

DIVISION 500 – CONCRETE PAVEMENT

SECTION 501 – QC/QA PORTLAND CEMENT CONCRETE PAVEMENT, PCCP

501.08, begin line 233:

The random sample per subplot shall be of sufficient quantity to perform all required tests and obtained in accordance with AASHTO R 60. Concrete and necessary labor for sampling shall be furnished as required by the Engineer. The test results of the sublots for each lot will be averaged and shall be in accordance with 501.05 and 501.06, except the lot average for thickness shall be in accordance with 501.26. Test results ~~are to~~*will* be shared in a timely manner.

501.14, begin line 315:

When concrete is delivered in transit mixers, additional water to increase the workability of a load may be added within 45 minutes of initial mixing ~~per~~*in accordance with* the QCP. Any addition of water shall be noted on the batch ticket and shall not occur as a continuing operation.

501.25, begin line 498:

At locations where the inertial profiler is used, all areas having a localized roughness ~~in excess of~~*greater than* 160 in./mi utilizing continuous IRI with a 25 ft window shall be corrected subject to approval by the Engineer. After ALRs have been identified, a grinding simulation shall be performed to estimate whether the ALR can be corrected to an IRI value of less than 160 in./mi with no more than a 1/4 in. maximum grind depth at any spot. If such correction is not possible, then an ALR with an IRI value of less than 190 in./mi can remain uncorrected if approved by the Engineer, and an ALR with an IRI value greater than 190 in./mi shall require full depth removal and replacement of sufficient area to meet specifications.

501.29, begin line 730:

Disputes over the acceptance test results will not be considered unless QC test results indicate greater than a 0.5% difference between the Department's and the Contractor's tests. Once additional testing has been approved, the Contractor shall obtain cores ~~as~~ as directed in the presence of the Engineer.

501.29, begin line 760:

QC/QA-PCCP will be measured by the square yard of the ~~specified~~*specified* thickness ~~specified~~. The area of QC/QA-PCCP will be the planned width of the pavement multiplied by the length of the pavement, or as directed in writing. The width of the pavement will be as shown on the typical cross-section of the plans. The length of the pavement will be measured parallel to the surface of the pavement along the centerline of the roadway or ramp, excluding paving exceptions as shown on the plans.

501.30, begin line 780:

Adjustments to the contract payment due to measurements for modulus of rupture, thickness, air content, range ~~and~~ and smoothness will be included in a quality assurance adjustment pay item in accordance with 109.05.1.

501.30, begin line 817:

Traffic control for disputes shall be ~~supplied with no additional payment~~*provided at no additional cost to the Department.*

SECTION 502 – PORTLAND CEMENT CONCRETE PAVEMENT, PCCP

502.03, begin line 24:

A~~concrete mix design submittal~~, CMDS, shall be in accordance with 502.04. The CMDS shall be submitted to the DTE. The CMDS shall be submitted a minimum of seven calendar days prior to production utilizing the Department provided spreadsheet and shall include the following:

502.04, begin line 82:

The CMD shall produce workable concrete mixtures, with the minimum amount of water, and ~~having~~*have* the following properties.

502.09, begin line 180:

If the slip-form method is used, the subgrade or subbase shall firmly support the paving equipment to construct the specified alignment and grade. The slip-form paver shall be operated ~~with as nearly in~~ a continuous forward movement ~~as possible~~. If it is necessary to stop the forward movement of the paver, the vibratory and tamping elements shall also be stopped. Edge slump of PCCP shall not exceed 1/4 in.

SECTION 503 – PCCP JOINTS

503.01, begin line 4:

This work shall consist of the construction of joints in PCCP, placing dowel bar assemblies, and joint sealing operations in accordance with 105.03.

503.03, begin line 92:

Tie bars for transverse construction joints may be placed in ~~the~~ plastic or hardened concrete. A header board with openings for tie bars shall be used when placing tie bars in plastic concrete. The header board shall be rigid and accurately set to grade. Tie bars placed in hardened concrete shall be retrofitted in accordance with 503.03(g).

SECTION 504 – PCCP FINISHING AND CURING

504.03, begin line 18:

PCCP shall be finished with equipment in accordance with 508.04. The operations shall be controlled so that an excess of mortar and water is not worked to the top. Long-handled floats may be used to smooth and fill ~~in~~ open textured areas in the PCCP.

504.03, begin line 78:

Areas of PCCP which are not finished and textured in accordance with the requirements herein shall be corrected by retexturing. Retexturing shall be ~~done~~*performed*

in the same longitudinal or transverse direction as the orientation of the existing tining. It shall consist of cutting longitudinal or transverse grooves in the PCCP surface by means of saw blades or other approved devices. The grooves shall be spaced in accordance with 504.03(b)1 or 2 above as appropriate. The PCCP surface, after cutting, shall not be polished.

504.04, begin line 101:

When blended portland pozzolan cements, coal ash, or slag cement are used in the concrete mix, the average ambient temperature ~~must~~shall be above 50°F for the curing period. The average temperature shall be calculated based on hourly temperature measurements taken at the jobsite or from published weather station data within 10 miles of the jobsite. If the temperature restrictions are not met during placement or during the required curing period, curing shall continue and the PCCP shall not be opened to traffic until the strength requirements are met.

SECTION 505 – TESTS AND PROCEDURES

505.01, begin line 36:

2. After 24 h, the molded specimens are taken to the storage location and removed from the molds.
3. Field stored beams will not require 24 ±4 h lime water soak prior to the time of testing.

SECTION 506 – PCCP PATCHING

506.03, begin line 113:

4. Fine to total aggregate ratio ~~in excess of~~greater than ±3% from the value designated by the original CMDP.

506.06, begin line 312:

Control of PCCP for air content, relative yield, and flexural strength beams will be determined from tests performed by the Engineer in accordance with 505. Concrete and necessary labor for sampling shall be furnished as required by the Engineer. Testing for air content and relative yield will be on the first load of the day and once ~~per~~ every 50 cu yds.

506.06, begin line 319:

At least one set, consisting of two beams per set, will be made once ~~per~~ every 150 cu yds of concrete placed and tested for compliance with either the 3-day or 7-day flexural strength requirements in accordance with 506.04(b) or 502.04(a) respectively, for the purpose of CMDP validation. Air content and relative yield will be measured on each sample of concrete from which beams are made.

506.11, begin line 466:

Covering with polyethylene film or any other covering ~~does~~shall not replace the requirement to use liquid membrane forming curing compound.

506.11, begin line 471:

For patches which are not to be overlaid and have a length greater than 20 ft, pavement smoothness ~~will~~*shall* be in accordance with 501.25 except inertial profiler requirements will not apply.

SECTION 508 – EQUIPMENT**508.04, begin line 148:**

Vibrators may be attached to the spreader or the finishing machine or mounted on a separate carriage. The frequency of the surface pan type shall be 3,500 impulses per minute or greater. The frequency of the internal type shall have no less than 5,000 impulses per minute for tube vibrators. ~~and s~~ Spud vibrators shall have a frequency of from 10,000 to 12,000 impulses per minute in air.

SECTION 509 - PORTLAND CEMENT CONCRETE PAVEMENT, PCCP, JOINT REPAIR**509.03, begin line 125:**

^D If the RHCC has a permeability of 900 coulombs or less at 56 days, the acceptable range of air content is allowed to be the same as LMC-VE. Verification of this property will be determined from testing of specimens cast at the trial batch. Testing will be ~~done per~~*performed in accordance with* AASHTO T 277, with the value determined by averaging the result of two specimens.

(c) RSP**509.04, begin line 148:**

Prepackaged RSP material may be extended with a coarse aggregate as recommended by the manufacturer. Water shall be added ~~in an amount not~~ to ~~not~~ exceed the amount recommended by the manufacturer. The material shall meet the same requirements for slump, compressive strength, and shrinkage as stated in 509.04(b).

509.08, begin line 273:

A machine configured to safely and consistently mill the necessary profile as detailed on the plans shall be provided. The teeth on the milling head shall be spaced at either 1/2 in. or 5/8 in. The milling machine shall be *as* approved by the Engineer prior to the start of milling operations. Whenever possible, the rotating axis of the milling head shall operate perpendicular to the joint being repaired. Should PCCP removal be confined to one side of a joint, the milling machine shall not cause damage to the adjacent pavement.

509.08, begin line 303:

Milling, or sawing and hand chipping, ~~is~~*will be* allowed for transverse joint repairs that intersect a longitudinal joint that has already undergone partial depth joint repair. Removal areas along a longitudinal joint shall not disturb a transverse joint that has already undergone partial joint repair in accordance with this specification.

509.08, begin line 308:

If there is no need for the transverse joint repair to completely cross the longitudinal joint, milling operations along the transverse joint shall stop short of the longitudinal joint ~~so as not to cause~~to prevent damage beyond the longitudinal joint. Sawing and hand chipping shall be used to complete the removal process up to the longitudinal joint.

509.08, begin line 342:

If the combination of removal for partial depth joint repair and bottom-half joint repair exposes more than two adjacent dowels at a contraction joint, the Engineer shall be notified to determine if full depth patching ~~is to~~shall be conducted in accordance with 506.08(b).

509.09, begin line 402:

2. Saw the joint after the repair concrete has adequately hardened. Sawing of the tooled joint shall be performed with a 1/4 in. blade. Sawing shall be ~~done~~performed with care as soon as possible without causing excessive raveling of the repair material. The depth of the saw cut shall extend below the full depth of the repair by at least 1/4 in., but no closer than 1 in. above the tie bar. If it is determined that a crack forms at the bottom of the tooled joint before sawing can be performed without raveling, sawing to re-establish the joint shall not be performed.

509.10, begin line 418:

For onsite weighing and batching of OPCC or RHCC, the appropriate number of ~~pre-packaged~~prepackaged bags of cement, shall be at the mixing site to accommodate the day's production. The fine and coarse aggregate shall be pre-weighed to within 2 % of their target for the batch size and placed in appropriate containers. Each aggregate component for a batch shall be identified as to material and weight, to facilitate accurate batching into the mixer in the proper sequence.

509.10, begin line 433:

Prepackaged concrete, CPM 3U18, and an air-entraining admixture, may be used instead of batching individual components. ~~Pre-packaged~~Prepackaged concrete, CPM 3U58, shall not be modified with admixtures.

509.12, begin line 464:

All CPM, OPCC, and RSP repair concrete mixes shall be placed within 15 minutes of mixing. RHCC and LMC-VE shall be placed within five minutes of mixing. All repair concrete shall be placed such that a cold joint does not occur within the limits of any type of joint repair. Placement may be isolated to one side of a joint if the joint face or joint filler is properly supported. Repair along a transverse joint that intersects a previously repaired longitudinal joint ~~is~~will be allowed as described in 509.08.

509.12, begin line 495:

When using a bonding grout, if the material dries or whitens prior to placing the concrete joint repair material, the repair material shall not be placed. The dried grout shall be thoroughly removed by sandblasting and cleaning ~~as specified in~~ accordance with 509.09.

509.14, begin line 566:

If additional manpower for concrete sampling is deemed necessary by the Engineer, the Contractor shall furnish the additional labor. Testing for slump, air content, and relative yield, as appropriate for the mix, will be on the first batch of the day and a minimum of once ~~per~~ every 400 cu ft thereafter. Beams or cylinders will be made for evaluating the quality of the delivered mix at least once for every three days of production or whenever slump, relative yield, or air content are failing the upper limit. The beams or cylinders will be tested for compliance with strength requirements, at an age consistent with the mixtures intended use as defined in 509.04. Beams or cylinders for this purpose shall be cured in accordance with Section 10.1 of AASHTO T 23 and 505.01(a).

509.15, begin line 582:

Joint openings within a repair area shall be maintained for the full depth of the joint repair concrete ~~as described in sections~~ *in accordance with* 509.09 and 509.12. Longitudinal and transverse joints shall be sawed to create a reservoir for the sealant, to be followed by cleaning and sealing.

509.19, begin line 706:

During periods of overnight lane closure, if the Engineer inspects an area of joint repair and determines that PCCP Patching, Full Depth in accordance with 506.08(b) is necessary, the joint repair may be completed if needed to meet the opening to traffic requirement. If *joint repair is* completed ~~in order~~ to meet the opening to traffic requirement, the joint repair will be paid at 100% of the contract unit price.

DIVISION 600 – INCIDENTAL CONSTRUCTION

SECTION 601 – GUARDRAIL

601.07, begin line 141:

Assembly and installation or resetting shall be supervised or performed ~~at all times~~ by an installer trained and certified by the unit's manufacturer and shall be in accordance with the manufacturer's recommendations.

601.10, begin line 204:

Removal of existing guardrail shall be in accordance with the applicable requirements of 202 and ~~these requirements~~ *as specified herein*. The locations shall be as shown on the plans. When it is specified that the removed guardrail is to become the property of the Department, the rail elements, posts, and blockouts shall be removed without being damaged. The removed material shall be stored as directed.

601.11, begin line 211:

The height of the existing guardrail shall be adjusted ~~by the use of~~ *using* moveable blockouts as shown on the plans. The height shall be measured to the top of the rail element along the face of the rail. Existing fixed blockouts shall be replaced with moveable blockouts installed at the proper height. Existing moveable blockouts shall be disconnected from the posts and re-mounted at the proper height.

601.14, begin line 279:

Where existing guardrail height is adjusted, such work will be paid for at the contract unit price per linear foot. The cost of removal, all necessary storage, new adjustable post brackets, attachment of rail section, and miscellaneous nuts and bolts as required shall be included in the cost of adjusting ~~the~~ guardrail height.

601.14, begin line 332:

The substitution of W 6 x 8.5 for W 6 x 9 steel posts, in MGS W-beam guardrail, will be at the same contract unit price for ~~the~~ heavier post.

SECTION 602 – CONCRETE BARRIER

602.03, begin line 37:

Precast concrete barrier and concrete glare screen shall be constructed in accordance with ~~the~~ applicable requirements of 707, except the minimum 28-day compressive strength shall be 3,000 psi. The precast units shall not be shipped or used until this strength is attained. The surfaces of individual precast units shall vary no more than 1/4 in. in 10 ft from the specified cross-section, as measured from a longitudinal straightedge. The maximum variation in the vertical and horizontal alignment of adjacent units shall be 1/4 in. across the joint, as measured from a 10 ft longitudinal straightedge. Approved bedding may be used to obtain proper alignment of the concrete barrier sections.

602.06, begin line 103:

Concrete barrier will be paid for at the contract unit price per linear foot, complete

in place. Class A concrete for cast-in-place modified concrete barriers will be paid for at the contract unit price per cubic yard. Reinforcing bars for cast-in-place modified concrete barriers will be paid for in accordance with 703.08. Barrier delineators used on concrete barriers will be paid for at the contract unit price per each, complete in place. Concrete glare screen will be paid for at the contract unit price per linear foot, complete in place.

SECTION 603 – FENCES

603.04, begin line 74:

Extra length posts shall be required at stream crossings as shown on the plans or as directed, ~~and~~ *Extra length posts shall* also at ground depressions where it is not practicable for the fencing to follow closely the contour of the ground. These posts shall be set in concrete as shown on the plans.

603.05, begin line 92:

The tension required to stretch the fabric and wire shall be applied by mechanical fence stretchers and with single wire stretchers designed and manufactured for the purpose, and in accordance with the fence manufacturer's recommendations. All splices in the fabric and wire shall be securely made in accordance with the best practice and the manufacturer's recommendations, and ~~by the use of~~ *using* tools designed for that purpose.

603.05, begin line 109:

The top and bottom tension wires of chain link fence shall be placed, stretched taut, and secured at the ends and to all posts before the fabric is placed. The ends of the fabric shall be secured ~~by the use of~~ *using* stretcher-bars threaded through the loops of the fabric and secured to the posts by means of clamps with bolts and nuts. The number of clamps shall be as ~~indicated~~ *shown* on the plans. The fabric shall be placed by securing one end and then applying tension to remove all slack before making attachments elsewhere. The fabric shall be fastened to the line posts and to the top and bottom tension wires with tie wires spaced as shown on the plans.

SECTION 604 – SIDEWALKS, CURB RAMPS, STEPS, AND HANDRAILS

604.02, begin line 23:

Hand railing shall be aluminum pipe in accordance with ASTM B221, Alloy 6063, temper T52, or galvanized steel pipe in accordance with ASTM A53, Grade B, ~~all~~ as specified.

604.03, begin line 132:

Brick surfaces shall be placed in a mortar setting bed within the hardened concrete block out. The concrete base of the block out shall have a rough textured finish, such as would be produced by a screed or wood float. The depth of the block out shall be such that a mortar bed thickness of 3/8 to 3/4 in. is achieved for the nominal depth of the brick. The hardened concrete base shall be free of all material which might prevent the mortar setting bed from adhering. The concrete base shall be dampened with water but the surface dry immediately prior to ~~the~~ placing the mortar setting bed. The mortar setting bed shall be placed at the desired thickness, and no more than 2 ft ahead of laying the bricks. The bricks

shall be buttered with mortar on the bottom before placement into the setting bed.

Brick surfaces shall be installed in a running or stacked bond pattern with a 1/16 in. average joint width. The joint width shall not exceed 1/8 in. Whole bricks ~~should~~shall be laid first, followed by bricks cut to size, keeping the number of joints to a minimum. A masonry saw shall be used to produce a clean, accurate, and straight cut. The joint between bricks shall be completely filled with a dry fine aggregate. The fine aggregate may be obtained from a non-Certified Aggregate Producer, but it shall be natural sand having a gradation where at least 95% of the material passes the No. 4 sieve. Excess fine aggregate shall be removed from the surface of the bricks.

604.05, begin line 184:

The new sidewalk shall have a joint pattern similar to the surrounding sidewalk. Sidewalk placed at drives shall be 6 in. thick, ~~or~~ the same depth of the existing drive, whichever is greater.

604.11, begin line 329:

If directed, concrete sidewalk shall be constructed to a depth greater than that shown on the plans. ~~Such~~The additional thickness will be converted into the equivalent square yards quantity of concrete sidewalk of the thickness shown on the plans and will be paid for ~~as such~~accordingly.

SECTION 605 – CURBING

605.04, begin line 56:

Forms shall be of wood or metal, straight, free from warp, and ~~of such construction that constructed so~~ there will be no interference ~~to~~in the inspection of grade or alignment. All forms shall extend for the entire depth of the curb and shall be braced and secured sufficiently so no deflection from alignment or grade occurs during the placing of the concrete.

605.04, begin line 85:

Consolidation of concrete placed in the forms shall be by vibration or other acceptable methods. Forms shall be left in place for 24 h or until the concrete has set sufficiently so that they can be removed without injury to the curbing. Upon removal of the forms, the exposed curbing face shall be rubbed immediately to a uniform surface. Rubbing shall be accomplished using water and a carborundum brick. ~~For the purpose of matching~~To match adjacent concrete finishes or for other reasons, other methods of finishing may be allowed. No plastering will be allowed.

605.04, begin line 107:

Preformed expansion joints, 1/4 in. thick, shall be placed at the beginning and end of all curb returns and ~~also~~at castings.

605.04, begin line 121:

Curb machines may be used to construct curb~~ing~~ provided the curb can be constructed ~~to the requirements of the specifications~~as specified.

605.07, begin line 190:

HMA curbing shall be constructed ~~by use of~~ using a self-propelled automatic curber, curb machine, or paver with curbing attachments. The curbing shall be in accordance with the section shown on the plans. The automatic curber or machine shall meet the following requirements and is subject to approval prior to use.

605.07, begin line 202:

The construction of curbing by means other than the automatic curber or machine may be allowed when short sections or sections with short radii are required, or for such other reasons as may seem be warranted. The resulting curbing shall match the curbing produced by the machine. The face and top of the HMA curb shall be checked with a 10 ft straightedge. Portions showing irregularities of 1/4 in. or more shall be removed and replaced.

605.07, begin line 212:

When sealing or painting is required, it shall be performed only on a curbing which is clean and dry, and which has reached the ambient temperature.

605.08, begin line 218:

Curbing specified for resetting shall be cleaned, removed, and stored. Any existing curbing ~~that is~~ to be reset which is lost, damaged, or destroyed ~~as a result of~~ due to Contractor operations or because of failure to store and protect it in a manner that would eliminate its loss or damage, shall be replaced.

605.08, begin line 231:

The curb shall be set on a firm bed in accordance with the required line and grade. All sections of curbing shall be set so that the maximum opening between adjacent sections is 3/4 in. wide for the entire exposed top and face. Any dressing of the ends of the curbing necessary to meet this requirement shall be performed as needed. Cutting or fitting may be necessary in order to install the curbing at the locations as directed.

605.10, begin line 287:

The cost of tack coat, reinforcing bars or welded wire reinforcement for curb, curb and gutter, or center curb shall be included in the cost of the pay items. The cost of replacement curb portions for those which show irregularities or 1/4 in. or more shall be included in the cost of the curb.

SECTION 606 – PAVEMENT CORRUGATIONS

606.03, begin line 66:

The rumble stripe traffic control procedures shall be submitted to the Engineer and shall be in accordance with 808.08. Vehicles used in performing the milling, sweeping, vacuuming, or sealing operations shall have a rear escort vehicle ~~that follows~~following at a distance of 100 to 500 ft.

606.05, begin line 88:

The cost of temporarily covering existing prismatic reflectors in rumble strip retrofit sections shall be included in the cost of the pay items. Milling, sweeping, vacuum cleaning, operation protection, and maintenance of traffic associated with these pay items, and all necessary incidentals shall be included in the cost of the pay items.

SECTION 609 – REINFORCED CONCRETE BRIDGE APPROACHES

609.12, begin line 107:

The Contractor and ~~the~~ Engineer will conduct an inspection of the new RCBA for any damage. The inspection and all necessary repairs shall be completed prior to opening to traffic.

SECTION 612 – UNDERSEALING

612.01, begin line 4:

This work shall consist of drilling holes and furnishing and pumping ~~an~~asphalt material under cement concrete pavement in accordance with 105.03.

612.06, begin line 51:

All storage tanks, pipes, retorts, booster tanks, and distributors used for storing or handling the materials shall be kept clean and in good operating condition ~~at all times so there is no~~to avoid contamination of the materials.

612.06, begin line 79:

The asphalt shall not be heated above 500°F at any time and, when pumped under the pavement, the temperature shall be no less than 350°F. All material heated beyond 500°F ~~shall~~will be rejected.

SECTION 615 – MONUMENTS, MARKERS, AND PARKING BARRIERS

615.03, begin line 26:

When tested as ~~hereinafter~~described, a specimen shall support a total load of at least 2,400 lb before the first crack appears. The specimen will be tested as a simple beam. The distance between supports shall be exactly 24 in. with the load applied at the rate of approximately 1,200 lb per minute in the center of the span. Loading will continue until the first crack appears.

615.04, begin line 47:

Monuments shall be of the type specified in the Proposal, ~~the details of which~~ *and areas* shown on the plans. Any portion extending above the ground shall be finished in accordance with 702.21.

615.04, begin line 56:

The pin shall be set perpendicular to *and* flush with *the* top of the monument while the concrete is plastic and left undisturbed until the concrete has set. The pin shall be steel and shall be 1 in. in diameter and 5 in. long. For Type D monuments, the hole shall be drilled in the center with a 1/8 in. drill for a depth of 1 1/2 in. The hole shall be filled with lead flush with the end of the pin. Castings for protected monuments shall be in accordance with 910.05(b).

615.07, begin line 95:

The back face of these markers shall be set on the right-of-way lines approximately 1,000 ft apart as hereinafter provided. They shall be set at all corners of irregular right-of-way lines, opposite each *point of curvature, P.C.* and *point of tangency, P.T.* of curves, and not to exceed 500 ft apart on the inside and outside of curves. Care shall be used in locating markers on tangents so that a marker is plainly visible from each adjacent marker.

615.11, begin line 149:

Benchmark posts shall be set at locations marked on the plans or as directed. Excavation shall be to the depth indicated and to dimensions sufficient to provide for the concrete backfilling. This concrete shall be Class A and shall extend for 6 in. around and below the post. The bottom shall be monolithic with the sides. The remainder of the excavation up to the original ground line shall be backfilled with suitable material well tamped in layers. Care shall be taken not to disturb the post. When specified on the plans, or *as* directed, benchmark tablets furnished by the Department shall be placed in newly constructed or existing drainage structures located within the limits of the contracts.

SECTION 616 – RIPRAP AND SLOPEWALL

616.11, begin line 110:

The surface to receive the geotextile shall be prepared to a relatively smooth condition free of obstructions, depressions, and debris within the limits ~~indicated~~ *shown* on the plans.

Geotextiles used along channels shall be placed with the machine direction of the geotextile parallel to the channel. Successive geotextile sheets shall be overlapped ~~in such a manner that~~ *so* the upstream sheet is placed over the downstream sheet and the upslope sheet over the downslope sheet.

616.11, begin line 139:

The geotextile shall be placed ~~in such a manner~~ *so* that placement of the overlying materials will not excessively stretch or tear the geotextile and will not pull the required overlap or seam apart. Construction equipment shall not be on the exposed geotextile. Placement of riprap or stone shall start from the base of the slope, moving upslope and

from the center outward. Riprap shall not roll downslope and the height of drop for riprap shall be kept to less than 2 ft.

SECTION 619 – COATING BRIDGE STEEL

619.03, begin line 41:

Cleaning and applying a coating shall be ~~done~~*performed* by a Contractor certified as SSPC-QP 2 on steel structures shown in the contract documents as being built before 1995.

619.03, begin line 71:

The blast cleaned surface ~~shall~~*will* be inspected for surface profile, oil contamination, dust, and blasting residue, and ~~will be as~~ accepted prior to the application of the primer.

619.03, begin line 77:

If a lot is ~~non-conforming~~*nonconforming*, corrective action shall be taken to make the lot acceptable. Corrective action shall be submitted in writing and performed as approved. A phase shall not be covered until the ~~whole~~*entire* lot has been accepted.

619.07, begin line 154:

Pollution control shall consist of two different operations. One shall be controlling and containing the atmosphere generated during the coating removal operation. The other shall be controlling and containing the solid waste stream generated ~~as a result of~~*due to* the coating removal operation.

619.07, begin line 172:

For structures shown in the contract documents as being built before 1995, the Contractor shall provide a containment system ~~in order~~ to contain all blasting materials, scrapings, wire brushings, and coating particles in accordance with SSPC-Guide 6, Class 2A or greater with Method A, Level 1 emission control capability. The Contractor shall take samples and monitor the work environment in accordance with IOSHA requirements and shall provide personal protective equipment appropriate to the conditions present within the work environment.

619.07, begin line 181:

For structures shown in the contract documents as being built after 1994, the Contractor shall provide a containment system ~~in order~~ to contain all blasting materials, scrapings, wire brushings, and coating particles in accordance with SSPC-Guide 6, Class 2A or greater with Method A, Level 3 emission control capability. The Contractor shall take samples and monitor the work environment in accordance with IOSHA requirements and shall provide personal protective equipment appropriate to the conditions present within the work environment.

619.07, begin line 202:

Each bridge shall generate a separate waste stream and shall not be ~~commingled~~*mixed* with other materials. A sample of the waste stream from the bridge shall be obtained at the conclusion of the first day of the coating removal operation for that

bridge. The sample will be shipped to be tested within 24 h in a manner agreed to by the Department and as described in the QCP. The Engineer will witness the extraction of the waste stream sample. The Department will maintain custody of the waste residue sample until it is shipped. The waste stream sample shall be taken by random method as described in the QCP which reflects representation of the entire bridge. The samples shall be analyzed for all contaminants listed in ITM 803 by the TCLP. The remaining waste shall be placed in an approved container. Such containers shall be labeled and maintained to comply with 40 CFR 264.

619.10, begin line 466:

If a blasted or coated surface is unsatisfactory, removal of the coating, a thorough cleaning of the surface, and recoating or other correction ~~will~~**shall** be required as directed. Where defects or damages occur in a film of any coating, all defective areas shall be removed to soundly bonded coating or bare steel and recoated to the specified thickness.

619.10, begin line 498:

Coating application shall begin only when the 24 h ambient temperature is to remain above 50°F after application, and the steel surface temperature is between 50°F and 100°F unless different temperature ranges are requested in the QCP and approved in writing. Coating and curing shall be ~~done~~**performed** only when the relative humidity ~~is to remain~~**is** between 30% and 80%. The pot life and induction time shall be in accordance with the manufacturer's recommendations for the existing temperature and humidity.

619.10, begin line 528:

Partially empty containers of a coating shall not be used. Partial mixing of containers shall not ~~be done~~**occur**. All containers of a coating shall remain closed until needed for mixing.

619.10, begin line 577:

For both coating systems, the stripe coat may be applied with either a brush or a sprayer. If the ~~Contractor~~ chosen method of applying the stripe coat ~~is~~**does** not ~~producing~~**produce acceptable** results ~~acceptable to the Engineer~~, the Engineer will require the stripe coat application method to be changed.

619.12, begin line 659:

Surface areas where the inorganic zinc primer was damaged during shipping, handling, and erection shall be cleaned in accordance with 619.08(a) and either 619.08(d) or 619.08(i). ~~Likewise, a~~**All** bolt and field connections shall be cleaned in the same manner. All the damaged areas, and bolt and field connections shall then be coated with the same manufacturer's inorganic zinc primer that was applied in the shop. This requirement will not apply to temporary steel bridges.

619.16, begin line 732:

If the pay item, coat steel bridge, or coat steel bridge, partial, is listed in the schedule of pay items for a particular structure, the entire bearing assembly shall be coated with the ~~structural steel~~ coating system that is being used on the rest of the bridge.

619.16, begin line 738:

All exposed steel piling shall be cleaned in accordance with 619.08(a) and either

619.08(e) or 619.08(i). The structural steel coating system in accordance with 619.09(a) shall be applied. The color of the finish coat shall be SAE-AMS-STD-595A, color No. 13711.

619.18, begin line 766:

Each bridge shall generate a separate waste stream and shall not be ~~commingled~~mixed with other materials. The waste stream shall be sampled in accordance with 619.07 and all other requirements of 619.07 shall be followed. Once the result from the waste stream sampling is known and the waste stream is appropriately characterized as hazardous or non-hazardous, all waste shall be disposed of in accordance with 619.07(b).

619.19, begin line 786:

For steel that will become the property of the Contractor, cleaning existing steel, removal of mill scale, testing, disposal of the waste, containment, and all other items involved with this work will not be measured ~~as per~~in accordance with 202.13.

SECTION 621 – SEEDING AND SODDING

621.04, begin line 50:

If ~~as a result of a rain,~~ results in a prepared seed bed ~~becomes~~becoming crusted or eroded, or if eroded places, ruts, or depressions exist, the soil shall be reworked until it is smooth. Such areas which are reworked shall be re-seeded.

621.05, begin line 69:

Leguminous seeds, unless otherwise specified, shall be inoculated with a culture in accordance with 914.06. The culture shall be mixed with sufficient water to distribute it thoroughly. The seed shall be wetted thoroughly with the solution and allowed to dry sufficiently to be in condition for sowing. Inoculated seed shall be sown within 30 h after treatment. Where seeding is to be ~~done~~performed by hydraulic methods, the inoculate may be added to the water in the spray tank.

621.05, begin line 122:

The mulch may be held in place with binder twine fastened down with wooden pegs not less than 6 in. long spaced 4 ft apart. The twine shall be placed parallel to and ~~also~~ at 60° with the pavement edge in both directions. The distance between the intersections of the diagonal strands measured along the strands shall be 12 ft. The strand parallel to the pavement shall cross the diagonal strands at their intersections to form equilateral triangles 12 ft on a side.

621.05, begin line 164:

Paper mats may be used for mulch for seeding where mulched seeding is specified or where erosion control blankets ~~is are~~ specified. Paper mats shall be placed within 24 h after seeding operations have been completed. The ground shall be prepared in accordance with 621.04.

After the area has been properly shaped, fertilized, and seeded, two anchor trenches shall be dug, one along the foot of the slope and the other 1 ft back from the crown of the slope. These anchor trenches shall be 4 in. deep and at least 6 in. wide. One edge of the

paper mat shall be placed into the top trench and stapled 9 in. on center. The trench shall then be filled with soil. The paper mat shall then be unrolled such that it lays out flat, evenly, and smoothly, without stretching the material. Paper mats shall be held in place by means of staples. The staples shall be driven at a 90° angle to the plane of the soil slope. Staples shall be placed not more than 3 ft apart with rows alternately spaced. The paper mat shall be secured in the bottom anchor trench in the same manner as it was secured in the upper anchor trench. The ends and edges of the mats shall be overlapped at least 4 in. and stapled.

Overlaps running parallel to the slope shall be stapled 18 in. on center and overlaps running perpendicular to the slope shall be stapled at least 9 in. on center. When paper mats ~~is~~are used, the mats shall be placed with the length running from top of slope to toe of slope, or the mats shall be placed with the length running horizontally or parallel to the contour.

621.05, begin line 188:

Straw mats may be used for mulch for seeding on projects where mulched seeding is specified or where erosion control blankets ~~is~~are specified. Straw mat shall be placed within 24 h after seeding. The ground shall be prepared in accordance with 621.04. After the area has been properly shaped, fertilized, and seeded, the straw mats shall be unrolled over the designated area so that the plastic mesh is on top and the straw fibers are snugly and uniformly in contact with the soil surface without stretching the material. The rolls shall be butted snugly together and stapled in place. The staples shall be driven through the blanket at a 90° angle to the plane of the ground surface. Each staple shall anchor the plastic mesh. The staples shall be spaced at approximately 3 ft increments, both longitudinally and transversely.

For placement on slopes, the straw mats shall be placed with the length running from the top of slope to the toe of slope and shall extend a minimum of 3 ft over the crown of the slope. On slope applications, six staples shall be installed across the uphill end of the roll. The downhill ends of the lowermost rolls across the slope shall also be anchored with six staples, placed on uniform spacing.

For placement in ditch lines, the straw mats shall be unrolled parallel to the centerline of the ditch. The mat shall be placed so that there are no longitudinal seams within 24 in. of the bottom centerline of the ditch. In ditch lines, six staples shall be placed at uniform spacing across the upstream end of each roll.

621.06, begin line 222:

Seed mixtures are classified as follows. Mixes including warm season grasses, forbs, or aquatic species ~~will be specified in~~shall be as shown on the plans.

621.09, begin line 321:

Pegs shall be wood at least 1/2 in. by 3/4 in. by 12 in. In lieu of ~~wood~~ pegs, T-shaped wire pins may be used. The pins shall be machine bent from 8 gauge low carbon steel with a minimum of an 8 in. leg, a 4 in. head, and a 1 in. secondary drive. Pins shall be driven flush with the top of the sod.

621.11, begin line 336:

Areas outside ~~shown~~*the* construction limits which are disturbed by the Contractor shall be repaired to their original condition or better. The areas shall be seeded with seed mixture R, U, P, Shade, or Floodplain as directed. If the contract contains seed mixtures other than the mixes listed here, the Contractor may seed the disturbed area with the mixture contained in the contract provided the area is less than 1 ac in size. If the area disturbed is well maintained and part of a residential or commercial lot, it shall be sodded unless the Engineer determines otherwise.

621.12, begin line 345:

The Contractor shall post a warranty bond for all permanent seeding ~~done~~*placed* from October 16 through January 31. Only completed seeding with seed mixtures R, U, P, or Shade will satisfy the requirements of the warranty bond. Seeding without mulch shall not be ~~done~~*placed* between May 1 and August 15.

621.14, begin line 463:

If the Contractor does not complete the necessary repairs before June 15, and there are no justifiable reasons for the Department to grant an extension, the Contractor shall forfeit the bond for the seeding work only. If a bond is forfeited, the Contractor ~~will~~*shall* be required to explain to the Department why the Contractor's experience reduction factors do not warrant an increase.

621.14, begin line 470:

A fertilizer may be required with a higher nitrogen content than that specified, or the fertilizer specified may be required to be enriched by adding chemicals in order to be in accordance with such requirements. All additional cost incurred due to such procedure will be paid at the prices shown by certified vouchers. ~~Such~~*The* payment will include and will be full compensation for furnishing the required chemicals, or furnishing and processing the additional materials required.

621.14, begin line 478:

The percent of moisture ~~shall~~*will* be determined at the time the mulching material is weighed. Facilities shall be provided for weighing in accordance with 109.01(b). Arrangements shall be made in advance so that the percent of moisture will be determined at the time of weighing and that the weight of the material will be checked.

SECTION 622 – PLANTING TREES, SHRUBS, AND VINES

622.03, begin line 52:

Temperature inside the storage building shall be maintained between 35°F and 55°F. Plants shall not remain in storage, either inside or outside, for more than seven days, unless otherwise specified ~~because of~~*due to* unfavorable planting conditions.

622.03, begin line 56:

~~Plants may be rejected on failure to comply with these specifications~~*Failure to comply with these specifications will be cause for rejection of the plants.*

622.03, begin line 66:

~~Plants may be rejected upon failure to comply with these specifications~~
Failure to comply with these specifications will be cause for rejection of the plants.

622.04, begin line 69:

At least 24 h before starting to dig collected plants, notification ~~shall be given~~ of the time and place of *the* digging *shall be provided* so inspection of the work and ~~of~~ the plants can be made, as desired.

622.05, begin line 93:

If, after staking or excavation of the plant holes at the locations shown on the plans, it becomes apparent that the location is unsuitable for planting due to accumulation of groundwater, possible flooding because of terrain conditions, or unsuitable soil conditions, plant holes shall be relocated as directed. Such relocation shall be ~~done~~*accomplished* with no additional payment.

622.06, begin line 100:

The planting season shall be from September 1 through the following May 25, with the exception that trees shall be planted from October 1 through the following April 15, ~~provided that~~ *if the* trees are dormant. Bare rooted plants shall be planted only when the outside air temperature exceeds 35°F. Unless otherwise approved, deciduous plants, except those ~~that are~~ container grown, shall be dormant at the time they arrive at the ~~work~~*worksite* or storage site. Evergreens shall not have active terminal growth. At least 40% of the total number of balled and burlapped, and container grown plants shall be planted from the beginning of the planting season through December 31. Bare root seedlings for wildlife habitat shall be planted from October 1 through the following April 30. Container grown seedlings for wildlife habitat shall be planted at any time.

622.07, begin line 133:

Bare rooted shrubs shall be cut back to 1/2 ~~of~~ their minimum specified height as shown on the plans.

622.08, begin line 149:

In areas which are designated on the plans as beds for group planting, the soil shall be tilled to a minimum depth of 6 in. ~~in such a manner~~*so* that all sod and vegetation is destroyed. These areas shall be tilled at least two times with an interval of 14 days between tilling operations. Planting may ~~be done~~*begin* immediately after the second tilling. Additional tilling shall be performed if vegetation appears before mulch is applied. Sod and vegetation shall be removed in lieu of the tilling operation when the soil temperature or moisture conditions are such that the sod and vegetation would not be destroyed by tilling. At other times, sod and vegetation may be removed in lieu of tilling. If the excavation resulting from sod removal is greater than 1 in. deep, it shall be backfilled with topsoil to 1 in. above the original ground.

622.08, begin line 191:

Balled and burlapped plants shall be handled by the ball and placed in the holes ~~in such a manner~~*so* that the soil of the ball does not become loosened from the roots. The soil directly beneath the ball shall be firmed to minimize settling. Guy stakes shall be driven before backfilling operations begin. After the hole has been partially backfilled and the

material firmed under and around the ball, the burlap shall be cut away and removed from the stem of the plant. Backfilling and firming shall then be completed in a manner to avoid loosening the soil from the root ball. Watering shall be ~~done~~performed in accordance with 622.08(a). Backfill material shall be in accordance with 914.01.

622.08, begin line 201:

Seedlings shall be from 6 to 18 in. in height. Seedlings shall be planted as directed in the locations shown on the plans. Species shall be selected from the list as shown on the plans. Alternate species selection shall be subject to approval. Seedlings shall be planted no closer to each other than the distance shown on the plans. Seedlings shall not be planted in rows, but instead shall be ~~planted~~arranged in a natural appearing pattern. Failure to comply with this procedure will require the replanting of the seedlings as directed with no additional payment. All damaged seedlings shall be replaced with no additional payment if replanting is required.

622.10, begin line 218:

Mulch, in accordance with 914.05(b), shall be placed as a top layer around each plant as soon as it has been installed. The mulch shall cover the entire area as described in 622.08 and shall be placed around individual plants ~~in accordance with~~as shown on the plans.

622.15, begin line 305:

Pipe underdrains, when shown on the plans or directed, shall be placed to drain tree wells or porous material for tree root protection. These shall be placed in accordance with ~~the~~ applicable provisions of 718.

622.17, begin line 319:

Weeding and mowing of grass in and around all group plantings, beds, and individual trees and shrubs shall be performed until final acceptance. The grass and weed control areas shall be the areas within 2 ft of the outer limits of all group plantings and shrub beds and within 2 ft of the outer limits of the mulch area of individual shrubs. For the care of individual trees, the area shall extend to a perimeter centered from the point itself to 2 ft beyond the stub stakes of the guy wires or 2 ft beyond the mulched area. In general, these areas shall be ~~in accordance with~~as shown on the plans.

622.18, begin line 330:

Watering, fertilizing, weeding, cultivating, spraying to control insect infestation and disease, and all other good horticultural practices necessary to maintain the plants in a living healthy condition shall be performed up to the time for termination of responsibility for care as set out herein. The plants shall be cared for throughout the life of the contract. All plants stolen, damaged, or destroyed by fire, automobiles, vandalism, or any other cause, ~~with the exception of~~except for plants damaged or destroyed by Department maintenance operations, shall be replaced with no additional payment as soon as practicable. Plants damaged or destroyed by the Department will be replaced by the Department prior to the date of final acceptance.

622.20, begin line 373:

These signs shall be placed at the boundaries of areas where seedlings for wildlife habitat have been placed. The locations and spacing of the signs shall be as shown on the

plans or as directed. The sign shall otherwise be in accordance with 621.06(hc).

SECTION 628 – FIELD OFFICE, COMPUTER SYSTEM, COMPUTER SYSTEM EQUIPMENT, OFFICE MACHINES AND COMMUNICATIONS

628.02, begin line 60:

Exterior doors shall have a satisfactory locking system. At least one door shall always be able to be unlocked and opened from inside the field office. If a padlock is used to secure a door, it shall be a high security type and shall be made inaccessible to bolt cutters, hacksaws, hammers, or prybars. The padlock shall be mounted ~~in such a manner~~so that locking and unlocking the door can be made with minimal effort. Installation of additional hardware to protect the lock or use of multiple padlocks on a door will not be allowed. Additional hardware to receive the padlock will be acceptable. The Contractor shall furnish the number of keys to the office as directed by the Engineer. The Department will maintain a list of all Department personnel who are given keys.

628.02, begin line 93:

The field office location shall be selected ~~in order~~ to provide satisfactory parking and trash disposal facilities for Department use. Parking spaces shall be either paved or surfaced with compacted aggregate, size No. 53, or other acceptable materials suitable for all-weather usage and shall be maintained, including snow removal. Satisfactory parking for a Type A field office shall be a minimum of six separate parking spaces. Satisfactory parking for a Type C field office shall be a minimum of 10 separate parking spaces. Satisfactory parking for a Type D field office shall be a minimum of 12 separate parking spaces. Satisfactory parking for a Type E field office shall be a minimum of 16 separate parking spaces.

628.02, begin line 120:

Potable water shall be provided separately for drinking and ~~hand washing~~handwashing purposes.

628.06, begin line 431:

Cellular telephone units will be paid for at the contract unit price per each ~~per~~for each type specified. Cellular telephone service will be paid for at the contract unit price per month ~~per~~for each phone. Monthly charges for cellular telephone minutes and data in excess of those specified in the contract will be paid for by the dollar amount for the invoiced price per each occurrence as cellular telephone, additional charges.

DIVISION 700 – STRUCTURES

SECTION 701 – DRIVEN PILING

701.04, begin line 70:

The Contractor shall submit a completed pile and driving equipment data form to the Engineer at least 15 calendar days prior to driving piles. The pile and driving equipment data form is available on the Department's website. The Contractor will be notified of the acceptance of the proposed pile driving system within 15 calendar days of the receipt of the pile and driving equipment data form. Acceptance of pile and driving equipment ~~does~~will not relieve the Contractor of the responsibility to provide equipment suitable for driving the specified piling to the required bearing without damage.

701.04, begin line 154:

Gravity or drop hammers shall be used to drive timber piles only. The ram shall have a weight of between 2,000 and 3,500 lb. The height of drop shall not exceed 12 ft. The weight of gravity hammers shall not be less than the combined weight of the helmet and pile. All gravity hammers shall be equipped with hammer guides and helmets to ensure concentric impact on the drive head.

701.04, begin line 227:

Piles driven with impact hammers shall have ~~an adequate~~ helmet that adequately distributes the hammer blow uniformly and concentrically to the pile head. The helmet shall be axially aligned with the hammer, ~~and the~~ pile shall be guided by the leads and not be free-swinging. The helmet shall fit around the pile head and prevent transfer of torsional forces during driving while maintaining proper alignment of hammer and pile.

701.04, begin line 266:

Piles shall be supported in line and position with leads while being driven. Pile driver leads shall be constructed in a manner that affords freedom of movement of the hammer while maintaining alignment of the hammer and the pile to ensure concentric impact for each blow. Leads may be either fixed or swinging type. Swinging leads, when used, shall be fitted with a pile gate at the bottom of the leads. The leads shall be adequately embedded in the ground, or the pile shall be constrained in a structural frame such as a template to maintain alignment. The leads shall be of sufficient length to make the use of a follower unnecessary and shall be designed ~~as~~ to enable proper alignment of battered piles.

701.05, begin line 351:

To assess the effects of relaxation and setup, each indicator test pile shall be restruck after the number of hours specified unless otherwise approved. The hammer shall be warmed up before driving begins by applying at least 20 blows to another fixed object. The maximum amount of penetration required during restrike shall be 3 in., or the total number of hammer blows shall be 20, whichever occurs first. If the indicator test pile does attain the nominal driving resistance upon restriking, the penetration resistance attained during initial driving shall be used to establish the adequacy of production piles.

[moved to a separate paragraph] If the nominal driving resistance is not attained upon

restriking, the Contractor shall redrive the indicator test pile until it achieves the nominal driving resistance and repeat the restrike procedure described above. If the nominal driving resistance is still not obtained, pile driving shall stop immediately, and the Office of Geotechnical Services shall be notified.

701.05, begin line 388:

The Contractor shall notify the Engineer at least seven calendar days before the scheduled date of driving piles to be monitored by PDA. The Contractor shall confirm the driving date three calendar days prior to the scheduled driving date. The Contractor shall indicate ~~at~~ which foundation ~~that~~ production pile driving ~~is to~~*will* begin. The Engineer will provide final driving criteria for the indicated foundation first.

701.05, begin line 411:

The Contractor shall drive the test pile to the minimum tip elevation and to the penetration depth at which the dynamic test equipment indicates that the nominal driving resistance shown on the plans and in accordance with 701.04(a) has been achieved. The Contractor may reduce the driving energy transmitted to the pile by using additional cushions or reducing the energy output of the hammer ~~in order~~ to maintain stresses below the values shown in 701.04(a)1. If non-axial driving is indicated by the dynamic test equipment measurements, the Contractor shall immediately realign the hammer system. Upon determination by the Engineer that valid data has been secured, the Contractor shall assist the Engineer with the removal of the instrumentation from the pile.

701.05, begin line 432:

Once the restrike test for the test pile is complete, the Engineer will run CAPWAP analyses and will provide the final driving criteria within two business days of the restrike test. Production piles driven prior to receipt of the final driving criteria shall be ~~done~~*driven* at the Contractor's risk. Final driving criteria for additional structures will be provided within two business days of the restrike test or, when multiple test piles are restruck the same day, at a rate of one substructure location per business day in the order requested by the Contractor.

701.05, begin line 469:

The Contractor shall provide complete protection ~~at all times~~ for the pile, supports, and reference beam from wind, direct sunlight, frost action, or other disturbances. The Contractor shall maintain an air temperature in the immediate vicinity of the test pile and reference beam of not less than 50°F and shall provide adequate lighting for the duration of the test.

701.05, begin line 532:

Hydraulic jacks and pressure gauges shall be used for the superimposed load. The jacks, pressure gauges, load cells, and hydraulic pumps shall be calibrated with each other within the last 30 days by an independent laboratory. When a jack, pressure gauge, load cell, and hydraulic pump are calibrated, they shall be calibrated and used as a unit. All calibration checks shall be within 5% of the applied load if calibrated as a unit. Changing one of the four components shall require recalibration prior to use. Pressure gauges shall be a minimum of 4 1/2 in. in diameter with gradations in accordance with ASTM D1143. Hydraulic jacks shall have a nominal load capacity exceeding the maximum anticipated jack load by at least 20%. The jack, pump, any hoses, pipes, fittings, gauges, or transducers

used shall be rated to a safe pressure corresponding to the nominal jack capacity. The Contractor shall provide copies of the most recent calibration certification a minimum of five days prior to the static load test.

701.09, begin line 628:

Pilot holes are prebored, predrilled, or cored. After a pile is driven ~~thru~~through a pilot hole, all voids around the pile shall be filled with B borrow. Water shall be added to the hole to saturate the final placement of B borrow.

701.09, begin line 670:

Pilot holes for end bent piles for structures with integral end bents shall be predrilled to the depth ~~specified in~~shown on the plans, regardless of the height of new embankment.

701.09, begin line 695:

A maximum deviation of 1 1/2 in. in any direction from the plan position will be allowed in pile trestle bents and exposed pile bents. A maximum deviation of 6 in. in any direction will be allowed for a foundation pile in footings for piers or abutments. The tendency of concrete or steel piles to twist or rotate shall be prevented and corrected. Piles to be swaybraced shall be aligned as necessary so that the swaybracing may be properly welded to the piles by a welder qualified in accordance with 711.32. No pile shall be closer than 4 in. from an edge of the pile cap. Pulling or pushing laterally on installed piles to correct misalignment or splicing a properly aligned section on a misaligned section will not be allowed. The pile head at ~~the~~cutoff elevation shall be within 2 in. of plan elevation for bent caps supported by piles.

701.11, begin line 777:

Splicing of steel piles shall be made as shown on the plans. The top of the pile to be extended shall be restored to its original cross-section shape. The mating end of the other pile shall be beveled as shown on the plans. A wire brush or grinder shall be used to remove any scale, dirt, slag, or other foreign material that is detrimental to fabricating a sound weld from all surfaces to be welded. For H piles, a mechanical splice shall not be used within 20 ft of the ground surface unless it is proven that the splice can transfer the full pile strength in compression, tension, and bending. Splices for pipe piles shall be watertight. All work shall be ~~done~~performed with approved methods and materials and by welders qualified in accordance with 711.32. If the temperature of the piles is below 50°F, both piles to be spliced shall be preheated to a minimum temperature of 70°F in the vicinity of the splice immediately prior to welding. The temperature of the piles shall be maintained at a minimum of 50°F until the welding is complete. There shall not be more than two splices exposed to view in each length of piling after driving is completed. A mechanical splice shall not be used in integral end bents.

701.13, begin line 805:

The tops of all steel piles shall be cut off at the elevation shown on the plans. All unused cut-off lengths shall become the property of the Contractor and shall be removed from the project site.

701.13, begin line 809:

The length of timber piles above the elevation of cut-off shall be sufficient to enable

the complete removal of all material injured by driving. [-----]

SECTION 702 – STRUCTURAL CONCRETE

702.03, begin line 45:

Fine Aggregate, Size No. 23 904.02

702.05, begin line 106:

Coal ash from a qualified source may be used as a partial replacement for portland cement. The substitution of coal ash for portland cement will not be allowed in conjunction with the use of slag cement or blended cement types IP, IP-A, IS, or IS-A. Mix designs ~~will~~shall be based on using a maximum 20% cement reduction with a minimum 1.25:1 ash-to-cement replacement ratio, by weight.

702.06, begin line 178:

The batch plant site, layout, equipment, and provisions for transporting material shall ~~assure~~ensure a continuous supply of reasonably uniform material to the work. Aggregate stockpiles shall be in areas sufficiently well drained to prevent any dirt underneath the stockpile from becoming softened and pumping into the aggregate to a level from which the aggregate is to be removed and used in the work. Stockpiles shall be built in layers not to exceed 6 ft in depth. Upper layers shall be prevented from spilling over the sides of the layers below.

702.06, begin line 199:

The batching plant shall include bins, weighing hoppers, and scales for the fine aggregate and for each size of coarse aggregate. If cement is used in bulk, a bin, hopper, and scale for cement shall be included. If coal ash is used, the separation of cement and coal ash bins ~~will~~shall be as approved. Bins with adequate separate compartments for fine aggregate and for each size of coarse aggregate shall be provided in the batching plant.

702.06, begin line 225:

For applied loads of 1,000 lb and greater on the cement scale and applied loads of 4,000 lb and greater on the aggregate scale, the scales shall be accurate to 0.5%. For applied loads of less than 1,000 lb and 4,000 lb for the cement and aggregate scales, respectively, the scales shall be accurate to 2.0% or one graduation, whichever is larger. Poises shall be designed to be locked in any position to prevent unauthorized change of position. Scales will be inspected as often as necessary to ensure their continued accuracy. A minimum of ~~ten~~10 weights, 50 lb ~~weight~~each, shall be provided for testing of scales.

702.08, begin line 280:

Structural concrete shall be mixed only in such quantities as required for immediate use and shall be placed while fresh and before initial set has occurred. Hand mixing will not be allowed except in an emergency and then only with permission. Hand mixing shall be ~~done~~performed on a watertight platform ~~in such manner and so continued~~ to ensure a homogeneous mixture of the required consistency. Hand mixed batches shall not exceed 1/2 cu yd in volume.

702.09, begin line 325:

1. Mixers may be stationary mixers or truck-mixers. Agitators may be truck-mixers or truck-agitators. Each mixer and agitator shall have attached metal plates, prominently placed and plainly marked, indicating the various designed uses of the equipment, the volume capacity of mixed concrete, the speed of rotation of the mixing drum, and the manufacturer's name and address. Stationary mixers shall be equipped with an acceptable timing device which does not enable the batch to be discharged until the specified mixing time has elapsed. Truck-mixers shall be equipped ~~with means by which~~^{so} the number of revolutions of the drum may be verified readily. The counters shall be actuated at the time of starting mixing at mixing speed.

702.09, begin line 362:

6. Mixers and agitators shall be examined daily for changes in conditions due to the accumulations of hardened concrete or mortar or to ~~the~~ wear of ~~mixing~~ blades. When such change of conditions is found, the tests described in 702.09(b)4 shall be repeated.

702.11, begin line 496:

Immediately after a pour is completed, the freshly poured concrete and forms shall be covered to form a complete protective enclosure around the element being poured. If the element is a bridge deck, the enclosure shall encompass the top, bottom, and all sides. The air within the entire enclosure shall be maintained at a temperature above 50°F for a minimum of 144 h for bridge decks, the top surface of reinforced concrete slab bridges, and for a minimum of 72 h for all other concrete. If for any reason this minimum temperature is not maintained, the heating period shall be extended. When dry heat is used, ~~means shall be provided to maintain~~ adequate moisture ~~shall be maintained~~ in the air within the enclosure.

702.11, begin line 506:

All necessary measures shall be taken during protective heating to keep the heating equipment in continuous operation and to maintain the proper temperature around all sides, including the top and bottom of the concrete. Adequate fire protection shall ~~always~~ be provided ~~and accessible~~ where heating is in progress ~~and such protection shall be accessible at all times~~.

702.13, begin line 527:

Forms shall be mortar-tight and sufficiently rigid to prevent distortion due to the pressure of the concrete and other loads incident to the construction operations, including vibration. Forms shall be constructed and maintained to prevent the opening of joints due to shrinkage of the ~~form~~ lumber.

702.13, begin line 576:

All forms shall be treated with a ~~formulated~~ form coating ~~that allows~~^{formulated to allow} them to be released without adhering, discoloring, or otherwise damaging the concrete.

702.13, begin line 598:

The metal forms shall be designed based on dead load of the forms, reinforcing

bars, and plastic concrete plus 50 lb/sq ft for construction loads. The unit working stress in the steel sheet shall be not more than 0.725 of the specified minimum yield strength of the material furnished but not to exceed 36,000 psi. Deflection under the weight of the forms, the plastic concrete, and the reinforcing bars shall not exceed 1/180 of the form span or 1/2 in., whichever is less. However, the deflection loading shall not be less than 120 lb/sq ft total. The allowable form camber shall be based on the actual dead load condition. Camber shall not be used to compensate for deflection ~~in excess of~~ *greater than* the foregoing limits. The design span of the form sheets shall be the clear span of the form plus 2 in. measured parallel to the form flutes. If the design span of the form sheets exceeds 9.5 ft, concrete will not be allowed to be placed in the valleys of the corrugations of the metal forms. Physical design properties shall be computed in accordance with requirements of the American Iron and Steel Institute Specifications for the Design of Cold Formed Steel Structural Members.

702.13, begin line 657:

Concrete shall be placed in accordance with 702.20. ~~Particular e~~ *Emphasis* shall be placed on proper vibration of the concrete to avoid honeycombs and voids, especially at construction joints, expansion joints, attachment hardware, and valleys and ends of form sheets. Pouring sequences, procedures, and mixes shall be submitted for approval.

If it is determined that the procedures used during the placement of the concrete warrant inspection of the underside of the deck, at least one section of the forms shall be removed at a location and time selected for each span in the contract. This ~~is to~~ *shall* be ~~done~~ *performed* as soon after placing the concrete as practical to provide visual evidence that the concrete mix and the procedures are obtaining the desired results. An additional section shall be removed if it is determined that there has been any change in the concrete mix or in the procedures warranting additional inspection.

After the deck concrete has been in place for a minimum of two days, the concrete shall be tested for soundness and bonding to the forms by sounding with a hammer as directed. If ~~unsound~~ *of doubtful soundness* areas are detected by this procedure, the forms shall be removed from such areas for visual inspection after the pour has attained adequate strength. This removal of the permanent metal bridge deck forms shall be with no additional payment. At locations where sections of the forms are removed, form replacement will not be required, but the adjacent metal forms and supports shall be repaired to present a neat appearance and ensure their satisfactory retention. As soon as the form is removed, the concrete surfaces will be examined for cavities, honeycombs, and other defects. If irregularities are found, and it is determined that these irregularities do not justify rejection of the work, the concrete shall be repaired as directed and shall be given a finish in accordance with 702.21.

702.13, begin line 728:

The shape, strength, rigidity, water-tightness, and surface smoothness of re-used forms shall be maintained ~~at all times~~. Any warped or bulged lumber shall be re-sized before being used. Unsatisfactory forms shall not be used.

702.14, begin line 796:

~~Unless driving of~~ *Unless driving of* piles for falsework bents is precluded by soil or other special conditions or unless otherwise specified, all bents for falsework shall have driven piles.

These shall be driven to support the required loads without settlement, spacing, and subsequent removal shall be satisfactory. If permission is given to place frame bents, they shall be placed on continuous concrete mudsills, or as approved.

702.15, begin line 854:

Construction joints shall be located across regions of low shearing stress and, ~~so far as when~~ possible, where they are hidden from view in the finished structure. They shall be ~~made constructed~~ only where shown on the plans, unless otherwise specified.

702.15, begin line 868:

Immediately before the new concrete is placed, the forms shall be drawn tight against the in-place concrete and the exposed surface of the concrete shall be coated with a thin coating of mortar composed ~~one of~~ one part cement and two parts No. 23 sand.

All concrete for slabs, beams, girders, cantilevered brackets, and footings shall be placed in one continuous operation to form monolithic construction. However, if, because of rain or other unavoidable reasons, concreting is interrupted where monolithic construction is required, the concrete shall be kept plastic by placing frequent small batches until this part of the work is completed or until normal operations can be resumed. If the interruption is such that even partial operations cannot be carried on and construction joints are unavoidable, the joints shall be made in planes exactly ~~normal~~ perpendicular to the main reinforcing bars and only where the shear is at a minimum. In simply supported slabs, beams, and girders, such regions of minimum shear are at or near the center of the span.

702.15, begin line 907:

Bridge expansion joints shall be of the form, dimensions, material, and design shown on the plans. Open expansion joints shall be completely open for the dimensions specified and for their entire length. Preformed expansion joint filler shall be placed true and even ~~and~~ with abutting sections pressed together tightly. The material shall be of the size shown on the plans and shall be in accordance with 906.03.

702.15, begin line 920:

The surface of the supporting concrete for a sliding joint shall be troweled to a smooth finish and then covered with the required thickness of bituminous material, or otherwise treated ~~if so as~~ designated.

702.19, begin line 951:

Caps shall not be poured on end bents or on any other bents ~~falling~~ located within the limits of the approach grade until the fill material has been placed.

702.20, begin line 969:

Except as otherwise directed, concrete shall be placed in horizontal layers of no more than 24 in. thick. When less than a complete layer is placed in one operation, it shall be terminated by a vertical bulkhead. ~~In order to~~ avoid planes of separation between the layers and damage to the plastic concrete beneath, each layer shall be placed and consolidated before the preceding layer has taken initial set. On horizontal surfaces and at horizontal construction joints, the forms shall be overfilled approximately 1/2 in. and then struck off to the required elevation prior to the initial set of the concrete.

702.20, begin line 995:

The external surface of all concrete shall be worked thoroughly, during placing, by means of tools of an approved type. The ~~working shall be such as~~ **concrete surface shall be worked** to force all coarse aggregate from the surface and to bring mortar against the forms to produce a smooth finish substantially free from water and air pockets or honeycomb.

702.20, begin line 1016:

Concrete shall not be dropped ~~in~~ **into** the forms a distance of more than 5 ft except when confined by closed chutes or pipes. Each part of the form shall be filled by depositing the concrete as near final position as possible. The coarse aggregate shall be worked back from the forms and worked around the reinforcement without displacing the bars. After initial set of the concrete, the forms shall not be jarred and no strain shall be placed on the ends of projecting reinforcement.

702.20, begin line 1029:

Vibrators shall be of an approved type and design, adequately powered and capable of transmitting 10,800 impulses per minute in air. The diameter of the head of the vibrator shall be 1 1/4 to 2 1/2 in. Vibrators shall be manipulated so that the concrete is thoroughly worked around the reinforcement and imbedded fixtures and into corners and angles of the forms. Vibrators shall not be used ~~as a means~~ to cause concrete to flow or run into position in lieu of placing. The vibration at any point shall be of sufficient duration to accomplish compaction but shall not be prolonged to the point where segregation occurs. Vibrators shall not be attached to or allowed to contact forms or reinforcement or to penetrate beyond any layer of fresh concrete.

702.20, begin line 1051:

A tremie shall consist of a tube having a diameter of no less than 10 in. and constructed in sections having flanged couplings fitted with gaskets. Support of the tremie shall ~~be such that it enables~~ **enable** free movement of the discharge end over the entire top surface of the area on which the concrete is to be deposited and allows rapid lowering, when necessary, to retard or stop the flow of the concrete. The discharge end shall be kept closed until immediately prior to depositing ~~in order~~ to prevent water entering the tube and shall be completely sealed except when concrete is actually being deposited. The tremie tube shall be kept full to the bottom of the hopper. When a batch is dumped into the hopper, the flow of concrete through the tube shall be started by slightly raising the discharge end, but always keeping it in the previously deposited concrete. The flow shall be continuous until all the required concrete is deposited.

702.20, begin line 1067:

If it is necessary to operate the pump while placing footing concrete, or immediately thereafter, the seepage water shall be conducted to a sump at the pump intake ~~in such manner that so~~ it does not flow over the fresh concrete. Special care shall be taken to prevent pumping cement out of the fresh concrete.

702.20, begin line 1080:

Piling, if any, shall be driven to or cut off at the proper elevation to enable embedment in the footing concrete equal to that shown on the plans. All laitance or other unsatisfactory material shall be removed from the exposed surface of the concrete in place by ~~some~~ means which does not injure the concrete. If a footing is to be constructed on a

foundation seal, it shall be to the dimensions shown on the plans and, if necessary, the height of the shaft adjusted to bring the bridge seat to the required elevation.

702.22, begin line 1161:

Unless otherwise specified, all other concrete shall be cured continuously 24 h per day for at least 96 h commencing immediately after the surface is able to support the protective covering without deformation. In addition to the required hours, curing shall continue until the flexural strength ~~stated in~~ *accordance with* 702.13(h) and 702.24 has been attained.

702.23, begin line 1218:

- (c) the ~~extrados~~ *exterior curve* of arches,
- (d) the inside faces of spandrel walls, and
- (e) the abutments up to the finish grade line.

The inside faces of spandrel walls and ~~extrados~~ *exterior curve* of arches shall be waterproofed.

702.23, begin line 1235:

Concrete surfaces to be waterproofed shall be reasonably smooth and free from projections and holes. Immediately before the application, the surface shall be cleaned of dust and loose materials. Waterproofing shall be ~~done~~ *performed* only when the surface is at least dry enough to prevent the formation of steam when the hot material is applied. When the air temperature is below 35°F, waterproofing shall not be ~~done~~ *performed*, unless otherwise specified.

702.24, begin line 1266:

- (c) The dead weight of steel or precast concrete superstructure shall not be placed on concrete until test beams representing the concrete have attained a flexural strength of 400 psi for third-point loading. A dead load shall not be placed on hammer-head piers until test beams representing the concrete have attained a flexural strength of at least 480 psi for third-point loading. The concrete floor, if ~~to be placed thereon~~, shall not be poured until test beams representing the concrete supporting the superstructure have attained a flexural strength of at least 440 psi for third-point loading.

702.28, begin line 1367:

If the foundation seal is constructed as shown on the plans, the pay quantity for excavation for foundation seal will be equal to the theoretical volume bounded by the bottom of the proposed footing, the bottom of the foundation seal, and vertical planes 18 in. outside the neat line of the footing and parallel ~~thereto~~ *to it*, regardless of the quantity ~~actually~~ removed.

702.28, begin line 1427:

The cost of grout for grouting reinforcing bars in place, the length of grouted hole recommended by the grout manufacturer ~~in excess of~~ *greater than* the length shown on the plans, and the additional length of reinforcing bars required shall be included in the cost of field drilled hole in concrete.

SECTION 703 – REINFORCING BARS

703.04, begin line 26:

Plain and epoxy coated reinforcing bars shall be protected from damage during storage, handling, installation, and concrete placement. Plain and epoxy coated reinforcing bars shall not be stored in direct contact with the ground. Epoxy coated reinforcing bars shall be protected from exposure to ultraviolet light and moisture during storage. Once placed into the work, epoxy coated reinforcing bars shall not be exposed to ultraviolet light for more than 21 days prior to placement of concrete. At the time of concrete placement, reinforcing bars shall be free of dirt, loose rust or scale, grease, oil, or other foreign ~~substance~~matter.

703.06, begin line 102:

All reinforcing bars shall be furnished in the full lengths shown on the plans unless splices are indicated. No other splicing will be allowed except with written permission. Unless otherwise shown on the plans, reinforcing bars shall be lapped 64 diameters to make a splice. Construction joints shall not be made within the limits of lapped bars. For lapped splices, reinforcing bars shall be placed in contact and rigidly clamped or wired in an approved manner. ~~Insofar as~~When possible, splices shall be staggered and well distributed or located at points of low tensile stress. Splices will not be allowed at points where the section does not provide a distance of at least 2 in. between the splice and the nearest adjacent bar or surface of the concrete.

703.07, begin line 175:

Reinforcing bars will be measured by the pound based on the theoretical number of pounds complete in place as shown on the plans or placed as ordered. The quantities of materials furnished and placed shall be based upon the calculated weights of the reinforcing bars ~~actually~~ placed in accordance with these specifications. The weights calculated shall be based upon the following table:

SECTION 704 – CONCRETE FLOOR SLABS

704.04, begin line 35:

Applicable provisions of 703 shall apply to placing reinforcing bars. No concrete shall be placed until the reinforcement has all been placed, secured, inspected, and approved. Walkways shall be in accordance with 702.20(a). Placing of reinforcement during ~~placing of~~ concrete ~~placement~~ will not be allowed without prior written approval. Splices, when allowed, shall be at locations of least tension in the steel.

704.05, begin line 119:

Immediately after screeding to the required cross-section, the surface shall be checked with a long-handled 10 ft straightedge of light construction, laid parallel to the centerline at intervals of no more than 2 ft transversely and 5 ft longitudinally. In case it is impracticable to operate the straightedge otherwise, it shall be operated from a footbridge or from bridges on the floor. All high spots shall be removed and depressions filled with fresh concrete and then leveled with a float having a blade approximately 5 ft long and 8

in. wide. Floating and manipulating concrete to fill depressions shall be held to a minimum. Checking and leveling shall continue until the surface has the required contour and is free of voids. The application of water to the surface for the purpose of lubricating the floats and straightedges may be used only when ~~absolutely~~ necessary and shall be held to a minimum. The water applied for this purpose shall be limited to such quantity as may be applied by heavy fogging as approved.

704.05, begin line 144:

Smoothness shall be in accordance with 502.20. If, after the above requirements have been met, portions of the floor are not entirely satisfactory, the removal and replacement of such portions may be ordered to secure a satisfactory floor. Such removal and replacement shall be ~~done~~*performed* with no additional payment.

SECTION 705 – SIDEWALKS ON STRUCTURES

705.03, begin line 31:

~~As soon as finished~~*After finishing*, the sidewalk shall be cured for no less than 96 h in accordance with 704.06.

SECTION 706 – BRIDGE RAILINGS

706.03, begin line 38:

Concrete railings shall not be placed until the falsework for all ~~of the~~ spans have been removed and the spans are self-supporting. Concrete railings shall be constructed in accordance with 702 and 703.

706.03, begin line 68:

The slip form paver shall consolidate, screed, and finish the freshly placed concrete in one complete pass so a minimum of hand finishing will be necessary to provide a dense and homogeneous railing in conformance with the plans and specifications. The slump shall be 1 1/2 in. ±1 in. The joints may be formed or sawed ~~as long as to attain~~ a satisfactory joint ~~is attained~~.

706.05, begin line 118:

Fabrication and placement of steel railings shall be completed in accordance with the applicable requirements of 711. Ends of tube sections shall be milled or sawed. Cut ends shall be true, smooth, and free from burrs and ragged edges. The rail system shall be continuous except as shown on the plans. Joints shall be spliced as detailed on the plans. Welding of steel shall be in accordance with 711.32. Radiographic, magnetic particle, and dye penetrant inspection will not be required. Anchor bolts shall be ~~pre-set~~*preset* in concrete.

**SECTION 707 – PRECAST CONCRETE AND PRECAST PRESTRESSED
CONCRETE STRUCTURAL MEMBERS**

707.03, begin line 60:

Prior to the beginning of fabrication, a prefabrication meeting shall be held at the fabrication facility or another agreed upon location. The meeting shall be conducted by the Contractor and attended by the fabricator's production supervisor and QC inspector, and the Engineer. The Contractor shall take notes of the meeting and distribute copies to all attending parties within five days of the date of the meeting. Items to be discussed at the meeting shall, at a minimum, include:

[items placed into list]

- (a) fabrication and shipping schedule including hours of operation;
- (b) line of communication between the Contractor and the Engineer;
- (c) material test reports;
- (d) working drawings;
- (e) special fabrication methods;
- (f) and-fabrication hold points for inspection;
- (g) final inspection and acceptance of materials; and
- (h) method of shipment.

[placed into a separate paragraph]The requirement to hold prefabrication meetings may be waived by the Department.

707.03, begin line 76:

In lieu of a field office, a work area and the following items, in accordance with 628 for the exclusive use by the Department, shall be provided on the property where the structural members are being fabricated:

707.04, begin line 138:

When a chemical admixture Type A, Type D, Type F, or Type G is used, it shall be used in combination with an air-entraining admixture. ~~An high-range water reducing, HRWR, or high-range water reducing retarding, HRWR, admixture system may be used.~~

707.04, begin line 209:

When it is necessary to fabricate concrete structural members during times of hot weather the mix water may be chilled or an appropriate amount of ice may be added to the concrete mix ~~in order~~ to produce concrete of the temperature specified herein.

707.04, begin line 242:

All cylinders shall be identified by ~~use of using~~ Department-marked cylinder identification tags which are inserted a maximum of 3/8 in. into the top of each freshly molded cylinder. The cylinder number, a unique structural member identification number, temperature, air content, and slump of the concrete represented by each cylinder shall be referenced to the numbers on ~~these~~the cylinder identification tags and provided to the Engineer by the end of each day in which cylinders are cast.

707.04, begin line 254:

Cylinders shall be in ~~the moisture~~a moist condition resulting from the selected curing treatment prior to testing. To meet these conditions, the cylinders shall be removed from the molds at the time the structural member is removed from the form work. Cylinders shall be tested in accordance with ASTM C39. The Contractor shall have on file a certificate of calibration for the testing machine. All cylinders in a cylinder set, for a given age, shall be broken within the time tolerances shown in ASTM C39. The Department will

remove cylinder identification tags prior to the Contractor testing the cylinders.

707.04, begin line 305:

3. Minimum compressive strength of concrete at ~~the~~ time of prestressing shall be 4,000 psi.

707.07, begin line 380:

Curing shall be in an enclosure designed to minimize heat and moisture loss. Insulated blankets may be used. The concrete in the form shall be maintained at a minimum temperature of 50°F during the entire curing cycle. Curing for precast concrete or precast prestressed concrete structural members shall be ~~done~~accomplished by wet curing without supplemental heat or by accelerated curing. During the period of initial set of the structural member and during the accelerated curing by radiant heat, the concrete shall be kept wet by the method outlined below for wet curing without supplemental heat.

707.07, begin line 419:

When accelerated curing of the concrete is used, it shall be ~~done by~~performed using low pressure steam or radiant heat curing. Radiant heat may be applied by means of pipes circulating steam, hot oil, hot water, or by electric heating elements. When steam is used, the jets shall be positioned so that they do not discharge directly on the concrete, forms, or cylinders. The steam shall be at 100% relative humidity to prevent loss of moisture and to provide moisture for proper hydration of the cement.

707.08, begin line 497:

The structural members shall remain in an upright position ~~at all times~~ and shall be supported as ~~indicated~~specified herein when in storage and during transportation to the construction site.

707.09, begin line 528:

If the method of lifting the structural members in the field differs from the method shown on the beam fabrication working drawings, the Contractor shall submit working drawings and calculations in accordance with 707.08. Erection of precast prestressed concrete structural members shall commence at the centerline and proceed out to the curb, one member at a time. As each structural member is placed, the transverse tie bars, if shown on the plans, shall be inserted and secured. Any shifting of the structural members shall be ~~done~~performed while they are held free of the supports by the hoisting device. The use of a steel pinch bar will not be allowed. Structural members shall be set to proper line and grade with uniform bearing on bridge seats, mortar joints, or bearing pads as required on the plans. Prestressed box beams and NEXT beams that are supported at two bearing locations on each end shall be shimmed as required to maintain a maximum gap anywhere between the bottom of beam and bridge seat no greater than 1/16 in. under the beam's own weight. The steel shims shall be in accordance with 915.04(b)2.

SECTION 708 – PNEUMATICALLY PLACED MORTAR

708.06, begin line 56:

This work shall be ~~done~~performed only by experienced personnel. No one operating the nozzle will be deemed experienced unless they have satisfactorily completed

similar work on other structures of like type.

708.09, begin line 129:

- (e) for all portions whose average depth is greater than or equal to 12 in., the work shall be ~~done~~*performed* as extra work.
Payment will be made in accordance with 104.03.

SECTION 709 – PORTLAND CEMENT CONCRETE SEALERS

709.05, begin line 61:

The sealer selected for use shall be applied at the application rate specified on the QPL of Non-Epoxy Portland Cement Concrete Sealers. The sealer shall be applied without dilution or alteration. ~~Sealers which are applied by spraying shall be sprayed onto the concrete surface using low pressure spray equipment with a sufficient number of passes to achieve the minimum application rate and a uniform coverage.~~*Sealers applied with low-pressure spray equipment shall be sprayed onto the concrete surface using a sufficient number of passes to achieve uniform coverage and meet the minimum application rate.*

The low-pressure spray apparatus shall have a 15 psi maximum nozzle pressure with a course fan spray, such as a garden, form oil, horticulture, or other low pressure sprayer. The spray equipment tanks and hoses shall be thoroughly clean, free of foreign matter, oil, residue, and water prior to use. Sealers shall be selected from the QPL of Non-Epoxy Portland Cement Concrete Sealers and shall be spread to achieve uniform coverage. If roller spreading is required, a clean new roller shall be used for each application sequence. If brooming is specified, a clean, stiff-bristled broom shall be used to spread and work the sealer into the concrete surface.

SECTION 710 – PATCHING CONCRETE STRUCTURES AND REPOINTING MASONRY IN STRUCTURES

710.01, begin line 5:

This work ~~shall~~ consists of patching concrete piers, end bents, abutments, wingwalls, retaining walls, concrete structure surfaces other than bridge decks, and patching concrete drainage structures, and repointing rubble, dressed stone, or brick masonry structures in accordance with 105.03.

710.07, begin line 142:

Areas where patching concrete structures or repointing rubble, dressed stone, or brick masonry in structures exceeds an average of 4 in. in depth, ~~payment~~ will be ~~paid~~*formed* at a price calculated by means of multiplying the contract unit price for the respective item by the following factors:

710.07, begin line 159:

- (e) for all portions whose average depth is greater than or equal to 12 in., the work shall be ~~done~~*performed* as extra work.
Payment will be made in accordance with 104.03.

SECTION 711 – STEEL STRUCTURES

711.02, begin line 19:

Where grades HPS 50W, HPS 70W, or HPS 100W steel are shown on the plans, the ~~high performance~~ steel shall be in accordance with 910.02(d).

711.03, begin line 47:

Fabrication of structural steel shall be in accordance with the AASHTO/AWS D1.5 Bridge Welding Code current edition. The AASHTO/AWS D1.5 Bridge Welding Code, current edition, will ~~hereinafter~~ be referred to as the Bridge Welding Code.

711.03, begin line 52:

The requirements contained herein will not be waived, nor will they be modified to conform with any set of rules that any shop has adopted as its standard unless ~~so~~ authorized in writing.

711.04, begin line 81:

The fabricator of structural steel furnished under this section shall be certified in accordance with the AISC Certification Program for Steel Bridge Fabricators – Standard for Steel Bridges, to the certification category commensurate with the work to be fabricated. Fabricators producing fracture-critical members, intermediate bridges, or advanced bridges, shall also meet the applicable supplemental requirements of the certification program. For shop painting, the Department will only accept an AISC-420-10/SSPC-QP 3 certification. It shall be the fabricator's responsibility to maintain a valid certification ~~and with~~ annual endorsements ~~thereto~~.

711.04, begin line 91:

Fabricators of simple bridges consisting of unspliced rolled sections ~~shall, asat~~ a minimum, be certified under the simple bridges category.

711.04, begin line 113:

Fabricators of main load-carrying components for the following types of structures shall, ~~asat~~ a minimum, be certified under the intermediate bridges category:

711.04, begin line 108:

- d. truss with a length of 200 ft or less that is entirely or substantially ~~pre-assembled~~ ~~preassembled~~ at the certified facility and shipped in no more than three subassemblies.

711.04, begin line 140:

Details of the nonconforming material shall include the date, contract number, fabricator's job number, working drawings and piece numbers, along with a complete description of the nonconforming material including marked up working drawings showing the nonconforming material in detail, and the status of the material in the fabrication process. The Nonconformance Report shall be signed and dated by the fabricator confirming the nonconforming material exists. The report shall include the fabricator's proposed remedy ~~to for~~ the nonconforming material along with a space for both the fabricator and the Engineer or QA inspector to sign and date once a remedy has been agreed upon. Changes to the fabricator's approved working drawings resulting from

nonconforming material shall be submitted with the as-built working drawings.

711.05, begin line 155:

Working drawings shall include a detailed bill of materials showing weights of materials completed in accordance with 711.73(b) if payment is on a unit weight basis. The working drawings shall indicate whether reaming is to be ~~done~~**performed** in the shop or in the field. The working drawings shall indicate which field splices shown on the plans are proposed to be eliminated.

711.11, begin line 273:

Material, before being laid off or worked, must be straight. If straightening is necessary, it shall be ~~done~~**accomplished** by methods that do not injure the metal. Sharp kinks and bends will be cause for rejection of the material.

711.11, begin line 278:

The straightening of plates, angles, and other shapes, when allowed, shall be ~~done~~**by accomplished using** methods that do not produce fracture or other injury to the steel. Distorted members shall be straightened by mechanical means or, if approved, by the carefully planned and supervised application of a limited amount of localized heat. The temperatures of the heated area shall be within the limits shown in 729.10, as controlled by temperature indicating crayons, liquids, or bimetal thermometers. Parts to be heat straightened shall be substantially free of stress and from external forces, except stresses resulting from mechanical means used in conjunction with the application of heat. They shall be allowed to cool naturally using only clean, dry air. Water quenching will not be allowed. Following the straightening of a bend or buckle, the surface of the metal shall be inspected for evidence of fracture.

711.12, begin line 305:

Portions of the work exposed to view shall be finished neatly. Shearing, flame cutting, and chipping shall be ~~done~~**performed** carefully and accurately.

711.12, begin line 317:

For cambered beams, the camber shall be to a smooth curve. Camber for beams shall be checked after shop welding is completed and while beams are supported so ~~as to have there is~~ no bending moment in the direction of camber. Beams which are not cambered shall be straight within a tolerance of 3/8 in. at center. If camber exists, beams shall be laid out with camber up. Beams shall be checked for camber while beams are supported so ~~as to have there is~~ no bending moment in the direction of camber.

711.13, begin line 325:

Structural steel in accordance with these specifications may be flame cut, provided a smooth surface free from cracks and notches and an accurate profile obtained and secured using a mechanical guide. Hand cutting shall be ~~done~~**performed** only where approved.

In all flame cutting, the cutting flame shall be ~~so~~ adjusted and manipulated ~~as~~ to avoid cutting inside the prescribed lines. Flame cut surfaces shall meet the roughness requirements of AWS D1.5. Flame cut surfaces of members carrying calculated stress shall have their corners rounded to a 1/16 in. radius by grinding after flame cutting.

711.32, begin line 577:

Welding of steel shall be ~~done~~**performed** only as shown on the plans or as specified and only with specific approval. Welding may be performed to remedy minor defects, if approved. No temporary or permanent welds, if not shown on the plans or otherwise specified, shall be made without specific written authorization.

711.34, begin line 623:

A record of each furnace charge shall identify the pieces in the charge and show the temperatures and schedule ~~actually~~ used. Proper instruments, including recording pyrometers, shall be provided for determining the temperature of members in the furnace. The records of the treatment operation shall be available and meet approval. Members, such as bridge shoes, pedestals, or other parts which are built up by welding sections of plate together shall be stress relieved in accordance with the procedure of the AWS when required by the plans or as otherwise specified.

711.38, begin line 687:

Pin holes shall be bored true to the specified diameter, smooth and straight, at right angles with the axis of the member, and parallel with each other unless otherwise required. The final surface shall be produced by a finishing cut. The distance outside-to-outside of end holes in tension members, and inside-to-inside of end holes in compression members, shall not vary from that specified more than 1/32 in. Boring of pin holes in built-up members shall be ~~done~~**performed** after the bolting is completed.

711.44, begin line 752:

1. This method shall consist of the assembly of at least three contiguous members, and no less than 150 ft. At least one beam or girder shall be added at the advancing end of the assembly before any member is removed from the rearward end so that the assembly portion of the structure is never shorter than that specified above. Each successive laydown assembly shall always include a previously reamed splice and the main member on each side of ~~this~~**the** splice.

711.45, begin line 800:

Except where drifting is specifically prohibited by this specification, ~~the~~**any** drifting ~~done~~**occurring** during assembly shall be only to bring the parts into position and not sufficient to enlarge the holes or distort the metal. If a hole needs to be enlarged to admit the bolt, it shall be reamed.

711.51, begin line 848:

When full size tests of fabricated structural members or eyebars are required by the contract, the plans or specifications shall state the number and nature of the tests, the results to be attained, and the measurements of strength, deformation, or other performance that ~~are to~~**shall** be made. Suitable facilities, material, supervision, and labor necessary for making and recording the tests shall be provided. The cost of testing, including equipment, handling, supervision, labor, and incidentals for making the tests shall be included in the contract price for structural steel, unless otherwise specified.

711.54, begin line 883:

The erection methods shall be those prescribed for the several parts which constitute the finished structure and shall be in accordance with the requirements set forth herein. Workmanship and finish shall be first-class and all work ~~done~~performed in a substantial and workmanlike manner in accordance with these specifications and in reasonably close conformance with the lines, grades, dimensions, and details shown on the plans, or as directed.

711.58, begin line 933:

If it is necessary to straighten beams, plate girders, plates, angles, and other shapes in the field, ~~the work~~ shall be ~~done~~performed in accordance with the applicable requirements of 711.11.

711.65, begin line 1047:

Threaded bolts shall be tightened with properly calibrated wrenches or by the turn-of-nut method. If required because of bolt entering and wrench operation clearances, tightening by either procedure may be ~~done~~accomplished by turning the bolt while the nut is prevented from rotating. Impact wrenches, if used, shall be of adequate capacity and sufficiently supplied with air to perform the required tightening of each bolt in approximately 10 s.

711.65, begin line 1124:

Verification testing shall be performed on a representative sample of not less than three typical bolts of each diameter prior to the start of work, and as directed ~~by the Engineer~~. Each bolted assembly shall be tested in a bolt tension measuring device, and in accordance with the measuring device manufacturer's recommendations. After bringing the assembly to a snug-tight condition, the nut and protruding end of the bolt shall be match-marked to visually inspect the nut rotation during the test. The nut shall then be tightened by the applicable amount of nut rotation specified in Table B, and the resulting bolt tension, as measured by the tension measuring device, shall be recorded. The resulting bolt tension shall be equal to or greater than the verification tension in Table C.

711.68, begin line 1215:

Field cutting of structural steel shall be ~~done~~ as shown on the plans or as directed. Flame cutting in the field shall not be performed unless approved by the Engineer. Approval will be based on a review of the Contractor's proposed flame cutting methods, which shall include written descriptions of the specific methods to be used and measures to be taken to ensure there are no heat affected zones or rough edges on load carrying structural components that are to remain in place.

711.68, begin line 1221:

Rivets or bolts connecting steel at locations shown on the plans or as directed shall be removed. This work shall be ~~done~~performed in a manner that does not damage the surrounding steel. If necessary, such work shall be accomplished by drilling.

711.73, begin line 1391:

No allowance in weight will be made for work which is ~~done~~performed at the option of the Contractor. No payment will be made for material used at the convenience of the Contractor ~~in excess of greater than~~ the quantities shown on the plans.

SECTION 712 – TIMBER STRUCTURES

712.03, begin line 52:

In structures of untreated timber, the ends, tops, and all contact surfaces of sills, caps, floor beams, stringers, end joints, contact surfaces of bracing, the back faces of bulkheads, and all timber which is to be in contact with earth, road material, or other timber shall be field-treated with copper naphthenate in accordance with AWP Standard M4 before being assembled. Countersinking shall be ~~done~~*performed* where smooth faces are required. The recesses formed by countersinking shall be field-treated with copper naphthenate in accordance with AWP Standard M4 after the bolt or screw is in place.

712.03, begin line 63:

[-----] ~~Insofar as~~*When* practicable, cutting, framing, and boring of timber to be treated, except pile cut-offs, shall be ~~done~~*completed* before treatment.

SECTION 713 – TEMPORARY BRIDGES AND APPROACHES

713.07, begin line 85:

[-----] They shall be ~~so~~ maintained until the new structure is opened to traffic. [-----]

SECTION 714 – REINFORCED CONCRETE BOX STRUCTURES

714.01, begin line 8:

The Contractor may be allowed to substitute a three-sided structure in accordance with 723 which shall be subject to a revision of the waterway permits; and shall be as approved by the Engineer.

714.02, begin line 42:

Cast-in-place concrete for a reinforced concrete box structure, or splices between an existing culvert structure and a precast reinforced concrete box structure section extension shall be Class A or higher in accordance with 707.04(c). ~~#The concrete~~ shall have a 28-day minimum ~~concrete~~ compressive strength of 5,000 psi. Cast-in-place concrete for headwalls or wingwalls shall be Class A or higher in accordance with 707.04(c). ~~#The concrete~~ shall have a 28-day minimum ~~concrete~~ compressive strength of 4,000 psi.

714.05, begin line 210:

The soils ~~in at~~ the bottom of the excavation shall be compacted in accordance with 203.23.

714.12, begin line 428:

If the Contractor elects to provide a three-sided structure in lieu of the box structure shown on the plans, the Department will not incur additional costs; for allowing the Contractor to substitute a three-sided structure for the box structure shown on the plans.

SECTION 715 – PIPE CULVERTS, AND STORM AND SANITARY SEWERS

715.02, begin line 11:

Pipe materials, minimum thickness or strength classification, and protective treatments for pipes, except underdrains and drain tile, will be determined based on height of cover, required service life, site abrasiveness, and structure pH criteria shown on the plans. Pipe with material thickness, strength classification, or protective coatings ~~in excess of greater than~~ the minimum required by the above noted criteria may be used.

715.13, begin line 534:

If increaser or reducer connections are made, measurement will be made ~~based on the basis of~~ the larger diameter pipe for the full length of the section forming such connections.

715.14, begin line 691:

The cost of concrete, grating, pipe tubing, reinforcing bars, aggregate leveling bed, hardware cloth, and necessary incidentals, for construction of grated box end sections ~~will shall~~ be included in the cost of the grated box end section.

SECTION 716 – TRENCHLESS PIPE INSTALLATION

716.01, begin line 48:

A remote-controlled trenchless construction method that simultaneously installs pipes as the soil is excavated. This method provides continuous ~~support of the~~ excavation face ~~support~~ with slurry pressure to balance groundwater and earth pressures.

SECTION 718 – UNDERDRAINS

718.10, begin line 176:

Geotextile for underdrains will be paid for at the contract unit price per square yard for the type specified. Outlet protectors will be paid for at the contract unit price per each ~~of the~~ type of unit installed, complete in place. The accepted quantities of HMA for underdrains will be paid for at the contract unit price per ton.

SECTION 719 – TILE DRAINS

719.04, begin line 61:

When an existing tile drain is encountered on permanent right-of-way, it shall be replaced in the following manner:

[placed into list]

(a) If the tile is intercepted by a side ditch prior to crossing proposed pavement, it shall be replaced between the right-of-way line and the ditch with non-perforated drain tile and a 10-ft long terminal pipe section of drain tile with a rodent screen.

(b) If the tile is to outlet into a storm sewer, it shall be replaced between the right-of-way line and the storm sewer with pipe in

accordance with 715.02(b).

(c) If the tile is to outlet at a side ditch after crossing the proposed pavement, it shall be replaced between the right-of-way line and the ditch with pipe in accordance with 715.02(a) with a rodent screen.

(d) If the tile is to be maintained across the right-of-way, it shall be replaced from right-of-way line to right-of-way line with pipe in accordance with 715.02(a).

719.07, begin line 93:

Increaser and reducer connections will be measured by the linear foot ~~as of~~ the larger diameter pipe ~~over for~~ the length of the connection.

719.08, begin line 108:

If increaser or reducer connections are made, payment will be made ~~based on the basis of~~ the larger diameter of the connection for the full length of the section forming such connections.

SECTION 720 – MANHOLES, INLETS, AND CATCH BASINS

720.04, begin line 173:

Excavation and backfill shall be ~~done~~~~performed~~ in accordance with 720.03.

720.05, begin line 194:

All structures ~~directed~~~~specified~~ to be capped shall be as shown on the plans or by filling the structure with Class A concrete after the existing drainage has been maintained. The flow of water through pipes or underdrains in structures shall be perpetuated. Alternate methods for capping shall be submitted for approval before they may be used.

720.07, begin line 239:

Inlet, ~~†~~Type H, with Slotted Drains EACH
Inlet, ~~†~~Type HA, with Slotted Drains EACH

720.07, begin line 257:

The cost of both inlets, the 12 in. pipe connecting the two inlets, the Type 5 castings, the concrete filler between the barrier wall and the inlets, the slotted drain pipe, the concrete collar around the slotted drain pipe, and other miscellaneous materials shall be included in the cost of the inlet, Type H, with slotted drains.

720.07, begin line 262:

The cost of the inlet, the Type 5 casting, the concrete filler between the barrier wall and the inlet, the slotted drain pipe, the concrete collar around the slotted drain pipe, and other miscellaneous materials shall be included in the cost of the inlet, Type HA, with slotted drains.

SECTION 722 – CONCRETE BRIDGE DECK OVERLAYS

722.04, begin line 42:

Fine and coarse aggregates shall be stored and handled ~~to~~ avoiding contamination and maintaining uniform moisture content. Fine and coarse aggregates which are stored in piles or bins shall remain separated and shall be covered with a moisture proof material which prevents variations in moisture content of the aggregates. The maximum variation of moisture content in successive concrete batches shall be 0.5%.

722.05, begin line 62:

The amount of fine aggregate shall be 60% ±5% by dry weight of the total aggregate and shall be considered as the amount of aggregate blend passing the No. 4 (4.75 mm) sieve. The coarse aggregate shall be No. 11, Class A crushed stone. The cement content shall be a minimum of 658 lb/cu yd of concrete. The same brand of cement shall be used throughout a bridge structure. The amount of latex modifier shall be 3.5 gal. per 94 lb of cement. The net water added shall produce a slump of 5 in. ±1 in. at 4 to 5 minutes after discharge from the mixer. The moisture content of the aggregates shall be controlled ~~such that so~~ the slump is within the specified limits. The maximum water/cement ratio shall be 0.400 including the water in the latex. The air content shall be a maximum of 6%, by volume, of the plastic mix.

722.05, begin line 110:

A trial batch shall be produced to verify that the mix design complies with the physical properties specified, ~~as well as, simulating and simulates~~ the placement properties unique to the conditions of the contract such as profile grade, cross slope, delivery time, discharge rate, slump loss with time, air content and target compressive strength. All testing of the trial batch concrete shall be performed by an ACI-Certified Concrete Field Testing Technician, Grade I.

722.06, begin line 215:

When an existing concrete deck without an overlay surface is ~~planned~~ to be removed, the removal shall be performed with a milling machine. The milling shall be to a depth shown on the plans. If no depth is shown on the plans, the milling shall be 1/2 in. depth. The surface removal operation shall be limited to that portion of the bridge deck that is closed to traffic at any one time. After this initial surface removal, additional milling may be required as directed.

722.06, begin line 222:

The milling machine shall uniformly remove the required depth of concrete surface in a satisfactory manner. Surface removal in areas adjacent to the curb that are inaccessible to milling, shall be ~~done~~ ~~accomplished~~ by handchipping in accordance with 722.06(b)3. All surface removal residue, including water, dust, and concrete, shall be immediately removed.

722.06, begin line 252:

After calibration of the equipment, concrete removal by hydrodemolition shall be performed on the bridge deck. The removal will be verified as necessary, every 30 ft along the cutting path. Handchipping shall be ~~used~~ ~~performed~~ in areas that are inaccessible to the hydrodemolition equipment. Handchipping tools may be handheld or mechanically driven.

The removal operation shall cease where it is determined that sound concrete is being removed. Equipment shall be recalibrated, or approved changes to equipment and methods shall be performed, prior to resuming the removal operation.

722.10, begin line 535:

$$E = (T_c^{2.5} - rT_a^{2.5})(1 + 0.4V) \times 10^{-6}$$

where:

E = Evaporation rate, lb/sq ft/h

T_c = Concrete mix temperature, °F

T_a = Ambient **air** temperature, °F

r = (Percent of Relative Humidity)/100

V = Wind velocity, mph.

722.11, begin line 563:

Grooving or tining in the plastic concrete of the concrete overlay will not be allowed. Longitudinal grooving shall not commence until the curing requirements have been met in accordance with 722.12. Grooves shall be cut into the hardened concrete surfaces parallel to the centerline using a mechanical cutting device. For curved bridges, grooves shall be cut along the curve chord within the spans. Grooving shall be **done/completed** before traffic is allowed on the surface except as follows.

722.11, begin line 576:

The completion of the grooving process shall be within 30 days of completion of the last phase of construction. Any additional maintenance of traffic operations required for the grooving process shall be included in the cost of Maintaining Traffic. The interim broom finish shall not be allowed as a surface texture when opened to traffic over a winter season. If the coarse broom texture is present and the Contractor **is not in a position to/is unable to** finish all phases of the project, longitudinal grooving shall be placed into the hardened concrete **in order** to establish an acceptable driving surface texture for the winter season.

722.12, begin line 661:

Immediately upon the start of the dry cure period or opening to traffic, the surface shall be checked for cracks. Upon request, the Contractor shall flood the deck with water to facilitate inspection for cracks and distress. Where cracks exist, a thorough investigation will be conducted prior to sealing cracks. Cores may be required to determine the actual crack depth. Surface cracks not exceeding 3/8 in. in depth shall be sealed with a PCC Sealer/Healer followed by an application of an approved sand.

[moved to a separate paragraph]Cracks exceeding 3/8 in. in depth shall not be sealed at this time. Corrective procedures for repairing cracks exceeding 3/8 in. in depth will be determined after further investigation which may include additional cores. The Department's Division of Materials and Tests will be contacted and the Engineer will determine the method of repair including possible removal.

722.13, begin line 696:

All special equipment required for calibration shall be furnished. It shall include but not be limited to suitable material containers, buckets, stop watches, and a scale accurate to within 0.1 lb or 0.3% of the test load, whichever is greater, at any point within the range of use. The minimum capacity of the scale shall be 150 lb. The scale shall be verified annually ~~per~~ **in accordance with** ITM 910. The Contractor shall provide paperwork that shows the date the scale was verified by a company with NIST traceable Class F weights. Samples shall be obtained and handled by the Contractor. Normal testing equipment such as aggregate sieves and containers shall also be furnished.

SECTION 724 – BRIDGE EXPANSION JOINTS**724.03, begin line 128:**

Prior to the epoxy curing, the Contractor shall force the tip of the silicone sealant between the substrate and the joint, and inject a corner bead of silicone sealant along the entire length of the joint. The Contractor shall tool the silicone sealant to blend with the substrate and silicone coating of the joint.

724.05, begin line 191:

- (c) for all portions whose average depth is 8 in. or greater, the work shall be ~~done~~ **performed** as extra work. Payment will be made in accordance with 104.03.

SECTION 725 – SLIP LINING OF EXISTING PIPE**725.02, begin line 53:**

Proper care shall be taken to ensure that no damage ~~is done~~ **occurs** to the liner pipe during the unloading process. All liner pipes shall be unloaded with straps and lifting equipment.

725.06, begin line 128:

Solid wall HDPE liner pipe that is to have extrusion welded joints shall have destructive testing performed on a test section of liner pipe of the same material as the liner pipe being installed. The Contractor shall propose and describe in the QCP a destructive test, such as but not limited to a bend strap test, to demonstrate that an operator can produce an extrusion welded joint that will not fail. Once an extrusion welded joint is produced on a test section that passes the destructive test, each subsequent joint fabricated that same day by that operator will be visually inspected for acceptance. A destructive test in accordance with the QCP shall be conducted on the test section at the beginning of each day that solid wall HDPE liner pipe joining is being ~~done~~ **performed**.

725.10, begin line 282:

The cost of repairing, trimming, or cutting jagged edges or deformities to existing pipe, filling cavities around the existing pipe with cellular concrete grout, acquisition and restoration of right-of-entry areas, acquiring all necessary new permits or amendments to existing permits to work in areas accessible via Contractor-obtained right-of-entry, erection, maintenance, and removal of temporary fence, removal and disposal of debris and

foreign material from the existing pipe, visual or video inspection of the existing pipe, deforming a circular liner pipe, supplying and constructing the bulkheads, grouting the annular space between the existing pipe and the liner pipe, and other incidentals will not be paid ~~for~~ separately, but shall be included in the cost of the pay items in this section.

725.10, begin line 304:

Any joint that does not pass the visual inspection and needs to be re-fused, re-welded, or re-joined shall be ~~done~~~~repaired~~ at no additional cost to the Department.

SECTION 726 – BEARING ASSEMBLIES

726.01, begin line 8:

plates, bolsters, ~~and~~ plain bearings consisting of elastomer only, and laminated bearings consisting of layers of elastomer restrained at their interfaces by bonded laminates, as shown on the plans.

SECTION 729 – HEAT STRAIGHTENING OF STEEL MEMBERS IN THE FIELD

729.04, begin line 26:

729.04 ~~Pre-Heat~~Preheat Straightening Inspection

729.05, begin line 83:

Upon completion of the ~~pre-heat~~preheat straightening inspection, the Contractor shall submit a written work plan for the following:

729.06, begin line 115:

Cracks discovered in the ~~pre-heat~~preheat straightening inspection shall be ground out by excavating the crack into a dish-like shape, the sides of which shall approximate a 3:1 taper. If the crack is not removed after grinding approximately a 1/8 in. depth of steel or if prior to grinding, the crack appears to be excessively long, deep or wide, the Engineer shall be notified prior to any grinding. Under no circumstances shall the cracks be v-grooved, filled with welding material, and then ground smooth.

729.13, begin line 226:

Following the completion of steel member straightening, the straightened steel member shall be inspected by the Engineer and the Contractor. The inspection shall be performed using the same methods and procedures used in the ~~pre-heat~~preheat straightening inspection, including performing NDT.

729.14, begin line 232:

If the top flange of the steel member has pulled away from and is no longer in contact with the concrete bridge deck, the resultant void shall be completely filled by epoxy injection in accordance with 727 after completion of all ~~of the~~ steel member straightening and repairs.

SECTION 731 – MECHANICALLY STABILIZED EARTH RETAINING WALLS

731.08, begin line 408:

After the excavation for the wall has been ~~performed~~**completed**, the Contractor shall notify the Engineer. The material beneath the leveling pad shall be compacted in accordance with 203. Concrete for the leveling pad shall not be placed until the Engineer has approved the depth of the excavation and the foundation material. The leveling pad shall be in accordance with 731.07.

SECTION 732 – MODULAR CONCRETE BLOCK RETAINING WALL

732.05, begin line 308:

All modular block wall units shall be handled, stored, and shipped ~~so as~~ to eliminate the danger of chipping, cracks, fractures, and excessive bending stresses.

732.09, begin line 338:

Modular block wall units shall be placed in successive horizontal lifts in the sequence shown on the plans as backfill placement proceeds. As backfill material is placed behind the units, the units shall be maintained in vertical position. Horizontal alignment tolerances shall not exceed 3/4 in. when measured with a 10 ft straightedge. Alignment shall be checked at each layer of modular block wall units after the backfill behind the modular block wall units has been compacted, and the results shall be recorded. Checking ~~of~~ alignments and tolerances shall include verifying that the modular block wall units are plumb over the entire height of the wall.

SECTION 737 – WELDED WIRE REINFORCEMENT, WWR

737.11, begin line 148:

If reinforcing bars or epoxy-coated reinforcing bars are not paid for separately, but instead included in the cost of ~~another~~ pay item, and WWR is substituted for reinforcing bars or epoxy-coated reinforcing bars, the WWR will not be paid ~~for~~ separately, but shall be included in the cost of the pay item.