CHAPTER 11
STRUCTURAL ITEMS REVIEW

11.1 PURPOSE

To reinforce the prescribed methods of reviewing structural construction items in order to verify final pay quantities in compliance with the Standard ***Specifications***, ***Special Provisions*** and pertinent Directives. The methods of measurements and the basis of payment for those items of work covered by ***Sections 400*** through ***470 of the Standard Specifications*** and related ***Special Provisions*** will be treated in this procedure.

11.2 PROCEDURE

11.2.1 **Major Concrete Structures**: ***Sections 346,*** and ***400*** of the ***Specifications***

(A) Concrete: The quantities to be paid for under this item shall be the volume, in cubic yards or cubic meters, of the various classes of concrete as shown in the plans, completed and accepted, and as designated in ***Section 346*** of ***Standard*** the ***Specifications***, based on plan quantity subject to ***Section 9-3.2*** of the ***Standard Specifications Article 9-3***. When review is required, spot-check at least one component per structure, (i.e., one end bent, one pier, and one slab), using the following criteria:

(1) Check if the final pay volume conforms to the plan dimensions within the neat lines of the components of the structure as shown in the plans.

(2) Check plans and notes for possible changes in footing elevations or dimensions.

(3) Check that Nno deductions shall beare made for weep holes, floor deck drains, or encroachment of inlets and pipes in box culverts and check that no chamfers, scorings, fillets, or radii 1 ½ 2 in5 ^{2} [970mm5] or less), in cross sectional areas, are taken into account.

(4) No deductions are to be made for encroachment of inlets and pipes in box culverts.

(5)(4) Check that Tthe volume displaced by embedded pile, structural steel, and prestressed units and materials, other than reinforcing steel, shall beare deducted from the final quantity.

(6)(5) For tTraffic railing pay items, transitional, sections and end sections are included in plan quantity.

(7)(6) Check that Cconcrete for build-up over beams shall be is added to the superstructure concrete quantity. These calculations shall beare based on plan dimensions, unless plan dimensions are in error or were redesigned.

(8)7 Verify that authorized concrete placed below plan depth in seals or footings 5 feet or less below the elevation of bottom of seal or footing as shown in the plans are paid for at the Contract unit price set forth in the proposal under the pay items for substructure concrete. more than 5 feet below plan elevation of seal or footing is paid for as unforeseeable work.

(98) When computing the volume of concrete in deck girders and beam spans, Eensure that the nominal thickness of the slab is taken as the nominal thickness shown on the drawings and that the width is taken as the horizontal distance measured across the roadway. The volume of haunches over the beams will be included in the volume to be paid for.

(9) shown on the plans was used to calculate the volume of concrete in deck girders and beam spans. The volume of haunches over steel beams shall be included for pay.

(109) Refer to the electronic deliverypour reports to assist in checking final quantities of concrete items that may be questionable.

(11) (10)The quantities for web walls should be carefully checked. Be sure that end blocks at the end bent are included when applicable.

(11) Ensure that Sketches or “Crack Maps” have been provided documenting all cracks within the structures as outlined in the ***CPAM, Section 10.3.5***.

(B) Concrete Traffic Railing: See ***Sections 521*** and ***450*** of the ***Specifications***. The quantity in linear feet or linear meters shall beis paid for on the basis of plan quantity, subject to ***Section 9-3.2*** of the ***Standard Specifications Article 9-3***.

(C) Precast Anchor Beams: See ***Section 400*** of the ***Specifications***. This item is paid for at the contract unit price "per each" and is a final measured quantity, with no separate price for the various types of anchor beams.

(D) Counterweight Concrete: The volume, in cubic yards or cubic meters, for this item is generally calculated by the bridge consultant and submitted with the shop drawing details. The quantity to be paid for shall beIt is a plan quantity pay item subject to ***Section 9-3.2*** of the ***Standard Specifications Article 9-3***. When reviewing is required:

(1) Verify shop drawings' dimensions and calculations. Compute if not submitted.

(2) Confirm that the volume displaced by structural steel, balance block wells, and other applicable materials are deducted from the final pay quantity of concrete.

(3) If the consultant has deducted the reinforcing steel volume, ensure that it is added back to the final pay volume.

(4) Check that the concrete volume and quantity of steel included in the balance blocks has beenis added to the pay volume. Ensure that a sufficient number of balance blocks have beenare furnished. (5% of the calculated weight of the counterweight).

(E) Cofferdam Bascule Piers: See ***Section 400*** of the ***Specifications***. The quantity to be paid for shall beThis pay item is paid for "Per each" and is a plan quantity item subject to ***Standard Section 9-3.2*** of the ***Specifications Article 9-3***.

(F) Reinforcing Steel: See ***Section 415*** of the ***Specifications***. The unit of weight for reinforcing steel is in pounds (Lbs) and is a The pay quantity of this item will be plan quantity pay item subject to ***Section 9-3.2*** of the ***Standard Specifications Article 9-3*** computed weight,

~~in pounds or kilograms~~. Review by spot-checking components as follows:

(1) The lengths ~~to be~~ used in the calculations ~~shall be~~are detailed length of bars shown in the plans.

(2) The unit weights to be used ~~shall be~~are per the Concrete Reinforcing Steel Institute (CRSI)'s Standard Reinforcing Steel Bar Weights.

(3) Review reinforcing steel required using the detailed drawings, bar diagram sheets and steel summary tables provided.

(4) When steel summary is done using the Department's Engineering Quantities Programs, the output shall be carefully checked for keypunch errors, for completeness and that bars of varying lengths are properly compared.

(5) Check to see that the bars detailed for a single component are not included in other components by mistake.

(6) No deductions will be made from reinforcing steel quantities for encroachment of inlets and pipes in box culverts.

(7) Spot-check at random individual bar marks for correct lengths, total numbers, weights, and mathematical extensions of total quantity.

(8) Using the Standard Index Sheets, review the summarization of reinforcing steel for all box culverts.

(9) Do not pay for steel lap-spliced that plans do not call for.

11.3 INLETS, MANHOLES, JUNCTION BOXES AND YARD DRAINS

See ***Section 425*** of the ***Specifications.***

(A) New Structures: The quantities to be paid for under these items shall be the number of each type of structure completed and accepted in accordance with the current ***Specifications*** and ***Special Provisions***.

(1) Check plan-profile sheets, Drainage Summary Sheets, and Drainage Structure Detail Sheets for agreement on structures completed.

(2) Verify by actual count the number built. The quantities should be summarized on the appropriate plan summary sheets or summary boxes.Small plans may be used to review and check off those built.

(3) Confirm construction by using Daily Record of Constructionwork reports and/or Test reports, or other back up documentation if structure count or locations are questionable.

(B) Adjusting Structures: When this item is included in a contract it provides, in general, for the payment of adjusting all common structure types.

(1) When the specific type is not shown, payment shall be is made under the item of Adjusting Miscellaneous Structures.

(2) Verify by actual count the number of the various structures which were satisfactorily adjusted.

11.4 DRAINAGE STRUCTURES

(A) Pipe Culverts and Storm Sewers: See ***Section 430*** of the ***Specifications***. The quantities to be paid for shall be the plan quantity subject to ***Section 9-3.2*** of ***Standard***the ***Specifications Article 9-3*** of the kind and size shown in the proposal, including the optional kinds specified as being permissible under the items of Cross Drain Pipe, Side Drain Pipe, Gutter Drain and Storm Drain Pipe Culvert completed and accepted. When reviewing is required:

(1) The Project Engineer (PE)/ or Project Administrator (PA) shall will submit justification if appreciable changes are made in the overall drainage system as designed. Appreciable is defined as follows for cross and storm drain pipe, and storm sewer drain trench, and requires adjustment to plan quantity: (1) Authorized plan revisions or (2) Plan errors more than 5% of original plan quantity or $5000.00 with supporting documentation.

(2) Cross check and compare all side drain pipes shown on the summary with the location of paved or stabilized turnouts on the plan profile sheets, ditch grades, and cross section sheets., and/or final flight aerial photo sheet as necessary.

(3) Verify that trench excavation is paid in accordance with the ***Ssection 125*** of the ***Specifications*** on excavation for structures and pipes.

(4) If excavation for structures is provided in the proposal, confirm that it ~~———~~ does not include quantities shown on the plans to be paid for as regular, subsoil, lateral ditch or channel excavation.

(5) Check excavation for structures below plan grade in accordance with ~~***Standard***~~ ***Section 125-14.3*** of the ***Specifications*** ~~. ***Subarticle 125-12.3***.~~

(a) If the pay item is in ~~on a~~ cubic yards ~~or cubic meter basis,~~, the material excavated below plan grade will be included in the measurement for this item, whether shown on the plans or authorized by the PE/PA.

(b) If the pay item is ~~on~~ a Lump Sum item~~basis,~~ all material within the limits shown on the plans ~~shall~~ will be included in the Lump Sum price. Any material~~,~~ authorized by the PE/PA to be excavated outside or below these limits will be paid for as extra work.

(6) Check the proposal, when no direct payment is provided ~~all~~ on excavating, except that specifically stipulated in ***Sections 125-14.3 ~~Standard Specifications Subarticle 125-12.3 through~~*** through ***125-1~~2~~4.7*** of the ***Specifications***, shall be included in the contract price for concrete or other items covering the applicable structure.

(7) Since there are several factors involved in final pay for backfill, be sure to check the field records, explanations of overruns and underruns, Work Orders, Supplemental Agreements, and Extra Work records to ascertain that payment is in compliance with the ~~Standard~~ ***Specifications***.

(8) Pavement, curb, sidewalk, etc., removed only for the purpose of constructing pipe culvert, ~~shall~~ will be included in the contract unit price of the pipe culvert and ~~shall~~ will be replaced at no cost to the Department.

(9) Verify that the volume of concrete and weight of reinforcing steel bars in baffles are included in the final pay quantities when they are called for in the plans.

(10) Check that special pipe sections required under railroads are in accordance with the ***Design Standards, Index No. 280*** "***Miscellaneous Drainage Details***" ~~in the Standard Index~~

Drawings,Check -Plans, and ***Special Provisions*** as required.

(11) Verify the volume of concrete for Endwalls, by checking the type and size of pipe used at each location versus the quantities shown on the index drawings, plans, and summary sheets or boxes.

(B) Structural Plate Steel Pipe and Pipe Arch Culverts: ***Section 435*** of the ***Specifications***. The quantities to be paid for shall be plan quantity subject to ***Section 9-3*** of the ***Standard Specifications Article 9-3***.. When review is required, spot - check as follows:

(1) Verify size, length, and location, showing changes in the final measurement field book or drainage summary- sheets in the final As-Built plans.

(2) Excavation and backfilling shall will be checked in accordance with the guidelines outlined in under ***Sections 125*** and ***430*** of the Standard ***Specification*** for section under Pipe Culverts and Storm Sewers.

(3) Plan length calculations shall will be on center line of structures, from end to end of metal for full section structures.

(4) Plan length calculations shall will be average end to end at top and bottom for beveled end structures.

(C) Underdrains and Roof French Drains: The quantities to be paid for shall be the linear feet or linear meters measured in place, along the completed accepted work.

(1) Verify the final quantities of under drain and French drain, using the summary sheets and detailed final measurement records, shown in the Final As- Built and the original plans details.

(2) Roof drains may be required whether or not they are specifically called for in the plans.

(3) The Daily Report of Construction forms may be helpful in determining when roof drains were constructed.

11.5 PRESTRESSED CONSTRUCTION

See ***Section 450*** of the ***Specifications***

(A) Prestressed Beams and Slab Units: Quantities to be paid for shall beThese are plan quantity quantity pay items and subject to provisions under ***Section 9-3.2*** of the ***Standard Specifications*** ***Article 9-3***. Unit of Measure is per foot. When review is required:

(1) Verify that pay lengths agree with casting lengths, as detailed on the plans. Verify final quantities, changes with back up documentation, etc.

(2) There will be **no deduction** for lengths included for elastic shortening beams or slab units.

(B) Prestressed Concrete Superstructure Spans: Payment is contract unit price per span, for the type and size detailed in the plans. Note: This item is not covered in the 1999 Specifications. When review is required:

(1) Verify that the required number of spans for each different type and dimensions were placed and accepted.

(2) Check all other prestressed members called for in the plans by the foregoing procedures, unless the ***special provisions*** specifically details other instructions.

(C) Concrete Approach Slabs: The quantity to be paid for will be Plan Quantity, to the nearest 10th of a cubic yard [cubic meter] completed and accepted. When reviewing:

(1) Review construction dimensions and plan dimensions.

(2) When all slab dimensions are not shown or there is an apparent error, compute the total quantity.

(3) Ensure that slabs constructed on adjoining jobs are not included for payment on both jobs.

11.6 ALL PILING

See (***Section 455-11 and 455-12***of the ***Specifications***)

~~(A) On contracts let in January 2001 starting with contract number 21105, all piling will be paid and measured in accordance with Supplemental Specification.~~

(A~~B~~) Treated Timber Piling: ~~the final pay quantity shall be the linear feet/meters of piling actually remaining in the completed structure below the elevation of cut off shown in the plans or designated by the PE.~~ This is a final measured pay item and measured in linear feet.

(1) The above payment includes furnishing all materials, including collars or bands, metal shoes, copper cover sheets, copper wire, and preservatives~~, and tar~~.

~~(2) The furnishing of material for and wrapping pile clusters with wire cable, where indicated by the plans is also covered in the Treated Timber Piling pay quantity.~~

~~(3) Metal shoes for fender piling are paid for at the contract unit price for each.~~

~~(4) Shoes for other types of timber piling the costs delivered at the site shall be paid for as extra work. The costs of placing metal shoes shall be borne by the Contractor.~~

(2) No build-ups allowed on timber piles. Timber piles will have to be extracted if driven below plan elevation.

~~(5)~~ (3) Review the level notes, pile driving records for ~~lengths,~~ pile elevations, and authorized pile lengths.

(C) Prestressed Concrete Pilings: The final quantity for this item will be based on ~~each foot [meter] fabricated~~prestressed concrete piling furnished, driven and accepted according to the authorized length list including any additions and excluding any deletion ~~as stockpile material, in addition to any activity~~ as authorized and approved by the Engineer.~~by the specification needed to reach the cut-off elevation.~~ This is a final measured pay item measured in linear feet. It will be essential that the field records clearly document ~~these~~ the following~~activities~~ to support the submitted quantity.

~~(1) Check that payment was made in the increments specified in the contract.~~

a. 70% of the unit price for each foot [meter] fabricated and accepted as stockpile materials.

b. 30% of the unit price for the entire authorized length upon completion of driving.

(1)Check pile records for completeness for all additional activity shown. Make sure that all build-ups, splices, driving of splices, cut-offs, etc., are clearly documented

(2) Review level notes, pile driving records, lengths, pile elevations, and authorized pile lengths.

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(2)

(3) Check number of cut-offs, and ensure authorized amount added to furnished as compensation for cut-off

(4) (3) Check if splices were authorized and added to piling quantity. If splice is added, check redrive records for additional compensation.

(5) (4) Check Specifications for When set-checks, and track documentation. are ordered by the engineer for pile redrives, it must be 72 hours from original driving before a redrive can begin. Payment of 10 feet [3 meters] will be compensated for additional piling furnished. Check redrive records if authorized for pay and that the proper amount is added as compensation.

(6) (5)Concrete used for build-ups 2 feet [0.6 meter] or less below the elevation of cut-off, may be cast with the cap. The Contractor will be compensated 9 feet of pre-stressed concrete piling as compensation for drilling, grouting, reinforcing steel and concrete used for the build-up.will be shown as overrun in the contract quantity for substructure concrete. Reinforcing Steel used for build-up will be shown as overrun in substructure reinforcing steel.

(7) The criteria for the additional piling for splices, build-ups, cut-offs, etc., under the 2000 Specification have not changed.

(86) Check the authorized lengths issued by the District Construction Engineer or designerEngineer and compare with piling furnished.

~~(9) Verify that the lengths of cast-in-place buildups greater than 2 ft. or [0.6 meters]. are measured from the plane of cutback to the head of buildup and included as piling furnished. Buildups using cutoffs from the same bridge site and previously paid for as piling furnished, shall be paid only as piling driven.~~

~~(10) When a pile splice is made where the head of the pile to be spliced is not more than 2 ft. or [0.6 meters] below the elevation of cut-off, the contractor if so elects, may cast the pile build-up with the cap. The contractor will receive 9 feet [2.7 meters] of piling as compensation for drilling and grouting the dowels. The reviewer must check the explanations of overruns and underruns to make sure that reinforcing steel and concrete used for the build-up is paid for as an over run of substructure reinforcing steel and substructure concrete.~~

(11 7) When cutoffs are transported to another bridge site under the same contract, as buildups or permanent piles, check that they are not paid for again.~~paid for at 30 percent of the contract price for piling furnished and 100 percent of the driven price.~~

(12 8) ~~Review level notes, pile driving records, lengths, pile elevations, and authorized pile lengths.~~

(13 9) Review piling lengths to determine if satisfactory bearing was obtained and measured from cut-off elevation to tip of pile.

(14 10) Check to see ~~I~~if a pile is driven below cut-off, and satisfactory bearing is not obtained, and additional driving is required after construction of a satisfactory splice, that an additional 10 feet ~~[3.0meters] of piling~~ will be added to production concrete piling as compensation for the additional driving, plus the authorized splice lengths.

(15 ~~5~~) There will be no ~~separate pay item for~~compensation for ~~prestressed~~ concrete pile cut-off. ~~For each cut-off, compensation will be made as 5 feet [1.5meters] of additional piling.~~

~~(16)~~ (12)Concrete pile splices authorized by the Engineer will be made as 30 feet ~~[9meters]~~ of additional ~~prestressed~~ concrete production ~~concrete~~ piling.

(13~~7~~) Check receipt tickets from maintenance to ensure that all salvaged cutoffs are delivered to the maintenance yard or disposition is other wise documented by the PE.

(D) Concrete Test Piling: ~~The final quantity for this item will be based on each foot [meter] fabricated and accepted as stockpile material, in addition to any activity as authorized by the specification needed to reach the cut-off elevation.~~Price and payment will be full compensation for all work necessary to complete driving to reach bearing under the test pile pay item including driving the pile and all other related costs, but excluding splices, build-ups, pile extractions and performed pile holes authorized by the Engineer. It will be essential that the field records clearly document these activities to support the submitted quantity.

~~(1) Check that payment was made in the increments specified in the contract.~~

~~a. 70% of the unit price for each foot [meter] fabricated and accepted as stockpile materials.~~

~~b. 30% of the unit price for the entire authorized length upon completion of driving.~~

(~~2~~1) Check documentation for completeness for all additional activity shown.

(~~3~~2) Verify that test piles, left in place as permanent piles are paid for only as test piling.

~~(4)~~ (3) Buildups made only to incorporate test pile into the structure as permanent pile shall be included in the quantities of ~~regular~~ production piling, not as test piling.

~~(5)~~(4) Review the level notes, pile driving records lengths, pile elevations, and authorized pile lengths.

(5) Check that length of splices > 2 feet, not driven are compensated for under Production Piles, and splices that were driven for test purposes are compensated for under test piles. The Contractor will also be compensated for the material & labor for these splices mentioned; compensation of 30 feet will be added to production concrete piles.

(6) Check receipt tickets from maintenance to ensure that all salvaged cutoffs are delivered to the maintenance yard or disposition is otherwise documented by the PE.

(E) Steel Piling: Price and payment will be included for furnishing all labor, equipment, and materials required to furnish and install steel piles, including welding, painting, predrilling pile holes, cost of sand or concrete fill and reinforcing steel in pipe piles. The final quantity for this item will be based on each foot (meter) fabricated and accepted as stockpile material, in edition to any activity as authorized by the specification needed to reach the cut-off elevation. This pay item is also a final measured item paid for in linear feet. It will be essential that the field records clearly document these activities to support the submitted quantity.

(1) Check that payment was made in the increments specified in the contract.

a. 70% of the unit price for each foot [meter] fabricated and accepted as stockpile materials.

b. 30% of the unit price for the entire authorized length upon completion of driving.

(12) Review level notes, pile driving records lengths, pile elevations, and authorized pile lengths.

(3) Ensure that Contractor did Do not splice to obtain authorized length less than 40 feet [12 meters] and will not require splice except when shown on Plans. The Engineer can approve splicing to obtain authorized lengths between 40 and 60 feet [12 and 18 meters]. The Engineer will permit splicing to obtain authorized lengths in excess of 60 feet [18 meters] of additional steel pile. is paid under Steel piling.

(4) Compensation for each steel splice authorized by the engineer will be 20 feet [6 meters] of additionaladded to the production steel piling pile.

(5) There will be no additional compensation for cut-off on steel piling.

(6) Point protectors will be paid per each protector authorized, furnished, and properly installed under pay item 455-120- .

~~(7) Check documentation, that production-piling splice, if authorized by the Engineer is compensated for additional piling.~~

(8) Check Specifications for ~~When~~ set-checks, compensation and when ~~are~~ ordered by the Engineer for pile redrives, ~~it must be 72 hours from original driving before a redrive can begin~~. Payment of 10 feet ~~[3 meters]~~ will be compensated for additional piling. Check pile redrive records if authorized for pay and the proper amount is added as compensation.

(9) Check receipt tickets from maintenance to ensure that all salvaged cutoffs (20 feet or longer) are delivered to the nearest maintenance yard and are not damaged. Any steel pile cut offs less than 20 feet are to be removed from the project by the Contractor, disposed of and documented.~~or disposition is otherwise documented by the PE.~~

(F) Replacing Piles: All remarks in field records concerning piling that required pulling and/or replacing shall be checked.

(1) Verify there is no duplication of payment for the quantity of pile ~~furnished except~~ when cutoffs are transported to another bridge site under the same contract for use as buildups or permanent piles. ~~In that case, check that they are paid for at 30% of the contract price for piling furnished and 100% of the driven price.~~

~~(2) Payment will be made on a per each basis for pulling pile under the following conditions:~~

(2) Ensure that in the event a pile is broken or otherwise damaged by the Contractor to the extent that the damage is irreparable, in the opinion of the Engineer, the Contractor shall extract and replace the pile at no additional expense to the Department.

(3) Also, in the event that a pile is mislocated by the Contractor, the Contractor shall extract and replace the pile at no expense to the Department except when a design change proposed by the Contractor is approved by the Department as provided in ***Section 455-5.15.5*** of the ***Specifications***.

(4) Ensure that in the event that a pile is driven below cut-off without obtaining the required bearing, and the Engineer elects to have the pile pulled and a longer pile substituted, it will be paid for as Unforeseeable Work.~~For piling driven below cut off without~~

attaining bearing and the PE elects to pull the original pile and substitute a longer pile

(a) .

(5) Verify that there is no duplication of payment If the extracted pile is undamaged and driven elsewhere the pile will be paid for at 30% of the Contract unit price for Piling.

(6) Ensure that in the event a pile is damaged or mislocated, and the (b) damage or mislocation is determined to be the Department's responsibility, the Engineer may elect to have the pile extracted, and it will be paid for as Unforeseeable Work. When pile is damaged and/or the Department is determined to be responsible for the damage or mislocation and the PE elects to have the pile pulled.

(73) In the event that the contract does not have an item for pulling piles the work will be handled as unforseen work.

(4) When a pulled pile, wholly or in part, is driven elsewhere, the length used shall be included in the quantity of piling driven but no additional compensation shall be made under the item of piling furnished.

(5) When it is determined that the Department is responsible for the damaged or mislocated pile, and a replacement pile is required, compensation will be made for both the original pile and the replacement pile under piling furnished.

(6) (8) Review the level notes, pile driving records lengths, pile elevations and authorized pile lengths.

(G) Steel Sheet Piling: The Quantity to be paid for will be the plan quantity area, in square feet [square meter] completed and accepted. It is Ccalculated from top of the pile elevation to the bottom of pile elevation and longitudinally along the top of the sheet pilesbeginning and end wall limits as shown in the plans with no allowance for variable depth surface profiles. When review is required:

(1) Verify the changes, lengths and widths shown in the final measurement field book or the plan details.

(2) Check the standard unit weights and mathematics of the computed pay quantities.

(3) Approved alternate support structures are paid for as plan quantity computed for sheet pile. Sheet piling used in cofferdams and to incorporate the contractor's specific means and methods not ordered by the engineer are to be paid per ***Section 125*** of the ***Standard Specifications***.

(4) Review the level notes, pile driving records for lengths, pile elevations, and authorized pile lengths.

(H) Concrete Sheet Piling: This is a final measure pay item, measured in linear feet. The total linear feetquantity for pay or linear meters to be paid for under this item shall be is the product of the number of such piles satisfactory completed, in place, times their lengths in feet [meters] as shown in the plans or authorized by the Engineer.

(1) When the plans do not indicate rock or dense material and the piles cannot be set by jetting, the work for removal or punching will be paid by the Department as unforeseeable work. Ensure that payment under this item includes furnishing all materials, including reinforcing steel, grouting, plastic filter fabric, preformed holes and installation.

(3) (2) Do not include reinforcing steel in the pile cap or the grouting of grooves between piles in any of the contract pay item quantities to be paid. Verify that this pay quantity is based upon piles 2-1/2 feet wide. However, if the Engineer approves, the Contractor may furnish the concrete sheet piling in widths wider than shown in the Plans; then the number of piles will be the actual number of units completed times the width used divided by the width in the Plans.

(3) Review the level notes, pile driving records lengths, for pile elevations and authorized pile lengths.

(I) Drill Shaft Excavation - Linear Foot or Linear Meter: Verify the length to be paid for as the distance from natural ground elevation at the center of the shaft prior to excavation to the final bottom of shaft excavation as authorized and accepted. Extra Depth Drilling - Linear Foot or Linear Meter: Verify the length to be paid for as the distance from the plan elevation of the bottom of the shaft to the final authorized elevation of the bottom of the shaft, completed and accepted.

Where casing is provided with an inside diameter smaller than the specified drilled shaft diameter, the Contractor is required to provide an additional length of drilled shaft at no cost to the Department. The additional length required is determined by the following relationship.

~~additional length =~~ $\frac{D_1 - D_2 L}{D_2}$

$(D1 - D2)L \div D2$

~~Where:~~ D_1 = Casing inside diameter specified = Shaft Diameter Specified

~~D_2~~ = Casing inside diameter provided ($D_2 = D_1$ minus twice the wall thickness)

~~Inside Diameter of Casing Provided~~

L = Authorized Drilled Shaft Length

~~below ground~~ for temporary casing methods or below casing for permanent casing methods.

In the above situation dealing with smaller inside diameter than is specified, the measured amount will be multiplied by a factor (F) determined below; this is necessary to compensate for smaller shafts:

$$F = \frac{2(D_2 - D_1)}{D_2}$$

Where: F = factor to adjust pay quantities to compensate for smaller shafts.
D1 = casing inside diameter specified - shaft diameter specified.
D2 = casing inside diameter provided (D2 = D1 minus twice the wall thickness).

Drill Shaft Records shall be kept with the Final "As-Built" Plan set and once the project has been moved to the "Pass Status" these records should be provided to the District Structures Maintenance Engineer for their use.

11.7 STRUCTURAL STEEL

~~(A)~~ Structural Steel and Miscellaneous Metals: See ***Section 460*** of the ***Specifications***. The pay items in this section are~~quantities~~ measured in pounds, square yards, feet, and per each ~~shall be paid for as plan quantity,~~

subject to ***Standard*** ***Section 9-3.2*** of the ***Specifications*** ***Article 9-3*** or paid at the contract lump sum price.

Ensure that final quantities and documentation display that tThe following items are included under Structural Steel and Miscellaneous Metals for purpose of payment:

(1) Shear connectors, shoes, rockers, rollers, pins, masonry plates, and lead bearing plates..

(2) All parts of rolled or cast steel which can be fabricated by the ordinary structural shop methodsWelding and welds: fastener assemblies not designated as high-strength such as: anchor rods, nuts, bolts and associated washers..

(3) Bolts and anchors used to fasten machinery to structural parts or to masonryTransporting, handling and erection.

(4) Anchor bolts and metal handrails, unless otherwise shown in the plansShims and Fill Plates: the weight quantities are included in determining the weight of the completed structure to determine quantity paid, but not for a lump sum.

(5) Aluminum ladders and platforms shown in the plans as alternates and specified to be included in the lump sum item of Structural Steel.Preparation, application, clean-up and the consumables used in the coating process.

(6) Preparation, handling, and/or clean up of weathering steel or the 'rust' marks on other items (concrete units, etc.) caused by the development of the patina.

(7) Jacking of substructure units of adjacent fixed piers required to set bearing in accordance wit contract documents.

(B) Miscellaneous Items: The various other items included in this section or in the special provisions may be paid for as plan quantity subject to ***Standard Specifications Article 9-3*** or lump sum.

(1) Machinery and Castings as detailed in ***Standard Specifications Subarticle 460-39.3***.

(2) Ladders and platforms when shown to be paid as a separate item whether aluminum or steel.

(3) Endwall grates: check plan details for type, size and weight in pounds.

(4) Replacing counterweight or swing-span cables.

11.8 TIMBER STRUCTURES

See ***Section 470*** of the ***Specifications***.

(A) Treated Timber Structures: The quantities shall be paid for as plan quantity, in feet board measure [cubic meters] subject to ***Standard Section 9-3.2*** of the ***Specifications Article 9-3***. When review is required, spot - check as follows:

(1) Check the nominal commercial sizes shown in the plans or ordered by the PE were used to calculate quantities.

(2) The lengths shall be the overall lengths of the pieces as shown in the plans, or the lengths actually incorporated in the structure are less than those shown in the plans.

(B) Untreated Structural Timber:

(1) This item of work shall be checked in accordance with the procedures outlined above.

(2) The quantities of structural timber, treated and untreated, are measured and paid for per thousand feet, board measure or per cubic meter.

11.9 RELATED BRIDGE ITEMSSTEEL GRID FLOORS

(A) Steel Grid Floors: See ***Section 504*** of the ***Specifications***. Quantities to be paid for shall be plan quantity, subject to ***Section 9-3.2*** of the ***Standard Specifications Article 9-3***. The quantities consist of the area, in square feet or square meters, installed, completed and accepted. The item consists of fFurnishing and erecting open type steel grid roadway and sidewalk floors on the movable spans of bridges and at other locations shown in the plans. When review is required, spot - check as follows:

(1) Check the dimensions and notes shown in the plans to verify quantities.

(2) Station to station lengths and widths may be used in the calculation of the dimensions actually constructed within the limits designated by the PE/PA.

(3) Determine that the proper deduction has been made for open joints in the floor~~, cutouts for post, etc.,~~ as required.

~~(B) Electrical Equipment: This item is paid for at the contract lump sum price as full compensation for furnishing and installing all equipment.~~

~~(1) Determine when navigation lights are included as part of the electric equipment lump sum price, to avoid duplicate payment.~~

~~(2) Verify quantities using plans, bills of materials, general notes, and final summary of materials incorporated.~~

~~(C) Control House: This is a lump sum item constructed in conjunction with movable bridges.~~

~~(1) Ensure that anchor bolts, steel framing, and plates are included in the item of Structural Steel.~~

~~(2) Check the various items for compliance with the prescribed specification requirements.~~

~~(3) Check that plan and final quantities agree within a reasonable tolerance.~~

~~(D) Pipe Handrail - linear feet [meters] furnished, painted, erected, completed, and accepted or linear meter, basis: plan quantity, per ***Standard Specifications Article 9-3***.~~

11.10 NO FIGURES FOLLOWING THIS CHAPTER