall apply together with the following:

A. A collector shall be suspended from the structure and shall, as measured over the water, be at least three meters greater in length and at least three meters wider than each side of the area on which work is underway. The collector shall be positioned in a manner acceptable to the Engineer so as to collect and prevent the loss of waste materials. The collector shall not remain in place overnight, if in the opinion of the Engineer it presents a hazard of any kind.

B. All waste materials that remain on the collector shall be removed at least once a day or more frequently if directed by the Engineer.

C. If it is determined by the Engineer that floating waste materials may form on the water surface they shall be contained from moving upstream or downstream by the use of floating water booms (straw or screens). Floating waste material shall be collected daily, or more frequently, as directed by and to the satisfaction of the Engineer. Straw or screening used in the fabrication of water booms shall be replaced with clean material weekly or as otherwise directed by the Engineer.

D. All waste materials and used straw and screening from dam devices shall be removed from the project site and disposed of in accordance with all applicable Local, State or Federal Law, regulation or codes.

E. If the bridge location and characteristics or the surrounding topography do not lend themselves to the specified control measures for waterway protection, the Engineer may approve modifications to meet the intent of this specification.

570-4 METHOD OF MEASUREMENT. Payment will be made at the lump sum price bid.

570-5 BASIS OF PAYMENT. The lump sum price bid shall include the cost of all labor, materials and equipment necessary to complete the work. All work shall be done in a manner satisfactory to the Engineer.

Progress payments will be made. They will be based upon the number of work days required to complete all of the work of cleaning and painting.

Prior to the beginning of any work, the Contractor shall supply the Engineer with an initial estimate of work days required to complete all of the work. This initial estimate shall not be considered final. The Engineer may request a revised estimate at any time during the progress of the work. The Engineer will determine a daily rate of payment using the estimate of work days and the lump sum bid price. The daily rate will be used to authorize payment in accordance with §102-17, Article 7.

Should the Engineer request a revised estimate and use that estimate to establish a new daily rate, the lump sum bid price shall be reduced by the total of the amounts previously authorized for payment, prior to the establishment of the new daily rate. Failure on the part of the Contractor to supply a revised estimate when requested, will be cause for the progress payment procedure to be immediately terminated.

Progress payments for this work will be made only for days during which cleaning, priming and painting work is actually performed.
§570-5

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item</th>
<th>Pay Unit</th>
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</thead>
<tbody>
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<td>570.09mnnn M</td>
<td>Environmental Ground Protection</td>
<td>Lump Sum (for each structure)</td>
</tr>
<tr>
<td>570.10mnnn M</td>
<td>Environmental Waterway Protection</td>
<td>Lump Sum (for each structure)</td>
</tr>
</tbody>
</table>

NOTE: mnnn denotes serialized pay item, see §101-02 Definitions of Terms under “Specifications”.

SECTION 571 - TREATMENT AND DISPOSAL OF PAINT REMOVAL WASTE

571-1 DESCRIPTION. The work shall consist of accumulating, packaging, labeling, loading, transporting, treating, and disposing paint removal waste declared to be a hazardous waste containing lead.

571-1.01 Hazardous Waste Disposal Facility. Prior to generating any paint removal waste, the Contractor shall supply the Engineer with a letter from a legally permitted Hazardous Waste Disposal Facility, stating that the Facility has agreed to accept the paint removal waste generated by the work requirements of this project; is authorized to accept paint removal waste under the laws of the State of residence; has the required capacity to treat and dispose of the material; and will provide, or assure the ultimate disposal method indicated on the Uniform Hazardous Waste Manifest. The letter shall be signed by a representative of the Disposal Facility who is legally authorized to sign such an agreement. The Engineer shall be given an original, signed letter. Facsimile copies will not be acceptable.

571-1.02 Waste Transporter. The Contractor shall present evidence that they have a 6NYCRR Part 364 Waste Transporter Permit to haul to the selected facility, or have contracted with a permitted Hazardous Waste Transporter to remove the waste to the selected facility.

571-1.03 Paint Removal Waste. For purposes of this item, paint removal waste is defined as removed paint particles combined with any material used to remove the paint. Paint removal waste will be referred to throughout the item text as 'waste'. Declaration of the waste as 'hazardous' is based on the Department's knowledge that the waste contains lead.

571-1.04 Waste Transport. All waste resulting from paint removal operations shall be in transit to the disposal site no later than 45 calendar days subsequent to 1000 kilograms of waste accumulated at the site, or two weeks following demobilization of the site, whichever occurs first. Waste shall be accumulated, handled, packaged, loaded, transported, treated and disposed in accordance with all applicable Federal, State and local laws, rules, regulations, and codes. The Contractor's failure to comply with the aforementioned deadlines may result in the actions described under §571-5 Basis of Payment.

571-1.05 Minimum Work Requirements. The Contractor is hereby notified that this work requires the following as a minimum:

- Waste transporter identification number issued by USEPA.
- Disposal facility identification number issued by USEPA. (This will be supplied by the Disposal Facility).
- Generator site identification number issued by USEPA. (This will be supplied by the State through the Engineer).
- Conformance to 6NYCRR364. Part 364 governs waste transporters. The Contractor shall furnish a copy of the Part 364 permit to the Engineer.
- Conformance to 6NYCRR372. Part 372 governs manifest requirements.
- Conformance to 6NYCRR373. Part 373 governs treatment, storage and disposal facilities and contains specific generator requirements.
- Conformance to 40 CFR 268 promulgated by the Environmental Protection Agency pursuant to the Hazardous and Solid Waste Amendments to the Resource Conservation and Recovery
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Act. That law prohibits the land disposal of hazardous wastes unless they are treated to diminish the toxicity of the migration of hazardous constituents from the waste.

NOTE: NYCRR regulations are administered by the NYS Department of Environmental Conservation, Albany, N.Y. EPA regulations are administered by the US Environmental Protection Agency, Region II, New York, N.Y.

571-1.06 Bridge Washing Waste. For the purposes of this item, bridge washing waste is defined as paint chips and any organic or inorganic materials dislodged from bridge surfaces by bridge washing operations. The paint chips are known to contain lead, the combined waste stream may therefore be hazardous waste. The Department has presumed that the waste will test as hazardous. Bridge washing waste shall be kept segregated from bridge paint removal waste and shall be placed in containers or roll-offs with additional labeling identifying it as “Bridge Washing Waste”.

571-2 MATERIALS. The waste shall be accumulated in clean, dry, weatherproof, watertight containers or roll-offs furnished by the Contractor. The Contractor shall furnish the Engineer with a signed statement from the Disposal Facility that the containers or roll-offs proposed for use by the Contractor are acceptable to the Facility. The dry volume capacity of the container, in cubic meters, shall be clearly marked upon each container, in a location easily readable by the Engineer.

All equipment and containers or roll-offs shall be approved by the Engineer prior to use.

571-3 CONSTRUCTION DETAILS

571-3.01 Containers. All generated waste shall be deposited and sealed, in containers or roll-offs concurrent with generation. No container or roll-off shall be filled to a capacity in excess of that marked on the container or roll-off as the maximum dry volume capacity. No waste shall be left exposed to the elements at the end of the working day.

All containers or roll-offs shall be located in a place secured from traffic and in a manner acceptable to the Engineer.

Each container or roll-off shall be labeled in accordance with US Department of Transportation regulations. Each container or roll-off shall be permanently labeled in the following manner:

HAZARDOUS WASTE. Federal law prohibits improper disposal. If found, contact the nearest police, or public safety authority, or the US Environmental Protection Agency.

Generator’s Name: NYSDOT

Manifest Document No. ...........................................................................................................

Date: ....................................................................................................................................

BIN: ....................................................................................................................................

Note: The date shall be the generation date. It shall be entered by the Engineer using permanent marking material supplied by the Contractor.

571-3.02 Labeling. All labeling, marking (except date mark), and placarding shall be the responsibility of the Contractor and shall be done under the supervision of the Engineer. This work shall be completed to the Engineer’s satisfaction prior to the filling or transportation of any particular container or roll-off. All label markings shall be permanent, printed in English, displayed on a background of contrasting color un-obscured by other labels, or attachments. Labeling shall be located away from other markings that could substantially reduce its effectiveness.

571-3.03 Document Preparation. All document preparation and distribution, including the Uniform Hazardous Waste Manifest, shall be the responsibility of the Contractor. The Engineer will sign the Generator’s Certification on the Uniform Hazardous Waste Manifest. The LDR (Land Disposal
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Restricted certification shall be completed and attached to the manifest, as required by 40 CFR Part 268, "Land Disposal Restrictions."

All waste shall be documented, transported, treated, and disposed as required by the current Federal, State and local laws, rules and codes.

571-3.04 Multiple Collection. It is permissible for the transporting vehicle to pick up paint waste debris, in bulk, from one or more bridge sites for delivery to an authorized treatment, storage and disposal facility (TSDF) if the following conditions are met:

- The materials picked up at each site must be essentially identical in physical and chemical characteristics. No materials, other than paint waste debris, may be included if wastes from several individual generating sites are to be combined on the same truck.
- All of the component shipments are presumed to be D008 hazardous wastes, and disposed as such.
- A manifest is prepared for each generating bridge site. Each manifest must reflect a bulk shipment, and all manifests being carried by the same transporting vehicle must express the quantity in cubic meters. In sum total, the manifests accompanying the shipment must account for the entire volume transported.
- All component shipments are intended to be conveyed to the same TSDF, and the TSDF has agreed to accept consolidated bulk loads.
- All component shipments must have originated at sites that are under the authority of DOT. No loads may be included that were generated at a site for which another agency is responsible.
- Measures must be taken to prevent the blowing or dispersion of the waste during each loading operation and while being transported.

571-3.05 Paint Waste Composition. The Contractor is responsible to ensure that only dry paint removal waste is deposited into the containers or roll-offs.

Provided in the proposal is a note entitled "Typical Paint Removal Waste Composition" which provides typical chemical composition of paint removal waste based on previous chemical testing. The determination has been made that such waste contains less than 2% by weight of organic material.

The Contractor is specifically forewarned that disposal facilities perform spot tests and may refuse to accept waste in excess of 2% organic content or that is otherwise different than the Typical Paint Waste Composition. Waste contaminated in this manner will be the Contractor's responsibility. All penalties and costs associated with the refusal of a disposal facility to accept waste not meeting its requirements will be borne by the Contractor. All testing of the waste necessary to satisfy the requirements of the chosen Disposal Facility or Transporter shall be the responsibility of the Contractor.

571-3.06 Paint Waste Stabilization. For the purposes of this item, treatment of the paint removal and washing waste as required by Federal regulations is presumed to require stabilization of the waste such as mixing it with portland cement and water as necessary at a permitted Hazardous Waste Treatment or Disposal Facility. The stabilized waste shall meet the treatment standards of the Federal regulations prior to disposal in a permitted Hazardous Waste Disposal Facility.

571-3.07 Bridge Washing Waste Composition. The Contractor is responsible for ensuring that only dried bridge washing waste is deposited into the containers or roll-offs. The contractor is warned that the bridge washing waste may contain more that 2% organic content. A typical waste composition profile is not available. All testing of the waste necessary to satisfy the requirements of the Disposal Facility or Transporter shall be the responsibility of the Contractor.

571-4 METHOD OF MEASUREMENT. The work will be measured as the number of dry cubic meters of waste accumulated, packaged, transported, treated, and disposed in accordance with the requirements of this item. The actual quantity within a single container or roll-off will be determined by the Engineer. Once the Engineer determines the quantity within a specific container or roll-off, that
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container or roll-off shall be properly sealed and not thereafter be tampered with. No additional waste shall be placed in it, nor shall any be removed from it. Under no circumstances will a container or roll-off be measured as containing more than the maximum dry volume capacity marked on it.

571-5 BASIS OF PAYMENT. The unit price bid per cubic meter shall include the cost of all labor, materials, equipment, sampling, testing, and fees necessary to complete the work based on the assumption that treatment by stabilization will satisfy the applicable Federal regulations. Should this prove not to be the case on an industry wide basis, as opposed to an individual Treatment or Disposal Facility, the difference in cost between the cost of treatment by stabilization and the method subsequently found to be necessary shall provide the basis for an order on contract. Only waste for which manifest copies are returned to the Engineer by the Contractor and Disposal Facility will be authorized for payment.

If the Department is fined or penalized as a result of the Contractor's performance or lack thereof on this item, in addition to other remedies the Department may possess, said fine or penalty will be deducted from monies due the Contractor.

The extent of the Contractor's compliance with the provisions under timeliness of disposal will be considered as relevant in any future determination of an award to the Contractor as the lowest responsible bidder for any project under the supervision of the Department.

Payment will be made under:

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<tr>
<th>Item No.</th>
<th>Item</th>
<th>Pay Unit</th>
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</thead>
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<td>571.01mnn M</td>
<td>Treatment and Disposal of Paint Removal Waste</td>
<td>Cubic Meter</td>
</tr>
</tbody>
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NOTE: mnnn represents numbers assigned by the designer and keyed to a particular structure. See elsewhere in these contract documents for a list of structures and the numbers assigned to mnnn.

SECTION 572 - STRUCTURAL STEEL PAINT SYSTEM: SHOP APPLIED

572-1 DESCRIPTION. This work shall consist of applying a three coat structural steel paint system to structural steel parts. All painting work, except field touch-up and bolt painting, shall be done in the shop. For purposes of this specification, a shop is defined as an enclosed facility.

572-1.01 Paint System. The three coat paint system shall consist of the following components; Primer, Intermediate Coat, and Topcoat. All components shall be compatible and supplied by a single manufacturer.

572-2 MATERIALS

572-2.01 Abrasive for Blast Cleaning. Abrasive material for blast cleaning shall be selected by the Contractor. Silica sand and other types of non-metallic abrasive containing more than one percent free silica, by weight, will not be allowed. The abrasive material shall leave the cleaned steel surface roughened to a degree suitable for the paint system that will be applied.

572-2.02 Paint

A. All paint used on any one structure shall be produced by a single manufacturer. Approved paint types and their manufacturers appear on the Department's Approved List of Paints for Structural Steel.

B. All paint in storage shall be protected from damage and maintained between 5°C, and 32°C.

C. Each single paint (primer, intermediate coat and topcoat) shall be of a different color from the others. The color of the primer and intermediate coat will be the Contractor's option. However, they shall contrast with the underlying substrate or previously applied paints. The intermediate coat color
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shall be such that it can be completely hidden by a single coat of topcoat applied at the minimum specified dry film thickness.

D. The color of the topcoat shall be as specified in the contract documents.

E. All components of the system (primer, intermediate coat and topcoat) will be accepted on the basis of the manufacturer's written certification that the batch produced meets their product specifications. Only paint arriving at the work site in new, unopened containers and labeled with the manufacturer's name, product name, component part, batch number and shelf life date shall be used. Paint in containers having expired shelf life dates shall not be used. They shall be immediately removed from the work site.

572-2.03 Paint Inspection Equipment. Prior to the start of and throughout the duration of the work, the Contractor shall ensure that the Engineer, or Inspector, is supplied with the following equipment in good working order:

- Air thermometer, pocket type, -20°C to 100°C (2)
- Surface Thermometer, -20°C to 150°C (2)
- Sling Psychrometer (2)
- Weight per cubic meter cup (kg) (2)
- Wet film thickness gage, prong type (3)
- Dry film thickness gage, magnetic pull-off (1)

Numbers in parentheses denote minimum quantity required.

572-3 CONSTRUCTION DETAILS

572-3.01 Cleaning

A. All structural steel surfaces to be painted shall be cleaned to bare steel in accordance with SSPC-SP6, Commercial Blast Cleaning. All blast cleaning and painting shall be performed at the same facility.

B. Before blast cleaning begins, visible deposits of oil, grease, dirt, salt, or other contaminants shall be removed by the methods specified in SSPC-SP1, Solvent Cleaning.

C. No blast cleaning operations will be conducted under the following conditions:

- The relative humidity exceeds 85%.
- The surface temperature is less than 5°C above the dew point.

D. The area cleaned shall be limited to that which can be cleaned and prime coated within a 16-hour period provided the condition known as flash rusting does not occur. (Refer to Priming). Cleaned areas shall be approved by the Engineer or Inspector prior to priming.

E. After blast cleaning is completed, cleaned surfaces shall be defined by SSPC-Vis 1-89, Pictorial Standards B SP 6, and C SP 6 as applicable. All surfaces shall be cleaned of blasting products and other residues in accordance with SSPC-SP6. Cleaned surfaces shall be cleared of all foreign matter by means of oil-free, moisture-free, compressed air, or vacuum systems.

572-3.02 Painting - General

A. At least five working days prior to the start of work the Contractor shall supply the Engineer with one copy of the paint manufacturer's current technical data and materials safety data sheets for each paint to be applied. Instructions, suggestions and precautions shall be followed to the extent they do not contradict the provisions of this specification.

B. All paint shall be thoroughly mixed in accordance with the manufacturer's instructions. Mechanical mixers shall be used.
C. Only properly sealed and unopened paint containers will be permitted for use. Containers opened prior to the Engineer's or Inspector's authorization, or containers indicating tampering, shall be rejected and removed from the work site. All such containers shall be replaced by properly sealed containers at no additional cost.

D. Thinning of paint will be allowed only with the express permission of the Engineer or Inspector. All thinning shall be done in strict accordance with manufacturer's instructions. Only the type and quantity of thinner recommended by the manufacturer shall be used. Unauthorized use of thinners will result in the re-cleaning and repainting of the affected surface in a manner satisfactory to the Engineer or Inspector at no additional cost.

E. Paint may be applied by any method permitted under §572-3.03 - Paint Application Methods.

F. Individual coats shall be applied in sufficient quantity so that the following minimum dry film thicknesses (DFT) result unless a different film thickness is required by the plans, or noted on the Approved List:

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<thead>
<tr>
<th></th>
<th>Primer</th>
<th>Intermediate</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>µm</td>
<td>100</td>
<td>100</td>
<td>75</td>
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NOTE: The wet film thickness required to obtain the required DFT is dependent upon the percent solids by volume of the paint. This will vary somewhat for each system.

DFT determinations will be made by the Engineer or Inspector in accordance with SSPC-PA2, Paint Application Specification No. 2, Measurement of Dry Paint Thickness with Magnetic Gages. The Contractor shall supply all the equipment required by §572-2.03 - Paint Inspection Equipment.

No work shall be done until all the required equipment is supplied.

G. No paint shall be applied unless all of the following conditions are met:
- The receiving surface shall be clean and absolutely dry.
- The surface temperature and ambient air temperature are as recommended by the paint manufacturer except in no case shall painting work be performed when surface and ambient air temperatures are less than 5°C or greater than 38°C.
- The receiving surface temperature shall be at least 3°C above the dew point.
- The relative humidity shall not exceed 85%.
- The Engineer or Inspector determines no poor adhesion or other non-acceptable condition will result.

All paint applied in violation of these conditions shall be completely removed, and the affected surface cleaned and repainted in accordance with stated requirements at no additional costs.

H. All individual coats shall be applied as required by the manufacturer's instructions. No coat of paint shall be applied until the previous coat has cured in accordance with the manufacturer's instructions and has been approved by the Engineer or Inspector.

I. All work is subject to inspection. The contractor shall provide adequate access and suitable lighting for such inspections to be made. Any work done while the Engineer or Inspector has been refused, denied, or restricted from access, or work performed in a manner that in the Engineer/Inspector's opinion prevents adequate inspection will automatically be rejected. All such work shall be re-cleaned and repainted in accordance with these requirements at no additional cost.

J. The Engineer or Inspector will take wet and dry film readings to ensure minimum coating thicknesses and evenness of application. Coatings shall also be monitored for the presence of holidays, pinholes, bubbles, craters, froth, lack of adhesion, and other defects. Coatings having less
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than the required dry film thickness, or other defects unacceptable to the Engineer or Inspector, shall be corrected in a manner satisfactory to the Engineer or Inspector at no additional cost.

572-3.03 Paint Application Methods

A. General. All paint shall be applied in a neat and workmanlike manner. Paint shall be applied uniformly at the manufacturer's specified wet film thickness. Coatings shall be free of runs, sags, drips, ridges or other defects. Paint may be applied by brushes, or rollers, or air-less spray, or a combination of these methods, unless otherwise recommended by the paint manufacturer.

B. Hand Brushing. The paint, when applied with brushes, shall be so manipulated by the brush as to produce a uniform even coating. When applying a coating to a previously painted surface, strokes should be made perpendicular to those of the receiving surface to insure adequate anchorage. Brushes shall be of good quality and the length of the exposed bristle shall be equal to or greater than the width of the brush.

On those areas which are inaccessible to brushes, the paint shall be applied by the use of rollers, air-less spray equipment, daubers, or sheepskins.

C. Rolling. Rollers for the application of paint shall be of such a quality to produce a smooth uniform coating. Roller covers shall be “all-mohair” made from Angora Goat wool; “mohair” made from blends of mohair, wool and/or rayon or as approved by the Engineer. Roller nap lengths shall be from 13 mm to 40 mm.

The roller cover shall be uniformly loaded with paint by rolling on the slanted surface of a tray, framed screen wire or other suitable device. Roller application shall be done at such a pace that no spinning of the roller or throwing off of paint occurs when the roller is lifted form the surface. The paint shall be applied by rolling from a dry to a wet area while varying the direction of the stroke. The paint shall be feathered out by using light pressure at the end of the stroke to promote uniformity.

On those areas which are inaccessible to roller application, the paint shall be applied by brushes, air-less equipment, daubers, or sheepskins.

D. Air-less Spraying. Air-less spray equipment shall be capable of applying paint in a fine, even spray so as to produce a uniform coating. Air-less spray equipment shall consist of a hydraulic pump (air or electric power) mounted over a paint tank, high pressure hoses, spray gun, valves, gages, regulators, screens, traps and other equipment necessary to satisfactorily complete the work.

Spray painting shall be done by experienced and qualified painters. Painters shall determine the best distance between the spray gun and receiving surface so as to promote uniform coverage and prevent discontinuity of the applied paint film. The spray gun shall be moved uniformly across and perpendicular to the receiving surface. To insure a uniform coating each spray pass should lap the other by 50%. All sags, drips, air holes or other film defects shall be immediately corrected by hand brushing.

On those areas that are inaccessible to air-less spray application, the paint shall be applied by brushes, rollers, daubers or sheepskins.

572-3.04 Termination of Spraying or Rolling Operations. The Engineer and Inspector are empowered to terminate spraying or rolling operations, temporarily or permanently, if it is determined that any of the following conditions exist:

- Satisfactory results are not being obtained.
- The required wet film thicknesses are not being obtained.
- Areas not specifically designated to be painted are likely to be or are being affected by the application method.
- The application method is causing damage to public or private property.
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If the Engineer or Inspector permanently terminates spraying or rolling operations, they may do so by verbal order. The Engineer shall notify the Contractor, in writing, of his reasons for termination, within one week of termination. The Engineer or Inspector may temporarily terminate painting operations by verbal orders. Spraying or rolling operations which are terminated due to damage to public or private property shall not be resumed until the Contractor takes appropriate measures to protect such property and demonstrates to the Engineer's or Inspector's satisfaction that such property damage will not recur. If spraying or rolling operations are permanently terminated, the Contractor may apply paint in accordance with another approved method. No extra compensation will be paid for the substitution of another method of application.

572-3.05 Shop Painting

A. Priming. Metal to metal contact surfaces, and all metal surfaces to be in contact with concrete shall not be painted.

Priming shall begin only after all welding and fabrication work is completed and accepted.

Cleaned bare metal surfaces shall have all blasting products removed and shall have the primer applied within 16-hours after completion of the blasting operations, and before the condition known as flash-rusting occurs. No bare steel surface prepared for priming shall be left un-coated long enough to allow the formation of rust. No rust formation of any nature will be permitted. Cleaned areas upon which rust has formed shall be re-cleaned in accordance with these cleaning requirements at no additional cost. The presence of rust shall be determined by the Engineer or Inspector. Surfaces receiving primer shall be absolutely clean and dry prior to primer application.

All welds, edges of plates, angles or other shapes, corners and crevices shall be stripped before the full coat of primer is applied. All stripe painting shall be done by spray application only. The stripe shall extend a minimum of 25 mm from the edge or corner. The stripe coat shall be set (dried) in accordance with the manufacturer's recommendations before application of the full prime coat.

B. Intermediate Coat. The requirements given under §572-3.05A together with the following shall apply:

Prior to application, if detrimental material, surface contamination(s), etc. are present, the primed surface shall be cleaned in accordance with the paint manufacturer's recommendations or as directed by the Engineer or Inspector. Stripe painting shall not be required.

The intermediate coat shall be painted within the time period recommended by the manufacturer for re-coating, except that in no case shall more than 30 days elapse between the time that primer is applied and the intermediate coat is painted. Steel not painted with the intermediate coat within the specified time period(s) shall be re-cleaned and repainted with another prime coat at no additional cost.

C. Finish Coat. The requirements of §572-3.05A and §572-3.05B (including the 30-day application requirements for re-coating) shall apply together with the following:

- Stripe painting shall not be required.
- Finish coat color shall be that required by the plans.

572-3.06 Field Painting. The only field work allowed to be done under this item is touch-up work after all steel erection has been completed and all concrete placement has been completed. All the requirements of this specification shall apply to field painted material with the following modifications:

A. Bolt heads, washers, nuts, bolt thread extensions, and other miscellaneous steel surfaces not painted in the shop, shall be cleaned and painted after the bolts have been installed and accepted.

B. Cleaning shall be done in accordance with the requirements of SSPC-SP-6, Commercial Blast Cleaning, or SSPC-SP11, Power Tool Cleaning to Bare Metal. After cleaning operations are completed, the cleaned surface shall be defined by SSPC Vis 1-89, Pictorial Standards BSP6 and CSP6, as applicable. All visible rust, millscale, dirt, grease and other foreign matter shall be
removed. Surfaces cleaned with power tools shall be roughened to produce a suitable anchor for the primer paint.

C. All surrounding steel that has been previously painted in the shop shall be protected from damage during cleaning operations.

D. All three coats (primer, intermediate and finish) shall be applied.

E. Application shall be made by brush only. DFT requirements of this item shall apply.

F. All damage to the paint system shall be corrected by the contractor in accordance with the requirements of this item and to the satisfaction of the Engineer/Inspector at no additional cost to the State.

572-4 METHOD OF MEASUREMENT. The unit measurement for this work is the square meter. The total payment quantity will be the number of square meters of structural steel to be painted with the entire paint system as shown in the Estimate of Quantities. No field measurements will be taken.

572-5 BASIS OF PAYMENT. The unit price bid shall include the cost of all labor, materials, and equipment necessary to complete the work.

572-5.01 Progress Payments. Progress payments will be made in accordance with the following:

A. Delivery. Upon delivery of properly painted structural steel to the project site or storage area as defined in §109-04. Shop painted steel will be considered properly painted only when accompanied by the Engineer’s, or Inspector’s, written certification that the delivered steel was painted in accordance with the requirements of this Section. The written certification shall include the area of properly painted steel. Total delivery progress payments will not be authorized for more than 80% of the total payment quantity.

B. Field Painting. Upon completion of cleaning and painting all bolt heads, nuts, washers and bolt thread extensions. Field painting progress payments will not be authorized for more than 10% of the total payment quantity.

C. Touch-up Work. After all touch up work is completed the remainder of the total payment quantity will be authorized for payment.

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Description</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>572.01xxnn M</td>
<td>Structural Steel Paint System: Shop Applied</td>
<td>Square Meter</td>
</tr>
</tbody>
</table>

xxnn denotes a serialized pay item. Refer to §101-02 Definitions of Terms under "Specifications".

SECTION 576 - BRIDGE DRAINAGE SYSTEM

576-1 DESCRIPTION. This work shall consist of furnishing and placing scuppers, drainage troughs and downspout systems for bridge drainage as shown on the plans and in accordance with the specifications.

576-2 MATERIALS

<table>
<thead>
<tr>
<th>Material</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cast Iron Scuppers</td>
<td>ASTM A48M, Class 30 and 715-05</td>
</tr>
<tr>
<td>Fabricated Steel Scuppers (Except Gratings)</td>
<td>ASTM A36M and 715-01¹</td>
</tr>
<tr>
<td>Plates or Bars</td>
<td>ASTM A500, Grade B¹</td>
</tr>
<tr>
<td>Tubes</td>
<td>ASTM A108, Grade 1015 or 1020</td>
</tr>
<tr>
<td>Headed Concrete Anchor Studs</td>
<td></td>
</tr>
</tbody>
</table>
§576-3

Grating Plates and Bars  
Bolts and Cap Screws  
Drainage Troughs (PVC)  
Steel For Erection of Trough  
Bars (A1, A2) and Plates (B1, B2, C1 and C2)  
Rods (fully threaded) and Bolts  
Clamps, Malleable Iron  
Ductile Iron Downspout Pipe and Pipe Fittings  
Pipe Couplings (Ductile Iron or Malleable Iron)  
Hoppers  
Pipe Brackets and Supports  
Anchors  
Nuts and Bolts  
PVC Downspout Pipe, Fittings and Solvent Cement  
Protective Cover (Cellular Polystyrene)  

NOTES:
1. In addition to the requirements of 715-01, Structural Steel, the Contractor will be required to furnish the Deputy Chief Engineer (Structures), two (2) certified copies of the records of the chemical analysis of the steel.
2. Bars shall be 16 mm diameter. Plates shall be 50 mm x 6 mm.
4. All pipe shall be groove cut around the full pipe circumference at both ends. The grooves shall be radius cut in accordance with AWWA C606. The grooves shall be such that a keyed housing clamp coupling shall fit into them. The grooves shall be such that a keyed housing clamp coupling shall fit into them. Unless otherwise approved, all pipe bends (elbows) shall be of the long radius type.
5. All couplings shall be gasketed, double keyed, housing clamps designed to lock and seal the joint between two grooved pipes, or fittings, when the housing clamp is bolted and tightened in place. The gasket shall be a molded or extruded compound of Butyl or EDPM, suitable for water service.
6. Galvanized in accordance with the requirements of 719-01. Nuts and bolts shall be galvanized in accordance with 719-01, Type II.

576-3 CONSTRUCTION DETAILS

576-3.01 Fabrication

A. Shop Drawings. Shop drawings will not be required for scuppers, drainage troughs or downspout systems.

B. Welding

1. Fabricated Steel Scuppers, Gratings. Welding shall conform to the provisions of the SCM. Weld inspection shall be done in accordance with the requirements of the SCM but radiographic testing will not be required. All groove welds shall be complete joint penetration groove welds unless otherwise approved by the D.C.E.S.

2. Drainage Troughs. Field Welding (by heat) of the polyvinyl chloride trough material shall not be allowed without written permission of the Deputy Chief Engineer (Structures).

C. Galvanizing

1. Scuppers and Troughs. Galvanizing shall conform to the requirements of §719-01, Galvanized Coatings and Repair Methods. Galvanizing shall be done after all welding and fabrication is completed.

2. Bolts, Fully Threaded Rods and Nuts. All bolts and rods shall have a ANSI B1.13M Class 6H thread. All galvanized nuts shall have a standard oversize tap to allow for the galvanizing on the bolts, rods and nuts.
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D. Gratings. Gratings for Types B1 and B2 scuppers shall have a full and even bearing on the underlying surface.

E. Basis of Acceptance. Scuppers, drainage troughs and downspouts shall be accepted at the work site by the Engineer-in-Charge upon certification of the manufacturer that the materials used and fabrication procedure employed conform to the requirements of section 576. The Engineer may reject any scupper, drainage trough or downspout system which, in his opinion, exhibits poor quality or workmanship.

576-3.02 Erection of Downspout Systems

A. General

1. Pipe Installation. The pipe shall be laid true to line and grade as shown on the plans or as directed by the Engineer, with joints close and even, so that a true and even surface of invert will be made over the joints throughout its entire length. Horizontal pipe shall be installed so that the minimum slope shall not be less than 1:50. Pipe shall be placed in accordance with the requirements of this specification unless special methods are called for on the plans or in the itemized proposal.

2. Field Testing. Prior to the acceptance of the structure by the Department, the downspout system should be flushed out and tested to insure that it is flowing at full capacity. Any obstruction in the downspout system preventing the free flow of drainage or its operation at full capacity shall be removed to the complete satisfaction of the Engineer.

B. Ductile Iron Downspouts

1. Pipe Supports. Supports for horizontal piping shall be spaced 1.5 m maximum. Supports for vertical piping shall be spaced 1.8 m maximum.

2. Pipe Joints. All joints in pipe, except when encased in concrete, shall be made with groove type couplings. Pipes encased in concrete shall have joints formed in accordance with the pipe manufacturer's recommendations.

3. Painting. All metal embedded in concrete shall not be painted. All other metallic portions of the downspout system shall be painted in the field in accordance with the requirements of the contract documents. Color shall be as shown on the plans.

C. PVC Downspouts and Protective Insulator

1. Pipe Joints. PVC pipe joints shall be sealed in the following manner: All necessary cuts shall be square and clean from burrs. Mating surfaces of pipe and fittings shall be cleaned with methyl ethyl ketone or acetone prior to solvent cement application. The solvent cement shall be applied as recommended by the manufacturer. The pipe and fitting should be joined with a twisting motion to distribute cement uniformly. The solvent cement manufacturer's recommendations for cure time shall be followed.

2. Protective Insulator. The protective insulator shall be attached to the pipe in such a manner so as to prevent its dislodgement as the concrete is placed. Suitable methods would include taping the joints with a weather resistant tape or bonding with a non-metallic substance.

3. Form Wire. The PVC pipe and its protective insulator shall be held in place by form wire in such a manner as to provide sufficient lateral support to prevent movement as the concrete is placed.

4. Vibrator. Particular caution shall be taken to prevent the vibrator from striking the pipe and its protective insulator during the placing of concrete.
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576-4 METHOD OF MEASUREMENT

576-4.01 Scuppers. Payment will be made at the unit price bid for each type of scupper furnished and placed as shown on the plans and in accordance with the specifications.

576-4.02 Drainage Troughs. The trough shall be measured as the number of meters measured along the center line of each polyvinyl chloride section, furnished and placed as shown on the plans and in accordance with the specifications.

576-4.03 Downspout System. The downspouts will be measured as the number of meters measured along the center line of pipe between the extreme outer limits of downspouts, including hoppers, furnished and placed as shown on the plans and in accordance with the specifications.

576-5 BASIS OF PAYMENT

576-5.01 Scuppers. The unit price bid for each type of scupper shall include the cost of furnishing all labor, equipment and materials necessary to set the scupper to its proper line and grade. No additional payment will be made for furnishing and placing the grating for the Type B1 or B2 scupper.

576-5.02 Drainage Troughs. The unit price bid per meter shall include the cost of furnishing all labor, materials and equipment necessary to erect the trough and its threaded rod supports as indicated on the plans.

576-5.03 Downspout System

A. General. The unit price bid per meter shall include the cost of furnishing all labor, materials and equipment necessary to erect the pipe and pipe fittings, pipe supports, hoppers, nuts, bolts, washers, to provide cleanouts if indicated on the plans, straps to cap and plug the pipe if necessary, and to replace cracked or otherwise defective material necessary to complete the work.

B. Ductile Iron Downspouts. The unit price bid per meter shall also include the cost of furnishing and placing pipe hangers and brackets, grooved type couplings and paint.

C. PVC Downspouts and Protective Insulator. The unit price bid per meter shall also include the cost of furnishing and placing the protective insulator and all adaptor fittings required at the juncture of PVC Pipe and Ductile Iron Pipe.

D. Excavation. All required excavation will be paid for under pay item 206.02 M Trench and Culvert Excavation and 206.04 M Trench and Culvert Excavation - O.G.

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item</th>
<th>Pay Unit</th>
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</thead>
<tbody>
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<td>576.01 M</td>
<td>Scuppers (Type A)</td>
<td>Each</td>
</tr>
<tr>
<td>576.02 M</td>
<td>Scuppers (Type B)</td>
<td>Each</td>
</tr>
<tr>
<td>576.10 M</td>
<td>Drainage Trough</td>
<td>Meter</td>
</tr>
<tr>
<td>576.2001 M</td>
<td>Downspout System (Ductile Iron)</td>
<td>Meter</td>
</tr>
<tr>
<td>576.21 M</td>
<td>Downspout System (PVC)</td>
<td>Meter</td>
</tr>
<tr>
<td>576.2201 M</td>
<td>Downspout System (Ductile Iron and PVC)</td>
<td>Meter</td>
</tr>
</tbody>
</table>

SECTION 578 - BONDED CONCRETE OVERLAY FOR STRUCTURAL SLABS

578-1 DESCRIPTION. Prepare the surfaces that will be in contact with slab reconstruction concrete and place slab reconstruction concrete. Prepare the structural slab surface and place a Class E, bonded concrete overlay.
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578-1.01 Scope. Concrete removal work will be paid for under the appropriate item(s). Minimum thickness of the overlay concrete is 75 mm. Include the cost of any grade changes necessitated by this requirement in the unit bid price for overlay concrete.

578-1.02 Definitions

A. Overlay Concrete. Class E Concrete placed over existing and slab reconstruction concrete.

B. Slab. Reconstruction Concrete. Concrete placed completely around the exposed top mat of bar reinforcement. Slab reconstruction concrete will be Class D for Method 1 and Class E for Method 2, as described in §578-1.03 Placement Methods.

578-1.03 Placement Methods.

A. Method 1 - Separate Placement. Place Class D slab reconstruction concrete and Class E overlay concrete separately.

B. Method 2 - Integral Placement (Optional). When 100% of the top mat of bar reinforcement is exposed or when all of the following conditions are satisfied, Class E overlay concrete and Class E slab reconstruction concrete may be placed in a single lift.

1. The area of the exposed top mat of bar reinforcement is 5% or less of the placement area, per span.

2. No individual area of the exposed top mat of bar reinforcement exceeds 2.5 square meters.

3. No dimension of any area of the exposed top mat of bar reinforcement exceeds 2 meters.

578-2 MATERIALS. All material listed under §557-2 and Bonding Grout, §705-22. Do not add water to the bonding grout once an acceptable consistency is achieved.

578-3 CONSTRUCTION DETAILS.

578-3.01 Blast Cleaning. §584-3.02

578-3.02 Preplacement Wetting. §584-3.03

578-3.03 Bonding Grout Placement. Mix bonding grout in a mixer that meets §584-2.04D and place in accordance with §584-3.04.

578-3.04 Handling and Placing Concrete. §584-3.05

578-3.05 Construction Joints. §584-3.07

578-3.06 Finishing and Curing Slab Reconstruction Concrete - Separate Placement. §584-3.09

578-3.07 Finishing Bonded Concrete Overlay. §557-3.09

578-3.08 Curing Bonded Concrete Overlay. §557-3.12 with the following: Cure concrete with wet burlap for 7 days. Provide uniform continuous wetting until concrete curing is complete. The wet burlap and curing cover option is not allowed.

578-3.09 Opening to Traffic. Traffic is allowed only after completion of the required curing period.

578-3.10 Defective or Damaged Concrete. §584-3.08
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578-4 METHOD OF MEASUREMENT. For placements with 100% exposure of the top mat of bar reinforcement, the number of square meters of slab reconstruction concrete will be equal to the number of square meters of overlay concrete.

For placements with less than 100% exposure of the top mat of bar reinforcement, measure slab reconstruction concrete prior to overlay concrete placement.

A. Method 1 - Separate Placement. Measure slab reconstruction concrete as the number of square meters of Class D slab reconstruction concrete placed. Measure overlay concrete as the number of square meters of plan area of Class E overlay concrete placed.

B. Method 2 - Integral Placement (Optional). Measure slab reconstruction concrete as the number of square meters of Class E slab reconstruction concrete placed. Measure overlay concrete as the number of square meters of plan area of Class E overlay concrete placed.

578-5 BASIS OF PAYMENT. Include the cost of all labor, materials and equipment necessary to complete the work in the unit bid price.

Payment will be made under:

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<tr>
<th>Item No.</th>
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<th>Pay Unit</th>
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</thead>
<tbody>
<tr>
<td>578.02nn</td>
<td>Overlay Concrete, Class E</td>
<td>Square Meter</td>
</tr>
<tr>
<td>578.03nn</td>
<td>Slab Reconstruction Concrete, Class D or E</td>
<td>Square Meter</td>
</tr>
</tbody>
</table>

*nn denotes a serialized pay item. Refer to §101-02 Definitions of Terms under "Specifications".*

SECTION 579 - STRUCTURAL SLAB RECONSTRUCTION PREPARATION

579-1 DESCRIPTION. The work shall consist of initially preparing an existing structural slab for reconstruction. Generally, this work shall entail the removal of concrete to the depths, and at the locations, required by the contract documents.

579-1.01 Structural Slab Scarification

A. This work shall consist of removing the top surface of structural slab concrete. Removal shall be done by scarification to the following limits, unless a greater depth is indicated on the plans:
   - Minimum of 6 mm
   - Maximum of 13 mm

B. After scarification, if a structural slab survey is required, the surface to be surveyed shall be cleaned sufficiently to allow the survey to be taken. The Engineer will determine if the surface is cleaned sufficiently to allow performance of the necessary delamination and potential survey tests.

C. All removed materials shall be transported from the work site and disposed of or disposed of in an area on the job site approved by the Engineer.

579-1.02 Exposure of Reinforcing Bars

A. Definitions

1. Bar Mat. That combination of transverse and longitudinal reinforcing steel placed with the structural slab to absorb stresses. Structural slabs generally contain two bar mats; an upper mat and a lower mat.

2. Upper Mat. That bar mat closest to the existing top surface of the structural slab. Only the upper mat is relevant to this work, except in localized areas.

3. Localized Area. An area where full depth removal and subsequent patching will be done as part of this work. For the work of this section a localized area shall not exceed 2.5m². The
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sum of the localized areas shall comprise no more than five percent (5%) of the structural slab area to be prepared.

B. The work shall consist of structural concrete removal from the periphery of the upper mat reinforcing bars to provide a minimum clearance of 25 mm between the reinforcing bar surface and the remaining concrete surface. In addition, the Engineer may order the removal of other concrete. (Refer to 579-3, Construction Details).

C. All work performed under the requirements of this subsection shall not extend beyond a plane which is 125 mm below the original top of slab, except for localized areas.

D. Removed materials shall be disposed of in accordance with 579-1.01B.

579-2 MATERIALS

<table>
<thead>
<tr>
<th>Class A Concrete</th>
<th>501</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quilted Covers (for curing concrete)</td>
<td>711-02</td>
</tr>
<tr>
<td>Plastic-Coated Fiber Blankets (for curing)</td>
<td>711-03</td>
</tr>
</tbody>
</table>

Notes:
1. 501, Class D Concrete, may be substituted at no extra cost.
2. For quantities of four cubic meters of total project placement, or less, automatic batching equipment will not be required.

579-2.01 Equipment

A. Power Operated Scarifier. The specific equipment the Contractor proposes to use shall be approved by the Engineer prior to use. Power bush hammers, or other impact type devices which indent or pulverize the surface shall not be allowed under any circumstances.

B. Pneumatic Hammers and other equipment. These shall be subject to the Engineer's approval prior to use. Pneumatic hammers shall meet the requirements of §580-3.02

C. Other Equipment. All other equipment proposed for use shall be approved by the Engineer prior to actual employment in the work.

579-3 CONSTRUCTION DETAILS. The Contractor shall exercise care during the execution of the work to avoid damaging or loosening material that is to remain. All damage caused by the Contractor's operations to material that is to remain shall be repaired, or the material replaced as determined by the Engineer. All repair and replacement work shall be done in a manner satisfactory to the Engineer.

579-3.01 Structural Slab Scarification. Scarification of designated areas shall be accomplished with a power operated scarifier. Inaccessible areas will be scarified with pneumatic hammers.

579-3.02 Reinforcing Bar Exposure

A. Concrete shall be removed from the uppermost reinforcing bars of the structural slab to the limits designated by §579-1.02B. The Contractor may remove concrete, to the designated minimums, from around both sets of bars in the upper mat.

B. If concrete is removed only from the periphery of the uppermost bar, removal shall be done in accordance with those details indicated on the plans.

C. If the Contractor chooses to remove concrete from the periphery of both bars of the upper mat, or if the Engineer determines that:
   - The lower bar is corroded; OR
   - The concrete around the lower bar is deteriorated; OR
   - Delamination extends to the level of, or below, the lower bar; OR
   - The lower bar is debonded;
then the concrete shall be removed from the periphery of the lower bar in accordance with the details indicated on the plans.

D. At locations where deteriorated concrete extends beyond the minimum removal limits, the Engineer will order its removal. The Engineer will be the sole determiner of what constitutes deteriorated concrete. This ordered removal shall be part of this work, except that removal of deteriorated concrete below the limit established by §579-1.02C, shall be part of this work only within the limits of localized areas. Locations where concrete is removed beyond minimum limits, lacking specific orders from the Engineer directing such removal, will be designated as damage locations. All damage locations shall be repaired in a manner satisfactory to the Engineer, at no additional cost to the State.

E. At localized areas, the Engineer may order concrete removal below the plane established by 579–1.02C. When such removal reaches the uppermost bar of the lower reinforcing bar mat, removal shall be continued until full depth removal is achieved.

F. Care shall be exercised when removing concrete to avoid damaging reinforcement, or other materials, which are to remain in place. Reinforcing steel damaged by the Contractor’s operations shall be replaced with new reinforcing steel of the same size, appropriately spliced. Reinforcing steel splices shall be made in accordance with the details shown on the plans. Other materials designated to remain in place, which are damaged by the Contractor’s operations, shall also be replaced.

579-3.03 Full Depth Patches. Refer to the details indicated on the plans.

A. Immediately prior to placing new concrete, the reinforcing bars and the edges of the existing structural slab, which will be in contact with new concrete, shall be blast cleaned. Forms shall be drawn tightly. Preparation and formwork shall be approved by the Engineer prior to any concrete placement. Existing concrete surfaces, which will come in contact with new concrete, shall be thoroughly coated with portland cement bonding mortar meeting the requirements of §705-22. The mortar shall be thoroughly worked into the surface by means of stiff nylon brushes.

B. Concrete shall be placed and consolidated in accordance with the requirements of 555-3.04. The uppermost surface of the concrete patch shall be level with the highest of the surrounding prepared surfaces. The uppermost surface shall be intentionally roughened. The Engineer may require that a coarse textured drag be used on the plastic concrete surface.

C. Concrete shall be cured, in a manner approved by the Engineer, for a minimum of 72 curing hours prior to any other concrete placement work in contact with the curing concrete. A curing hour is defined as any hour, starting from the hour of placement, during which the ambient air temperature at the concrete surface remains at, or above 7°C as measured by a recording thermometer. Curing shall be done by means of quilted covers (711-02), or plastic coated fiber blankets (711-03). Quilted covers, if used, shall be kept wet during the entire curing period. The use of curing compounds shall not be allowed.

579-3.04 Hydrodemolition Equipment. Hydrodemolition equipment, if approved by the Engineer, shall be subject to the following:

A. Water Filtration and Disposal. At least two weeks prior to the employment of any hydrodemolition equipment, the Contractor shall submit to the Engineer, for approval, a comprehensive plan for the filtration and disposal of hydrodemolition water.

This plan shall ensure, to the extent practical, that all debris particles will be removed from hydrodemolition water, prior to its being introduced into any lake, river, stream, or any drainage system which empties into a lake, river or stream.
The Contractor is specifically notified that use of the existing bridge drainage system for hydrodemolition water disposal will not be permitted.

**B. Water Retention.** Hydrodemolition water shall be prevented from running onto, or over all portions of the project site not immediately subject to hydrodemolition work. In addition, the Contractor shall provide shielding, acceptable to the Engineer, that protects traffic and prevents all debris from escaping the immediate work location. A comprehensive plan for accomplishing these requirements shall be submitted to the Engineer, for approval, at least two weeks prior to the beginning of any hydrodemolition work.

The Contractor is specifically notified that use of the existing bridge drainage system, for this purpose, will not be permitted.

The plan for this work may be submitted as part of the requirements of §579-3.04A.

**C. Adherence.** Once approved, the water filtration and disposal, as well as the water retention plans shall be strictly adhered to by the Contractor. Should the Engineer determine that these plans are not being followed as approved, the Contractor will be required to immediately cease work until the conditions are rectified in a manner satisfactory to the Engineer.

Should the Contractor fail to rectify the situations to the Engineer's satisfaction, the Engineer may, with the concurrence of the D.C.E.C., require the Contractor to use equipment other than hydrodemolition equipment.

No extension of time will be granted, nor will any additional compensation be granted, for either the ceasing of work, or the substitution of equipment, if either one is required as a result of the Contractor's failure to follow the approved plans.

**D. Debris Removal.** All debris shall be removed quickly enough to prevent rebounding of the debris to the concrete surface. All debris which rebounds shall be removed in a manner satisfactory to the Engineer at no cost to the State.

Material designated to be left in place, which is damaged by rebounded debris removal work, shall be repaired in a manner satisfactory to the Engineer at no cost to the State.

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### §579-4 METHOD OF MEASUREMENT

**579-4.01 Structural Slab Scarification.** The work will be measured as the number of square meters stated in the Estimate of Quantities shown on the plans. Except to allow for progress payments, no field measurements will be taken. Field measurements for progress payments shall not exceed the Estimate of Quantities figure.

**579-4.02 Reinforcing Bar Exposure.** The work will be measured as the number of square meters of concrete removed. Quantities will be determined from field measurements.

**579-5 BASIS OF PAYMENT.** The unit price bid per square meter shall include the cost of all labor, materials and equipment necessary to complete the work. No additional payment will be made for removals, repairs or replacements made necessary due to the Contractor's operations.

**579-5.01 Reinforcing Bar Exposure.** The unit price bid per square meter shall include the cost of all labor, material and equipment necessary to perform full depth patching in localized areas. Full depth concrete removal, and full depth patching, in excess of the limits established for localized areas will be paid for as extra work in accordance with §104-03, Contingencies, Extra Work and Deductions.

**Payment will be made under:**

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<thead>
<tr>
<th>Item No.</th>
<th>Item</th>
<th>Pay Unit</th>
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<tbody>
<tr>
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<td>579.02 M</td>
<td>Reinforcing Bar Exposure</td>
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