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Instructions:

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**Washington State
Department of Transportation**

TECHNICAL MANUAL

Construction Manual

M 41-01.05

July 2008

Environmental and Engineering Programs

Construction Office

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1-1 General Information

1-1.1 Purpose and Scope of Manual

This manual is published by the State Construction Office primarily as a resource for construction engineering personnel. It is intended as instruction for administering Washington State transportation projects. The manual recognizes established standards and describes accepted engineering practices. The instruction provided by this manual is intended to identify desired results, establish standardized requirements, and provide statewide uniformity in the administration and construction of transportation related contracts.

Construction engineering staff responsible for work on construction contracts will want to be familiar with the guidance and instructions included in this manual. The guidance presented by this manual is intended to complement the requirements of the *Standard Specifications* and the contract provisions and to promote uniformity of results among all Regions of the Washington State Department of Transportation (WSDOT).

Suggestions for corrections, additions, or improvements to this manual, and to the *Standard Specifications or General Special Provisions* are welcomed and encouraged. Any means of communication with the Construction Office will be accepted and reviewed promptly.

1-1.2 Definition of Terms

In using this manual, the interpretation of words or terms should be considered the same as set forth under "Definitions and Terms" in Section 1-01 of the *Standard Specifications*. If a conflict should occur between the guidance or instructions offered by this manual and the specifications or provisions identified in the contract, the latter should always prevail.

1-1.3 WSDOT State Construction Office

The State Construction Office strives for consistent, cost-effective, quality construction through direct support of WSDOT's Regional construction program. The Construction Office coordinates the development of policies and standards, provides training, guidance, oversight, technical expertise and advocacy, introduces innovation, and coordinates and shares information on construction issues.

1-1.3A State Construction Engineer

The State Construction Engineer reports to the Director of Environmental and Engineering Programs and is assigned the responsibility for all WSDOT contract construction projects, except those contracts executed by the Director of Washington State Ferries Division. The State Construction Engineer is responsible for all matters pertaining to contract administration and represents the Director in managing the performance of these contracts. In addition, the State Construction Engineer acts for the Director in approving increases or decreases of work, changes in the work, changes in materials incorporated into the work, authority

to accomplish work by force account, extensions of time, and the assessment of any liquidated damages. The State Construction Engineer is responsible for providing guidance and direction to the Regions and State Construction Office personnel who are investigating construction claims and is responsible for the approval of all claim settlements. The State Construction Engineer establishes WSDOT policy relative to inspection and documentation and ensures uniform interpretation and enforcement of the *Standard Specifications* and contract provisions throughout the State. The State Construction Engineer is assisted by three principal assistants for construction as outlined in the Table of Organization shown in Figure 1-1.

1-1.3A(1) Administration

The Construction Engineer, Administration, acts for the State Construction Engineer in setting requirements for contracting, policy, and responding to questions from the regions on all issues pertaining to Division 1 of the *Standard Specifications* and Chapters 1 and 10 of the *Construction Manual*. These include, but are not limited to, time extensions, external civil rights contract changes, prevailing wage issues, documentation, and claims resolution. The Construction Engineer, Administration, also represents WSDOT on task forces with contractor organizations, other public agencies, and at the legislature regarding public contracting issues.

The Construction Engineer, Administration, is assisted by:

- The *Assistant Construction Engineer, Administration*, who reviews time extensions and liquidated damage assessments, represents the Construction Office on external civil rights issues, and the monitoring of the Apprentice Utilization program. The Assistant Construction Engineer for Administration also acts as liaison to various external stakeholders and suppliers.
- The *Documentation Engineer*, who provides guidance for contract documentation and contract payments, as well as providing support to Region Documentation Engineers. The Documentation Engineer resolves issues of material documentation deficiencies for all federal aid projects, is responsible for prevailing wage issues, and is also responsible for evaluating the contract for Acceptance.
- The *Specification Engineer*, who is responsible for maintaining the *Standard Specifications*, and *General Special Provisions*, and provides guidance and review in the writing of Special Provisions.
- The *Construction Administration Specialist*, who is responsible for the *Construction Manual*. The Construction Administration Specialist also supports the *Assistant Construction Engineer, Administration* in matters concerning goal setting.
- The *Construction Administration Support Engineer*, who is the CCIS System Manager, the Construction Office Liaison to MIS, supports the Region and Project Engineer offices by providing training in the use of

CCIS, the CCIS Sequel Database, and the Construction Data Mart. This position also maintains the *Equipment Rental Rate Blue Book*.

1-1.3A(2) Roadway

The Construction Engineer, Roadway, acts for the State Construction Engineer in matters of highway construction such as:

Grading	Drainage	Surfacing
Paving	Gravity Walls	Structural Earth Walls
Geosynthetic Walls	Concrete Slope Protection	<u>Roadside Restoration</u>
Guardrail	Signing	Illumination
Traffic Signals	Intelligent Transportation Systems	3-Sided Culverts
Rest Areas	Traffic Control	<u>Slope Stabilization</u>

For the purpose of establishing uniformity between the Regions, the Construction Engineer, Roadway, is responsible for establishing accepted practices for construction, construction engineering, and contract administration for work performed within these fields. Some of these responsibilities include inspecting projects, evaluating reasons for contract changes, approving change orders, conducting or assisting in contract negotiations, investigating complaints and claims, and providing recommendations on major changes to the State Construction Engineer.

The Construction Engineer, Roadway, is assisted by three professional engineers.

1-1.3A(3) Bridges

The Construction Engineer, Bridges, acts for the State Construction Engineer in such matters as:

Fixed Span Bridges	Moveable Span Bridges	Standard Reinforced Concrete Walls
Non-Standard Reinforced Concrete Walls	Soldier Pile Walls	Tie-Back Walls
Soil Nail Walls	Slurry Walls	Cylinder Pile Walls
Noise Walls	Concrete Bridge Deck Overlays	Sign Structures
Signal Structures	Bridge Approach Slabs	Other Projects As Assigned

For the purpose of establishing uniformity between the Regions, the Construction Engineer, Bridges, is responsible for establishing accepted practices for construction, construction engineering, and contract administration of work performed in construction of bridges and other related structural construction. Some of these responsibilities include inspecting projects, evaluating reasons for contract changes, approving change orders, conducting or assisting in contract negotiations, acting as a resource to the Regions for resolving construction related problems, investigating complaints and claims, and providing recommendations on major changes to the State Construction Engineer.

The Construction Engineer, Bridges, is assisted by three professional engineers.

1-1.4 Materials

The Materials Engineer acts for the Director of Environmental and Engineering Programs by directing the materials testing, inspecting, and acceptance functions of WSDOT. Subject to the approval of the Director of Environmental and Engineering Programs, the Materials Engineer; formulates and recommends policies and procedures; directs operating methods to be followed in providing precontract soils, foundation, and materials analysis and testing; recommends and/or approves Pavement Designs; furnishes counsel and technical assistance to the Regional Construction Manager in conducting required materials tests and analysis and provides for periodic review of these test methods and procedures to ensure their conformance to established policies, procedures, and methods; and provides a program that verifies the uniformity of all testing and sampling procedures.

The Materials Engineer is assisted by a staff of professional engineers, administrative personnel, engineers, and technicians.

1-1.5 Region Organization

1-1.5A Regional Administrator

The Regional Administrator represents the Secretary in a geographic area, organizes and supervises a staff of personnel which perform administrative duties and supervise location, design, construction administration, and maintenance of the transportation system within the Region. For the purposes of this manual, the Administrator of the Urban Corridors Office is considered to be a Regional Administrator.

1-1.5B Regional Construction Manager

In supervision of construction, the Regional Administrator is assisted by a Regional Construction Manager. The Regional Construction Manager assigns Project Engineers with appropriate supporting personnel and provides training and guidance to the Project Engineers. It is the responsibility of the Regional Construction Manager to ensure that sufficient personnel are provided on all projects at all times to ensure adequate inspection, documentation, and quality controls. For the purposes of this manual, the Deputy Administrator of the Urban Corridors Office is considered to be a Regional Construction Manager.

1-1.6 Relationship With Other Agencies

1-1.6A Federal Highway Administration

The Federal Government provides transportation funding to Washington State through the Federal Highway Administration (FHWA), a division of the United States Department of Transportation. These funds are subject to applicable Federal law, Executive Orders, regulations, and agreements.

The WSDOT contact with FHWA for Construction Administration matters is the State Construction Office. In preparing and approving *Standard Specifications*, general special provisions, and this manual, the Construction Office seeks the review and approval of FHWA. Use of approved provisions and meeting the required outcomes described in the manual become the basis of federal reimbursement.

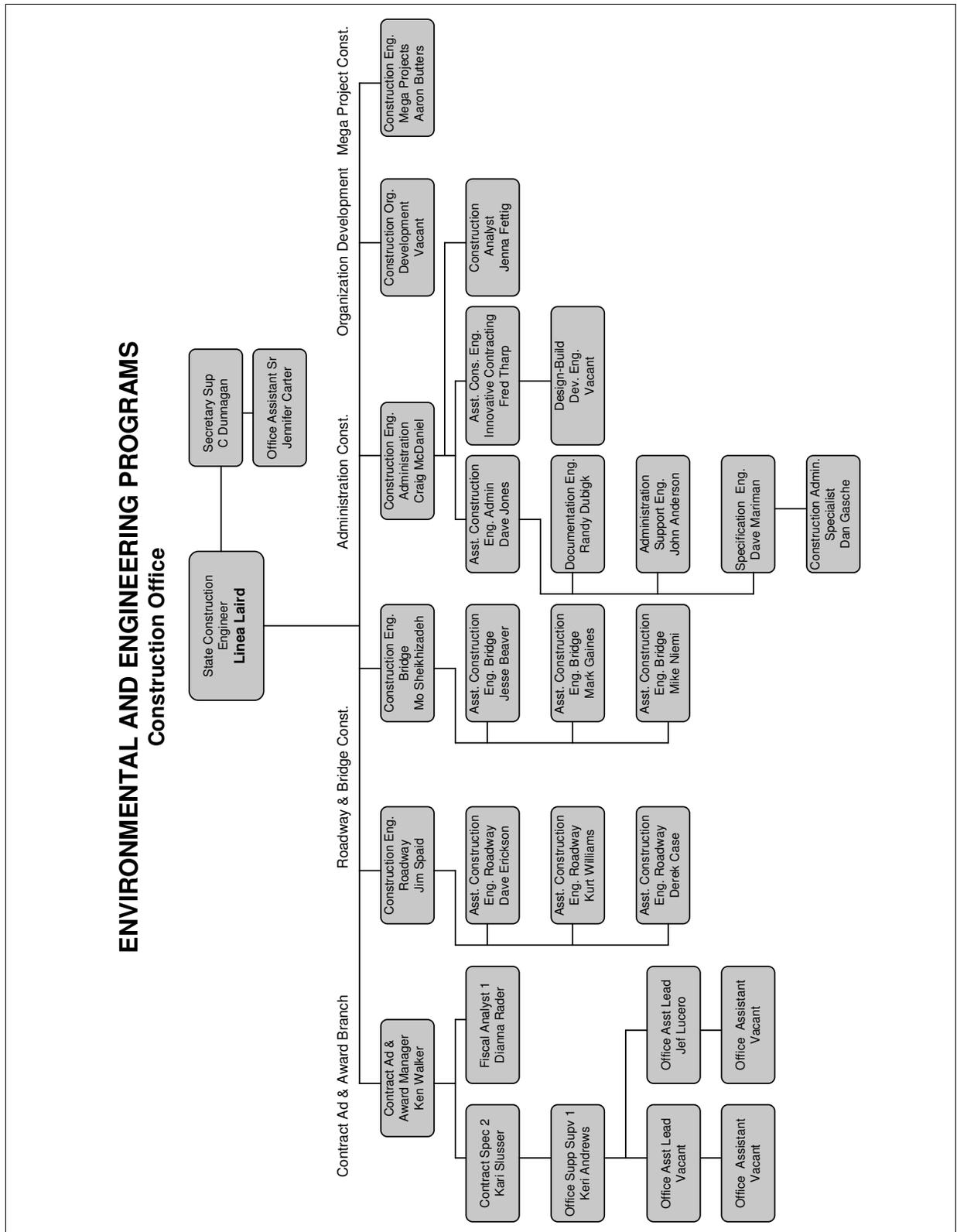


Figure 1-1

FHWA provides oversight of WSDOT work on some projects and has delegated that responsibility to WSDOT on others. A full discussion of WSDOT responsibilities under Stewardship is included in this Manual (Section 1-3.4).

1-1.6B Local Agencies

Cities, counties, and other municipalities within the state may also perform work funded with Federal dollars. When this happens, the money is passed through the Department of Transportation and we will have entered into agreements with the local agencies to provide services. For example, WSDOT will allow the use of testing facilities by a local agency.

1-1.6B(1) Project Engineer Administering Local Agency Project

Occasionally, a WSDOT Project Engineer may be assigned to provide engineering and inspection services on a local agency project. The duties of the Project Engineer will be determined by the actual contract provisions and by any specific agreement made between the Region administration and the local agency. The provisions of this manual may or may not apply, depending on the situation.

1-1.6B(2) Local Agency Administering Its Project on State Right of Way

In some cases, WSDOT may grant approval for a local agency to construct a facility on State Right of Way using local agency staff and contractors. (For example, a city funded overpass of an interstate). When this happens, a Project Engineer will be assigned to provide oversight of the local agency work. The Project Engineer is expected to assure that the local agency provides the same level of engineering and inspection that State employees would accomplish. While the Local Agency may have different administrative provisions with respect to risk-sharing and submittal requirements, all of the technical aspects of the *Standard Specifications* and this manual must be met.

1-1.6C Other Federal, State, and Local Agencies

The design and construction of transportation improvements often incorporates locations and features that fall within the jurisdiction of other agencies. It is the policy of WSDOT to cooperate with all agencies as partners in the completion of each project, recognizing and complying with each agency's legal requirements. The Project Engineer shall cooperate with local authorities to help ensure that the contractor complies with local laws, ordinances, and regulations. However, unless specifically allowed in the statutes and the contract documents, no WSDOT employee shall engage in any kind of enforcement of laws, rules, regulations, or ordinances which are the responsibility of other agencies. As WSDOT attempts to earn confidence and build trust with resource agencies and the public, it is critical that we take the proper actions when we are aware of an issue. When WSDOT employees observe something which is questionable or appears to not be in compliance with local laws, ordinances, and regulations, it shall be brought to the Project Engineer's attention. The Project Engineer is responsible for bringing it

to the Contractor's attention for proper action. Rely on the Regional and Headquarters expertise and the appropriate agencies when dealing with complex issues such as environmental compliance, safety, or hazardous materials.

1-1.6C(1) Highways over National Forest Lands

WSDOT has entered into a Memorandum of Understanding (MOU) with the United States Forest Service (USFS) and the Project Engineer is required to do the following when performing work on National Forest Service Lands:

1. Represent the department in all matters pertaining to the project.
2. Confirm that the USFS has been notified of the project advertisement and award.
3. Notify and obtain approval from the USFS for any changes in the project that will affect National Forest System Lands, beyond that of the original contract.
4. Notify the USFS when the project nears completion, at which time the USFS will indicate if they choose to participate in the final review of the project.

1-1.7 Relating to the Public

Public confidence is enhanced by WSDOT personnel being responsive to reasonable requests for information, providing timely advanced notice of possible impacts, and reducing inconvenience to traffic while maintaining worker safety. When possible, the Project Engineer should rely on resources such as Regional Public Information Officers and the State Office of Communications and Public Involvement. If there is concern or reason to question the confidentiality or sensitivity of the information requested, consult with your supervisor or seek the advice of the Attorney General's office.

1-1.8 Safety

Safety is not optional in WSDOT. No employee will be permitted to disregard applicable safety and health standards of the State Department of Labor and Industries or other regulatory agencies.

The Secretary of Transportation's Executive Order E 1033 provides direction to all WSDOT employees to adhere to the following basic safety provisions in every work activity:

- Participate in your work group safety plan (or Safety Management System for WSDOT Ferries Division employees).
- Look for ways to prevent accidents.
- Immediately identify hazards and safety concerns.
- Always use personal protective equipment.
- Promptly report all injuries.

The Order also states that all employees at WSDOT Ferries Division are already covered and shall continue to be covered by the existing Ferries Division Safety Management System. Therefore:

- All Ferries Division employees will refresh their knowledge of existing Safety Management System procedures and shall follow them accordingly.

- A concerted effort will be made to address existing and new Safety Management System safety reports in a timely manner.
- All Ferries Division employees shall address issues of concern with existing safety procedures using the existing Safety Management System reporting program.

All other WSDOT employees are covered and continue to be covered by the policies and procedures in the *WSDOT Safety Procedures and Guidelines Manual M 75-01*, and other related policy documents. Therefore, a pre-activity safety plan is required prior to performing any new field work. Office staff will conduct a hazard assessment and mitigation plan for all office environments.

Since WSDOT employees on transportation construction projects are routinely exposed to a variety of hazards, they must take adequate safety precautions at all times. The following items represent common activities that workers or work crews may encounter, and should be addressed in pre-activity safety plans as needed.

- The employee shall ensure that an area is safe before entering it for the purpose of inspection. For example, a deep trench must be adequately shored and braced before entering it.
- Aggregate production and material processing plants should be inspected for safety hazards. Corrective measures should be called to the attention of the Contractor or producer. Corrections must be completed before WSDOT personnel will be permitted to proceed with entry or work upon the premises.
- The employee must at all times watch for backing trucks and not depend upon hearing alone for warning. The noise of plants and other equipment often make it impossible to hear trucks approaching and the truck driver's vision area is restricted when backing a truck.
- Parking WSDOT vehicles too close to the path of construction equipment, behind standing equipment, or in other hazardous locations is not permitted.
- Where traffic is maintained in work zones, care must be taken to avoid approaching traffic when it is necessary for inspectors and others to step onto or cross the traveled portion of the roadway. Whenever possible, work activities, ingress and egress, should be conducted within the relative safety of the work zone.
- WSDOT employees working on foot in the highway right of way and other areas exposed to vehicular traffic must comply with the same high visibility clothing requirements imposed on the contractor by Section 1-07.8 of the *Standard Specifications*.
- Where the engineering crew is working adjacent to traffic, without positive barriers, the work area should be marked with proper signs and traffic control devices as shown on the appropriate Traffic Control Plan (TCP). The crew may be protected by a certified flagger or spotter as needed.
- When the engineering crew is working under the protection of the Contractor's flaggers and signs, other signs may not be needed, but a "STOP"/"SLOW" paddle should be available for use in special situations.

Good communication with the Contractor and Flagger is needed to ensure that they are aware of crew activities within the work zone.

- A survey crew is typically exposed to traffic hazards and should conduct survey work under approved TCPs from the *Work Zone Traffic Control Guidelines for Survey Operations* booklet or the Traffic Control Guidelines book. The Region Traffic Office will assist survey crews with TCPs for situations not covered in these publications.
- During blasting operations, employees are instructed to seek cover at least 500 feet from the location of the blasting.

In addition to the above requirements for workers and work crews, supervisors also have the following responsibilities:

- Each supervisory employee is charged with the responsibility of providing safety leadership at all times and safety enforcement when necessary.
- Supervisors shall give thorough instructions to employees under their jurisdiction on the safe use of tools, materials, and equipment and the safe prosecution of work on construction projects.
- The Washington Industrial Safety and Health Act requires that every foreman, supervisor, or other person in charge of a crew have a valid first aid card.
- When employees are injured on the job to the extent that the services of a doctor are required, the Regional Safety Officer shall be notified immediately.
- When traffic control measures are necessary, approved Traffic Control Plans (TCPs) should be used in conformance with the *Manual on Uniform Traffic Control Devices*, as adopted by WSDOT. Supervisors should ensure that the appropriate TCP is used and that the necessary signs, devices and equipment is available.

1-1.9 Archaeological and Historical Objects

It is both National and State policy to preserve historical or prehistorical objects and ruins. These objects and ruins may include sites, buildings, artifacts, fossils, or other objects of antiquity that may have particular significance from a historical, cultural, or scientific standpoint.

If provisions for archaeological and historical salvage have not been made in the contract and it appears that significant historic or prehistoric objects or ruins have been or are about to be encountered, the Project Engineer should immediately take steps to preserve and protect the objects or ruins. Once the objects or ruins have been sufficiently protected, the Project Engineer should immediately notify the Region Construction Manager, who will provide any necessary initial assistance to the Project Engineer. Where the Region determines appropriate, the Project Engineer will contact and inform through existing Region environmental staff, the cultural resources consultant, the State Historic Preservation Officer (SHPO), FHWA, and affected tribes of the discovery. The Project Engineer will also help facilitate any on-site meetings for the appropriate parties should either FHWA, SHPO, or the cultural resources consultant believes it necessary.

1-1.10 Construction Work in International Boundary Strip

The International Boundary Commission of Washington, D.C., by treaty with Canada, has the exclusive jurisdiction of the 20-foot boundary strip, 10 feet on each side of the International Boundary. Any construction work within this strip must be with the exclusive permission of the International Boundary Commission (IBC). Boundary monuments are not to be moved or disturbed in any manner without the expressed approval of the IBC. It is expected that permission for all work within the boundary strip will be obtained from the IBC during the design stage of a project. However, it is the Project Engineer's responsibility to ascertain that permission has, in fact, been obtained from the IBC for all work performed within the boundary strip. The Region shall be immediately notified if, upon construction, it is found that permission has not been obtained to relocate boundary markers or perform construction work in the 20 foot boundary strip.

1-2 Contract Administration

1-2.1 Proposal and Award of Contract

1-2.1A Contract Proposal and Bids

When the design phase of a project is completed and funding has been secured, the public is then notified that WSDOT is ready to accept bids for completion of the work involved. This notice is accomplished by publishing an advertisement for the project, along with an invitation to bid the work, in the "Daily Journal of Commerce". The advertisement includes a specific date and time for the opening of bids along with the necessary information for obtaining plans, specifications, and bid documents. Once advertised, these plans and specifications are then made available to all contractors who wish to study the project. Contract proposal forms or bid documents are also furnished, but only to those prospective contractors who have been prequalified to bid on the types and quantities of work involved. Once bids have been opened, an announcement in the "Daily Journal of Commerce" will also be made identifying the "Apparent Low Bidder". Specific information regarding the advertisement phase and bidding procedures can be found in the *Ad & Award Manual*, M 27-02

If the Project Engineer determines that prospective bidders may have difficulty locating the project or determining the project limits, the Project Engineer may choose to post the project limits. If this is determined necessary, signs similar to those illustrated in Figure 1-3 should be used.

Section 1-02.4 of the *Standard Specifications* requires that all requests for explanation or interpretation of the contract documents be submitted in writing. Anytime the answer to a question from a prospective bidder would provide additional information that would not be available to all bidders, the Project Engineer should immediately contact the Region Construction Manager or Region Plans Office in order to facilitate the preparation of an Addendum. Answers to such questions must be provided to all bidders in the same manner. If the question has to do with generic issues such as office

procedures (for example, methods of payment calculation or handling requests for information,) the answer may be provided directly to the questioning party without involving other bidders.

All questions from prospective bidders regarding an advertised project should be referred to the Project Engineer listed in the "Notice to All Planholders" for a complete response. The Project Engineer will coordinate the effort to determine if any requested information needs to be addressed by an addendum.

1-2.1B Award and Execution of Contract

Bids for the contract are opened at a public meeting where each prospective bidder's proposal is read and the Apparent Low Bidder is announced. Within 45 calendar days of bid opening, the proposals will be closely reviewed and the contract will be awarded to the lowest bidder deemed responsive. In accordance with Section 1-03 of the *Standard Specifications*, the successful bidder is then allowed 20 calendar days to return the signed documents that are necessary to enter into a contract with WSDOT. The Contract Administration and Payment System (CAPS) Unit of Accountability & Financial Services (AFS) sends the awarded contract to the Contractor for execution within 3 days of award. Additional copies go to the Region, State Construction Office, Bridge and Structures Office, other internal WSDOT divisions and railroads as needed.

After these documents are returned to WSDOT, the contract must be approved and executed. No proposal submitted by a Contractor is binding upon WSDOT prior to the date of execution by WSDOT. No work is to be performed within the project limits or WSDOT furnished sites prior to the execution of the contract by WSDOT. Any work that is performed by the Contractor outside of these areas, or any material that is ordered prior to WSDOT execution, is done so solely at the risk of the Contractor.

In order to ensure timely notification to the Contractor regarding execution of the contract and authority to proceed, the following procedure is used:

1. Immediately after execution of the contract documents by WSDOT, the CAPS Unit of AFS or (for Region Ad & Award projects) the Region Plans Office will e-mail notification to the office administering the contract (the Regional Construction Manager's Office, the Director of Terminal Engineering, or the Architecture Office). The CAPS Unit of AFS also notifies, by memorandum, the National Association of Credit Management, and internal interested parties that the contract has been executed and/or the work may proceed.
2. The Regional Construction Manager or a representative should contact the Project Engineer's office as soon as notification is received. The Project Engineer should then contact the Contractor and provide notification of the execution date. The date, time, and method of notification in all instances should be recorded in the project diary.
3. Following the initial contact, the CAPS Unit of AFS will return fully executed copies of the contract to the Contractor.

1-2.1C Preconstruction Meetings, Discussions

The Project Engineer is required to communicate with the Contractor for the purpose of discussing the project and exchanging a variety of information. Depending upon the complexity of the project, this information can be exchanged in any combination of the following methods:

- Information packets provided to the Contractor
- Letters transmitting information
- Informal meetings
- A single multipurpose formal meeting
- Several formal meetings with different purposes

If the Project Engineer decides that a formal meeting is necessary in order to successfully begin work on the project, a meeting should be arranged as soon as practical after the contract is awarded and the Contractor has organized for the work.

In the case of a project that includes utilities to be adjusted, relocated, replaced or constructed by a utility, or their contractor, during the performance of the contract, the Project Engineer shall facilitate a mandatory utility preconstruction meeting with the Contractor, all affected utility owners and their contractors prior to any on-site work. The Project Engineer should request assistance from the Region Utilities Engineer for help in getting utilities to attend this meeting. This meeting should include a discussion of all utility work schedules, in order to enable the utilities and the Contractor to coordinate their work, resolve schedule conflicts, and eliminate delays.

All information exchanged should be documented in the project records, by formal meeting minutes, by file copies of letters, or by diary entries.

The nature, amounts, and methods of communication with the Contractor are left to the Project Engineer. As a minimum, the following subject areas should be covered during the preconstruction time period:

- **CONTRACTOR WSDOT RELATIONSHIPS**
The Project Engineer should begin to develop a positive and effective relationship with the Contractor as soon as the contract is awarded. This is also a good time to introduce the concept of “Partnering” if it has not already been introduced on the project. The Project Engineer should strive to create an environment that encourages a cooperative approach to completing the project. This can be helped by beginning the development of a team consisting of both the Contractor’s and WSDOT’s project people. The level of authority delegated to each member of the Project Engineer’s staff should be discussed with the Contractor. In addition the methods of establishing the Contractor’s Performance ratings can be reviewed (Manual M 41 40) (see Chapter 1-2.8F of this manual for additional information). The Contractor should also be informed that there is an opportunity to evaluate the WSDOT construction process as well.

- **ENVIRONMENTAL COMMITMENTS**
If there are commitment files for the project, these should be made available and discussed with the Contractor. Any references in the *Standard Specifications* or the special provisions to environmental requirements or permits should be discussed. The Contractor’s responsibility to obtain any local agency permits should also be discussed. If rock crushers are involved in the project, the State Department of Ecology registration requirements should be discussed (WAC 173-400). In addition, a written record of this discussion should be sent to the regional office of the State Department of Ecology so that they are aware of the timing and location of the rock crushing operation.
- **ORDER of WORK AND TIME SCHEDULES**
In order for the Project Engineer to set up the required crews, arrange for any special inspections, provide timely reviews of submittals, etc., the project office must be made aware of the contractor’s schedule of work. In addition the contract specifications may include specific requirements for sequencing or durations for some items of work. The contract requirements for progress schedule or time for completion in accordance with Section 1-08, or as amended by the special provisions, can also be discussed.
- **SUBCONTRACTORS AND LOWER-TIER SUBCONTRACTORS**
In accordance with Section 1-08.1 of the *Standard Specifications*, the Project Engineer needs to become aware of the Contractor’s plans to delegate portions of the work to subcontractors. These plans must conform with the condition of award, if any, related to disadvantaged business enterprise participation. The Project Engineer should explain the requirements and process involved for subcontractor and lower-tier subcontractor approval, including the prevailing wage rate requirements outlined in the contract documents (see Chapter 1-2.6 of this manual), the requirement to verify that each subcontractor meets the responsibility criteria outline in 39.04 RCW and possesses any license required by 19.28 RCW or 70.87 RCW. WSDOT/Contractor/Subcontractor relationships should also be discussed. The Project Engineer should remind the Contractor that there is no contractual relationship between WSDOT and the subcontractors. All subcontractor correspondence with WSDOT should pass through the Contractor for submittal to WSDOT or vice versa. Contractor representation should also be discussed. It will be necessary for the Contractor to be represented at the job site at all times, even when there is only subcontractor work in progress.
- **UTILITIES, RAILROADS, AND OTHER THIRD PARTIES**
If the project affects or is affected by third party organizations, the Project Engineer must advise the Contractor about the relationships with the third parties and the expectations they hold regarding the actions of both WSDOT and the Contractor. The Project Engineer may wish to arrange face-to-face meetings with representatives of affected third parties. In the case of

utilities, reference should be made to the underground locator services and the requirements to utilize them (see RCW 19.122). If WSDOT has agreed to notification time limits, these should be communicated to the Contractor. If special insurance is required by any agreements with third parties, then these requirements should be pointed out to the Contractor.

If utilities are to be adjusted, relocated, repaired or constructed by the utility during the performance of the contract, the Project Engineer shall facilitate a separate, mandatory, utility preconstruction meeting with the Contractor, the utility, and their contractors.

- SAFETY AND TRAFFIC CONTROL

The Contractor's safety program should be discussed as outlined in Section 1-2.21(3) of this manual. WSDOT has an interest in safe operations on the job and the Project Engineer should make clear that this interest will be protected. As part of a discussion of specific safety requirements of the particular work, safety considerations for workers and WSDOT personnel, such as safety zone requirements, vehicle intrusion protection, fall prevention, closed spaces, hazardous materials, work around heavy equipment, etc., should be addressed. The need for control of speed on all construction equipment should be emphasized.

The Project Engineer should describe WSDOT's traffic requirements. The Contractor's Traffic Control Manager (TCM), Traffic Control Supervisor (TCS) and WSDOT's traffic control contact person should be identified and their responsibilities and authorities clearly stated. Any traffic control requirements that are unique or restrictive should be emphasized and addressed by the Contractor with respect to construction operations. Unacceptable delays to traffic should also be discussed.

The *Manual on Uniform Traffic Control Devices*, as adopted by WSDOT, is the legal standard for all signing, traffic control devices and traffic control plan requirements on the project. These standards have been incorporated into the project Traffic Control Plans (TCPs.) If the Contractor chooses to use these TCPs, they must be formally adopted in writing as required in Section 1-10.2(2) of the *Standard Specifications*. If the Contractor wishes to use some other traffic control scheme, then that plan must be submitted and approved in advance.

Flaggers and their intended locations must be included in the plans. When Flaggers are utilized, they must have a current flagging card and shall be equipped with hard hats, vests, and standard stop/slow paddles as required in Sections 1-07.8 and 1-10.3 of the *Standard Specifications*. Overuse of flaggers is not appropriate as "catch all" traffic control and should be discouraged. Safety of flaggers, through use of physical protection devices where practical, proper flagging methods and formulating an emergency escape plan, should be emphasized.

The Contractor and the Project Engineer should establish communication with the Washington State Patrol (WSP) and local law enforcement agencies. Law enforcement advice about traffic control should be considered. Arrangements for all law enforcement agencies to notify the project office about accidents near, or in, the construction area should be established, if possible. If WSP traffic control assistance is to be used, a general discussion of strategy and responsibilities should be included.

Off site hauling can pose a safety hazard to the public. WSDOT will cooperate with law enforcement agencies in the enforcement of legal load limit requirements and the covered load regulations. The Project Engineer should discuss this with the Contractor before any hauling begins.

- CONTROL of MATERIALS

The Contractor should be reminded of Section 1-06.1 of the *Standard Specifications*, requiring the Engineer's approval of all materials prior to their use. In order to expedite these approvals, the Contractor should be encouraged to make these requests as early as possible. The Project Engineer should provide the Contractor with a current copy of the Record of Materials (ROM) for the project. The Project Engineer should discuss the ROM with the Contractor, covering the various requirements for sampling, catalog cuts, shop drawings, certification requirements, etc., which may be needed for approval of materials prior to their use. The requirements of Section 1-06.2 of the *Standard Specifications* for ongoing acceptance of approved materials prior to their being incorporated into the work, should also be discussed. If fabricated items will be needed, the inspection process for fabricated materials, including shop drawing approvals and notification requirements for fabrication inspectors, should also be outlined. The requirements of Section 1-06.3 of the *Standard Specifications* that require manufacturer certifications prior to use of the materials should also be reviewed.

The Contractor should be reminded that, in order to avoid deferred progress payments for portions of work not completed, all necessary documentation for approval of materials and required certifications must be received and accepted prior to their use. A method of notification of intent to defer payment should be discussed with the Contractor, and an agreed upon method documented in the project files.

- OTHER SUBMITTALS

Discuss any other submittals that may be needed during the course of the contract. This may include Falsework and Forming Plans, Traffic Control Plans, Temporary Water Pollution/Erosion Control Plans, Schedules, Installation or Operating Procedures, or other Contractor initiated items requiring WSDOT review and/or approval. There are requirements for a number of submittals which, if not satisfied in a timely manner, could delay the initial progress payment. These include

the Statement of Intent to Pay Prevailing Wages, the Progress Schedule, and the Training Plan. There may be others depending on the work to be done and as required by the contract provisions. The Project Engineer should identify and remind the Contractor of these requirements and the potential for deferred payments.

- DBE PARTICIPATION / EEO / TRAINING

The Project Engineer should briefly discuss and answer any questions the contractor may have with regard to the efforts, reports, and monitoring necessary to ensure successful performance for DBE *Participation*, *EEO*, & *Training*. Chapter 1-2.7A provides a breakdown of these various programs and the general requirements each contains. However, the specific requirements and contractor performance information are included in the *Standard Specifications for Road and Bridge Construction*, the Amendments included in the contract, as well as the contract specific special provisions titled *Equal Employment Opportunity Responsibilities*. If additional assistance or information is necessary, the Project Engineer could also request assistance from the Region EEO Officer, the State Office of Equal Opportunity, or the State Construction Engineer's Office.

- WAGE RATE ADMINISTRATION

Advise the Contractor of the requirement to pay prevailing wage rates as identified in the Contract. Advise the Contractor that it is their responsibility to work directly with Washington State Department of Labor and Industries (L&I) for approval of the Statement of Intent to Pay Prevailing Wages (SI) and Affidavit of Wages Paid (AWP) and that:

- The SI and AWP will be on forms provided by L&I.
- The forms will be obtained from L&I or can be filed electronically with L&I online at www.LNI.wa.gov/prevailingwage, if the contractor is registered by L & I to file electronically.
- The contractors, subcontractors, lower-tier subcontractors, suppliers, manufacturers, and fabricators that are required to submit SI and AWP will pay the approval fee directly to L&I.
- The Contractor will provide the Project Engineer a copy of the approved forms (SI, before any payment can be made for the work performed and all AWP, before any retained percentage can be released). If payrolls are required, establish submittal deadlines in accordance with Section 1-07.9(5) of the *Standard Specifications*. Describe the wage rate interview process. Describe the required job site posters and provide them to the Contractor (See Chapter 1-2.6 of this manual). On all Federal-Aid contracts, the Project Engineer must remind the Contractor that the work falls under the guidance of Davis-Bacon and Related Acts and the Contract Work Hours and Safety Standards Acts. As indicated in Chapter 1-2.6C of this manual, the U.S. Department of Labor may conduct investigations to ensure compliance with these Acts.

- FORMS

The Project Engineer should provide the Contractor a description of all required forms, giving the Contractor an initial supply of each. Additional forms required by the Contractor over the course of the work should be provided by the Project Engineer upon request by the Contractor. Remind the Contractor that all form submittals, including those of subcontractors, lower-tier subcontractors, and suppliers, should be routed through the Prime Contractor for submittal to WSDOT.

- SUMMARY

While these issues are to be discussed with the Contractor in some manner at the beginning of each contract, the Project Engineer is free to select the most effective method of doing so. A formal preconstruction conference may or may not be the best solution. Perhaps a single meeting is adequate or several meetings may be required. The entire preconstruction communication may also be covered in a short meeting between the Project Engineer and the Contractor. The Project Engineer is responsible to address these subjects, inform the Contractor in some manner and maintain a written summary of the preconstruction meetings or discussions for the contract files.

The Contractor and Project Engineer may be knowledgeable about those normal requirements listed above. In this situation, some items need only be listed in a mailing as a convenience to the Contractor's staff. Unique features, constructability, and third party coordination should be focused on with as many of the interested parties as can be assembled.

The key is effective communication, getting the right message to the necessary people. Additional meetings may be required as people change, as new facets of the work become imminent, or as the project goes into a second or third season. In order to assist this process, a checklist has been developed as a tool for the project office's use. It can be used to help identify the issues and track them for completion through the various preconstruction communications. See Figure 1-4.

1-2.2 Project Engineer's Relationship and Responsibilities

1-2.2A Assignment

The Region will appoint a Project Engineer to act as the authorized representative of the Secretary of Transportation for each contracted project. After the contract has been executed by WSDOT, the Region may provide the Contractor with written confirmation of the name and address of the Project Engineer assigned. (The Region may rely on the special provisions and forego this letter, unless a change is made.) If a letter is sent, the Contractor should be reminded to send all correspondence and forms regarding the project to the Project Engineer.

The Project Engineer is then responsible for enforcement of the contract specifications and provisions and the completion of all work according to the plans. The Project Engineer supervises the work of WSDOT personnel assigned to the project and ensures that they perform their

work in accordance with the Plans, specifications and all applicable WSDOT policies. The Project Engineer is responsible for keeping complete and accurate records of all construction data and work progress, preparing progress and final estimates, and preparing other records necessary for a complete documentation of the project, including a performance evaluation of the Contractor (see Chapter 1-2.8F).

Changes made to the project or substitutions for work detailed in the contract plans or specifications, must be made in accordance with the requirements of Section 1-04 of the *Standard Specifications* and the guidance provided by Chapter 1-2.4C of the *Construction Manual*. The Project Engineer should review the project on a regular basis with the Regional Maintenance personnel so they have an opportunity to present any maintenance problems that may arise.

The Project Engineer must, at all times, stay aware of the design implications of actions taken during construction. Change orders and undocumented field adjustments can affect the design standards utilized. If change orders or field adjustments affect the project design criteria, the changes must be documented, approved and incorporated into the Design Documentation Package. The Project Engineer shall contact the Region Project Development staff for guidance in documenting these design criteria changes.

1-2.2B Responsibility as a Public Official

The Project Engineer is responsible for a project that is affected by Federal, State, Tribal, and local laws, ordinances, and regulations. While no one could be familiar with every requirement, the Project Engineer should seek to understand as much as possible. Beyond that, the prudent Project Engineer will look for guidance and seek information related to whatever current issue is at hand. Legal requirements could affect State employees, those employed by the Contractor in performing the work, the materials to be incorporated, the equipment that is used on the project, or could otherwise affect the conduct of work.

If the Project Engineer discovers that any provision of the contract, plans, or specifications appears to be inconsistent with a law, ordinance, or regulation, the inconsistency should be investigated and, if appropriate, referred to the Region Construction Manager. The Project Engineer should, at all times, strive to comply with all laws, ordinances, and regulations.

1-2.2C Relationship With the Contractor

The Project Engineer must be familiar with the conditions of the contract, special provisions, and specifications for the work. The Project Engineer must attend to any reasonable request of the Contractor, i.e., furnishing grades, stakes, plans, etc., whenever necessary and within reason. In general, the Project Engineer should do all things necessary to enable the Contractor to work to advantage and without delay. The Project Engineer should not set any stakes or furnish to the Contractor any plans which are the responsibility of the Contractor to set or provide. The Project Engineer must ensure that the Contractor performs the work in accordance with the contract provisions, plans, and specifications.

Integrity on the part of all employees is essential. The attitude of the Project Engineer and staff toward the Contractor and the Contractor's personnel should be one of cooperation, consistent with the requirements of the specifications. It should be recognized that both the State and the Contractor have explicit rights under the contract and that both parties must respect those rights. The Contractor is generally trying to fulfill the contract honestly, and errors or difficulties, which may arise are usually due to a lack of information or a misunderstanding. If conflict should occur, the Project Engineer should make every effort to determine the cause of the conflict and make appropriate corrections.

1-2.2D Relationship With Other Government Agencies

Other agencies responsible for such things as flood control, land development, stream navigation, pollution, etc., may be affected by the work. The Project Engineer should attempt to determine that the Contractor has complied with all regulations known to be in effect. The Project Engineer is encouraged to obtain a copy of commitments from the project design file. This should be available from a region or project design office. This file should contain environmental permits, real estate commitments, utility commitments, design deviations, and other good important information. When the Contractor is specifically required by the contract to obtain an approval document from other agencies, the Project Engineer must confirm that the document was received. Other approvals required of the contractor, but not mentioned in the contract documents should be confirmed to the extent that the requirements are known and the confirmation is possible. If a representative of an agency visits the project, the Project Engineer or an inspector should accompany the representative on the visit.

In carrying out construction work in forested areas, the Project Engineer should encourage the Contractor to comply with all Federal and State forest rules and regulations governing the protection of forests and the prosecution of the work within both national and State forests. The Contractor must take all precautions necessary to prevent and suppress forest fires. The Project Engineer shall report to the nearest forest fire warden at the earliest possible moment, the location and extent of any fire and shall take immediate steps to control the fire if practicable.

Construction work in or near streams, rivers, or other bodies of water may require a permit from the State Department of Fish and Wildlife. In an agreement with the agency, for each project requiring a Hydraulics Project Approval (HPA) (RCW 75.20.100), the State Department of Fish and Wildlife will issue the permit to WSDOT only and not to its contractor. One representative of the State Department of Fish and Wildlife will be assigned to coordinate requirements with the Project Engineer. The permit is specific to the work provided for in the contract itself and will not cover other work in support of the project, such as operations in Contractor staging areas, material sources, or waste sites. When a Hydraulics Project Approval has been obtained for the project, and the permit has not been incorporated into the contract documents, the Project Engineer shall provide copies of the permit to the Contractor and ensure it is properly

posted at the work site at all times work is in progress. The Project Engineer should ensure that both the intent and the specific provisions of the permit are rigidly enforced. If the Contractor's method of operations, weather conditions, design changes, or other factors affect waters of the State in ways not anticipated or represented in the Hydraulic Project Approval, the Project Engineer will work with the assigned representative and the Contractor to modify the existing permit or obtain a new or revised one as appropriate.

The U.S. Department of Labor, Mine Safety and Health Administration, Metal and Non-Metal Mine Health and Safety Division, 3633 136th Place SE, Suite No. 206, Bellevue, Washington 98006, (206) 553-7037, must be notified at the beginning and closing of all mining operations. This includes surface mining, such as our normal pit site operations. Notification is required for all crusher operations and for all pits and quarries, including borrow pits, which are separated from the roadway under construction. The Project Engineer is responsible for this notification for WSDOT furnished pits and must submit the required report as soon as the date of opening or closing can reasonably be determined. The Contractor is responsible for notification for all pits and quarries not furnished by WSDOT. The Bureau of Mines reports are in addition to reports required by the Department of Natural Resources.

Whenever construction work is performed in navigable waterways, it is necessary to obtain a construction permit from the Coast Guard. One of the requirements of the construction permit is regular submission of Bridge Construction Progress Reports. Two copies of the report should be prepared by the Project Engineer sufficiently in advance of the first working day of the month and transmitted to the State Bridge and Structures Engineer. When a Coast Guard permit modification is proposed (by the Contractor or WSDOT), it shall be submitted to the Bridge and Structures Engineer for processing through the Coast Guard. The time required for approval/disapproval of the proposed permit modification is variable and depends on the nature and significance of the modification. Up to six months may be required. When all construction obstructions to navigation have been removed, the Project Engineer shall report that fact immediately to the Bridge and Structures Engineer indicating the date removal was completed. Upon completion of all permitted bridge work, a final report indicating the date of completion and certifying that the bridge has been constructed in compliance with the Coast Guard Bridge Permit shall be submitted by the Project Engineer to the State Bridge and Structures Engineer.

1-2.2E Relationship With Public and Private Utilities

In some cases, utility adjustments will be completed prior to contract work. In other cases, adjustments are to be made concurrently with the work. The Project Engineer and the Contractor should meet with the public utility companies, individuals, and others owning or maintaining utility features within the limits of the highway right of way and confirm the relationship, the terms of the relocation agreements, and

the relocation work schedule. Where the feature will require adjustment during construction, notice should be provided far enough in advance to allow the utility to perform the adjustment without affecting the Contractor's work schedule.

Utilities should have been given prints of the preliminary plans, prior to awarding of the contract, showing grade lines and right of way to enable them to prepare plans and estimates for making the necessary changes to their facilities in as timely a manner as possible. The Project Engineer should determine that plans for the work have been made, that the relocated facilities will be clear of the construction, and that the utilities coordinate with the Contractor's operations to the fullest extent possible.

When utilities are known to exist within the limits of the project and are not planned for relocation but may be affected by the Contractor's construction activities, the Project Engineer and the Contractor should become familiar with the requirements of RCW 19.122, Underground Utilities. The Project Engineer may wish to obtain copies of the RCW for review at Preconstruction Meetings.

The approximate locations of most existing underground utilities are shown on the contract plans. However, the existence of some underground utilities may not have been known or detected during design. If a one number locator service is available, the Contractor must utilize it in an attempt to locate all affected utility features. If no one number locator service is available, notice shall be provided individually to those owners of underground facilities known to have or suspected of having underground facilities within the area of proposed excavation. Even areas covered by a one number service may contain utilities not included in the service. If the Contractor discovers underground facilities which are not identified, the Contractor shall cease excavating in the vicinity of the facility and immediately notify the owner or operator of such facilities, or the one number locator service.

1-2.2F Responsibility for Coordination of Railroad Agreements

When railroads are involved within the project limits, an agreement covering the work involved is usually entered into between WSDOT and the Railroad Company. Upon identifying that the contract involves work or involvement by a railroad, the Project Engineer should immediately obtain a copy of the Railroad Agreement or contact the Region Utilities Engineer to determine the status of the agreement and to make sure it contains all elements needed to accommodate the construction of the project. If an agreement has not been made with the railroad, the Project Engineer should coordinate and monitor the development and processing of the agreement through the Region Construction and Region Utilities Engineers. Where notices are required. The Project Engineer should ensure that proper notice is provided to the railroad company and that such notice is acknowledged by them. The Project Engineer should work with the Region Construction Manager and Utilities Engineer to resolve any conflicts with the Railroad Company and prevent delays to the Contractor's operations.

1-2.2G Responsibility for Railroad Encroachment Insurance

Projects which include work on railroad right of way generally require special insurance protection. Pay particular attention to the Contract Special Provisions for project requirements because they vary from project to project. It is the responsibility of the Project Engineer to enforce the provisions. The required insurance documents are to be furnished by the Contractor (usually through the Project Engineer) to the State Accounting Services Office who will (a) review the documents and (b) obtain approval of the insuring documents from the railroad company. Written notification of approval by the railroad company will be furnished to the Project Engineer by the State Accounting Services Office as soon as approval is obtained.

No work shall be started on railroad property until the necessary approvals have been obtained. The railroad insurance must be maintained until the date of physical completion of the project unless otherwise stated. However, the Contractor may make a written request to be relieved of the responsibility to continue all or part of the railroad protective liability insurance before the completion date under certain conditions. The details and conditions for this relief are specifically set forth in the special provisions of the contract. If the Contractor should make a request for relief, the Project Engineer should contact the Region Construction Manager and Utilities Engineer for guidance and assistance in coordinating this effort with the railroad.

1-2.2H Responsibility for Coordinating Work With Other Contracts

When two or more Contractors, including any utility or their contractor, are working in the same area, Section 1-05.14 of the *Standard Specifications* will apply. The Contractor shall not cause any unnecessary delay or hindrance to the other contractors on the work, but shall cooperate with other contractors to the fullest extent. Progress schedules and plans for all contractors involved should be reviewed by the Project Engineer to detect possible conflicts which might be resolved before a delay of work is experienced or extra costs are incurred as a result. If an adjacent project requiring coordination is known prior to holding a Pre-Construction meeting, it would be beneficial to invite principals from that project to the meeting.

1-2.2I Responsibility for Enforcement of Safety and Health Requirements

1-2.2I(1) General

All contractors doing work for WSDOT must provide safety controls for the protection of life and health of the Contractor's employees and other persons, for the prevention of property damage, and for the avoidance of interruptions in the performance of the work under the contract. As the owner contracting agency, WSDOT has the responsibility for enforcement of the provisions of the contract, however, provisions and regulations which are by law the fundamental responsibility of other agencies, both from the standpoint of interpretation and enforcement, should be monitored by

WSDOT, but with full recognition as to the responsibilities and authorities of those agencies. The Project Engineer will cooperate fully with the responsible agency.

Any violations noticed by the Project Engineer will be brought to the attention of the Contractor for correction. The Project Engineer will also notify the responsible agency (if that action is deemed necessary by the Region Construction Manager) and utilize such sanctions as are consistent with contract terms in assisting the responsible agency in enforcing laws, rules, and regulations.

The Contractor is obligated by law to comply with both State and Federal safety regulations. State regulations are administered by the Washington State Department of Labor and Industries under the Washington Industrial Safety and Health Act (WISHA). Federal regulations are administered by the Occupational Safety and Health Administration (OSHA) and the Mine Safety and Health Administration (MSHA) of the U.S. Department of Labor, which has jurisdiction over Federal safety requirements for pit and quarry operations up to the point where materials leave the quarry area or go into a batch plant. Inspectors from any or all of these agencies may review the Contractor's operations at any time. (See Section 1-07.1 of the *Standard Specifications*.) in order to fulfill WSDOT obligations to monitor contract operations in accordance with the above, the following procedures should be followed on both Federal-aid and non Federal-aid contracts.

1-2.2I(2) Precontract Preparation

- The Project Engineer shall obtain the WISHA manuals, particularly Safety Standards for Construction Work WAC 296-155, General Safety and Health Standards WAC 296-24, and General Occupational Health Standards WAC 296-62, and shall review them with the key field WSDOT inspectors to ensure reasonable familiarity to the extent that they can recognize important requirements.
- The Contract Plans and contract provisions should be reviewed to identify those aspects of the work meriting special attention from the standpoint of potentially dangerous types of work and hazard elimination.
- The project site should be reviewed to identify those aspects of the location that present hazards such as limited sight distance, confined spaces, difficult terrain, extreme temperatures, or exposure to biological and physical hazards associated with animals or humans.

1-2.2I(3) Preconstruction Duties

As part of the Preconstruction Meetings and Discussions (see Chapter 1-2.1C), the Contractor's safety program should be discussed. Some of the things that the Project Engineer may want to consider are:

- The contractual obligation of the Contractor for complying with State and Federal construction safety standards. (See Section 1-07.1 of the *Standard Specifications*.)
- The availability of the safety standards that apply to the contract.

- The accident prevention program of the Contractor — organization, staff, names of responsible individuals, meetings, training, reports, etc. A review of specific areas for which plans are required (especially those also affecting WSDOT personnel). These might include Fall Protection, Confined Spaces, Respirators, Hearing, and Hazardous Materials plans. Implementing a mechanism for employees to report “near misses” and/or work zone accidents.
- The Contractor’s responsibility for seeing that subcontractors comply with safety regulations.
- The Contractor’s plans for meeting specific safety requirements and for eliminating potentially critical hazards on the project for all Contractor employees, Contracting Agency employees, and the public.

1-2.2I(4) The P.E.’s Role in Safety on the Project

It is difficult to generalize about safety. It’s a judgment call which is dependent on risk, knowledge, authority to direct corrections, etc. As people, professionals and representatives of the State, Project Engineers have an obligation to take action if they become aware of a situation that presents an immediate threat. Project Engineers should advise their employees on what the lines of communication are and what the procedures are for alerting the responsible agencies with regard to serious safety hazards.

Employees should be made aware that the Contractor is obligated to make the work-site safe, to their satisfaction, for inspection activities. Anyone who is uncomfortable with access for inspection should inform their supervisor of the situation and expect resolution. Project personnel should also be made aware of project specific hazards and be trained in specific areas as the project warrants. For example; fall protection, confined space requirements, respirator training, lead paint hazards, hazardous material training, and exposure to medical waste (sharps). It is suggested that the expertise of the Regional Safety Officers or Headquarters Safety Office be utilized as appropriate.

Be aware that the construction contract requires the contractor to perform any measures or actions the Engineer may deem necessary to protect the public, and that the Engineer may suspend work if the Contractor fails to correct unsafe conditions. Project staff should continuously monitor the Contractors’ work activities for potential violations of legal safety requirements, and for any condition that poses an immediate threat to the health of any person. Immediately notify the Contractor upon becoming aware of any such condition.

Additional information, such as safety regulations and Department of Labor and Industry (L&I) contacts, are available on the Internet at <http://www.wa.gov/lni/>. Keep in mind that many WSDOT employees are not trained to interpret and apply safety regulations; however, employees need to have a reasonable understanding of what hazards may be encountered on a project. Many, but not all, of the requirements are listed under Chapter 296-155 WAC, “SAFETY STANDARDS FOR CONSTRUCTION WORK” under the various “Parts A through V”.

State L&I offers consultation service (advise is given) and enforcement (assessment of a violation would result in a citation being issued). A listing of phone numbers for the various L&I field offices is as follows:

- REGION 1 Offices

Bellingham Field Services Location	360 647-7300
Everett Field Services Location	425 290-1300
Mount Vernon Field Services Location	360 416-3000
- REGION 2 Offices

Bellevue Field Services Location	425 990-1400
Seattle Field Services Location	206 515-2800
Tukwila Field Services Location	206 835-1000
- REGION 3 Offices

Bremerton Field Services Location	360 415-4000
Port Angeles Field Services Location	360 417-2700
Tacoma Field Services Location	253 596-3800
- REGION 4 Offices

Aberdeen Field Services Location	360 533-8200
Longview Field Services Location	360 575-6900
Tumwater Field Services Location	360 902-5799
Vancouver Field Services Location	360 896-2300
- REGION 5 Offices

East Wenatchee Field Services Location	509 886-6500
Kennewick Field Services Location	509 735-0100
Moses Lake Field Services Location	509 764-6900
Yakima Field Services Location	509 454-3700
- REGION 6 Offices

Colville Field Services Location	509 684-7417
Pullman Field Services Location	509 334-5296
Spokane Field Services Location	509 324-2600

1-2.2I(5) Pedestrian Safety

When the work area encroaches upon a sidewalk, crosswalk, or other areas that are near an area utilized by pedestrians or bicyclists, special consideration should be given to their accommodation and safety. Pedestrians are more susceptible to personal injury in work areas than are motorists. Visibility and recognition of hazards is an important requirement for the safety of pedestrians and bicyclists.

Protective barricades, fencing, handrails, and bridges, together with warning and guidance devices, should be used so that pathways for pedestrians, bicyclists, equestrians, and other non-motorists are safe and well defined. Where walks are closed by construction or maintenance, an alternate walkway should be provided where feasible. Where it is necessary to divert pedestrians into the parking lane of a street, barricades and delineation should be provided to separate the pedestrian walkway from the adjacent traffic lane. Pedestrians should not be diverted into a portion of the street used by vehicular traffic. At locations where adjacent alternate walkways cannot be provided, pedestrians can be diverted across the street by placing appropriate signs at the construction limits and at the nearest crosswalk or intersection. When hazardous work conditions exist overhead, it may be necessary to install a fixed pedestrian walkway of the fence or canopy type to protect and control pedestrians. In such cases, wood and chain link fencing can be used with warning lights and illumination to warn and guide both pedestrians and motorists. These accommodations for pedestrians and bicycles should be included in Traffic Control Plans.

Fences around a construction area are often necessary and may be a requirement of the local jurisdiction building code. They are often constructed in conjunction with a special pedestrian walkway or when there are deep excavations or when pedestrian access to the job site is not desirable. Installation of such fencing must take into account relocation of existing control devices and facilities such as traffic signals, pedestrian signals, traffic signs, and parking meters. The use of chain link fencing which can be seen through may be needed at intersections to provide adequate sight distance.

Relocating a walkway without unreasonable inconvenience to pedestrians, residents, or commercial interest, is the safest practice of all. Remember, however, that pedestrians like to “see what’s going on”. Simply denying them access does not, of itself, prevent their encroachment onto the worksite. Sometimes it is advisable to design and construct a pedestrian observation area for this purpose.

1-2.2J Responsibility for Environmental Considerations

During the precontract period, the Project Engineer should obtain copies of the final Environmental Impact Statement and any special environmental studies related to the project. It is important that all key personnel become familiar with the environmental decisions considered during the design process. The contract documents should include necessary provisions for protection of the environment, including requirements that the Contractor secure permits from and abide by regulations of appropriate Federal, State, and local agencies. Any changes in contract work that may become necessary must also be reviewed to ensure conformance with the original intent, requirements, and commitments established during the environmental design of the project.

1-2.2J(1) Spill Prevention, Control, and Countermeasures (SPCC) Plans

Spill Prevention, Control, and Countermeasures plans are written by the Contractor to prevent, respond to, and report hazardous material spills in a safe and effective manner. SPCC Plans should include information regarding the project site and contractor activities as they relate to spill prevention, control, and response activities. Additionally, SPCC Plans should identify possible sources of hazardous materials, methods to prevent and control spills, and spill response procedures. Plans are written and maintained by the Contractor and are required on all WSDOT projects, regardless of the size or duration of construction activities.

SPCC Plans are applied to the life of a construction project and may need to be amended over time with changing conditions. Periodic inspections will ensure that the required preparation and preventative steps identified in the SPCC Plan have been taken to keep the site in compliance throughout the life of the project.

The *Standard Specifications* provide the complete list of required contents for the Contractors SPCC Plan in Section 1-07.15(1).

1-2.2K Responsibility for Environmental Compliance During Construction

The following procedure pertains to WSDOT personnel on all WSDOT contracts and contains duties and activities by persons other than the project staff, but all of which are related to construction contracts and affect the Project Engineer to one degree or another. The Project Engineer must stay aware of this procedure and follow it as written.

1-2.2K(1) Environmental Compliance Assurance Procedure

The purpose of the Environmental Compliance Assurance procedure is to recognize and eliminate environmental non-compliance events during the construction phase on Washington State Department of Transportation (WSDOT) construction sites, and to ensure prompt notification to WSDOT management and agencies. For purposes of this procedure, non-compliance events are defined as actions that are not in compliance with environmental standards, permits, or laws.

When any action (Notification Trigger) below occurs or if there are questions about compliance, the Project Engineer (PE) shall initiate this procedure to develop corrective actions to solve the identified problem. The Regional Environmental Manager (REM) will serve as a resource to the PE and give priority to addressing the actions, activities, or situations that stem from notification triggers. The PE and REM will work together on an appropriate response to the notification trigger to avoid or minimize environmental damage.

A. **Notification Triggers:** “Notification Triggers” (listed below) means an action, activity, or situation that requires the Project Engineer to implement the Environmental Compliance Assurance Procedure.

1. Notice from a resource agency that a violation has occurred;
2. Any action that, in the judgment of the REM, contractor or Project Engineer, may violate environmental permit conditions, agreements, or approvals for the project; or other environmental laws, ordinances, or regulations;
3. Any unauthorized work, activity, or fill in wetlands, shorelines, creek beds (including dry channels), other waters of the state, or critical habitat;
4. Any emergency protection activity that involves unauthorized placement of fill in wetlands, shorelines, creek beds (including dry channels) or waters of the state or for bank stabilization activities where fill or structures are placed on the bank;
5. Any action or project revision requested by an agency after a site inspection that may be in conflict with other permits;
6. Any spill, or release of hazardous materials, petroleum products, or chemicals to:
 - water or areas that have the potential to enter waters of the state (i.e. stormwater conveyances, ditches, swales, ground water).

- land, when the spill or release is an immediate threat to human health or the environment (i.e. dangerously toxic, explosive or flammable situations that result in severe or substantial consequences, etc.).¹

7. Any evidence of a release from a buried underground storage tank.
8. Any situation that results in a fish kill, or if dead or dying fish are discovered in the vicinity of the project;
9. Activities that monitoring shows are out of compliance.

B. Notification and Resolution Process: In the event of a notification trigger, the following steps shall be taken:

1. If a notification trigger is observed first by the contractor or REM, the contractor or REM shall immediately notify the Project Engineer.

2. The Project Engineer must:

Step 1. Immediately notify the Contractor of the situation, implement emergency response procedures including agency notification, and suspend all non-conforming work on the site.

Step 2. Immediately notify the Regional Environmental Manager (REM). Consultation with the REM must occur before any remediation actions are taken.

Step 3. In consultation with REM assemble the following information

- a. The activities that triggered the notification and why they occurred.
- b. Location of the work.
- c. Potential solutions to the problem, or if additional investigation is needed, the agreed upon course of action.
- d. Any related site constraints or safety issues.
- e. Urgency of the issue

Step 4. Notify his or her immediate supervisor.

Step 5. *Notify the Regional Administrator.

Step 6. In consultation with the REM, determine the resource agencies having jurisdiction and who will notify them.

Step 7. Document all actions, conversations and activities.

3. The Regional Environmental Manager must immediately:

Step 1 *Notify the Director of Environmental Services.

Step 2. Notify his or her immediate supervisor.

Step 3. Work with the Project Engineer to resolve the issue that caused the notification trigger.

Step 4. Identify and obtain appropriate permits or permit revisions with the aid of the Project Engineer.

Step 5. Document all actions, conversations, and activities. Communicate issues and send appropriate documentation to Regulatory and/or Resource Agencies.

4. *The Director of Environmental Services must immediately:

Step 1. Notify Compliance Branch Manager and any other ESO Program Managers associated with the resource issue.

Step 2. Notify Director of Environmental & Engineering Programs.

Step 3. Notify the Regional Environmental Manager that the Director of Environmental & Engineering Programs has been contacted. Regional Environmental Manager must then notify the Project Engineer that the reporting procedure has been completed.

5. *The Regional Administrator will:

Step 1. Coordinate with the Director of Environmental & Engineering Programs to contact the Assistant Secretary of Engineering and Regional Operations advising him or her of the situation, and provide updates as needed on the situation.

Step 2. Ensure that the Project Engineer and the Regional Environmental Manager have the necessary resources, authority and organizational support to successfully resolve the Non-complying activity.

C. Timing: Due to costs of project delays, or risk of not acting quickly during emergency situations, the REM shall provide a 24 hour contact person for environmental consultation.

- D. Documentation:

1. The Project Engineer shall document the details of the notification and non-complying activity resolution in the contract records.

2. The Regional Environmental Manager shall maintain a record of all regional non-compliance events. REMs shall collect and maintain, at a minimum, the following data on all non-compliance events:

- a. Project name and Location
- b. PE and Prime Contractor
- c. Incident Date
- d. Incident Description
- e. Permit/Regulation Violated

¹ Note: All spills need to be contained and disposed of and reported properly. Follow the procedures outlined in the project specific Spill Prevention, Control and Countermeasures Plan (SPCC).

- f. Resource Agency(s) notified and date of notification
- g. Whether or not resource agency staff conducted site review in response to notification
- h. Record of Notice Of Violation and/or penalties issued

The REM shall provide all regional non-compliance tracking data to ESO Compliance Branch Manager for the purposes of annual reporting and review of compliance performance.

3. The Project Engineer and the Regional Environmental Manager shall coordinate and prepare the appropriate response to the regulatory and/or resource agency. The response shall include documentation about the non-compliance event and how it was resolved, including any preliminary mitigation solutions.

E. Roles and Responsibilities:

1. "Project Engineer" is the person responsible for the project and administration of the construction contract. This responsibility may be delegated to a subordinate employee on site, but the ultimate responsibility for making sure these procedures are followed will be with the Project Engineer. The Project Engineer shall have a thorough knowledge of all of the environmental permit conditions and design requirements for the project, and have such certifications and other qualifications as may be required.
2. "Regional Environmental Manager" is the person responsible for administering the regional environmental program. This responsibility may be delegated to a subordinate employee with knowledge of environmental permitting and procedures, but the ultimate responsibility for setting and interpreting regional environmental policy will be with the Regional Environmental Manager.
3. "Contractor" is as defined in Section 1-01.3 of the *Standard Specifications* for Road, Bridge, and Municipal Construction.

**Denotes that the action is mandatory when the non-compliance event 1) results in agency enforcement staff coming on site to conduct enforcement review; and/or 2) there is a high likelihood the event will result in a Notice Of Violation or a monetary penalty.*

1-2.2L Responsibility for Posting Required FHWA and State Labor and Industries Job Site Posters

A combination of both State and Federal laws require that on all WSDOT administered contracts some or all of the posters listed below are to be posted at the place of employment such that all employees have ready and free access to inspect their contents. The Project Engineer must ensure that the Contractor complies with these requirements.

- FHWA 1495 and 1495A — Wage Rate Information
- FHWA 1022 — Fraud Notice Poster
- OFCCP-1420 — Equal Employment Opportunity is the Law
- WISHA F416-081-099 — Job Safety and Health Protection
- F242-191-909 — Notice to Employees (L&I)
- F700-074-909 — Your Rights as a Non-agricultural Worker
- EMS 9874 — Notice to Employees (Emp. Security)
- Copy of approved Statement of Intent to Pay Prevailing Wages
- Copy of prevailing wage rates from the contract provisions

If Federal funds are involved, all of these posters are required. If only State funds are involved, the first three do not apply. After contract execution and before work begins, the Contractor should be given a package containing the appropriate required job site posters. This package should also be accompanied by either a written or verbal explanation of the contents and include notification that the Contractor, each subcontractor, and each lower-tier subcontractor will have to post a copy of the State L&I approved Statement of Intent to Pay Prevailing wages. This action shall be specifically noted in the project records.

1-2.2M Responsibilities When Working on Tribal Lands

Indian nations have the political distinction of being sovereign. This is different from being designated as having protected group status based on racial classifications. Being sovereign, tribes have the ability to create and enforce tribal ordinances such as Tribal Employment Rights Ordinances (TERO). These are legal requirements pertaining to work within the boundaries of the reservation which are enforced by the respective tribes. When a contract includes work on a reservation, the project should include a general special provision "Indian Preference and Tribal Ordinances" that alerts the contractor to the possibility that TERO requirements may apply and provides a contact person for the tribe. The provision also reminds the contractor to bid any costs associated with TERO compliance into associated items of work. TERO requirements may take a variety of forms, some of which are listed in the noted provision. The provision also notes that complying with TERO requirements shall not be a violation of the contract equal employment opportunity requirements. The end result is that the contractor is expected to comply with TERO requirements as they would any other legal obligations. The underlying intent is to reduce Indian unemployment and most tribes are willing to work with contractors to best meet this goal. We want to avoid creating any contractual requirements that interfere with their ability to do so. Our role is to assist in communication but not become involved in determining or paying the tax.

1-2.2N Responsibilities Following Unanticipated Discovery of Cultural Resources

Given the wealth of historical and archeological resources found in Washington, the Project Engineer should be familiar with the requirements of the National Historic Preservation Act (NHPA), *Standard Specification* 1-07.16(4), and any contract specifications regarding the discovery of cultural resources. The Project Engineer should discuss these requirements with the Contractor and WSDOT staff at the Pre-Construction Conference. These resources include, but are not limited to:

- Human skeletal remains,
- Anthropogenic soil horizons (areas showing the influence of humans on nature), occupational surfaces (areas showing evidence of human activity or habitation), midden (refuse heap), etc.,
- Areas of charcoal or charcoal-stained soil and stones,
- Stone tools or waste flakes (i.e. arrowheads or stone chips),
- Bones, burned rocks, or other food related materials in association with stone tools or flakes,
- Clusters of in cans or bottles,
- Logging or agricultural equipment more than 50 years old.

The Project Engineer will include a project-specific unanticipated discovery plan (UDP) in the project provisions for use by the Contractor. A sample of may be found at <http://www.wsdot.wa.gov/eesc/environmental/culres/default.htm>. The Cultural Resources Office, at the Headquarters Environmental Services Office, will assist with completing the plan.

1-2.2N(1) Discovery of Human Skeletal Remains

The following guidance is given to assist the Project Engineer when construction activities cause disturbance to human skeletal remains. All human skeletal remains, which may be discovered, shall at all times be treated with dignity and respect.

Should any WSDOT employee, contractor, or subcontractor believe that he or she has discovered human skeletal remains; the following steps shall be initiated:

1. Ensure that all work adjacent to the discovery has ceased. The area of work stoppage shall be adequate to provide for the total security and protection of the integrity of the human skeletal remains.
2. The Project Engineer shall:
 - a. Notify the Region Construction Manager.
 - b. Immediately notify the local coroner and the local sheriff, or other appropriate law enforcement official, requesting that a person who is competent and qualified to identify human skeletal remains be present. Do not call 911 or the media.

- i. No persons other than the coroner or proper law enforcement personnel, WSDOT Cultural Resources staff, SHPO (State Historical Preservation Officer), and DAHP (Department of Archeological and Historic Preservation) staff will be authorized direct access to the discovery location. This access must comply with all safety and security procedures.

- ii. The coroner will make a determination as to whether the human skeletal remains are forensic (evidence of a possible crime) or non-forensic (historical). If the human skeletal remains are determined to be forensic, the coroner will retain control of the human skeletal remains and the discovery site will be treated as a crime scene. If the human skeletal remains are determined to be non-forensic, the coroner will notify DAHP.

- iii. The DAHP state physical anthropologist will make the initial determination as to whether the human skeletal remains are of Native American ancestry. If the human skeletal remains are determined to be of Native American ancestry, DAHP will notify the affected tribe(s).

- c. Notify the WSDOT Cultural Resource Manager at HQ Environmental Services, who will notify:
 - i. Regional FHWA Administrator
 - ii. State Historic Preservation Officer (SHPO)
 - iii. WSDOT Tribal Liaison Office. The WSDOT Tribal Liaison Office will contact the affected tribe(s) and notify them of the unanticipated discovery.
 - iv. Region Environmental Manager

3. If the human skeletal remains are determine to be of Native American ancestry, tribal access will be allowed to the designated representative(s) of the affected tribe(s). WSDOT and FHWA will make a good faith effort to accommodate requests from affected tribe(s) to be present, prior to implementation of mitigation measures. The Project Engineer, WSDOT Cultural Resources, SHPO, and the affected tribe(s), in consultation, will determine what treatment is appropriate. If disinterment of Native American remains becomes necessary, FHWA, WSDOT, SHPO, and the affected tribe(s) will jointly determine the final custodian of the human skeletal remains for re-interment.

1-2.2N(2) Discovery of Other Cultural Resources

The following guidance is given to assist the Project Engineer when construction activities cause the disturbance of cultural resources, other than human skeletal remains.

Should any WSDOT employee, contractor, or subcontractor believe that he or she has uncovered a cultural resource, at any point in the project, the following steps should be initiated:

1. Ensure that all work adjacent to the discovery has ceased.
2. Immediately notify the Project Engineer. The Project Engineer shall immediately notify:
 - a. The Regional Construction Manager
 - b. The WSDOT Cultural Resource Manager at HQ Environmental Services who will notify:
 - i. FHWA Regional Administrator
 - ii. State Historic Preservation Officer (SHPO)
 - iii. WSDOT Tribal Liaison Office.
 - iv. Region Environmental Manager
3. Ensure that the area of work stoppage is adequate to provide total security and protection of the integrity of the resource. Vehicles, equipment and unauthorized personnel will not be permitted to traverse the site, nor will work resume, until treatment of the cultural resource is completed.
4. All archeological deposits discovered during construction are to be treated as if they are eligible for inclusion in the NRHP (National Register of Historical Places). Intentional disturbance of archeological sites without a permit from DAHP is prohibited by RCW 27.35. Disturbance of Indian burials, cairns and glyphs is prohibited by RCW 27.44.
5. If cultural resources are discovered, but additional project effects to the resource are not anticipated, project construction may resume, away from the site of the discovery, while documentation and assessment of the resource proceeds.

1-2.3 Construction Traffic Control

1-2.3A Public Convenience and Safety

1-2.3A(1) General

Under the many special conditions encountered where traffic must be moved through or around construction operations, serious problems of traffic control can occur. Most conditions are temporary and are, therefore, dangerous and difficult to deal with because they are unexpected and not in accordance with the normal pattern of highway traffic. Section 1-07.23(1) of the *Standard Specifications* requires the Contractor to conduct all operations with the least possible obstruction and inconvenience to the public and to provide adequate safeguards, safety devices, protective equipment, and any other needed actions to protect the life, health, safety, and property of the public. The responsibility to comply with these requirements is the Contractor's. It is the Project Engineer's responsibility to ensure that the Contractor complies.

1-2.3A(2) Work Zone Clear Zone (WZCZ)

When a project requires traffic control, a Work Zone Clear Zone (WZCZ) shall be established and will apply during both working and non-working hours. During non-working hours no equipment or materials shall be within the WZCZ, unless it is protected by permanent guardrail or temporary concrete barrier (location and installation to be approved by the Project Engineer). During working hours, unless protected as stated for non-working hours, only materials or equipment absolutely necessary to construction shall be allowed in the WZCZ or allowed to park on the shoulder of the roadway.

The minimum clear zone distance, measured from the edge of traveled way, shall be based on the posted speed as follows:

Posted Speed	Distance From Traveled Way
35 mph or less	10 Ft.
40 mph	15 Ft.
45 to 55 mph	20 Ft.
60 mph or greater	30 Ft.

Any deviation from these requirements shall only be allowed if the Contractor has requested the deviation in writing and the Engineer has provided written approval. The Region Traffic Office should be contacted to help evaluate the deviation and determine if the requested deviation is approvable.

1-2.3A(3) Temporary Breaks in Limited Access for Construction

The Federal Highway Administration (FHWA) cannot delegate its approval authority to add access points to existing limited access controlled Interstate facilities through the WSDOT-FHWA Stewardship Agreement. The FHWA has granted approval to break limited access in order to gain access to the worksite from adjacent properties. This approval was granted through the FHWA approval of Standard Specification Section 1-07.16. This approval does not extend to allowing the contractor to use this access to merge construction vehicles and equipment with public traffic in the traveled way, auxiliary lanes or shoulders. It is therefore necessary to seek approval from the FHWA when proposing to break limited access and merge construction vehicles with public traffic in the traveled way, auxiliary lanes, or shoulders.

Standard Specification Section 1-07.16 allows the contractor to access the worksite from adjacent properties but does not allow the contractor to merge construction vehicles or equipment (including contractor workforce vehicles of any type) from that access with public traffic. Standard Specification Section 1-07.23 allows the Interstate highway system to be accessed through existing facilities or through access points allowed within the contract only. These access points allowed in the contract will either be in the form of site specific traffic control plans or by contract provisions included in the contract documents.

A General Special Provision (GSP) to allow the contractor to merge construction vehicles with public traffic in the traveled way, auxiliary lanes or shoulders may be included in the contract provisions. Consultation with Region and Headquarters Design and approval by the FHWA must occur prior to deciding to include this GSP in a contract on Interstate facilities.

If the contractor proposes to merge construction vehicles with public traffic in the traveled way, auxiliary lanes or shoulders and the contract contains the GSP that allows this access, then the contractor shall submit a site-specific plan for traffic control in accordance with the MUTCD Part VI. The Region Traffic Engineer should review this plan and it should be submitted to FHWA.

During construction on Interstate projects the Project Engineer will notify the FHWA Area Engineer by sending them a copy of the approved vicinity map showing the location of the access break and site-specific traffic control plan. FHWA approval of a PS&E containing this GSP constitutes approval of access from adjacent properties to the traveled way, auxiliary lanes or shoulders.

While some contracts may not contain provisions for breaking limited access for construction and for merging of construction vehicles with mainline and/or interchange ramp traffic, the contractor may request one. If the Region agrees and the project is on limited access controlled Interstate, the FHWA Area Engineer shall be contacted for approval. The contractor shall submit a vicinity map showing the location of the access break, a site-specific plan for traffic control in accordance with the MUTCD Part VI, and the duration for which the accesses will be in operation. On non-interstate limited access controlled facilities, approval will be required by the Region. If approval is granted and the facility is a limited access facility, the GSP will be added to the contract by change order. On all other roadways the Project Engineer may approve the access with Region concurrence.

1-2.3B Public Information and Customer Focus

Most drivers still have the expectation of proceeding to their destination with little or no delay even though traffic conditions on many of our highways are deteriorating, primarily due to increased traffic volume. This increased volume may create congestion, delays, accidents and aggressive driving during normal daily operation. Highway construction will usually require a more restricted roadway to accommodate work zones and can further reduce traffic mobility and safety. Even some of our lower volume rural highways can present a challenge due to factors such as drivers not expecting construction work and seasonal/recreational traffic increases. Construction and user delays present significant costs in addition to costs associated with crashes and worker safety. These delays and costs can be minimized by implementing a traffic control strategy based on traffic conditions and construction requirements, and which includes public information and customer focus considerations.

Our goal on every highway construction project should be to provide the best overall balance of work zone safety and traffic mobility while constructing quality highway projects. Much of our effort is directed at engineering responses to safety and mobility issues and is generally included in the contract requirements. Recent customer focused highway construction studies have shown that accurate and timely project information is a valuable element in an overall traffic control strategy. Advance planning and coordination between the project engineer and contractor is necessary to ensure that there is an opportunity to provide public information for all phases of the project that impact traffic. Proper use of public information and customer focused techniques will provide safety and mobility benefits that would not otherwise be gained, as listed below:

- Alert drivers to potential delays by advance notice through project signing and the news media that would allow drivers to take alternate routes, adjust scheduled trips and have better awareness of traffic impacts and how to avoid them.
- Provide benefits to the Contractor from reduced traffic volume and better driver awareness through fewer crashes, less material delivery delay, better worker safety, fewer complaints and overall public acceptance of the project.
- Achieve better driver acceptance, reduced aggressive driving and improved work zone credibility by minimizing delays and providing accurate and timely information.
- Consider innovative construction techniques and shorter term intense work stages with more severe traffic restrictions, such as weekend closures, if possible.
- Closely monitor traffic conditions when traffic is restricted to determine the need for any traffic control or work hour adjustments that would improve traffic flow. Specified working hours and the accompanying traffic restrictions are critical elements of the project traffic control strategy and should not be adjusted without proper traffic analysis.
- Maintain ongoing communication during the life of the project with local law enforcement, emergency services, local agencies, transit groups, affected local businesses, etc.
- Continue use of innovative devices such as portable, changeable message signs, project information signs with information phone number and highway advisory radio systems.

The Regional Construction Manager, Traffic Engineer, and Public Information Officer should be involved in the project traffic control strategy and may be able to offer assistance.

1-2.3C Work Zone Traffic Control

1-2.3C(1) General

The primary function of work zone traffic control is to move vehicles and pedestrians safely through or around work zones while protecting on-site workers and accommodating the contractor's construction operations.

All work is to be performed by the contractor under the contractor's control and supervision. All resources are to be provided by the contractor unless the Special Provisions of the contract specifically states that the department will provide some resource(s), what those resources will be and how they are to be utilized. Such provided resources will be placed in the contractor's control to be used in the contractor's operation. Any additional resources provided to the contractor during the project should be accompanied by a change order to the contract and, where appropriate, a price reduction.

The "General" requirements for traffic control (Section 1-10.1) address the responsibility to provide adequate traffic control measures at work zones as follows:

- No work shall be done until all necessary signs and traffic control devices are in place and/or conflicting and confusing signs are covered.
- If the Contractor does not provide necessary traffic control, WSDOT may do it and deduct the cost from the Contractor's payments.
- The Contractor is responsible regardless of whether or not WSDOT orders, furnishes, or pays for necessary traffic control.

It is important for the Project Engineer to ensure that the Contractor has an approved traffic control plan in place and implemented providing all necessary signs and other traffic control devices so that the traveling public is aware of all deviations from the normal traffic conditions and is furnished adequate direction and guidance to permit safe travel through the construction area.

WASHINGTON STATE PATROL (WSP) TRAFFIC CONTROL ASSISTANCE

Washington State Patrol (WSP) troopers may fulfill two roles on a construction project. In the first case, troopers may be dispatched to participate in the Contractor's traffic control activity, perhaps as Flaggers or Spotters, perhaps to operate a vehicle during one-way piloted operations or rolling slowdowns. The WSP role will be defined in the contract provisions.

WSDOT has an agreement, GC9131, with the Washington State Patrol (WSP) for that agency to provide troopers and vehicles to help with traffic control on construction projects. WSP traffic control assistance is considered an enhancement to the required work zone traffic control and should be reserved for those work zones that have unusual hazards or a high degree of worker exposure to traffic, which cannot be addressed by traditional traffic control means.

The Project Engineer should ensure that good communication is maintained with WSP troopers assigned to the project and that the appropriate traffic control strategy is applied. On each shift of WSP traffic control assistance, Form 421-045, WSP Field Check List, shall be filled out. WSDOT will fill out the top portion of the form and give it to the WSP trooper on the project to complete. At the end of the officer's shift, the completed form shall be returned to WSDOT.

The Contractor shall direct the activities of the WSP troopers assigned as a labor resource provided by the State.

Instructions for WSP assistance are in Instructional Letter "IL 4008.00" and the *Traffic Manual* M 51-02.

The second case of WSP involvement is in the area of enforcement. In this case, the troopers are not considered to be a State-provided resource and do not participate in the Contractor's traffic control work. When this situation occurs, WSP is present (at WSDOT expense) to provide enhanced, increased and visible enforcement of all traffic regulations, including those installed by the Contractor in the course of the work.

Enforcement officers are simply doing more of what they usually do. Their presence or lack of presence is due to administrative decisions by the department and WSP that are completely independent of the contract. They are not to be considered a provided resource, there shall be no entitlement to their services and neither the Contractor nor the Project Engineer shall direct their activities.

As stated above, a mid-project decision to provide troopers would be a change order. To be fair to unsuccessful bidders, such a change would need a price adjustment if nothing else had changed.

1-2.3C(2) Traffic Control Management

GENERAL

"Traffic Control Management" (Section 1-10.2) addresses the requirements and duties of the Contractor's management personnel responsible for traffic and the Traffic Control Supervisor (TCS). The Contractor has the responsibility for managing traffic control and providing safe traffic control measures that are appropriate for the type of work and consistent with the requirements of the contract plans and specifications. The Contractor's traffic control work is a contract activity. Just like other contract activities, it is associated with pay items. The activity must be inspected for adequacy and conformance with the contract. Once it is performed and inspected, associated contract items must be measured and paid. Traffic management actions affect not only the Contractor's work operations, but also those of subcontractors. The process for coordinating and approving those actions must be well defined and consistent with the contract requirements.

Contractor management and the TCS work together with the Project Engineer and WSDOT's traffic control contact person to address traffic control issues as the work progresses. Planning and coordination of the Contractor's work efforts with appropriate traffic control measures are the primary responsibilities of contractor management. It is also the responsibility of management to ensure that any adopted State-provided or approved Contractor-proposed Traffic Control Plans (TCPs) needed to implement the contract work operations are provided to the TCS and that any necessary resources to implement the TCP are available.

TRAFFIC CONTROL SUPERVISOR

The TCS ensures that the traffic control measures shown on the approved traffic control plans (TCPs) are properly implemented, operating, and documented on the project. The Contractor's TCS may not be required full time on the project, but is required to perform all the duties required by the specifications. When the Contractor is working multiple shifts, it may be necessary to have more than one person assigned to the role.

In addition to the Contractor's responsibility to designate a Traffic Control Supervisor, WSDOT may designate a DOT employee who is qualified, but not necessarily certified, to serve as the State's traffic control contact. It is intended to have qualified, trained representatives from both the Contractor and WSDOT work together to achieve safe traffic control operations on the project.

Among the duties of the Project Engineer in the area of Traffic Control are the following:

- **Communication:** About the planned work, traffic control needed and adjustments to the approved Traffic Control Plan. During the work, to stay aware of changes, events and issues.
- **Monitoring:** The activities of the Contractor TCS and traffic control workers. The status of signs and control devices. Conformance with specifications and requirements.
- **Documentation:** Obtaining and reviewing daily reports. Handling Traffic Control Plans and their approvals.
- **Coordination:** With adjacent projects, with DOT Traffic offices, notices to the media.

The Project Engineer may assign these duties in any manner. It would make sense to include the State's traffic representative in these activities.

When reference is made to the "Traffic Control Supervisor (TCS) in these provisions or in the *Standard Specifications*, it shall mean the Contractor's Traffic Control Supervisor unless stated otherwise.

TRAFFIC CONTROL PLANS

"Traffic Control Plans" (Section 1-10.2(2)) addresses the requirements of Traffic Control Plans (TCPs). The Contractor must either adopt the TCPs appearing in the contract or propose modified TCPs to be used for the project. The Contractor must submit proposed modifications to plan TCPs or alternate plans at least ten calendar days in advance of the time the traffic control will be required. Approval of these plans must be obtained before the work can begin.

The possibility of alternate plans is covered by the contract. No change order will be needed because of that reason. However, if a price adjustment is needed then a change order will be necessary to accomplish that. We would allow additional payment, either through added units or revised lump sums, only if the original contract TCP was shown to be inadequate or in the case of traffic control needed for another change in the work. If the proposal is only for contractor convenience or preference, then a discussion of no pay for added traffic control or a credit for less traffic control would be appropriate. If the contractor should balk at this, the response could be "build according to plan."

Minor modifications to the TCP may be made by the Traffic Control Supervisor to accommodate site conditions. Modifications or adjustments to the plan must maintain the original intent of the plan. When there is a change in the intent and/or substantial revisions are needed, a revised TCP shall be submitted for approval through the TCM to the Project Engineer. The Regional Traffic Office should be consulted when this situation occurs. Again, changes may call for a formal change order.

Traffic Control Plans should not only address all work zones and standard devices and signs but should also address issues such as:

- Conflicting or temporary pavement markings
- Maintaining existing operational signs and covering conflicting signs
- Staging requirements
- Temporary vertical or lateral clearance restrictions
- Temporary work zone illumination
- Consistency with any existing work hour restrictions
- Position of positive barriers for traffic hazards or worker protection
- Vertical drop-offs
- Work zone access
- Intersection or access control (traffic signals, road approaches)
- Pedestrians and bicycles
- Work zone capacity and related mobility impacts

If the Contractor's method of operation or the work area conditions require other than minor modification of the specific TCP appearing in the contract or any of the TCP's previously designated and adopted by the Contractor, the Contractor shall submit a proposed modification of the TCP for approval. If the Contractor's proposed modifications comply with the MUTCD requirements and are consistent with contract requirements as well as State and Region policy, the Project Engineer may approve these proposed modifications (perhaps utilizing a change order, if appropriate.) If the Contractor's proposed modifications do not comply with the MUTCD requirements, the Project Engineer should consult with the Region Traffic Engineer.

Any Contractor proposed TCP or modifications to an existing TCP should be evaluated for their effects on work zone safety and mobility. The Project Engineer should refer to the guidance in the *Design Manual* Chapter 810 Work Zone Safety and Mobility when evaluating how the new TCP works within the projects overall Transportation Management Plan (TMP).

If there is any doubt that the proposed TCP complies with the MUTCD or provides for the safe movement of traffic, the Project Engineer shall consult with the Region Traffic Engineer or the Region Construction Manager.

CONFORMANCE TO ESTABLISHED STANDARDS

“Conformance to Established Standards” (Section 1-10.2(3)) addresses the requirements for standards and condition of flagging, signs, and all other traffic control devices. In addition to standards established in the latest adopted edition of the “*Manual on Uniform Traffic Control Devices*” (MUTCD) and/or as specified in the contract plans, the “National Cooperative Highway Research Project, 350” (NCHRP 350) has developed requirements for safety of four categories of traffic control devices. Category 1 devices consist of small lightweight devices that generally do not present a hazard. Typical Category 1 devices are cones, tubular markers, and plastic drums with no attachments. Conformance to NCHRP 350 for Category 1 is described in Section 1-10.2(3). The Contractor is required to keep the manufacturer’s certification document on file and available for inspection if needed. Inspection of certification documents by WSDOT is not routinely required but should be considered if operational or safety issues are observed.

Category 2 contains devices that are more hazardous due to their rigid construction, such as barricades, portable sign stands, intrusion alarms, and drums with lights. The collision test certification rules apply to all new Category 2 devices. The Inspector should verify, and document, that all portable sign stands have an identifying label affixed. The label will display the FHWA approval letter designation and will appear similar to the image below.



Category 3 devices are fixed or substantial in mass and could cause significant damage to a vehicle or its occupants. Devices such as barriers, fixed sign supports, and TMAs are included in this category. WSDOT approved devices in this category currently meet NCHRP 350 standards.

Category 4 devices are typically trailer or truck mounted and could cause significant damage if impacted by an errant vehicle. Devices such as arrow boards, PCMS, portable signals, and portable lighting units are included in this category. Crash testing is not required for these devices.

1-2.3C(3) Traffic Control Labor, Procedures and Devices

1. TRAFFIC CONTROL LABOR

All traffic control labor must be trained with a video about safety in the work zone. Flaggers and spotters have additional requirements concerning flagging cards and apparel.

All flaggers and spotters working on WSDOT construction projects must have a valid State of Washington flagging card or a flagging card issued by the states of Oregon, Montana, or Idaho. Flaggers and spotters are required to wear high visibility clothing as specified in Section 1-07.8 of the *Standard Specifications*. Other workers involved in traffic control may certainly use this type of clothing, but doing so is not a contract requirement.

Flaggers used as spotters to protect an exposed work crew may be considered appropriate if other worker safety measures are not feasible. Before the Project Engineer approves the use of a spotter not shown on a contract plan, careful evaluation of the hazards involved should indicate that the spotter could actually provide a safety benefit to the work crew without undue risk to the spotter.

FLAGGERS AND SPOTTERS

Typically, flaggers have the highest exposure to traffic hazards and are more frequently injured or killed than other workers. Flaggers should only be used when all other forms of traffic control are inadequate to control traffic. When flaggers are used, flagging stations must be shown on the TCP along with the required illumination, warning signs and devices. Flagger stations should be protected with a positive barrier, if possible. The flagger should also have in mind an “escape plan” to avoid errant vehicles. It is not recommended to use flaggers at locations, such as freeways, where their primary function of warning or directing traffic is ineffective or not intended. Use of flaggers to exclusively display the “SLOW” message is also not recommended and is, in fact, not required by the contract. The provisions call for a flagger with intermittent responsibilities to direct traffic to step back from the flagging station between tasks. Additional guidance on the use of flaggers is located in the “*Traffic Manual*” and the “*Work Zone Traffic Control Guidelines Book*.”

OTHER TRAFFIC CONTROL LABOR

For some projects, labor in addition to the assigned Flaggers and Spotters is needed for a variety of traffic-related tasks. Some of these tasks are listed in the provisions. Hours for this item are measured only for work on certain defined tasks (see Section 1-10.4(2)).

2. TRAFFIC CONTROL PROCEDURES

ONE-WAY TRAFFIC CONTROL

The major points to note in Section 1-10.3(2)A are:

- The provision does not limit one-way traffic control to treated bases, surface treatments, and pavements. This type of configuration can be used in other operations, such as grading, when appropriate.
- Line of sight is important in coordination of side roads and approaches with the limits of the one-way operation.

- When the contract does not stipulate a pilot car operation (i.e., bid proposal does not include such an item,) a new item can be established by change order if the Engineer deems that method of traffic control to be most appropriate; and
 - Contractor vehicles and equipment may utilize the closed lane in any manner. The one-way controlled open lane is for public traffic and, should the contractor use that lane, all rules and procedures applicable to public traffic will apply to the contractor. There will be no “wrong-way” travel in the open lane, no heavy equipment will join the public traffic and any additional traffic control will be performed according to approved plans only.
 - The contractor is required to plan and conduct operations so that the roadway can be reopened to two-way traffic at the end of the shift. If the nature of the work prevents this, or if the work area is left in a condition unsafe for public two-way traffic, then the contractor must continue the one-way operation throughout the off-shift hours.

ROLLING SLOWDOWN

This can be a useful method of creating gaps in traffic for very short-term activities. The key is planning and communication. If all goes well, the gap will arrive at the site and be of long enough duration that the activity can be completed. If this breaks down, the contractor must undertake the most expeditious method of restoring the open roadway. If demobilizing and pulling off is faster than finishing the task, then demobilizing is the path that will be followed, without regard to cost, efficiency or schedule.

LANE CLOSURE SETUP/TAKEDOWN

The use of truck-mounted attenuators with arrow boards is required by the provisions. This combination is to be used during the transition from open lane to closed lane. Once a lane is closed, the TMA may be removed, leaving the arrow board alone.

MOBILE OPERATIONS

The key to this operation is to keep the traffic control equipment effectively close to the work and moving to match the work operation. Two traffic protection devices are used. One is a TMA/Arrow Board combination upstream of the work. The primary purpose of this device is to protect the errant vehicle from fixed object collisions. The second device is immediately adjacent to the work area. Its purpose is to protect the workers from the errant vehicle.

PATROL & MAINTAIN TRAFFIC CONTROL MEASURES

This activity is to observe, repair and maintain traffic control devices and layout. The provisions require an hourly visit to each device and layout. Depending on the extent of the control measures, more than one patroller may be required.

3. TRAFFIC CONTROL DEVICES

CONSTRUCTION SIGNS

The standard of these provisions is that the contractor provides all signs, posts and supports. If the special provisions do not promise that some or all of these will be furnished by the State, then the contract requires the contractor to do it all.

“Do Not Pass” and “Pass With Care” signs are the responsibility of the Contractor. The provisions explain how to determine the number of these and that determination is to be made by the Contractor as well.

Construction Signs (Section 1-10.3(3)) divides construction signs into two categories, Class A and Class B, and lists the work required for the Contractor.

At no time should signs be left in traffic control position during periods when they are not necessary to traffic safety. Indiscriminate use of traffic control signs soon destroys public confidence and respect for the signs. Unnecessary traffic restriction and inconvenience tends to reduce the effectiveness of all signing and causes difficulty in enforcement by authorities. The Project Engineer should ensure that signs are removed or completely covered with metal or plywood during the hours they are not needed, either before or after working hours and on nonworking holidays or nonworking weekends.

Signing for nighttime traffic is more difficult than that required for daylight hours. A review of the project signing should be made and recorded during the hours of darkness.

Signs and other traffic control devices should be shown on the traffic control plan (either State-provided or contractor-submitted) approved and in use and should be installed with adjustments for work zone and traffic conditions. The Contractor and WSDOT should ensure proper use and placement of signs and devices. For situations not addressed by the TCPs, the Project Engineer will determine who is responsible for preparing a revised TCP. Refer to the Work Zone Traffic Control Guidelines Book, MUTCD, or seek assistance from the Region Traffic Engineer for appropriate TCP revisions. A modified or new TCP may be needed if adjustments to signs and devices do not adequately address existing hazards or resolve observed traffic problems or accidents.

Judgment will be required when a traffic control plan is changed. The project engineer must determine if the change has arisen because of a flaw in the original plans or because of the contractor’s activities or preferences. In the first case, a change order, perhaps with compensation, may well be needed.

The remaining devices listed in the provisions are the following:

SEQUENTIAL ARROW SIGNS

PORTABLE CHANGEABLE MESSAGE SIGN

BARRICADES

TRAFFIC SAFETY DRUMS

BARRIER DRUMS

TRAFFIC CONES

TUBULAR MARKERS

WARNING LIGHTS & FLASHERS

TRUCK-MOUNTED ATTENUATOR

The specifications for these devices should be sufficient to explain their use and requirements.

1-2.3C(4) Measurement

Measurement is the key element of the new provisions, which now contain lump sum bid items. The provisions will define one of several pay item strategies, which will determine the measurements to be made.

First, the “normal” project with these provisions will contain items. The items are different from previous contracts and are non-standard, although several have very similar item names. Each of these is described below.

Instead of items, the project may be designated as a “Total Project Lump Sum.” This will be the case if the item “Project Temporary Traffic Control, Lump Sum” is included in the proposal. If this is the strategy of the project, then all measurement and payment provisions for all other pay items are deleted from the contract. When this occurs, then all temporary traffic control costs of whatever nature (everything defined in Section 1-10) are included in the lump sum.

The project may be a lump sum hybrid. In this case, the Total Project Lump Sum item will be present, but the provisions will reinstate one or more of the deleted standard items. If that happens, the measurement and payment of the reinstated item(s) will be separate from and not included in the lump sum.

These are the items and a discussion of the features of the measurement spec for each:

Traffic Control Supervisor (lump sum). Previously paid by the hour, this item is now a fixed cost. Overtime is not considered, a second TCS for a night shift makes no difference. This lump sum status will likely cause TCS to become a part of change order negotiations. If the change does, in fact, require additional TCS work, then there would be entitlement. This will also apply to extended contract duration, as the TCS can be considered part of on-site overhead.

Flaggers and Spotters, (per Hour). This contract activity is separated from other kinds of traffic control labor. It is measured according to the hours that an approved flagging station is manned. We will not count minutes and seconds; time will be rounded up to the half hour as specified in

Section 1-09.1. If a station is manned, but full-time presence of the flagger is not necessary (trucks entering roadway, equipment crossing) then the flagger is expected to step back out of harm’s way until the next event. No deduction will be made for this stepping back, provided the flagger can not be assigned to other duties while waiting. In measuring flagging, disregard overtime, split shifts, union rules for show-up time, the trade classification of the flagger and any other payroll issues. The flagging is a service that is provided and paid by the hour. It is only peripherally related to the flagger’s paycheck.

Spotters may be used and are encouraged. Spotter stations must be shown on the TCP and approved. Once approved, the item will be measured when the approved station is manned. The same rules apply to the non-relationship between Spotter payment and the paycheck of the spotter employee.

Other Traffic Control Labor (per Hour). There are other duties for traffic control labor besides flagging and spotting. Some of them are included in this item for separate measurement. If one of the activities listed in the provision is provided, then measurement of that activity is appropriate. Only the hours that the activity is performed will be measured. Again, this is not a payroll measurement.

Note the limit under patrolling and maintaining. No matter how many people are involved in this activity, measure only one hour for each hour that each approved route is operated.

Another little feature shows up under the last bullet (Installing and removing devices). Time spent ahead of the setup marking layout points on the shoulder or getting signs ready in the yard will be measured under this item.

Do not succumb to pressures to add other hours to this item. As the payment spec for “Other Temporary Traffic Control” states, all costs not compensated by other items are covered there.

Construction Signs, Class A (per sq. ft.) to qualify for payment under this item, the sign must be designated as Class A on an approved TCP or be directed installed by the Engineer and designated as Class A at the time of direction. After-the-fact re-designations of signs that have been originally thought to be Class B should not be considered.

Other Unit Price Items. The new traffic control provisions limit unit items to major devices. These include Sequential Arrows, Changeable Message Signs and Truck Mounted Attenuators. The measurement and payment requirements for these are similar or identical to those which have been in use for some time and are relatively straightforward.

One point to make is with the force account item for “Repair Truck-Mounted Attenuator. Because this is a temporary installation and not a part of the permanent work, the Third Party Damage item does not apply and that is why a separate force account is established. If the damage was caused by a third party, the department may well be able to recover the costs paid to the Contractor under this item. The Project Engineer should take steps to protect the department’s interest and involve the Maintenance, Accounting and Risk Management offices to initiate the efforts to recover costs.

1-2.3C(5) Payment

The payment provisions of the new specifications are intended to provide a mechanism that accounts for all of the Contractor's costs for temporary traffic control. The total project lump sum item is self-explanatory. There is no additional payment unless there is a change order.

If the job contains items, the pay definition for each describes the limited portion of the Contractor's costs that are covered by each item. The summary lump sum item (Other Temporary Traffic Control) is written to be a catchall cleanup that lets nothing escape for "additional compensation" discussions.

Watch out for change orders. A principal concern over lump sum items is that work will be added that is not required by the original contract and no mechanism exists to increase traffic control payment. This can be straightforward in identified changes, merely becoming an additional aspect of the negotiation. More troubling are constructive changes, which are not written, but which do end up in negotiation. An "overrun" of asphalt pavement to add a few driveways may be a convenient way to do field decisions, but may also create a dispute over the related traffic control costs (not to mention the dispute about the changed nature of the paving.).

1-2.3C(6) Construction and Maintenance of Detours

Construction zone detours will normally be detailed in the plans. When detours not shown in the plans are required, the design will likely be done by the construction office under the direction of the Project Engineer and requirements of the MUTCD. If the detour is a full-fledged roadway, design and traffic reviewers should check the design. Short-term minor detours may be installed and operated without formal review, but the Project Engineer must be satisfied that the facility is suitable and safe for traffic use.

Existing pavement markings on asphalt pavement should never be merely blacked out with oil or paint. Rather, the striped and adjacent areas should be sandblasted or ground in a pattern different from the original marking until the marking is no longer visible. This change in pattern minimizes the possibility that the original marking will still be visible to drivers, especially at night or in rainy weather when covered-over stripes have a tendency to shine in contrast to the pavement. Temporary pavement marking tape, either for temporary lane marking or masking of existing markings may offer another option.

Barricades and barriers are inherently fixed object hazards. Therefore, they should not be used unless the combined hazard for the motorist and the workers of operating without barriers is greater than the hazard of striking the barriers themselves. They should not be used as primary delineation to guide traffic. Delineation devices must be maintained, and kept clean. When delineators become covered with grime or are damaged, they become ineffective. The condition and positioning of these devices should be checked daily.

1-2.3C(7) Road/Ramp Closures

When it is necessary to close a road, street, or ramp, the Project Engineer shall submit a request that includes the appropriate closure/detour plan to the Region Traffic Engineer in advance of the need. Per RCW 47.48.010, the Regional Administrator may close a road, street, or ramp.

With proper planning and implementation, road/ramp closures can be an effective and safe method of traffic control. As required by RCW, notice of the closure shall be published in one issue of a newspaper in the area in which the closure is to take place. Signs indicating dates and times of the closure shall be placed at each end of the section to be closed on or before publishing the notice in the newspaper. Publishing the notice and placing of the signs shall be a minimum of three days in advance of the closure. Advance notice using local radio, portable changeable message signs or HAR may be effective in diverting traffic from the closed or impacted locations.

Coordinate with the Region Public Information Officer for assistance with public notification.

In cases of emergency, or closures of 12 hours or less, the road, street, or ramp may be closed without prior notice to the public. If possible, a notice should be posted one working day in advance of the closure.

1-2.3D Speed Reductions

If speed reductions are considered, the Project Engineer shall consult with the Regional Traffic Engineer in advance of the need. Per RCW 47.48.010 and Directive D55-20, the Regional Administrator may post advisory speeds and/or establish a reduced regulatory speed limit. Speed reductions must be determined in accordance with standard traffic engineering practice by the Regional Traffic Engineer.

- **ADVISORY SPEED**

Within a construction area, there may be short sections of roadway, such as curves or rough roadway, which may not be safely negotiated at the established speed limit. For these areas, an advisory speed sign should be used in conjunction with proper warning signs. The speed shown on the sign is not intended as an enforceable limit but should show, in multiples of 5 miles per hour, a safe speed for normal conditions of weather and lighting. Advisory speed signs should only be used in conjunction with appropriate warning signs.

- **REGULATORY SPEED LIMITS**

Traffic controls that are designed and implemented for site specific work zone conditions, including actual traffic speed, are generally more effective than a speed limit reduction. Speed limit reductions should be considered at work zones where conditions reduce operational safety to a point where other traffic control measures are not effective.

Directive D55-20 describes the appropriate conditions and requirements to implement advisory speeds and reduced regulatory speed limits.

1-2.3E Records of Construction Signing, Collisions, and Surveillance

Due to the increased damages being awarded by the courts for improper signing, it has become more important that detailed records of signing and delineation be continuously maintained on every project on sections of highway within the construction limits under traffic. The following are recommended procedures and methods of recording the signing on the project:

- Use extensive photographic, digital or videotape records.
- The Contractor's signing must adhere to the TCP, and the records must confirm that the sign installation is checked against that plan. The Regional Traffic Engineer should only be involved in significant changes to TCPs and need not be involved in minor adjustments.
- Documentation of the Contractor's activity for traffic control, including signing, should be completed by the Contractor's Traffic Control Supervisor (TCS). In accordance with the *Standard Specifications*, the TCS must maintain a daily project traffic control diary. DOT Forms 421-040A, "Contractor's Daily Report of Traffic Control- Summary", and 421-040B, "Contractor's Daily Report of Traffic Control Traffic Control Log," are provided to the Contractor for this purpose.

The Summary report will typically contain a brief description of the daily activities of the TCS with expanded details of any important happening such as traffic collisions, meetings, decisions, or rapidly deteriorating conditions of traffic or weather.

The Summary report is usually sufficient to verify the location and status of Class A signs once they are installed.

- The Traffic Control Log report is used to specifically identify all details of each Class B work zone setup. This includes identification of specific signs used, location of the signs, location of flaggers, location of the work zone, the time it was set up, and the time it was removed. Additional information includes cone layout, if used, comments about piloted traffic, and comments about the relationship of the setup to an approved traffic control plan.

The Project Engineer should make an effort to become aware of any traffic collisions that occurs within the project area. Where possible, thorough records should be maintained about the collision, including site conditions and the status of signing and other traffic control measures. In case of an incident investigated by the WSP, do not move signs until released to do so by the trooper. When inspections are made of the work zone, either by project or region personnel, the documentation of these inspections should be maintained in the project files. The 1997 report on Highway Work Zone Reviews contains recommendations for review procedures and reporting format. The report emphasizes the following points:

- Each Region should designate an office or individual responsible for oversight of traffic control issues.

- Regions should conduct regular reviews of traffic control with management involvement and document results.
- Expand discussion of work zone traffic control within the Region.
- Regions will take the lead in scheduling statewide annual traffic control reviews.
- State Traffic Office will prepare an annual summary of the statewide traffic control reviews.

1-2.3E(1) Work Zone Safety and Mobility

In keeping with the above recommendations, the Project Engineer should utilize the information obtained from traffic control reports, collision reports, and other field observation in order to better manage Work Zone impacts. This will allow the Project Engineer to implement any necessary changes to traffic control in order to increase safety and to enhance mobility through the work zone.

At the completion of each project, the Project Engineer should review the traffic control used on the project in order to identify trends, etc. that may be used to improve Work Zone practices or strategies. This information should be summarized and provided to the Region Traffic Office for inclusion in annual reports.

1-2.3F Resources for Traffic Control and Work Zone Safety

The following information may provide additional guidance and more specific detail. Also, this list includes the staff, reference documents and manuals mentioned throughout Section 1-2.3 of this manual.

- *Work Zone Traffic Control Guidelines*, M 54-44
- *Traffic Manual*, Chapter 5, M 51-02
- MUTCD Part VI
- Work Zone Safety Task Force Recommendations
- Quality Standards for Work Zone Traffic Control Devices (ATSSA)
- Work Zone Traffic Control Supervisor's Notebook
- Highway Work Zone Reviews, 1997 (Work Zone Safety Task Force)
- Planning and Scheduling Work Zone Traffic Control (FHWA-IP-81-6)
- Directive D 55-20, Reduced Speed in Maintenance and Construction Zones
- Instructional Letter IL 4008.00, "WSP Traffic Control Assistance in Work Zones"
- Traffic Control Supervisor Evaluation - Final Report
- Region Construction or Traffic Office and Public Information Officer (Traffic Engineer or Work Zone Traffic Control Specialist)
- State Traffic Office (Traffic Specialist or Traffic Control Engineer)

1-2.4 Application of Contract Provisions, Plans, and Specifications

1-2.4A Construction Contracts Information System (CCIS)

The CCIS system is a mainframe application designed to track contract information and generate reports for all WSDOT administered construction projects. The initial setup of contract information into CCIS is done automatically by using information in the CAPS system. However, after the initial setup, the project offices must enter the majority of the contract information into the CCIS system. The data entered is then maintained and stored on the mainframe.

Among other things, CCIS generates the Weekly Statement of Working Days and Change Orders, and tracks this information. The system creates the forms for these reports so a preprinted form is not needed. Following is a list of data that needs to be entered into the CCIS database over the life of the project:

A. Contract Information

This part of CCIS will contain general contract information.

Region administering contract

Region the contract is located in

Regional Administrator

Operations Engineer

Project Engineer/PE Org code

Begin and End mile post

County

Prime Contractor's local address, if applicable

Prime Contractor contact person

Prime Contractor D/M/WBE type if applicable

Prime Contractor ethnic code if applicable

Date of Statement of Intent to Pay Wages - Prime

Date of Contractor and Subcontractor/Agent Cert. for F.A. Projects

Date of Affidavit of Wages Paid - Prime

Date of Preconstruction Meeting Minutes

Date time started

Date work started

Date Orig. Progress Schedule approved

Date Last Supplemental Progress Schedule approved (if applicable)

Date of Substantial Completion (if no Substantial Completion granted, use Physical Completion date)

Date of Physical Completion

Final Estimate to Contractor

Date of Completion

Final Estimate to Headquarters (filled in by Region office)

Contract time – Original Authorized Working Days

B. Contractor Information

This part of CCIS tracks information about Request to Sublet and Affidavits of Amounts Paid.

Request to Sublet

Affidavit of Amounts Paid

C. ECR Tracking

This part of CCIS tracks the Contractor's training program, trainees, and MWDBE reviews

Training Program

Apprentice/Trainee Approval Request

DMWBE and EEO reviews

D. Change Orders

Change orders are created, printed and tracked in this part of CCIS. It is very important to keep the information current to facilitate correct tracking and reporting.

Approval (to proceed when granted)

Date sent to Contractor

Date received from Contractor

Is there Surety consent

Date of Surety consent

Dates of approval and execution *Note: Line 4 "Date Executed" should only be used by Region or HQ.*

Change Order Voided (if applicable)

E. Weekly Statement of Working Days

The "Weekly Statement of Working Days" is a report generated by CCIS, based on information entered into the system by the project office. This report details the number of workable/unworkable days charged to a project, the reason a day is charged as unworkable, daily weather codes, the current status of contract days, and a summary of the week's construction activity. The Project Engineer must ensure that the appropriate information is entered into CCIS on a weekly basis, a "Weekly Statement of Working Days" is generated, and a copy of the report is sent to the Contractor. Weekly statements shall cease when physical completion is granted, or when substantial completion is granted and all working days are expended.

Refer to the *CCIS Manual* for details on using the system.

1-2.4B Order Lists

Contract language requiring an order list can be found in Section 6-05.3(2), which addresses piling other than cast in place concrete and steel piles, and in Section 8-21.3(1), which addresses the determination of lengths of wood and steel sign posts. In other types of work, such as drainage, guardrail, etc., the actual layout will often result in quantities and lengths that vary from the plan estimates. A project engineer could choose to communicate this information in several ways, one of which could be the development of a formal order list. If an order list is used, extra care should be taken to ensure its accuracy. An alternate method of notice could also be a walk through with the contractor representative after staking.

1-2.4C Changes in the Work

• INTRODUCTION

WSDOT reserves the right, under *Standard Specifications* 1-04.4, to make changes to the work, work methods, working days, or quantities, as necessary to satisfactorily complete the project as originally intended.

Adding work beyond the original scope is, in essence, entering into a contract to perform work without the benefit of a competitive bid. There is a statutory (RCW 47.28.050) exception from the competitive bid requirement for work up to a value of \$7,500. If the value of the work is in excess of \$7,500 it is necessary to go through the competitive bidding process.

Change order work may impact the design criteria used to develop the project. The Project Engineer must be alert to this, and ensure that the Design Documentation Package is revised to reflect any such changes. The Project Engineer must contact the Region Project Development staff to obtain approval for the change, and for guidance in documenting and incorporating the change into the Design Documentation Package.

1-2.4C(1) Types of Changes

There are several categories of changes that may occur during the course of the work. A change may warrant additional payment to the contractor or a credit for the contracting agency. A change may also warrant an increase or decrease in the working days. Every situation is different. The *Standard Specifications* are very specific on what additional costs are eligible for adjustment. The balance of this discussion of types of changes is intended to help describe and explain the various categories of changes.

(I) VARIATIONS FROM ORIGINAL BID QUANTITIES

Contracts are set up with estimated quantities. Contractors provide unit prices and actual measured quantities are paid using those unit prices. What happens when the actual measured quantity varies from the estimated proposal quantity? The WSDOT *Standard Specifications* (Section 1-04.6) require that variations of less than 25% be performed without changes in the bid price, but that variations greater than 25% may qualify for a payment adjustment of the contract bid. This distribution of estimating risk is a policy of WSDOT and is also a Federal requirement for any project with Federal funds.

Variations may occur because field conditions cause a different quantity for the planned work than was envisioned during the estimating. Other variations may occur when work is added or deleted by change order and original contract unit items are included as the method of pricing the change order. Finally, quantity variations occur when work is added, deleted or revised without a formal change order (constructive change) and units with unit prices are the only measure of the revision. The work represented by a constructive change order is in fact work not anticipated at the time the contract was bid and executed, and as such would be outside of the requirements of *Standard Specifications* Section 1-04.6. In other words, you cannot deny a payment adjustment based solely on the fact that the

accepted quantity of a bid item is within 25% of the original proposal quantity.

As discussed below, quantities included in formal change orders are excluded from consideration of quantity variations. The project engineer who allows constructive changes without formal documentation may find an additional negotiation waiting when final adjusted quantities are calculated and compared with the original proposal quantity.

A unit bid price consists of four different parts. First, and most obvious, are the costs of labor, equipment, materials and services needed to accomplish the work. These are the “direct costs” involved and they vary directly with the amount of work. Second are the variable overhead costs, such as field supervision, field support items (phones, computer rental, payroll clerks, sanicans, etc) whose amounts will vary along with the direct costs. Third, and more difficult to assess, are unavoidable, distributed, fixed overhead costs. These are typically long term and exist whether the quantity varies or not. They include things like home office costs, field trailer setup, long term equipment rentals and other fixed costs. These are typically distributed to the project by allocating them to the plan quantity. Fourth, and finally, the unit price will include some amount for profit.

[1] Section 1-04.6

The standard contract provision calls for the calculation of an adjusted final quantity. This is the method of revising the final measured quantity to allow for proposal item quantities included in agreed change orders. Unit prices as originally bid will be utilized if the adjusted final quantity is more than 75% of the original proposal quantity and not more than 25% greater than the original proposal quantity.

If the final adjusted quantity is outside these limits, then either party to the contract may initiate a renegotiation. If neither party does so, then unit prices will apply to the entire measured quantity of the item. Neither of these actions would be a change to the contract, as the provisions already allow a price change. A formal change order document might well be initiated to show the agreement, however, and would be the mechanism to create new prices.

If a negotiation is initiated, the provision calls for a new price for the quantity in excess of the 25% overrun or a contract price adjustment to compensate for costs and losses associated with an excessive underrun. The renegotiated price for the overrun portion is not an equitable adjustment and this is an important distinction. The new price is based upon actual costs experienced and is completely unrelated to the old bid price. The typical discussion about “what’s different from the bid work and what number should be used to modify the bid price?” does not apply in this type of negotiation. The underrun compensation is an equitable adjustment, however, and much of the negotiation is related to the bid price and discussions of the actual work costs as opposed to the planned costs.

Other features of the provision include an exclusion of force account items and other items where an amount has been entered solely to provide a common proposal for the bidders. Consequential damages and lost profits are specifically excluded. The effect of any unbalanced allocation of overhead costs is also excluded from compensation under the provision.

Force accounts and calculated quantities are already taking actual costs into account for overruns. Because of the nature of these items, contractors are unable to allocate unavoidable fixed costs to them except as a share of the allowed markup. The contractor is aware of this provision at the time of bid and knows that this item will not be eligible for renegotiation in the case of an underrun.

Consequential damages are those which are separated from the project and which might be presented as part of a negotiation. "Because of your overrun, I was unable to start work on my other project and had to do that other work in the wintertime." This *consequence* of the quantity variation is not compensable because of the wording of the provision. Similarly, the profit that the contractor might have made on some other work but for the need to perform the extra work in an overrun is also not compensable.

Unbalanced bidding might result in a significantly higher or lower price for an item than normal. It means that too much or too little of allocated overhead or other costs is assigned to the item. This is not a problem in a low bid situation when all items come in at plan quantity. The problem would arise if an unbalanced item were to be involved in an excessive underrun. This provision allows the project engineer to evaluate this possibility during an underrun negotiation (remember that the overrun pricing takes care of the problem automatically by assessing cost and ignoring the bid price.)

Contract time may be affected by the first unit of overrun or underrun. It may be appropriate to add or delete working days; depending on how the quantity variation affects critical activities, as shown on the Contractor's approved progress schedule.

[2] Negotiation Guidelines

{a} Adjusted Final Quantity the Standard Specification language is quite clear on this subject. Start with the final measured quantity, the number that would be included in the final estimate for the item. Review all change orders that have been approved and have been accepted by the Contractor (see Section 1-04.5 for a definition of contractor acceptance of change orders.) Identify change order increases in the item and subtract these from the final measured quantity. Identify change order decreases in the item and add these to the result of the previous subtraction. The result of these calculations is defined as the Adjusted Final Quantity.

Compare the Adjusted Final Quantity to the original proposal quantity. If the Adjusted Final Quantity is greater than 1.25 times the original proposal quantity, then the item is eligible for an overrun renegotiation. If the Adjusted Final Quantity is less than 0.75 times the original proposal quantity, then the item is eligible for negotiation of an equitable adjustment due to underrun.

{b} Renegotiation for Overruns the first analysis should be to determine, if possible, where and when the overrun took place. This is not necessarily the work done after the quantity of 1.25 times proposal was reached. In many cases, a review of the work will disclose which part of the project actually experienced the low estimate and the resulting extra quantity. This

is more common in physical items that are visible and can be measured by weight or physical dimensions (Roadway Excavation, Culvert Pipe, Select Borrow, etc.) These are often detailed in the plans to the extent that actual work can be compared with the relevant portion of the proposal quantity. When actual overrun work can be identified and when records exist showing the resources utilized for that work, then those records can form the basis for the revised payment amount. In other cases, the item is a support function, often measured by time, where the plan segments cannot be separated for analysis. This is common in Flagging, Pollution Control items, etc. To analyze these, the only choice is often to look at the actual work that occurred after the threshold was reached and price it. A third method, where records are adequate, is to evaluate the actual costs for the entire item, and apply those only to the overrun units.

Regardless of method of determining direct cost, markups will be allowed. A good place to start would be the force account percentages described in Section 1-09.6. If the contractor is providing other records for overhead and profit, these can be used, if they are reasonable. Any overhead items that are unavoidable, distributed fixed costs should be excluded. Remember that the Contractor has already been compensated for these one and a quarter times over.

The revised price will apply only to the units measured in excess of 1.25 times the original proposal quantity. The overrun units between the proposal quantity and the threshold will be paid, according to the terms of the contract, at the bid price.

{c} Equitable Adjustment for Underruns the adjustment for an underrun is limited by the contract terms to three factors. The first of these is an adjustment for any increase or decrease in direct costs that result solely from the reduction in quantity. The most common example of this type of cost is the learning curve. "By the time my crew learned how to do this work at this site with these specifications, we were done. They should have been able to apply these skills to an additional 30, 40 or 50 percent of the plan quantity. I experienced the least efficient units and missed out on the most efficient." in negotiation, this might be demonstrated by production rates, by inspectors' reports or by the agreed judgment of the negotiators. If such a condition did exist, then an agreed amount for inefficiency during the learning curve could be included in the adjustment.

The second factor has to do with the nature of the work actually done, when compared with the work shown in the plans. The most common manifestation of this is "You deleted the easiest units and left me with the most difficult," or "You added units that were much more difficult than those shown in the plan." Compensable, if true. Logic dictates that, if all of the work shown in the plans was performed and, if no work was added except by formal change order, then this factor can have no value. The work that was performed was what was shown in the plans and was what the Contractor bid. If, on the other hand, the project engineer has allowed

constructive changes without formal documentation, then this factor could well come into play.

Finally, the negotiation should include a look at reallocation of undistributed unavoidable fixed overhead costs. The contractor has allocated these to 100% of the proposal amount. The bid price is firm as long as 75% of the units are measured and paid. If the final adjusted quantity is less than 75%, then the anticipated contribution of the units not performed (up to 75%) can be identified, negotiated and included in the equitable adjustment.

One final aspect of underruns: There is a reality that, if more units were paid up to the 75% threshold, then there would be no eligibility for negotiation. Because of this, there is a limit to the equitable adjustment. The total paid for the item, including units actually performed and the equitable adjustment cannot exceed 75% of the original proposal quantity, multiplied by the unit bid price.

(II) DELETION OF ITEMS

[1] **AUTHORITY to DELETE** As provided in Sections 1-04.4 and 1-08.10(2) of the *Standard Specifications*, WSDOT may cancel all or portions of work included in a contract. When deleting work that is condition of award (COA), be sure to also delete that work from the COA requirements by completing the condition of award portion of the change order in CCIS. An adjustment in working days may also be appropriate.

[2] **PAYMENT FOR REMAINING WORK** There are some limitations to payment that should be noted under *Standard Specification* 1-09.5. When work is decreased or deleted by the contracting agency, payment will only be for the costs actually incurred for partially completed work. No profit will be allowed for work that was not completed. Consequential damages are also not allowed. Consequential damages may include such things as: loss of credit, loss of bonding capacity, loss of other jobs, loss of business reputation, loss of job opportunities, etc. In the case of a portion of a lump sum item or partially completed unit items, the value of this work will need to be determined. It may also be necessary to negotiate a price adjustment for the work that was performed and paid using a contract unit price if there is a material difference in the nature of the accomplished work when compared to the nature of the overall planned work. Under certain circumstances when the contractor says "you eliminated all the easy work and left the difficult," there may be entitlement to an adjustment.

In the event that the deletion impacts the critical path for the project, an adjustment in working days may also be appropriate.

[3] **PAYMENT FOR MATERIALS** When work is deleted from the project and the contractor has already ordered acceptable materials for such work, Section 1-09.5 of the *Standard Specifications* controls.

{a} contractor restocks the first and best method for disposing of the materials is to request that the

contractor attempt to return the materials to the supplier at cost or subject to a reasonable restocking charge. If the materials are restocked then, in accordance with Section 1-09 of the *Standard Specifications*, the contractor's actual costs incurred in handling the materials may be paid.

{b} contractor purchases If WSDOT cannot utilize the materials, the contractor may elect to retain them for other work. Once again, in accordance with Section 1-09 of the *Standard Specifications*, the contractor's actual costs incurred to handle the materials may be paid.

{c} state purchases and disposes As a last resort, if the materials can not be disposed of at a reasonable cost to WSDOT, the Department may choose to purchase the materials from the contractor. There are some limitations that come with the use of federal funds that may require that the materials be purchased with state funds depending on the situation. The State construction office may be contacted for advice. If possible, such materials may be provided to a future contractor (work with Design) or to Maintenance (work with the Regional Maintenance Office). If the materials cannot be used, they shall be disposed of as described in the manual for *Disposal of Personal Property* (M 72-91). Once again, in accordance with Section 1-09 of the *Standard Specifications*, the contractor's actual costs incurred in handling the materials may be paid.

(III) CONTRACT MODIFICATIONS

Changes in Materials, Work Method, or Work Sequence may or may not be a change to the contract. The determining factor is if the change is a modification of a specific contract requirement. If the contract includes language such as "recommends", "suggested", or "approved equal" associated with the item or allows the engineer to approve changes, then a change order is probably not required. In essence, this would not be a violation of the contract and therefore, does not require a change to the contract. A common situation is when the contractor proposes a change to a submitted manufacturer's recommendation, drawing or plan such as a falsework drawing or erection plan. Changes to those drawings/plans may be made by the same authority that approved them the first time. Once again, it is not a change to the contract.

(IV) COST REDUCTION INCENTIVE PROPOSAL (CRIP)

It is the policy of WSDOT to encourage our contractors to be innovative in planning and performing the work when a cost savings can be realized. When a contractor identifies such a savings and provides a significant portion of the efforts needed to develop the proposal, then WSDOT will share the resulting savings with the contractor. This policy is carried out through change orders containing Cost Reduction Incentive Payments. The Project Engineer should encourage CRIPs and seriously consider the mutual benefits of these proposals brought forth by the contractor as a partner in the contract.

[1] **IS IT A CHANGE/CRIP?** A proposal may include

material and/or product substitutions, work method changes, work sequencing changes, etc., that normally take place during the construction of a project. Contractor proposals do not require change orders nor qualify as CRIPs when the change does not require modification of the contract. See the previous section “contract modifications”.

[2] AGENCY CREDIT OR NO COST CHANGES (NOT A CRIP) the contracting agency is not obligated to accept a proposal which is not equivalent or superior to what is required by contract. However, if a contractor proposed change is acceptable and desirable to WSDOT, but is not equivalent or superior to what is specified by contract, then a credit should be considered as part of the change order. This type of change would not be considered a CRIP. The credit required would normally be 100 percent of the cost or time savings. If it is determined that contract time is not affected and that the cost differential is negligible or to the state’s advantage, then the change might require a “no cost” change order. If, in the opinion of the evaluator, the State is not harmed and there is no windfall savings for the contractor, then a no-cost change would be appropriate.

[3] IDENTIFYING A TRUE CRIP

A CRIP might exist if:

- the change is the contractor’s idea
- it offers, in effect, the same end result as what is specified in the contract
- savings will be achieved in dollars or time by its implementation

Qualifying actions by the contractor:

- accepts design risk of temporary features
- accepts risk of constructability
- makes a significant effort to develop the proposal
- employs an engineer to assist in development (indicator, but not required)
- prepares all documentation, presentations, and plans
- invests an appreciable amount of time

[4] DEVELOPMENT OF CRIPS Once a CRIP is identified and developed to the point of conceptual approval, it is treated in nearly the same manner as any other change order. There are some differences, such as the contractor’s responsibility for preparing the documents, and there is a special method of calculating the incentive payment amount. In the interest of uniformity, the following guidelines are to be used for the evaluation of CRIPs submitted by the contractor:

General Requirements and Principles Applying to CRIPs:

- The proposed change must alter a contract requirement.
- The proposed change must result in a product that meets the intent of the original design.
- In the judgment of the evaluator, the ultimate life cycle costs to WSDOT shall not be unduly increased.
- The contractor agrees to substitute for deleted condition of award COA work.

Additional Requirements for Time Reduction CRIPs:

- The time saving is a direct result of an actual change

in the design or method of work (simply adding more crews would not qualify as a CRIP).

- The original time for completion was realistic (an early finish of a job with an unnecessarily long time for completion would not be a CRIP).
- The project does not already have an incentive/disincentive clause (in that case, the cost of accelerating the completion is assumed to be included in the bid and a CRIP sharing of the cost is inappropriate).

{a} **Step 1: concept approval** the first effort in development of a CRIP shall be to achieve concept approval. To this end, the contractor shall submit a written proposal to the Engineer for consideration. The proposal shall contain the following information:

- An explanation outlining the purpose of the change(s).
- A narrative description of the proposed change(s). If applicable, the discussion shall include a demonstration of functional equivalency or a description of how the proposal meets the original intent of the design.
- A cost discussion estimating any net savings. Savings estimates will generally follow the outline below under “Calculating the Incentive Payment”.
- A statement providing WSDOT with the right to use all or any part of the proposal on future projects without further obligation or compensation.
- A statement acknowledging and agreeing that the Engineer’s decision to accept or reject all or part of the proposal is final and not subject to arbitration under the arbitration clause or otherwise be subject to claims or disputes.
- A statement giving the dates the Engineer must make a decision to accept or reject the conceptual proposal, the date that approval to proceed must be received, and the date the work must begin in order to not delay the contract.

A separate copy may be sent to the Headquarters Construction Office to initiate tracking of the progress of the proposal. After review of the proposal, the Engineer will respond in writing with acceptance or rejection of the concept. This acceptance shall not be construed as authority to proceed with any changed contract work. Depending on the nature of the proposal, the review could include Region and Headquarters designers and, possibly, outside consultants. The completeness and quality of the proposal will have an effect on the time needed for the review. WSDOT will make every effort to expedite the review.

{b} **Step 2: formal approval** Concept approval allows the contractor to proceed with the work needed to develop the final plans and other information to support the ultimate preparation of a change order. To qualify for an incentive payment, the contractor will normally take the lead in the development effort. The Project Engineer is encouraged to provide whatever assistance

is needed. The development of a CRIP is an example of partnering at work in a contract. The contractor's submittal shall provide the Project Engineer with the following:

- Deleted Work — Calculated quantities of unit price work to be deleted. Proposed partial prices for portions of lump sum work to be deleted. Time and material estimates for deleted work in force account items.
- Added Work — Calculated quantities of unit price work to be added, either by original unit contract prices or by new, negotiated unit prices. Proposed prices for all new items to be negotiated.
- Contractor's Engineering — Costs of engineering to develop the proposal shall be submitted. Costs of employees utilized in contract operations on a regular basis will not be included.
- Schedule Analysis — If the CRIP is related to time savings, a partial progress schedule showing the changed work. A discussion comparing this schedule with the approved progress schedule for the project.
- Plans and Working Drawings — All drawings and supporting calculations necessary to accomplish the work. Those drawings which include engineering calculations and features shall be prepared by a professional engineer licensed in the State of Washington and shall bear the professional engineer's signature and seal.

{c} Step 3; Preparing and approving The change order the change order itself shall be prepared and processed in the same manner as any other change order.

Accordingly, the change order must incorporate the terms of the agreement into the contract. Along with all of the components of a change, all CRIP change orders shall include the following:

- A statement that the Contractor accepts design risk of temporary features of the changed work.
- A statement that the Contractor accepts risk of constructability of the changed work.
- A statement providing WSDOT with the right to use all or any part of the proposal on future projects without further obligation or compensation.

Calculating the Incentive Payment in the interest of uniformity, all CRIP change orders shall include separate payment items as follows:

- Any deleted work, whether at contract prices or at agreed prices.
- Any added work, whether at contract prices or at agreed prices.
- The contractor's engineering costs, reimbursed at 100 percent of the contractor's cost.*
- The incentive payment to the contractor.*

*Where added work exceeds deleted work, but time savings make a viable proposal, these two items would be replaced by:

- WSDOT's share of added cost to achieve time savings.
- The contractor's share of savings from deleted work.

The final sum of these shall ordinarily be the savings to WSDOT. However, in some cases, savings may be offset by any increased inspection and administration costs, or augmented by intangible benefits, such as user benefits, or by indirect benefits, such as overhead and engineering savings in time reductions, or by theoretical savings, such as a CRIP that eliminates a large anticipated overrun in plan quantity. In these cases, the benefits would not be expressly reflected in the change document, but should be discussed in the justification letter.

Proposal Savings: The incentive payment shall be one-half of the net savings of the proposal calculated as follows:

$$(\text{gross cost of deleted work}) - (\text{gross cost of added work}) = (\text{gross savings})$$

$$(\text{gross savings}) - (\text{contractor's engineering costs}) - (\text{WSDOT's engineering costs}) = (\text{net savings})$$

$$(\text{net savings})/2 = (\text{incentive pay})$$

WSDOT's engineering cost shall be actual consultant costs billed to WSDOT and extraordinary in-house personnel labor costs. Project personnel assigned to the field office or who work on the project on a regular basis shall not be included.

Cost to Achieve Time Savings:

$$(\text{cost of added work}) + (\text{contractor's engineering costs}) = (\text{cost to achieve time savings})$$

$$(\text{cost to achieve time savings})/2 = (\text{WSDOT's Share of Added Cost})$$

If the timesaving proposal also involves deleting some work and, as a result, creates a savings for WSDOT, then the contractor would also receive one-half of the savings realized through the deletion.

{d} Authority to Proceed with Changed Work the need may arise to proceed with changed work before the change order is executed. WSDOT is willing to provide an approval, allowing the work to proceed, if the following criteria has been met:

- Concept approval has been granted.
- The necessary design reviews and approvals have been completed, including plans and specifications.
- The contractor has guaranteed, in writing, the minimum savings to WSDOT.

Such advance approval, if given, shall be in writing and shall constitute commitment by WSDOT to ultimate formal approval of the proposal. Where appropriate, the advance approval may contain a narrative formula of the elements to be utilized in the final cost negotiations. When work has begun under such an approval, detailed records shall be kept of the labor, equipment, and

materials utilized and, if ultimate approval is not gained soon enough to provide prompt payment for the work, then an interim change shall be executed to allow partial payments.

{e} Problems Arising After the Agreement the contractor assumes the risk of constructability. However, there will occasionally be problems that arise while the work of the CRIP is being performed. These will be evaluated on a case-by-case basis. The controlling philosophy will be that we entered the CRIP as a team with the contractor and we will approach problems in a similar vein. If the problem is something that could not reasonably have been anticipated in the design work of the CRIP, then the risk shall be shared as will the cost of the solution.

{f} Proposed CRIP is not accepted If the evaluator decides to reject a CRIP proposal, the contractor will be notified in writing with an explanation. Copies of this notice, with an attached analysis of evaluation costs and any other factors, shall be provided to the Region Construction Manager and the Headquarters Construction Office.

1-2.4C(2) Equitable Adjustment

(I) PRICING

Section 1-04.4 of the *Standard Specifications* specifies that an equitable adjustment (EA) in accordance with Section 1-09.4 will be made when changes cause an increase or decrease in the cost of performing work on the contract. The basic theory of an EA is to leave the parties to the contract in the same position cost wise and profit wise as they would have been without the change, preserving to each as nearly as possible the advantages and disadvantages of their agreement. Although the contractor is entitled to profit on the changed work, the profit (or loss) on the unchanged work should remain unaffected by the equitable adjustment.

- This is an important point, *for unchanged work*, the contractor is entitled to the profit bid or a windfall, if the work turns out to be easier than expected.
- On the other hand, *for unchanged work*, the contracting agency is not obligated to make the contractor well for an under bid item.

Consequential damages are never allowed as part of a negotiated equitable adjustment. Consequential damages may include such things as: loss of credit, loss of bonding capacity, loss of other jobs, loss of business reputation, loss of job opportunities, impacts to another project, etc.

[1] UNIT PRICES An appropriate price may be established using average unit bid prices, citing similar unit bid prices, a determination of market value, by estimating the cost to perform the work, or a combination of these methods. Unit bid price is one indication of an equitable price, however the contracting agency should be prepared to support the price by other means.

[2] FORCE ACCOUNT When added work is paid by force account, a change order shall be prepared detailing the added work to be performed and the estimated cost. Standard Item Number 7715 is to be used for all force account items that do not have an assigned standard item number. Force account should be a last resort used only if the work can't be clearly defined.

[3] OVERHEAD There are two basic types of overhead as follows:

- **DISTRIBUTED FIXED COSTS:** Offsite "home office overhead" is the cost of running a company. These costs are assumed to be distributed among all the projects performed by the company. Onsite overhead is incurred as a function of time needed to accomplish the project. Onsite costs are assumed to be evenly distributed among contract items. This category of overhead is eligible under an equitable adjustment if working days are added to the contract as part of the adjustment.
- **VARIABLE FIXED COSTS:** these costs are directly associated with performing an item of work on the project and therefore vary with the quantity, the contractor is entitled to recover these costs as a part of an equitable adjustment.

(II) FORWARD PRICING AND RISK

The first and best option for an equitable adjustment is agreement in advance between the contractor and WSDOT on the increased or decreased cost and time for performance of the changed work. The Project Engineer should expend every effort possible to obtain a satisfactory negotiated equitable adjustment prior to submitting the change order to the contractor for endorsement. The Project Engineer must remember that the contractor is a full participant in the contract and retains all the rights and privileges during a negotiation. When bidding a job, the contractor must be optimistic and take appropriate risks. When negotiating, it is understandable and acceptable for the contractor to be pessimistic and avoid risk, unless compensated. Some key points to remember are:

CHANGE ORDER — CHECKLIST					
Cont. #: _____		Cont. Title: _____		If Yes, State Construction Office Approval Required	
Change Order #: _____		C.O. Title: _____			
I. Executed by the State Construction Office			Yes	No	
1.	A cost or credit equal to or exceeding \$500,000.*1		<input type="checkbox"/>	<input type="checkbox"/>	X
2.	A change in the contract documents beyond the scope, intent, or termini of the original contract.*2		<input type="checkbox"/>	<input type="checkbox"/>	X
3.	Any proposed revision or deletion of work that affects the condition of award requirements.		<input type="checkbox"/>	<input type="checkbox"/>	X
II. Executed by the Region					
4.	A cost or credit greater than \$100,000 but less than \$500,000. *1		<input type="checkbox"/>	<input type="checkbox"/>	
5.	A change in contract time greater than 10 and less than or equal to 30 working days must be related to changes implemented by change order.		<input type="checkbox"/>	<input type="checkbox"/>	
6.	A change in contract time greater than 30 working days or a change in contract time unrelated to any change order.		<input type="checkbox"/>	<input type="checkbox"/>	X
III. Executed by the PE					
7.	A determination of impacts and/or overhead.		<input type="checkbox"/>	<input type="checkbox"/>	X
8.	Specification change, involving Headquarters generated specifications. (Includes Region Generated specification requiring State Construction Office Approval)		<input type="checkbox"/>	<input type="checkbox"/>	X
9.	Specification change, involving Region generated specifications.		<input type="checkbox"/>	<input type="checkbox"/>	
10.	Material or product substitution.		<input type="checkbox"/>	<input type="checkbox"/>	X
11.	A structural design change in the roadway section. (Requires State Materials Lab approval)		<input type="checkbox"/>	<input type="checkbox"/>	
12.	A determination of changed condition. (Section 1-04.7 of the <i>Standard Specifications</i>)		<input type="checkbox"/>	<input type="checkbox"/>	X
13.	Settlement of a claim submitted(Section 1-09.11(2) of the <i>Standard Specifications</i>)		<input type="checkbox"/>	<input type="checkbox"/>	X
14.	Repair of damage regarding “acts of God” or “acts of the public enemy or of government authorities”. (Section 1-07.13 of the <i>Standard Specifications</i>)		<input type="checkbox"/>	<input type="checkbox"/>	X
15.	A structural change for structures (see BTA authority as shown in the Construction Manual).		<input type="checkbox"/>	<input type="checkbox"/>	X

Approvals Obtained:

Project Engineer (Required): _____ Date: _____

Region (Required if yes marked): _____ Date: _____

State Construction Office: _____ Date: _____

State Materials Lab: _____ Date: _____

Other (Local Agency, FHWA, Surety, etc.): _____ Date: _____

To be completed by Project Engineer:

CO Reason (s) (see CCIS “Browse Reasons” or HQ Const. SharePoint): _____

Change order prepared by: _____ Date: _____

Has change been entered in lessons learned? Yes ___ No ___

Has design documentation been updated: Yes ___ No ___

To be completed by Region:

Is the change eligible for Federal participation where applicable? Yes ___ No ___

Change order reviewed by: _____ Date: _____

*1 Change greater than \$200,000 on Federal Stewardship requires FHWA approval (see Ch. 1-2.4C(3) and Ch. 1-3.4).

*2 Per RCW 47.28.050, any change beyond \$7,500 that is beyond the original scope shall go through the competitive bidding process.

This form represents the minimum information required by State Construction. If you wish to supplement this information, you may do so on a separate sheet of paper.

Figure 1-5

- A negotiated price will likely be higher than a competitive bid price.
- A proposal which assigns extensive risk to the contractor will likely be more costly yet.
- The contractor may be willing to take on this risk if the price is a bit higher
- The significant advantage of reaching a price agreement before the work is started (forward pricing) is that the contractor assumes the risk of the accuracy of the pricing assumptions and predicted duration for performing the work.
- (when forward pricing) the Project Engineer may utilize the high end of the estimating range in justification.
- (when forward pricing) an audited overhead rate may be substituted for the markups described in Section 1-09.6. Contractors can usually provide an estimated home office overhead rate which may be checked by an annual audit, if warranted.

(III) PRICING AFTER FACT

When establishing prices after the work has been performed, actual costs should be used to the extent they are available. The following are key points to keep in mind:

- Costs for equipment cannot exceed the rates established by the AGC/WSDOT *Equipment Rental Agreement* for an equitable adjustment.
- When pricing after the fact, the markups described in Section 1-09.6 are appropriate for measuring time and materials because there is no risk involved in after the fact pricing.

(IV) UNILATERAL PRICING

In the interest of being timely, the change order should be a tool to document agreement and not a negotiation tool back and forth. Ideally we will have agreement with the contractor when pricing the work. On occasion, however, due to time constraints and difference of opinion, we can't always come to agreement. The difference of opinion may be for only a small portion of the work. *Standard Specification* 1-09.4 (2) provides, "If the parties can not agree, the price will be determined by the Engineer using unit prices, or other means to establish costs". This is not to say that the contractor is obligated to honor unit bid prices for work that qualifies for an equitable adjustment. This allows us to proceed with changed work prior to reaching an agreement on the price. In the interest of being timely, and provided the Project Engineer is comfortable that the included price can be supported, there's nothing wrong with issuing a change order to the contractor unilaterally. This orders the work to proceed, establishes the State's position on cost, and puts the decision to continue negotiations in the contractor's hands as detailed under 1-04.5. The contractor is obligated to endorse, write a separate acceptance, or protest as described in the specification and a timeline is provided for these actions.

(V) TIME

The completed equitable adjustment should include provisions for any increases or decreases in contract time based on impacts to overall contract duration. The decision on time should be supported by an analysis of the project schedule. Analyzing time in advance encourages communication between the parties allowing the contracting agency to make an informed decision on the true costs. It also enables the contracting agency to mitigate time impacts if that is in the agency's best interest.

1-2.4C(3) Approval of Changes/Checklist

In addition to noting who can execute a change order, the checklist (see Figure 1-5) further indicates who must approve the change prior to execution. The completed checklist shall accompany the change order when it is transmitted to Headquarters, and represents the minimum information required to process the change order. If the Region wishes to supplement the checklist, they may do so on a separate sheet. Written approval constitutes agreeing with the general nature of the change and can be granted by memorandum or e-mail. The checklist works as follows: for any item marked "yes", approval from the State Construction Office must be obtained if indicated by the column with the "Xs". The Project Engineer and the Region Construction Office have the authority to decide not to proceed with the change. This approval does not constitute authority to proceed with the work. That authority must come from the person who will execute the change order (*see prior approval*) in an emergency; the Region Construction Manager may authorize work to begin on any change order if the State Construction Office cannot be contacted for the required approvals within a reasonable amount of time.

(I) STATE CONSTRUCTION OFFICE

[1] FHWA APPROVAL on a project with federal funding and for which the stewardship responsibility has not been delegated, written FHWA approval, or other less formal prior approval if the public interest is served by the more timely action, is required prior to beginning work on change orders that will:

- involve new construction on the Interstate
- alter the termini, character, or scope of work
- increase or decrease the project cost by more than \$200,000 (except for changes prepared in accordance with *Standard Specification* Section 1-04.6)

{a} *who does what?* the State Construction Office will formally submit this type of change order to FHWA for approval.

[2] CONSTRUCTION ENGINEER, ADMINISTRATION

{a} *areas of responsibility* Contract Payments and Withholding of Payments; Contractor Assignment of Payments; Contractor Default; Time Extensions; Assessment of Liquidated Damages; Contract D/M/WBE, EEO, and Training Programs (i.e., Division 1 of the *Standard Specifications*).

[3] CONSTRUCTION ENGINEER, BRIDGE

{a} *areas of responsibility:* Division 6 of the *Standard Specifications* (See Chapter 1-1.3A(3))

[4] CONSTRUCTION ENGINEER, ROADWAY

{a} areas of responsibility: Divisions 2, 3, 4, 5, 7, and 8 of the *Standard Specifications* (See Chapter 1-1.3A(2)).

[5] State MATERIALS LAB

{a} areas of responsibility as you will notice from the checklist, the lab plays two roles:

CHECKLIST ITEM #10 the Materials Lab advises whether an alternate material is capable of performing the same function as a required material. However, the State Construction Office makes the final approval based on application of the material, maintenance concerns, etc.

CHECKLIST ITEM #11 the State Materials Lab is the design approval authority for a structural change with regard to roadway sections. Once design approval is obtained, the Region may approve the change order.

[6] BRIDGE TECHNICAL ADVISOR (BTA)

{a} areas of responsibility the BTA is an on call advisor to the Project Engineer on issues related to structural design. The BTA's role is to act as a resource for the Project Engineer in answering questions relating to design, plan clarifications and "minor structural changes".

{b} assignment of BTA After the contract has been awarded, the Region may send a written request to the Bridge Design Engineer in the State Bridge and Structures Office for the assignment of a Bridge Technical Advisor (BTA).

{c} delegation of executing authority if BTA is assigned When a BTA has been assigned to the project, the Region may execute certain "minor structural" change orders provided: 1) the BTA's stamp and signature are on sheet one of the change order, or on a drawing that shows the change; or there is other written structural concurrence from the BTA; and 2) the magnitude of the change is within the Region's authority to execute. All other requirements of the change order checklist apply with the exception that for "minor structural" changes under item #15 the BTA's recommendation may substitute for the State Construction Office approval. A "minor structural" change is not easy to identify, therefore when in doubt, contact the State Construction Office for advice. Changes involving specifications, materials, work method changes, repairs and major design changes should be referred to the State Construction Office. The BTA would never become involved in contract administration issues such as payment, determining the existence of a change to the contract or directing the contractor. These would be construction issues. Structural questions which require support analysis exceeding field capabilities or questions regarding geotechnical or hydraulics issues should be referred to the State Construction Office. Any redesign of significance will be managed through the State Construction Office.

{d} BTA duties the Region and the Construction Office have agreed that "minor structural" questions may be referred to the BTA. Those "minor structural" questions which can be resolved on site may be handled directly by the BTA. Documentation will be provided to the Project Engineer in support of the recommendations. The BTA also takes on the responsibility of keeping the Bridge and Structures Engineer advised of any changes, as appropriate.

{e} BTA guidelines Specific guidelines for the BTA's role on site are as follows:

- Be alert to the need for technical advice to the Project Engineer and be available and responsive to the Project Engineer's requests.
- Develop solutions in accordance with the best structural interest of the project.
- Recommendations should generally be made in writing to the Project Engineer and should include an assessment of the approximate cost of the change.
- Provide the Project Engineer with written documentation to support the recommendations for changes. The Project Engineer will consult with the State Construction Office, as appropriate.
- The BTA has the authority to approve and endorse the structural changes on behalf of the State Bridge and Structures Engineer.
- Keep a written record of activities and recommendations pertaining to the assigned project (project diary).
- Refer/leave contract administration issues to the Project Engineer.
- Conform to the field safety requirements of the Region and the contractor.
- Give the construction project priority but be prudent in the use of time and expenses charged to the project.

The above guides are not meant to be all inclusive, but are generally representative of the scope of services to be provided by the BTA. The BTA's immediate administrative support on site will be provided by the Project Engineer. The BTA's technical responsibility will be to the BTA's regular supervisor in Olympia. Overall determination and monitoring of the assignments will be made by the State Bridge and Structures Engineer.

{f} BTA summary in conclusion, it is the role of Bridge Technical Advisors to advise the project engineer in their area of expertise, which is structural design. The project engineer has the responsibility and authority to administer the contract. Therefore, when it comes to contract issues of payment, work methods, material substitution, etc., it will be the Project Engineer's responsibility to get the proper approval of those aspects of structural changes.

1-2.4C(4) Delegation of Execution Authority**(I) HIGHWAY CONSTRUCTION**

The Change Order Checklist (Figure 1-5), in addition to describing the approval requirements previously described, also outlines who has authority to execute a change order.

The State Construction Office executes the change order:

- if any one of 1, 2, or 3 is true (checklist item # 1, 2, or 3 is yes)

The Region (Regional Administrator or designee) may execute a change order provided:

- 1, 2 and 3 are not true of the change (checklist item # 1, 2, and 3 are no)

The Regional Administrator's authority to execute change orders may be:

- delegated to the Regional Construction Manager
- further delegated to the assistant to the Regional Construction Manager

The Region's (Regional Administrator or designee) authority to execute a change order may be delegated to the Project Engineer provided:

- items 1 through 6 are not true of the change (boxes 1 through 6 are marked no)

In the absence of the Project Engineer, the Project Engineer execution authority may be further subdelegated to the Assistant Project Engineer.

(II) WASHINGTON STATE FERRIES

The Director and CEO of WSDOT Division of Washington State Ferries is authorized to approve all changes for terminal construction projects and may consult the State Construction Office for advice. This authority to execute change orders may be:

- Delegated to the Director of Terminal Engineering provided the change does not include a cost or credit exceeding \$500,000 nor does it change the condition of award requirements.
- Authority may be further delegated to the Manager of Terminal Maintenance and Construction provided the change does not exceed \$100,000 and does not include a time extension exceeding 10 days.
- In the absence of the Manager of Terminal Maintenance and Construction, that Manager's execution authority may be further subdelegated to the Assistant.

(III) LOCAL AGENCY PROJECTS

When the project being administered includes local agency participation, the project engineer should coordinate with the Regional Local Programs Engineer and the local agency to establish an approval process acceptable to all the parties. Any funding constraints and timelines for reviews and approvals should be established and specified in the contract, if appropriate.

1-2.4C(5) Prior Approval

The best business practice is to have a signed change order in place prior to proceeding with the work. Prior approvals should be the exception. A prior approval might be warranted if it will provide a cost/time benefit to WSDOT or minimize a cost/time disadvantage to the contractor. In the event that the Project Engineer determines that it is in the State's best interest to proceed with the work prior to having a signed change order, the permission "prior approval" of the executing authority to proceed with the change under these circumstances must be documented in the file. The executing authority is the person who will ultimately execute the change order. The project engineer must have either an executed change order or a prior approval in place prior to proceeding with the work

1-2.4C(6) Documentation**(I) STATE CONSTRUCTION OFFICE ROLE**

The State Construction Office will review Region executed change orders and provide appropriate feedback. Four main areas the Construction Office will review are:

- whether the change is appropriate and there is entitlement
- determine compliance with the change order checklist
- check for existence of supporting documentation
- determine if eligibility for federal-aid participation has been addressed

(II) PROJECT FILES

[1] CCIS INPUT The Project Engineer shall ensure that the following information is input into CCIS accurately and in a timely manner:

- Page 1
 - Contract No.: (in 6-digit format)
 - Proposed By: C(Contractor), E(Engineer), or B(Both)
 - Order Date: Date change order entered into CCIS
 - Unilateral Change: Y/N
 - PE Stamp required: Y/N
 - Short Description: Descriptive title for change order
 - Is this a MINOR CHANGE? :Y/N
- Page 2 – (Use only if approval to proceed is requested)
 - Approval Date: The date approval given
 - Estimated Amount:
 - Requested By: Who requested approval
 - Approved By: Who gave approval
 - Estimated Amount: The estimated dollar amount of the change order
 - Narrative: Description of why approval is needed
- Page 3 – (Use only if this change order is a CRIP)
 - CRIP Amount
 - Commentary on CRIP

- Page 4
 - Sent To Contr: The date the change order was sent to the contractor for signature/concurrence
 - Rec'd From Contr: The date the change order was returned from the contractor
 - Surety Consent: Was surety consent obtained
 - Surety Date: Date Surety consent obtained
 - PE Recom: Is PE recommending approval by Region or HQ
 - Exec: Initials of PE if executing change order
 - Date: Date that PE executed or recommended execution (Note: the date field on line 4 is for Region or HQ use only)
 - By Whom: Who voided change order (if applicable)
 - Date: Date change order was voided (if applicable)
- Page 5
 - Phase: Contract phase affected by change order (if days added/deleted)
 - Description: Phase description (if days added/deleted)
 - Net Change: Number of days added/deleted by change order
- Page 6
 - What Section of contract changed?
 - Describe the Detail Change:
 - What created the need or caused the change?
 - What is the purpose of this change order?
- Page 7
 - Description: Change order text (uploaded from MS Word)

If new items are created, contract items modified, or Condition of Award is modified by the change order, this information must be input into CCIS as well.

It is important that CCIS input be accurate and timely. CCIS is used by internal and external customers to monitor project changes and costs. Information on change orders (*including minor changes*) is readily accessible through a numbering process and must be adequate so that everyone involved will understand the need for the change. Some key items to remember are as follows:

- Is there a clear description of the work?
- Is the origin and purpose of the change being entered using at least two of the reasons listed in the system?
- Was there an order, other than a signed change order, by the engineer for the contractor to proceed?
- Is there a reference to any key documents in the change order file?
- Are any increases or decreases in contract time associated with the change order entered in the appropriate field enabling the *Weekly Statement of Working Days* to be automatically updated?

- For condition of award change orders, are the appropriate fields filled in to generate the change order and automatically update the condition of award items?
- Are any disclaimers included in the change order and are any agreed upon disclaimers included in the text?
- Are all the appropriate dates entered?

[2] Memorandum: The memorandum transmitting the change order and attachments should include an explanation in sufficient detail so that everyone involved will understand the need for the change, will see that the price is appropriate and that appropriate checks and consultations have been made. The following is a list of items to consider for inclusion in the transmittal when putting together a change order:

{a} describe the change

- what is required by contract?
- what is the change?
- how does it solve the problem?
- reason for entitlement/why is this not paid under the contract?
- is there time associated with the change?
- did the contractor concur/if not why?
- is FHWA participation appropriate?
- does the change affect COA?

{b} evolution of the change

- how did the change evolve?
- discussions with associated offices (maintenance, utilities, environmental, budget, design, etc.)
- alternatives considered
- BTA involvement
- design approval necessary
- COA substitutions authorized by State Construction Office
- approvals in accordance with the checklist/date

{c} payment

- any increase or decrease in cost
- how it was established (see equitable adjustment)
- force account must include estimate

{d} time

- does the change impact the critical path?
- how was any change in working days established?
- note if a change in contract time affects the amount of liquidated damages

{e} prior approval

- was the change order executed by the appropriate WSDOT authority prior to proceeding with the work?
- if not, prior approval by whom and when

{f} attachments

- checklist
- documentation of approval to proceed
- any supporting documentation needed for understanding

[3] DISTRIBUTION

{a} *Region-executed* When the Region (PE or Region Construction Office) has executed a change, then copies should be sent to the Contractor and the CAPS Unit of Accountability & Financial Services, (if necessary, the CAPS Unit of Accountability & Financial Services creates and coordinates new groups in “CAPS” and “TRAINS”). The original signed change order, the original memorandum and any other pertinent documentation, along with one copy of the change order and one copy of the memorandum should be sent to the State Construction Office. If the change order utilizes the “Minor Change” process, then the two page document substitute for the transmittal and CCIS change order print out. The original two page “Minor Change” document should be sent to the State Construction Office,

{b} *Headquarters-executed* If the change is executed at the State Construction Office, copies will be sent to the contractor, the Region, the CAPS Unit of Accountability & Financial Services, (if necessary, the CAPS Unit of Accountability & Financial Services creates new groups and/or items) and, if appropriate, to the State Bridge Office, Design and the Materials Lab.

{c} *protecting the interest of the surety* One area for the Project Engineer to watch is the interests of the bonding company. Consent of Surety should be required on any change order that expands the scope of the contract. It is also appropriate on any change of large value or risk. Failure to obtain consent of surety could weaken the State’s protection under the bond.

1-2.4C(7) Minor Changes

(I) OVERVIEW

All contracts will have a standard item for “Minor Changes”. This item will be established in every group as a calculated lump sum. Credits, debits, changes in working days and no cost changes may all be processed under the minor change method subject to the listed criteria.

(II) CRITERIA FOR USE

Keep in mind that although the change meets the criteria for using the minor change process, the Project Engineer may decide that this process is not appropriate. The use of this item is at the Region’s and the Project Engineer’s discretion. Also keep in mind that the limitations and approvals required by the change order checklist still apply as well as all other change order criteria not modified by this *Minor Changes* section. The Minor Changes process is limited to changes that satisfy all three of the following criteria:

- non-structural changes (checklist item #15 is no) and,
- the value of the change (credit or debit) is estimated at \$15,000 or less and,
- any change in working days not greater than ten days.

(III) ENDORSEMENT

In the interest of being timely, the change order should be a tool to document agreement and not a negotiation tool back and forth. The contractor’s authorized signature on the change order is desirable but not mandatory. A phone call or a verbal agreement with the project superintendent may be appropriate if payment is to be made by “Minor Changes”. This may be a good discussion item at preconstruction meetings. The Project Engineer should determine when the Contractor’s signature is required based on when it is in the State’s best interest to document agreement prior to proceeding with a change order. Some situations that may warrant the Contractor’s signature are as follows:

- The contract includes substantial incentives.
- There are mutual benefits associated with the change.
- The change might include impacts to time or other work.
- The change is proposed by the contractor.
- The change is a claim settlement.

In any case, a copy of the Minor Change must be sent to the contractor. If the contractor does not agree with the terms or conditions of any change order and has not endorsed the change, then the contractor is required to follow the procedure outlined in Section 1-04.5 of the *Standard Specifications*. This orders the work to proceed and puts the decision to continue negotiations in the contractor’s hands as detailed in that section. The contractor is obligated to endorse, write a separate acceptance or protest as described in the specification, and a timeline is provided for these actions.

(IV) EXECUTION

Due to the criteria for the application of minor changes, the Project Engineer has the authority to execute these change orders.

(V) PAYMENT BY LUMP SUM

The negotiation of prices for payment under “Minor Changes” is intended to be the same as any other change order. The focus, as always, should be forward pricing such that the contractor controls the work and assumes the risk. However, situations occur where it makes sense to measure portions of the work in a variety of ways such as units, force account and/or lump sum. The method for establishing, measuring and monitoring the total may be by any combination of methods however, the payment will only be by a lump sum under the item “Minor Changes”.

(VI) PROJECT FILES

[1] CCIS INPUT “Minor Change” change orders must be entered into CCIS, however the required input is slightly abbreviated. Since a formal change order document as described in Chapter 1-2.4C(6) is not processed, the *Work Description* section in CCIS requiring a detailed upload of text is not required. However, the *Short Description* is required and should provide enough detail to identify the content of the “Minor Change” change order. All other information requested by CCIS, including changes to working days, is required.

[2] TRANSMITTAL Under the Minor Change process, the "Change Order - Minor Changes form # 421-005A EF" substitutes for the transmittal included in the more formal process described above. The information on the Minor Changes form should at a minimum briefly document three key items:

- A description of the change
- Reason for entitlement/why is this not paid by bid items.
- Any increase or decrease in cost and time and briefly how it was established.

[3] DISTRIBUTION When utilizing the "Minor Change" process, the minor change form is substituted for the change order document and the transmittal. The original, signed, "Minor Change" form shall be submitted to HQ. In the case of the "Minor Change" process, it is not necessary to route the backup documentation nor a CCIS print out, as part of the distribution. A copy of the form may be used to document the payment.

1-2.4D Force Account

1-2.4D(1) General

When it is difficult to provide adequate measurement or to estimate the cost for certain items of work, force account may be used in order to pay the Contractor for performing the work. Some contract items may be set up to be paid by force account. Some change orders may require payment by force account. Section 1-09.6 of the *Standard Specifications* describes the boundaries for payment of work performed by the force account method. In any case, the purpose of force account is to fully reimburse the Contractor for costs incurred on the work. These costs may also include indirect segments, such as travel, per diem, safety training, industrial safety measures, overhead, profit and other hidden costs. The objective is to minimize the inclusion of any "contingencies" included in the contract bid in anticipation of costs that may be incurred during force account work and not reimbursed.

When work is added to the contract and is to be paid by force account, a change order will have been prepared describing the added work to be performed. The change order package will also contain an independent estimate of the cost to perform the added work. All non-standard force account items are assigned the Standard Item Number 7715.

Force account payments are typically not authorized for employees engaged in management or general supervisory work. The cost for this type of activity is presumed to be included in the Contractor's markups for overhead and profit. However a foreman or, in some cases, a dedicated superintendent devoting full time to the force account work is eligible for payment on the force account.

On projects that require the Contractor to employ trainees, these employees may be utilized in force account work.

In the case of some Emergency Contracts (see *Emergency Relief Procedures Manual* M3014.01) which will be measured and paid by Force Account, it is appropriate for the Engineer to consider payment for mobilization of equipment to the site of the emergency, including all staff

time employed to procure and coordinate the mobilization. It may also be appropriate to include the labor payment for a dedicated superintendent and foremen employed solely to oversee the emergency work. On emergency contracts the mark ups may not be enough to cover the cost of performance bonds; the Project Engineer may consider payment for performance bond costs when making payment under emergency force account contracts.

The Project Engineer should consider a decision to direct force account work with the same degree of caution that would be applied to directing any other work on the contract. The Contractor should have the expertise to schedule the work and determine what equipment is required. In most cases, it is best that we allow the Contractor to propose the method and approach to the work. Our most effective role would be to concur or approve of the Contractor's proposal or suggest modifications to it. Before any work is performed by the Contractor on a force account basis, the inspectors should review and agree with the Contractor upon:

1. **Labor.** The classification and approximate number of workers to be used, the wage rate to be paid those workers, whether or not travel allowance and subsistence is applicable to those workers, and what foreman, if any, will be paid for by force account. This agreement will be closely tied to the development of the Labor List.

2. **Materials.** The material to be used, including the cost and any freight charges whether the material is purchased specifically for the project or comes from the Contractor's own supply. For materials representing a significant cost, or where the industry experiences fluctuations in price, the contract allows for shopping and the Contractor may be directed to obtain quotations. If time permits and the situation seems appropriate, the Project Engineer may want to do this.

3. **Equipment.** The equipment to be used including the size, rating, capacity, or any other information to indicate the equipment is proper for the work to be performed whether the equipment to be used is owned by the Contractor or is to be rented. The cost per hour for the equipment to be used. In the case of rented equipment, the Engineer may ask for competitive quotations, provided the request is made in advance and there is time to obtain them.

Payment for force account work should be made on the same timely basis as any other item of work. When money is being withheld from a progress estimate, the criteria for withholding should apply equally to all items of work, not just to force account work, because of its method of payment.

The procedure for record keeping and payment of force account work on change orders shall be the same as for contract items to be paid by force account. Separate records are to be kept for each force account whether it is an item in the original contract or established as a result of a change order.

1-2.4D(2) Payment Procedures for Force Account Work

1. **Labor.** The specifications require the Contractor to prepare and submit a "Labor List" in advance of force account work. Once approved by the Project Engineer, this list provides the hourly rate for force account calculations until a new list is approved. New lists will not be approved retroactively and calculations previously made from an approved list will not be changed when a new list is approved. If the Contractor fails to submit a list before the first force account calculations are made, then the Project Engineer will determine the rates from the best data available (payrolls on this job, payrolls on other jobs, prevailing wage requirements, union information, etc). Labor list rates will include all the pieces of wage expense — base rates, benefits, assessments, travel, with allocations shown where necessary. Examples of Labor List entries might be:

Generic Laborer (Straight Time)		John Doe, Teamster (Overtime)	
Basic Wage/hr	\$21.36	Basic OT Wage/hr	\$32.81
FICA (7.65%)		FICA (7.65%)	
FUTA (0.80%)		FUTA (0.80%)	
SUTA (5.42%) Total =	2.96	SUTA (5.42%) Total =	4.55
Indust Ins \$1.01/hr	1.01	Indust Ins \$1.01/hr	1.01
Benefits/Hr \$30.78/hr	5.45	Benefits/Hr \$46.37/hr	8.00
Travel Expense		Travel Expense	
\$250/40 hrs	6.25/hr	\$250/40 hrs	\$52.62/hr
Total	\$37.03/hr	Total	\$52.62/hr
Use	\$37per hr	Use	\$53per hr

These examples show the rate rounded to the nearest dollar, which is permissible. If either party would prefer to use the unrounded amount, that is also acceptable. When deciding how many hours require compensation, the specification allows all hours that are a contractual obligation or are customary payments made to all employees. This means that, if a labor contract calls for 4 hours of pay for any call out, then that is a contractual obligation and the 4 hours would be eligible for reimbursement. (As always, the Contractor is expected to reassign the employees, if possible, to avoid the penalty.). In the same vein, a non-Union contractor, who has made call out payments to all employees for years, would be eligible for reimbursement for similar payments in a force account.

2. **Materials.** Materials also work from a list, but the list is generated in a different fashion. The Project Engineer provides the basic list of materials observed by the inspector. This is done in a timely manner (daily, unless the Contractor agrees otherwise). The Contractor adds prices to the list and attaches invoices or affidavits to support the prices. Once the list is returned and checked, payment can be made.

If a shipment of material is only partially consumed during the force account reporting period, the inspector may choose to include the entire amount in the first report or to estimate the amount consumed during each reporting period. The decision should be based upon the amount of the shipment, the nature and cost of the shipment and the security of the

stockpile. A case of empty sandbags to be utilized throughout the winter for pollution control would adapt well to a single report, while a stockpile of galvanized conduit should probably be reported piecemeal as it is used in the work. The Contractor may use copies of the original invoice when the material is reported incrementally. If the Contractor has to restock unused material, restock charges can be reimbursed if the original order was reasonable for the work planned.

Along with supplying prices and invoices, the Contractor may suggest additions or corrections to the Materials List. These suggestions will be reviewed by the Project Engineer and, if appropriate, added before payment is made.

If the Contractor does not have an invoice, as in the case of stockpiles or some warehouse stock, then an affidavit will suffice. The Engineer may review the affidavit and, if it is an unreasonable price that cannot be supported, the Engineer may substitute another price, utilizing the best data available. The reasonableness of the price must consider the circumstances of the purchase and all costs associated with obtaining material from another source.

The specifications allow the Engineer to require competitive quotations, if this is done before the work is started and sufficient time is available. If the Contractor has to divert an employee to obtain the quotations, then that employee may be included in the labor reimbursement for the force account.

3. **Equipment.** The Project Engineer should review and comply with the rules governing payment for equipment as outlined in the most current AGC/WSDOT Equipment Rental Agreement. This agreement was developed as a supplement of the specifications and is relatively self explanatory.

There are three methods of acquiring equipment for use on a force account. "Owned" means that the Contractor controls and operates the equipment. A long term lease arrangement would be the same as ownership. Owned equipment is priced according to the Blue Book. "Rented to Operate" means that the Contractor has obtained a piece of equipment through a short term rental and will operate that equipment with its own employees. Rented to Operate equipment is priced according to the invoice from the rental agency. "Rented Operated" means that the Contractor has obtained a service from an individual or a company to provide a piece of equipment with an operator. An operated rental is not paid as equipment, but rather as a Service. In some cases, the Service will be reclassified as an entity performing in the manner of a subcontractor (see below).

Damage waivers are compensable. The Engineer has the discretion to reimburse for a damage waiver when it makes good business sense. Upon request, the Contractor should be able to demonstrate that the purchase of the damage waiver is consistent with their standard business practice. Consideration should be given to the potential risk of damage to the equipment versus the cost of paying for the damage waiver. In most cases, the cost of the waiver is minimal. The damage waiver does not cover damage caused by operator negligence, nor should the Department reimburse the Contractor for repair of any damage caused by operator negligence.

Normal wear and tear on equipment is included in the Blue Book rental rates. The ownership rates include major overhaul of the equipment. The Blue Book defines major overhaul as the periodic rebuilding of the engine, transmission, undercarriage, and other major equipment components. The operating rates include the cost of daily servicing of the equipment, including the replacement of small components such as pumps, carburetors, injectors, filters, belts, gaskets and worn lines. The operating rates also include the cost of expendables such as fuel, lubricants, filters, tires, and ground engaging components, such as pads, blades bucket teeth, etc.

The costs of extraordinary operating expendables are not covered in the operating rates due to their highly variable wear patterns. These extraordinary operating expendables may include certain ground engaging components, such as hammer and drill bits, drill steel, augers, saw blades, and tooth-bits. The cost for these items will normally be recovered separately, based upon invoices for their cost.

Repair of damage is considered a risk of providing equipment. The cost of this risk is assumed to be in the markup for overhead and profit. Costs for repair of damage should not be included in the force account direct charges. A common event is the offer of a Damage Claim Waiver by a renting agency. If such a charge appears on an invoice, it may be considered for inclusion when payment is calculated.

As with Materials, the Engineer may require competitive bids for equipment rentals. Normally, this requirement must be made in advance, before the work is started. However, if the rental is not made in an “arm’s length” transaction, for example when the contractor rents the equipment to himself through some sort of business structure, then after the fact quotations may be obtained from independent rental agencies and the lowest such quotation may be used in place of the rental invoice.

Finally, as a special insertion into this Manual, there is a separate method of paying for Pavement Routers for Crack Sealing. WSDOT has agreed to set aside the Blue Book rate for this equipment and to pay \$20 per hour for the operated router.

4. **Services.** Services billed by invoice will be compensated according to the invoice if that is the typical method in standard industry practice. Typical industry practice might include specialized technical services, such as Testing Labs and Environmental Cleanup firms. Also included might be unit price invoices, such as Sweeping per mile or Concrete Pumping per cubic yard, or lump sum quotation invoices, such as Remove Danger Tree or Pump Septic Tanks.

The markup for services depends on the nature of the firm’s activities on the project. If the firm is clearly an uninvolved supplier, then the Service markup will apply. If the firm is acting as a subcontractor, then the markup will be made under the subcontractor provisions described below, with the underlying (subcontractor’s) overhead and profit assumed to be embedded in the invoice.

It should be noted that payment of force account work through an invoice does not excuse the Contractor from other requirements of the contract. Wage rate rules, subcontractor

approvals and other provisions are still contract requirements and must be enforced. Such enforcement, however, is independent of the administration of force accounts and force account payment will not ordinarily be withheld to aid in the enforcement. Note that the statutes associated with some provision requirements do involve the withholding of payment for associated work.

As with materials and equipment rentals, the Engineer may require competitive bids for invoiced services. Normally, this requirement must be made in advance, before the work is started. However, if the service is not obtained in an “arm’s length” transaction, for example when the invoice comes from a subcontractor without sufficient effort to find competitive prices, then after the fact quotations may be obtained from independent service providers and the lowest such quotation may be used in place of the service invoice.

5. **Mobilization.** Mobilization and demobilization are reimbursable expenses for assembling equipment, materials, supplies and tools for any force account item and then returning those items to the previous location when the work is finished. Demobilization can include restocking costs for materials not utilized. Force account mobilization applies to original bid item force accounts as well as force accounts added through change orders. The standard bid item “Mobilization” is assumed to not include mobilization activities for force account work.

Mobilization may occur within the project limits if special efforts are required to assemble needed items to the force account location. For example, if a lowboy is required to move a bulldozer from one end of a project to the other, then that mobilization effort would be reimbursed.

If off site preparation work is needed, the Contractor must notify the Engineer in a timely enough manner that the work can be observed, if that is desired. Without such notice, that preparation work will not be reimbursed.

The AGC Agreement allows for pro-rating mobilization costs for equipment that will be used in both force account and bid item work. This will be done by negotiation and agreement. For example, if the Project Engineer and Superintendent agree that a mobilized backhoe will be used three hours on regular work for each hour on force account, then 25 percent of the mobilization costs would be paid on the force account.

All mobilization activities can be categorized as Labor, Equipment, Materials, or Services and will be listed under those categories for payment.

6. Other Payments

Permits or Fees

When a force account requires the Contractor to pay for permits or fees (hazardous waste dumping, etc.) that would fall outside the scope of overhead, these costs are reimbursable and may be included in the “Services” section of the force account payment.

Sales Tax

How retail sales tax is handled on the overall project depends on the ownership of the property upon which it rests. Keep in mind that a project may span more than one type of ownership.

STATE AND PRIVATELY OWNED LANDS

Work performed on state or privately owned land falls under Section 1-07.2(2) of the *Standard Specifications* and Department of Revenue Rule 170. Retail sales tax **is required** on the total contract amount. The Contracting Agency provides this payment to the Contractor to be passed through to the Department of Revenue. This is the tax noted in the summation of contract payments.

The Department of Revenue considers materials incorporated into the final work (such as concrete, signs, aggregates) to be an integral part of the completed improvement. These materials are purchased for “resale”. **No tax is required** when purchasing these materials, therefore, no tax is paid as part of force account payments or as part of pricing change order work. The contractor purchases these materials as tax exempt and, in turn, sells them to the State as a part of the total project and the only tax collected is on the total contract as described previously.

There may be items that the contractor **is required** to pay sales tax on at the point of purchase. The Department of Revenue considers supplies consumed (such as concrete forms, fuel or tools, equipment purchased or rented) during the performance of the contract to be “consumables”, a part of the overall cost of doing business. The contractor is required to pay retail sales tax at the point of purchase/rental for these items. These costs are bid as a part of the associated bid items.

When calculating or estimating the cost of force account or change order work, sales tax should be included in the individual invoices for “consumable” items. It’s a fine line; for example, permanent striping is considered “resale” (tax exempt), temporary striping is a “consumable” (taxed). The fact that taxes are shown or not shown on invoices is not a reliable indication of what the contractor is obligated to pay. The contractor may receive reimbursement later or be required to pay additional taxes when the contract is complete. The contractor’s books are audited by the Department of Revenue upon completion of each project to ensure compliance. The Project Engineer must apply these guidelines as closely as possible. Note that, in some cases, it is possible and necessary to pay a tax on a tax.

CITY, COUNTY, AND FEDERALLY OWNED LAND

Work performed on city, county or federally owned lands falls under Section 1-7.2(1) of the *Standard Specifications* and Department of Revenue rule 171. Retail sales tax **is not required** on the total contract amount.

The Contractor **is required** to pay retail sales tax on all purchases regardless of use (“consumable” or not). For contract work, this expense is incidental and therefore included in the individual contract items as a part of the bid amount.

When calculating or estimating the cost of force account or change order work, sales tax should be included on all invoices. As stated previously, the fact that taxes are shown or not shown on invoices is not a reliable indication of what the contractor is obligated to pay. The contractor may receive reimbursement later or be required to pay additional taxes when the contract is complete. The contractor’s books are

audited by the Department of Revenue upon completion of each project to ensure compliance.

Exceptions

Construction of the following facilities has been specifically exempted from Department of Revenue rule 171. Work on these facilities falls under Department of Revenue rule 170 even if they are on non state owned land:

- Water mains
- Sanitary sewers, if they are not a part of the road drainage system
- Telephone and telegraph lines
- Electrical power, if such power does not become a part of a street or road lighting system
- Other conduits or lines

Conclusion

Most of the time, retail sales tax on invoices is required. In turn, we need to reimburse the contractor for the tax (paid or deferred) on force account invoices and include the costs when estimating the value of change order work.

The one exception is “resale” items if the contract falls under Department of Revenue rule 170. “Resale” items under this rule do not require that retail sales tax be paid at the point of purchase.

These rules should be adhered to regardless of whether retail sales tax is shown on the invoice.

Subcontractor Markup

If work is being performed by a subcontractor (or by a service supplier acting in the manner of a subcontractor), then a supplemental markup will be added. This supplement will be added one time for each payment, even if a lower-tier subcontractor is doing the work. The markup is a graduated step down rate, which gets smaller for each force account item as the amount of work increases.

The amounts on which the rate is determined will be tracked separately for each subcontractor on each force account item included in the original contract or added by change order. If two subcontractors work on the same force account, then the accumulated total will be tracked for each, and markup for work done by each will be according to the respective total. If a single subcontractor works on two force accounts, then there will be a running total of work done by that subcontractor on each account and the markup rate for the same sub on different force accounts could be different.

1-2.4D(3) Records and Source Documents

Accurate daily time records should always be kept when performing force account work. Form 422-008, “Daily Report of Force Account Worked”, is provided for the Project Engineer’s use to help facilitate timely, accurate, and complete records of the daily force account activities. Whatever method of record keeping is used, it is recommended that the document be signed by both the Inspector and a representative of the Contractor agreeing on the materials used and the hours noted for labor and equipment. A copy of the daily report must be provided to the

Contractor. When the work is performed by a subcontractor, a copy should also be provided to the subcontractor.

The costs for force account work should be determined and entered into the CAPS system in as timely a manner as possible.

All calculations for determining force account costs should be checked, initialed, and dated. After the cost of the work has been computed in the office, a copy of calculations shall be furnished to the Contractor.

1-2.4D(4) Summary

To summarize, the purpose of force account is to fully reimburse the Contractor for costs incurred on the work. The objective of force account administration is to minimize the inclusion of any “contingencies” included in the contract bid in anticipation of costs that may be incurred during force account work and not reimbursed.

Items which are bid or negotiated with a unit price or a lump sum agreement will not be converted to force account unless a change (as defined in Section 1-04.4 of the *Standard Specifications*) has occurred. On the other hand, any work to be done or the remaining portion of work underway on a force account basis may be converted to unit prices or a lump sum at any time the parties can reach an agreement. Such a conversion is highly desirable and should always be a goal of the Project Engineer.

1-2.4E Differing Site Conditions (Changed Conditions)

There are two types of changed conditions. The first (Type I) is a hidden condition that is different from that indicated by the contract (the borings do not show this rock). The second (Type II) is a hidden condition that is not shown differently in the contract, but is unusual and different from what a reasonably prudent contractor would expect (I’ve never seen this before and nobody else has ever seen it, either). In either case, to qualify for renegotiation, the condition must have a “material” affect on the cost of doing work. In other words, there must be a definable difference in the way the work will now be done and that difference must be significant.

The contractual rules included in Section 1-04.7 are related to fair notice and to giving the State an opportunity to examine the condition and, perhaps, order a different approach to the work. If the contractor takes away this opportunity, then there may be grounds for denying compensation for the different approach to the work. In some cases, the changed situation is not recognized until much or all of the work has been done. In that case, the determining factor for notice is the time when the Contractor knew or should have known of the condition. Whenever notice is served, it must be written.

In a perfect world, a changed condition will be recognized, notice will be given and work will be stopped until all the interested parties can reach agreement on how to proceed. In the real world, we are often faced with traffic closures and safety issues. Contractors work on tight schedules with one activity interdependent on others and it is not in the public interest to stop work while a changed condition discussion takes place. As soon as possible, to the extent possible, and in any manner which accomplishes the intent, the Project

Engineer is expected to consult with the Region Construction Manager and the State Construction Office to obtain the approval before agreeing that a changed condition exists or before entering negotiations for price adjustments.

The Department response to a contractor’s assertion of changed conditions, whether agreement or denial, must be written. The Project Engineer must keep accurate time and material records whether the response was negative or positive.

1-2.4F Termination of Contract

Contract termination is divided into two major categories, termination for default and termination for public convenience. Section 1-08.10(1) of the *Standard Specifications* defines the situations when a contract may be terminated for default (doesn’t happen very often.) Section 1-08.10(2) of the *Standard Specifications* defines the situations when a contract may be terminated for public convenience.

Keep in mind that the conditions of the termination may be negotiated in the event that the termination is in the best interest of both parties. An example would be if a major change is beyond the abilities of the contractor. Negotiations with regard to conditions of the termination may include pricing partially completed items, mobilization payment, or the State taking possession of fabricated/purchased materials.

In both categories, if federal funds are involved, FHWA needs to be notified and informed of the situation early in the process. Specifically, Federal participation eligibility should be discussed prior to making a decision on termination. Formal notification and discussion should use normal channels through the Region to the State Construction Office. Authority to terminate a contract rests with the same position that had authority to execute the contract.

1-2.4G Subletting Portions of the Contract

Requests by the Contractor for subletting are submitted on Form 421-012 EF (Request to Sublet) and are to be approved by the Regional construction manager or designee. The request must be approved prior to the performance of any work on the project by either the subcontractor or a lower-tier sub. A copy of the Statement of Intent to Pay Prevailing Wages, executed by the subcontractor or lower-tier sub and approved by Washington State L&I, must be provided to the Project Engineer by the Contractor prior to payment for any work performed by that subcontractor or lower-tier sub. In addition, for Federal-aid projects, Form 420-004 EF (Contractor and Subcontractor or Lower-Tier Subcontractor Certification for Federal-aid Projects), must be submitted with the Request to Sublet.

Section 1-08.1 of the *Standard Specifications* defines what is not considered to be subcontracting. By default, any entity performing bid item work on the project is a subcontractor, unless: (1) they are the Prime Contractor, (2) an Owner furnished resource (such as WSP, utility owner or its contractor or consultant), or (3) they are specifically excluded from consideration as a subcontractor in Section 1-08.1. Do not be confused by the distinction between Professional Services and Subcontractors in the markups for force account work described in Section 1-09.6. Those provisions apply

only to how the markup for overhead and profit is applied to force account work, and they have no relationship to the requirement for a Request to Sublet.

If a subcontractor wishes to further sublet a portion of its work to a lower-tier firm, the Contractor must submit the name of the lower-tier firm along with the request to sublet the work to the subcontractor. If more than one subcontractor on a project wants to utilize the same firm as a lower-tier subcontractor, separate requests are required. Section 1-08.1 of the *Standard Specifications* sets limitations on the amount of work a lower-tier sub may perform for each subcontractor. Section 1-08.1 of the *Standard Specifications* also sets forth the procedure for subletting portions of the project, and the percentage of the contract which may be sublet. The dollar value to be used for determining the amount of work that must be performed by the Prime Contractor is the total original contract amount less the amount of any specialty items which have been subcontracted. In order to ensure proper tracking and reporting of sublet information, the Project Office shall enter data from each request to sublet into the CCIS database. When the Project Office is in a situation where the CCIS database is not utilized during the administration of a project (i.e. Emergency Contracts, State Aid Contracts, etc.), and requires the “hand calculation” of the percentage of amount sublet, the percentage will be calculated for all items except specialty items, using the amount shown on the Request to Sublet or the bid amount whichever is smaller.

When Condition of Award items are sublet, ensure that the total amount is equal to or greater than the amount in the Condition of Award letter and that the Condition of Award items will be sublet to the proper Condition of Award subcontractor. If a bid item shown on the Condition of Award letter is not sublet to the proper D/M/WBE, then the request cannot be approved until the contract is changed.

1-2.4H Contractors' Shop Plans and Working Drawings

In general, all shop drawings and supplemental details submitted by the Contractor should be checked, in detail, for conformance to all contract requirements before forwarding on for approval or further actions by others. A Change Order is required for any deviation from the contract plans. Any conflicts with the contract plans that have been detected or revisions that may be desired by the Project Engineer should be noted on one copy of the drawings being forwarded to Headquarters for approval. If Change Orders to cover any deviations from the contract plans have been issued, or are being processed, those changes should also be noted.

Figure 1-6 is a list of many of the most common shop plans and drawings, and includes references to the specifications that require them and the section of this manual that covers the procedures for processing them. Use Form 410-025 to transmit all listed bridge and structure plans to the Bridge and Structures Engineer.

The Project Engineer should maintain a log of all shop plans or other drawings received for each contract.

Shop plans for items that conform to the contract plans or a standard plan, except those listed in Figure 1-6, should be checked and approved by the Project Engineer.

1-2.4I Relief of Responsibility for Completed Work and Relief of Responsibility for Damage by Public Traffic

Section 1-07.13(1) specifically designates the Contractor as being solely responsible for the completed work or material until the entire improvement has been completed. All work and material, including change order work, is at the sole risk of the contractor and when damaged must be rebuilt, repaired, or restored. When these damages occur to either the permanent or temporary work, and have occurred prior to the contract Completion Date, the costs for these repairs shall be entirely at the Contractor's expense. However, the specification does provide the contractor exceptions for causes that are generally beyond the contractor's control.

While the Contractor is fully responsible for the work and materials, the section does provide the contractor some options for relief. Relief is broken into 2 categories. The first category being relief of maintenance and protection for portions of works that have been completed. The second category is for relief of damage caused by the public when it is necessary that the public use the facility during construction. Both options for relief have specific criteria in order to exercise them. While a brief explanation of each option is provided, the Project Engineer should review the entire Section 1-07.13 of the *Standard Specifications* to ensure that the extent of responsibilities are understood and that any relief from responsibility is granted in accordance with those provisions.

Section 1-07.13(2) provides relief to the Contractor from maintaining and protecting specific portions of contract work as they are completed. The Contractor must submit a written request for relief to the Project Engineer. Before granting any relief, the Project Engineer will review the request to ensure that the items of work noted conform to the requirements and limitations outlined in Section 1-07.13(2) of the *Standard Specifications* and have been fully completed in all respects of the contract. The Regional Construction Manager or designee may approve these requests for relief. Relief may be granted for several specific items, for example: “Item 17, Beam Guardrail, Type I; Item 18, Beam Guardrail Anchor Type I; etc.” Relief may also be granted for all work except certain items, for example: “All work except Item 38, Electrical.” the approval of the Contractor's request must be in writing.

When it is necessary for public traffic to utilize a highway facility during construction, Section 1-07.13(3) of the *Standard Specifications* provides relief of responsibility to the Contractor for damage caused to the permanent work by the public traffic. When the conditions specified in this section are met, the Contractor is automatically relieved of this responsibility. However, this section does not provide relief for damage caused by vandalism or other causes. The Contractor will resume full responsibility for both temporary and permanent work if traffic is relocated to another section of roadway. This responsibility will again continue until contract completion unless the section is reopened to public traffic or the Contractor is granted relief under 1-07.13(2).

The first paragraph of Section 1-07.13(3) refers to damage to “permanent work”. This refers to work included in the contract that is being constructed in accordance with the

requirements noted in the plans and specifications and is damaged. The intent is to exclude equipment, temporary facilities and temporary materials such as formwork and falsework. Contract features such as “Temporary Traffic Barrier,” are included if they have been constructed according to plan and are damaged by public traffic using an approved traffic plan.

1-2.4J Protested Work

Occasions may arise where the contract may not have fully or clearly defined a work activity or financial responsibility. In these cases, the Project Engineer may determine that, in order to avoid delay of other critical work, protect the traveling public, or other critical circumstances, it may be necessary to direct the Contractor to proceed immediately to complete the work. In some instances, this order may be against the Contractor’s wishes. While acknowledging the Contractor’s verbal protest, the Project Engineer should again direct the contractor to proceed with the work in accordance with Section 1-04.5 of the *Standard Specifications*. The Contractor should also be advised that, as a separate action, they should follow the guidance in this same section for protest and protest resolution. While these provisions require the Contractor to keep accurate records for completing the protested work, it is not advisable for the Project Engineer to rely on these records to determine what may have taken place when trying to verify costs for protested work many months later. In order to help document the Contractor’s work, the form “Report of Protested Work” (DOT Form 422-007) was developed as a tool for the Project Engineer’s use.

1-2.4K Metric Designed Projects Administered with English Standard Specifications

Some recent projects, whose plans were developed using Metric dimensions, are being administered utilizing the English version of the *Standard Specifications*. Any dimensions in the *Standard Specifications*, Amendments, or Special Provisions that are expressed in English terms are to be converted, utilizing a precise arithmetical “hard” conversion method, to equivalent Metric units, when necessary, to be compared to the contract documents, field conditions or Contractor’s equipment or operations.

The Department still has some Metric projects “on the shelf”. There are also Metric jobs being developed for other agencies, such as Sound Transit. Since there is no current Metric Standard Specification Book, those jobs will be administered using the English book. Several General Special Provisions will be included to accomplish this. These provisions require that, whenever an English dimension or value in the specifications needs to be compared with a contract plan or provision, a field condition or measurement or with the Contractor’s equipment or operation, the necessary conversion will be made utilizing a precise arithmetical “hard” conversion method.

To accomplish the conversion to English specifications, a series of General Special Provisions have been developed to replace those Metric specifications that contain soft conversions. In all cases, the English specifications have

been left intact so that, if items must be added through change order, English units may be utilized with the reference to the *Standard Specifications* without including all the Metric specs in the change order.

The old Metric books contained provisions for “soft” or approximate conversions for a number of elements (bolts, re-steel, etc.). These have been converted to General Special Provisions which will be included with all Metric plan sets. This will allow these exceptions to the “hard” conversion rule noted above. Metric plan sets will have Metric pay units. Change orders on Metric plan set jobs will automatically reference the English specifications and will require English units.

When making payment to the contractor, the project office should measure and pay for the bid item, either Metric or English, indicated as the unit of measure in the contract plan or change order. For example, if the contract calls for “Clearing and Grubbing” to be paid for by the hectare, then the engineer should instruct his crew to measure and pay for the work performed in metric units. The opposite would apply if a change order was written for the project utilizing the English specifications for clearing and grubbing. In that case, the bid item would be measured and paid for in English units (by the acre).

If a situation arises when a conversion is required from English to Metric for an interpretation, a measurement or a payment, the conversion should be made utilizing a “hard” conversion factor. In the case of a payment, the level of precision of the factor will be such that the resulting payment will not vary from the true calculated value by more than one dollar.

1-2.4L Emergency Work Performed Under the Contract

When a natural disaster impacting a wide area strikes, WSDOT may utilize an existing construction Contract in order to restore essential travel, minimize damage or protect remaining facilities. RCW 47.28.170(2) allows WSDOT to contract this work on a negotiated basis provided (a) the cost does not exceed force account rates for the work performed and (b) the contract does not to exceed thirty working days. There must be an emergency declaration by the appropriate authority, the Project Engineer must complete a Detailed Damage Inspection Report (DDIR) and the Project Engineer must contact the Regional Program Manager, since this work will initially be funded by state funds. The Project Engineer should follow the guidance provided in the *Emergency Relief Procedures Manual*, M 3014.01.

Emergency repair work, when performed by the Contractor under an existing Federal-Aid Contract, may be eligible for Emergency Relief funding. In order to qualify for Emergency Relief funding, the repair work must be the result of a natural disaster over a wide area, such as a flood, an unusually severe storm or a landslide. The work must be demonstrated to be beyond the Contractor’s responsibility and not work that has already been scheduled for repair or replacement of deficient structures. Only the work required to protect and open the roadway is eligible for Emergency Relief funding.

Adding emergency work to a State funded contract would require the addition of all Federal-Aid specifications, and is not practicable. It is however acceptable to hire the existing contractor to perform emergency work at the same location under a separate emergency force account contract which would include all the Federal requirements.

1-2.5 Contract Time

1-2.5A General

The contract duration specified for physically completing the contract is stated in the contract provisions normally under the general special provision "Time For Completion." Although there are exceptions, the guidance in this chapter pertains to contracts in which time is accounted for in terms of working days.

The Contractor may begin work as soon as the contract is executed and shall prosecute the work diligently until physical completion has been reached.

The Region will be notified by telephone on the day the contract is executed by WSDOT. Because it can take several days for the executed contract to reach the Contractor, the Region should immediately provide the Contractor with verbal notification of the date of execution so that the Contractor may order materials and prepare to mobilize onto the project and begin work. The date the contractor actually begins work on the project is to be noted and entered into CCIS.

Between the execution of the contract and the acceptance by the State Construction Engineer, the Project Engineer will likely encounter time-related issues. These will be documented through Weekly Statements of Working Days (Section 1-08.5), Suspensions of Work (1-08.6), Protested Work (Section 1-04.5), and Time Extensions (Section 1-08.8).

Contract Completion Milestones

There are two milestones that establish the end of contract time. They are defined in Section 1-01.3 of the *Standard Specifications* as Substantial Completion and Physical Completion. These two milestones are discussed in greater detail later in this chapter.

1-2.5A(1) Progress Schedules

The requirements for progress schedules are specified in Section 1-08.3 of the *Standard Specifications*. A copy of the specified reference, *Construction Planning and Scheduling, Second Edition*, published by the Associated General Contractors of America, has been sent to each Project Office and each Region Construction Office. One of three progress schedules will be specified in the contract. Two types of progress schedules are identified in the *Standard Specifications*, Type A and Type B. A third type may be inserted in the contract as a General Special Provision specifying a Type C Progress Schedule. The three types of progress schedules represent levels of job complexity. Type A being the simplest and easiest to produce and Type C being the most complex. Application is such that the complexity of the project (whether it be timing, coordination or the work itself) will be reflected in the complexity of the schedule.

In addition, a preliminary schedule is required on contracts requiring Type B or C Progress Schedules. Preliminary progress schedules show the work to be accomplished within the first 60 working days. As always the contract provisions may contain requirements that add to, or supersede, all or parts of Section 1-08.3 to allow for special circumstances.

There are four basic reasons that we ask for a schedule:

- To better understand the contractor's plan to deliver the project within the time allowed
- To plan our work force and other resource requirements
- To advise the public and executive staff of major milestones
- And to enable us to actively manage impacts to the contract

Progress schedules should have sufficient detail such that the progress of the work can be evaluated accurately at any time during the performance of the contract. The owner is obligated by contract to return the schedule for correction or approve it within 15 calendar days of receipt. Approval requires that the schedule complies not only with Section 1-08.3 but it demonstrates compliance with other contract requirements such as interim completions, staged work, order of work, etc. Periodically as warranted by progress, delays or changes, the Project Engineer should review the schedule for accuracy and progress of work. If it is determined that the current schedule does not provide the required information or is no longer accurate, a Type B supplemental schedule update may be requested from the Contractor. Monthly updates are required when Type C progress schedules are specified, and the cost of the updates is included in the Lump Sum price of the bid item.

The cost of Type B schedule updates is not included in the Lump Sum price of the bid item. When work is added to the project or the work method is changed at the request of the contracting agency, the respective cost to update the Type B progress schedule should be included in the change order. Type B schedule updates driven by the contractor's actions shall be provided to the contracting agency and are considered incidental to other work. No payment is made for Type A Progress Schedules or Type A schedule updates. Type B and C Progress Schedules are paid as a lump sum. Eighty percent of the lump sum payment is paid upon approval of the initial schedule. The remaining portion is paid when eighty percent of the original work is completed, provided updates have been provided as requested. Weekly look-ahead schedules are considered incidental to other items of work in the contract and therefore are not paid for separately.

When the Contractor has failed to provide a required schedule, the Engineer may:

- Withhold payment for the Type B or Type C schedule if it is not received (but not for other conforming work).
- Withhold all progress payments for failure to comply with the terms of the contract as specified in Section 1-09.9 (this should be a rare event).
- Suspend work and continue to charge each day as workable (this should only be implemented when the Agency is harmed by lack of knowledge of the contractor's intended approach to the work).

In extreme cases, the Agency may determine that the Contractor is in breach of contract according to Section 1-08.10 (usually accompanied by other serious breaches).

When lacking a progress schedule, the Engineer must base progress on the information available and their best judgment. According to Section 1-08.5, the Contractor may protest working day charges, but must support the protest in sufficient detail to enable the Engineer to ascertain the basis and amount of time disputed. This provides another opportunity for the PE to communicate our need for a progress schedule.

1-2.5A(1) Review and Approval of Progress Schedules

It is the responsibility of the Project Engineer to insure that the Contractor submits a correct and complete progress schedule in the time specified. Progress schedules must meet the general as well as type specific criteria. Once it is determined that the progress schedule submitted is of the type specified by the contract, the Project Engineer should evaluate the schedule to determine if it meets the requirements of Section 1-08.3 of the *Standard Specifications*, the Special Provisions and the Contract.

(I) GENERAL REQUIREMENTS

- The progress schedule must include all activities necessary to physically complete the project. By definition, activities consume time and usually consume resources. Activities like concrete curing time and slope staking earthwork may be rolled-up into the overall duration of the activity.
- The progress schedule must show the planned order of work in logical sequence, and in compliance with any requirements of the contract. The reviewer should remember that some work is sequenced by factors inherent in the work, but the Contractor may sequence the work by their preference as long as the project is completed within the authorized time and in conformance to the contract.
- The progress schedule must show durations of work activities in working days. Except for defining nonworking days, the calendar has no relationship to administering contract time. An activity may be stalled by unsuitable weather for days or weeks and remain "on schedule".
- The progress schedule must show activities in durations that are reasonable for the intended work. Since durations of work are a function of resource allocation, the Project Engineer may be required to estimate production rates using estimating manuals, experience or other resources, or to ask the Contractor to explain their planned resource allocation to support the duration.
- The progress schedule must define activities in sufficient detail that progress of individual activities may be evaluated on a daily basis. The reviewer should keep in mind that the level of detail required in a progress schedule is driven by the amount of precision required to perform and monitor the work. For example a single activity that represents several miles of grading may not

provide adequate detail, and may need to be subdivided into smaller activities described by station limits.

- The progress schedule must show the physical completion of all contract work within the authorized contract time.

WSDOT may accept a Progress Schedule indicating and early physical completion date but cannot guarantee that WSDOT's resources will be available to meet an accelerated schedule.

If the progress schedule does not provide the required information, it should be returned to the Contractor for correction and resubmittal. Because the *Standard Specifications* do not specify timelines for resubmittal, the Engineer should provide a reasonable amount of time for the Contractor to revise and resubmit the schedule, and advise the Contractor of the expected date of resubmittal.

(II) TYPE A PROGRESS SCHEDULE

Type A Progress Schedules are required for any projects that do not include the bid item for Type B Progress Schedule or Type C Progress Schedule. The Contractor is required to submit five copies of Type A Progress Schedules to the Engineer within ten calendar days after the date the contract is executed. This may be a critical path method (CPM) schedule, a bar chart, or other standard schedule format, such as fenced bar charts, linear schedules, PERT networks and others. These scheduling methods are described in detail in the benchmark document "Construction Planning and Scheduling, Second Edition", a copy of which has been provided to each Project Office and each Region Construction Office. The Contractor is required to identify the critical path of the project, because a bar chart schedule does not rely on network calculations to determine the critical path.

The Engineer will evaluate this schedule and approve or return it for correction within 15 calendar days of receiving the submittal.

(III) TYPE B PROGRESS SCHEDULE

Type B Progress Schedules are required for all projects containing the bid item for Type B Progress Schedule.

The Contractor is required to submit a preliminary schedule to the Engineer no later than five calendar days after the date the contract is executed. Preliminary schedules must meet all requirements of a Type B Progress Schedule except that they may be limited to activities occurring in the first 60 days of the project.

The Contractor is required to submit five copies of the Type B Progress Schedule to the Engineer no later than 30 calendar days from the date that the contract is executed. This schedule must be a critical path method (CPM) schedule developed by the Precedence Diagramming Method and may employ restraints provided the restraints do not alter the network logic or critical path. As a minimum the Type B Progress Schedule must show:

- The Contract Number and Title
- Construction Start Date
- Critical Path

- Activity Description
- Milestone Description
- Activity Duration
- Predecessor Activities
- Successors Activities
- Early Start and Early Finish for each activity
- Late Start and Late Finish for each activity
- Total Float and Free Float for each activity
- Physical Completion Date
- Data Date

(Many of these terms are defined in “Construction Planning and Scheduling.”)

The reviewer should watch for fixed date constraints that override network logic and force activities to become critical. Specific work windows or “open to traffic” milestones may legitimately influence sequence and duration of related activities. Resource constraints (such as availability of a large crane) may be preferential and may be explained by the Contractor if necessary. Fixed completion milestones for work that is susceptible to unsuitable weather are inappropriate because completion may be extended by the determination of unworkable days.

It is not unusual to see dual critical paths on a CPM schedule, nor is it prohibited. Multiple critical paths are generally very short in duration. Lengthy occurrences of parallel critical activities should be cause for careful scrutiny of activity durations and sequencing.

The Engineer will evaluate this schedule to insure that all required information is included in the schedule, check the network calculations, and approve or return it for correction within 15 calendar days of receiving the submittal.

(IV) TYPE C PROGRESS SCHEDULE

Type C Progress Schedules are required for all projects that include the bid item for Type C Progress Schedule. The Contractor is required five copies of a preliminary Type C Progress Schedule to the Engineer no later than the first working day (as defined in Section 1-08.5 of the Standard Specification). The preliminary schedule must meet all requirements of a Type C Progress Schedule and of Section 1-08.3(1) except that it may be limited to activities occurring within the first 60 working days.

The Contractor is required to submit five printed copies of a Type C Progress Schedule no later than 60 calendar days after the contract is executed. If the Contractor can demonstrate that they are unable to determine resource availability, and that this lack of information prevents them from preparing a reasonable schedule, the Engineer may allow an additional 30 calendar day for schedule submittal.

Each time that a preliminary schedule, Progress Schedule, or Schedule Update is submitted, the Contractor is required to provide the Engineer with an electronic copy of that schedule, on CD-ROM in Primavera Project Planer Enterprise Version, P3e/c or P3 format.

Type C Progress Schedules must contain all of the information required of a Type B schedule, and the following additional information:

- A timed scale logic diagram.
- Activities for traffic detours and closures.
- Milestones for required delivery of State furnished materials (if any)
- Activities for State furnished traffic controller resources (if any).
- Activities for fabrication of materials with longer than 120 calendar days lead time.
- Fixed constraints shall be identified on the activity listing and be supplemented with a written narrative describing why the constraint exists.
- Monthly schedule updates.

If requested by the Engineer, the Contractor shall provide a written narrative describing assumed production rates and planned resource allocation to support activity durations.

(V) WEEKLY LOOK-AHEAD SCHEDULE

Weekly Look-Ahead Schedules are required for all projects. The Contractor is required to submit a Weekly Look-Ahead Schedule, for each week that work is to be performed on the project, showing Contractor and all subcontractor activities for the next two weeks. The Weekly Look-Ahead Schedule must show:

- Description of the work
- Duration of the work.
- Sequence of the work.
- Planned hours of work.

The specification requires that Look-Ahead Schedules show the contractor’s planned hours of work. This information is necessary to evaluate the results of unsuitable weather on the critical path and to assess working days charges correctly.

This schedule is to be submitted by mid-week of the week preceding the scheduled work, or other mutually agreed upon submittal time.

(VI) SCHEDULE UPDATE

Schedule Updates are required for all projects. The Engineer may request schedule updates when any of the following events occur:

- A change that affects the critical path.
- The sequence of work is changed from that in the approved schedule.
- The project is significantly delayed (10 days or 10 percent of the original contract time, whichever is greater).
- An extension of contract time is requested.

It is important to note that schedule updates are only required when they are requested by the Project Engineer, when a contractor submits a request for a time extension, or monthly in the case of a Type C Progress Schedule. The Project Engineer may request an update when any of the triggers occurs, but may choose to forego the update if the impacts to the schedule are readily evident.

The Contractor is required to submit five copies of the Schedule Update for approval within 15 calendar days of a written request, or when an update is required by contract provisions.

In addition to all other requirements, a Schedule Update must show:

- Actual duration and sequence of as-constructed work activities, including changed work.
- Approved time extensions.
- Construction delays or other conditions that affect the progress of work.
- Modifications to sequence or duration of remaining work.
- Physical completion of all remaining work within the remaining time authorized.

It is important to know the difference between an as-planned schedule and an as-constructed schedule. All updates must show the as-constructed sequence and actual durations of all activities prior to the status date.

When the need for a schedule update is triggered by an event that is the contractor's doing, they are responsible for the cost. When WSDOT causes an event or requests an update for their need, payment will be made as part of an equitable adjustment. When WSDOT is adding work or time by means of a change order, the price of the schedule update can be included as part of the work.

Any unresolved request for time extension must be shown by assuming that no time extension will be granted, and by showing the effects to follow-on activities necessary to physically complete the project within the currently authorized time for completion.

Working Drawing, Shop Plan or Submittal Type	Const Manual References	Standard Spec or Other References	Number of Paper Copies (Contact Bridge & Structures to discuss the option of electronic Submittals)	Reviewer Prior to Approval	Approving Authority	PE Distribution of approved drawings (surplus copies stay @ PE)	Notes
Supplemental Drawings (Shop Plans for Contract or Standard Plan Item)	1-2.4H	1-01.3	6 sets to PE	Project Engineer	Project Engineer	2 sets to Contractor 1 set to Fabrication Inspector	
Calculations for Overload of Structure	None	1-07.7(2) 6-01.6 6-01.9	3 set to PE	Bridge & Structures Engineer	Bridge & Structures Engineer	2 sets to Contractor	PE Stamp required.
Mfg. Specification for Portable Temporary Traffic Control Signal	None	1-10.3(3)K	3 set to PE	Project Engineer	Project Engineer	2 sets to Contractor	
Prefabricated Vertical Drainage Wick Submittals	None	2-03.3(14)H	3 set to PE	Project Engineer	Project Engineer	2 sets to Contractor	
Calculation for Backfilling Abutment Prior to Superstructure Placement	None	2-03.3(14)I	3 set to PE	Bridge & Structures Engineer	Bridge & Structures Engineer	2 sets to Contractor	
Blasting Plan	None	2-03.3(2)	3 set to PE	Project Engineer	Project Engineer	2 sets to Contractor	
Excavation Slope Working Drawings and Calculations	None	2-09.3(3)B	3 set to PE	Project Engineer	Project Engineer	2 sets to Contractor	
Cofferdams, Shoring, Crib, and Trench Boxes	6-1.5	2-09.3(3)D 2-09.3(4) 6-01.9 6-02.3(16)	6 sets to Bridge & Structures 2 sets to PE TRENCH BOXES 3 sets to PE	Project Engineer & Bridge & Structures Engineer	Bridge & Structures Engineer	2 sets to Contractor 1 set to Region Const	PE Stamp is Required. 4 additional sets to Bridge if RR is involved (per RR) 6 additional if US Bureau of Reclamation is involved
Faisework, Forming, and Bracing Plans (including design calculations)	6-1.5	6-02.3(16) 6-02.3(17)F	6 sets to Bridge & Structures 2 sets to PE FOR PREAPPROVAL 1 set Plans & 2 sets design calculations to Bridge & Structures	Project Engineer & Bridge & Structures Engineer	Bridge & Structures Engineer	2 sets to Contractor 1 set to Region Const	PE Stamp is Required. 4 additional sets to Bridge if RR is involved (per RR) 6 additional if US Bureau of Reclamation is involved
Girder Erection Plans (including falsework and stress calculations)	None	6-02.3(16) and 6-02.3(25)N 6-03.3(7)A	6 sets to Bridge & Structures 2 sets to PE	Project Engineer & Bridge & Structures Engineer	Bridge & Structures Engineer	2 sets to Contractor 1 set to Region Const	PE Stamp is Required. 4 additional sets to Bridge if RR is involved. (per RR)
Welding Reinforcing Steel	6-2.6D	6-02.3(24)E	5 welding procedures to Bridge & Structures 2 welding procedures to PE	Project Engineer & Bridge & Structures Engineer	Bridge & Structures Engineer	2 sets to Contractor 2 sets to Fabrication Inspector	No mention in spec of Bridge & Structures or number of drawings

Shop Plans & Working Drawings
Figure 1-6

Working Drawing, Shop Plan or Submittal Type	Const Manual References	Standard Spec or Other References	Number of Paper Copies (Contact Bridge & Structures to discuss the option of electronic Submittals)	Reviewer Prior to Approval	Approving Authority	PE Distribution of approved drawings (surplus copies stay @ PE)	Notes
Shop Detail Plans of Prestressed Concrete Girders, Prestressed Structures, Precast Conc Piles	6-2.7A	6-02.3(25)A None for Piles	5 sets to Bridge & Structures 2 sets to PE <i>SPLICED GIRDERS</i> 7 sets to Bridge & Structures	Project Engineer & Bridge & Structures Engineer	PE approval standard series I girders and concrete piling on standard plans E-4 & E-4a - all other prestressed concrete products and precast piles to Bridge & Structures for approval.	1 set to Contractor 2 sets to Fabrication Inspector	6-02.3(16)B is for the formwork plans for preapproval
Post-Tension Shop Drawings	6-2.8	6-02.3(26)A	7 sets to Bridge & Structures 2 sets to State Bridge Const. Engineer 2 sets to PE	Project Engineer, State Bridge Const. Engineer & Bridge & Structures Engineer	Bridge & Structures Engineer	1 set to State Const. 2 sets to Contractor 1 set to Region Const.	
Precast Concrete Panels	None	6-02.3(28)A 6-12.3(1)	7 sets to Bridge & Structures 2 sets to PE	Project Engineer & Bridge & Structures Engineer	Bridge & Structures Engineer	1 set to State Const. Engr. 2 sets to Contractor 1 set to Fabrication Inspector	Additional sets for RR not mentioned in spec.
Welding Structural Steel (Submitted with Shop Drawings)	6-3.6C	6-03.3(25)	8 sets to Bridge & Structures 2 sets to PE	Project Engineer & Bridge & Structures Engineer	Bridge & Structures Engineer	1 Set to Region Const. 2 sets to State Materials Lab 2 sets to Contractor	4 additional sets to Bridge if RR is involved. (per RR)
Shop Plans for Structural Steel for Bridges (Expansion Joints, Metal Bridge Rails, Bridge Drains, Etc.)	6-3.1	6-03.3(7) 6-06.3(2) Special Provisions	8 sets to Bridge & Structures 2 sets to PE	Project Engineer & Bridge & Structures Engineer	Bridge & Structures Engineer	1 set to Region Const. 2 sets to State Mat'ls Lab 2 sets to Contractor	4 additional sets to Bridge if RR is involved. (per RR)
Treated Timber Structures	6-4.1	6-04.3(3)	6 sets	Project Engineer & Bridge & Structures Engineer	Bridge & Structures Engineer	2 sets to Contractor 1 set to Fabrication Inspector	
Welding Steel Piling	6-5.6	6-05.3(6) 6-03.3(25)	8 sets to Bridge & Structures 2 sets to PE	Project Engineer & Bridge & Structures Engineer	Bridge & Structures Engineer	2 sets to Contractor 2 sets to Fabrication Inspector	Weld splices of steel casing for cast-in-place conc. Piles shall be the Contractor's responsibility 4 additional sets to Bridge if RR is involved. (per RR)
Pile Driving Equipment Adequacy Submittals		6-05.3(9)	3 sets to Geotechnical Engineer 2 sets to State Bridge Const Engineer 2 sets to PE	Geotech. Engr. State Construction Engr. (Bridge)	Geotech. Engr.	2 sets to Contractor	

Shop Plans & Working Drawings (Continued)
Figure 1-6

Working Drawing, Shop Plan or Submittal Type	Const Manual References	Standard Spec or Other References	Number of Paper Copies (Contact Bridge & Structures to discuss the option of electronic Submittals)	Reviewer Prior to Approval	Approving Authority	PE Distribution of approved drawings (surplus copies stay @ PE)	Notes
Working Drawing, Shop Plan or Submittal Type	Const Manual References	Standard Spec References	Number of Hard Copies (Contact Bridge & Structures to discuss the option of electronic Submittals)	Reviewer Prior to Approval	Approving Authority	PE Distribution of approved drawings (surplus copies stay @ PE)	Notes
Painting – Containment of Abrasive Blasting Plan	None	6-07.3(2)	3 sets to Bridge & Structures 2 sets to PE	PE, Bridge & Structures Engineer	Bridge & Structures Engineer	2 sets to Contractor	
Modified Concrete Overlays (Mix Design, Equipment Specifications and Procedures)	None	6-09.3(2)	3 sets to State Bridge Const. Engineer 2 sets to PE	PE, State Bridge Const. Engr.	State Bridge Construction Engr.	2 sets to Contractor	
Shaft Installation Plan for Noise Walls, Soldier Pile Walls, and Luminaire Bases	6-2.3E	6-12.3(1) 6-16.3(2)	4 sets to Bridge & Structures 1 set to PE	Bridge & Structures Engineer, & Geotech. Engr.	Bridge & Structures Engineer	2 Sets to Contractor	
Structural Earth Wall Submittals	None	6-13.3(2)	3 sets to Bridge & Structures 2 sets to PE	PE, Bridge & Structures Engineer, & Geotech. Engr.	Bridge & Structures Engineer	2 sets to Contractor	
Geosynthetic Retaining Wall Plans	None	6-14.3(2)	3 sets to Bridge & Structures 2 sets to PE	PE, Bridge & Structures Engineer, & Geotech. Engr.	Bridge & Structures Engineer	2 sets to Contractor	
Soil Nail Walls	None	6-15.3(3)	3 sets to Bridge & Structures 2 sets to PE	PE, Bridge & Structures Engineer, & Geotech. Engr.	Bridge & Structures Engineer	2 sets to Contractor	Include State Bridge Const. Engr. if shotcrete facing is permanent (6-18.3(1))
Soldier Pile Walls	None	6-16.3(2)	3 sets to Bridge & Structures 2 sets to PE	PE, Bridge & Structures Engineer, & Geotech. Engr.	Bridge & Structures Engineer	2 sets to Contractor	
Permanent Ground Anchor Submittals	None	6-17.3(3)	3 sets to Bridge & Structures 2 sets to PE	PE, Bridge & Structures Engineer, & Geotech. Engr.	Bridge & Structures Engineer	2 sets to Contractor	
Roadside Plant/Weed & Pest Control Plan	None	8-02.3(2)	4 sets to PE	Project Engineer	Project Engineer	2 sets to Contractor 1 set to Region Const.	Signed by Licensed Chemical Pest Control Consultant
Shop Plans for Light Standard and Traffic Signal Standards	8-20.2B	8-20.2(1)	6 sets to Bridge & Structures 2 sets to PE	Project Engineer & Bridge & Structures Engineer	Bridge & Structures for light standards and Types II, III, IV, V and SD signal standards. Project Engr for Types PPB, PS, & I signal standards shown on Standard Plan J-7a.	2 sets to Contractor 2 sets to Fabrication Inspector	Shop drawings are required for all signal standards and for those light standards without pre-approved plans. (per Std. Spec)

Shop Plans & Working Drawings (Continued)
Figure 1-6

Working Drawing, Shop Plan or Submittal Type	Const Manual References	Standard Spec or Other References	Number of Paper Copies (Contact Bridge & Structures to discuss the option of electronic Submittals)	Reviewer Prior to Approval	Approving Authority	PE Distribution of approved drawings (surplus copies stay @ PE)	Notes
Shop Plans for Sign Structures	8-21.3	8-21.3(9) A refers to Section 6-03.	8 sets to Bridge & Structures 2 sets to PE	Project Engineer & Bridge & Structures Engineer	Project Engineer for Standard Plans G2 through G9a Bridge & Structures for special design sign structures or sign fittings	2 sets to Contractor 2 sets to Fabrication Inspector	4 additional sets to Bridge if RR is involved. (per RR)
Column Jacket Shop Drawings & Installation Plans	None	See BSP 02300403.GB6 02300404.GB6	8 sets to Bridge & Structures 2 sets to PE	PE, Bridge & Structures Engineer, & Geotech. Engr.	Bridge & Structures Engineer	2 sets to Contractor	PE Stamp required.
Form Liners (Various patterns per GSP)	None	See GSP 0231405.GB6	2 sets to Bridge & Structures Architect 2 sets to Project Engineer	PE Bridge & Structures Architect	Bridge & Structures Architect	1 Set to Region Const 2 sets to Contractor	Include 2ft X 2'ft sample with drawing to Bridge & Struct. Architect
3-Sided Structures	None	See GSP 023281.GR6	8 sets to Bridge & Structures 2 sets to PE 2 sets design calculations to Bridge & Structures	PE, Bridge & Structures Engineer, & Geotech. Engr.	Bridge & Structures Engineer	2 sets to Contractor	PE Stamp required.
Project Specific Powder Coating Plan and Materials Submittals	None	See Special Provision	3 Sets to Bridge & Structures. 1 Set to PE	State Materials Engineer, Bridge & Structures Engineer	Bridge & Structures Engineer	2 Sets to Contractor	
Bridge Demolition Plans	None	See Special Provisions	6 sets to Bridge 7 Structures	Project Engineer & Bridge & Structures Engineer	Bridge & Structures Engineer	2 sets to Contractor 1 set to Region Const	PE Stamp is Required.
Shaft Installation Plan and Construction Experience for Bridges and Permanent Signing Structures	None	See Special Provisions	3 sets to Bridge & Structures 1 set to PE	PE, Bridge & Structures Engineer, & Geotech. Engr. & State Construction Engr. (Bridge).	Bridge & Structures Engineer	2 Sets to Contractor	Construction Manual does not mention approval – only mentions meeting of all parties.
Precast Vaults	None	See Special Provisions	3 sets to Bridge & Structures 2 sets to PE	PE, Bridge & Structures Engineer, & Geotech. Engr.	Bridge & Structures Engineer	2 sets to Contractor	
Pipe Jacking Plans	None	See Special Provisions	3 sets to Bridge & Structures 2 sets to PE	PE, Bridge & Structures Engineer, & Geotech. Engr.	Bridge & Structures Engineer	2 sets to Contractor	

Shop Plans & Working Drawings (Continued)
Figure 1-6

1-2.5B Working Day Charges

The first working day will be established in accordance with Section 1-08.4 of the *Standard Specifications* or such other date as prescribed by the contract provisions. Section 1-08.4 indicates that time may start at a time different from that specified if “otherwise approved in writing”. Such other approval is intended only for very unusual circumstances, usually associated with mis-handling of contract documents. It will only be granted in consultation with Headquarters Construction. Time associated with each phase of work established in the contract is to be shown on the Weekly Statement of Working Days. The Project Engineer is to furnish a weekly statement advising the Contractor of the current status of working day charges against the contract. Weekly Statements are generated by the CCIS computer system. This statement is to be issued in accordance with Section 1-08.5 of the *Standard Specifications*. The purpose of this statement is to advise the Contractor about the Project Engineer’s decision for each passing day. The questions to be answered when determining if a day is chargeable are; is it a nonworking day (holiday or a day the contract does not allow critical work to advance)? was it a chargeable working day (critical work progressed uninhibited)? or was it an unworkable day (critical work delayed by weather or conditions caused by the weather)? in evaluating each day, the Project Engineer should take into consideration the following conditions:

1. The effect of inclement weather on critical activities.
2. The effect of conditions caused by inclement weather on critical activities.
3. Critical work restrictions imposed by the contract or the Project Engineer.

If any of the above conditions prevent work or reduce the Contractor’s efficiency on critical activities on the project, working day charges shall be adjusted accordingly. If the Contractor is able to continue work on critical activities but the efficiency is significantly reduced, a half day may be charged. When determining unworkable days the Project Engineer shall take into consideration the prolonged effects of weather events. If the contractor is required to divert resources from working on critical path activities due to the lasting effects of a weather event the Project Engineer may determine a half day, the whole day or several days as unworkable.

If the contract does not specifically define a working day, a working day will be considered a 24 hour period. The contractor establishes the hours of work in the Weekly-Look Ahead Schedule and the start of the day should be by mutual agreement. The contractor shall be charged for one day during the defined 24 hour period regardless of how many shifts are worked.

Section 1-08.5 grants the Contractor the right to protest working day determinations and working day charges determined by the Engineer. In the event the Contractor submits the required written protest within 10 calendar days following the date of the statement, the Project Engineer will analyze the information provided, and respond to the Contractor by either denying the protest or revising the Weekly Statement of Working Days.

The Project Engineer will complete Weekly Statements of Working Days throughout the course of the project, showing workable, nonworking and unworkable days as they occur. These statements will continue to be completed until the project has reached Substantial Completion and the Working Days assigned to the contract have been exhausted. Following are the three possible scenarios:

- The working days are exhausted prior to reaching Substantial Completion. Weekly Statements of Working Days continue until Substantial Completion.
- The working days are exhausted on the day Substantial Completion is achieved. Weekly Statements of Working Days cease upon Substantial Completion.
- The working days are not exhausted upon reaching Substantial Completion. Weekly Statements of Working Days continue until the working days are exhausted or until physical completion.

Upon Substantial Completion the Project Engineer will ensure that the date is entered into CCIS and is noted in the remaining Weekly Statements of Working Days. After Weekly Statements have stopped, comments concerning weather and other events beyond the Contractor’s control should be entered into the project diary. The effect of these conditions on remaining work and on the scheduled completion should also be noted.

If contract time is expressed in calendar days, then Section 1-08.5 becomes difficult to interpret and the contract special provisions will provide guidance for the charging of contract time.

1-2.5C Suspension of Work

When, in the judgment of the Project Engineer, inclement weather, or conditions caused by inclement weather, make it impracticable to achieve satisfactory results on a critical item of work, an order should be issued to suspend the affected portions of the contract work or the entire project. If at all possible, suspensions for weather should be made with the concurrence of the Contractor. If the Contractor does not agree to a weather suspension, the Project Engineer should consult with the Region Construction Manager before issuing a unilateral suspension.

In addition, subject to the agreement of the Contractor and the approval of the Regional construction manager, delays caused by other conditions beyond the control of the Contractor may also warrant an order to suspend work.

During suspensions of long duration, for example a winter shutdown, the publication of Weekly Statements may be suspended. Notices to suspend or resume work should be written. Forms 421-006 and 421-007 have been developed for this purpose. A letter may accomplish the same purpose. If it is determined that some items of noncritical work on the project could be continued unaffected by weather conditions, then those items may be excluded from the order to suspend work. The prime consideration for unworkable days or suspensions is always the ability to work on critical items.

In the event that a suspension of work for weather or for other reasons beyond the control of the contractor is necessary for an extended period of time, the Project Engineer may recommend that the Contractor be relieved of

routine maintenance during the period of suspension. Before WSDOT will assume the responsibility for maintenance, the Contractor must have taken all necessary actions to control erosion, pollution, and runoff prior to, and during, the shutdown period. The extent of the project area that will be maintained by WSDOT is the subject for a three party negotiation and agreement among the Project Engineer, the Maintenance Superintendent and the Contractor.

The suspensions described above are related to weather or other causes beyond the control of the Contractor. They apply only to critical work items and, therefore, always result in a determination of an unworkable day. If the Engineer and the Contractor agree to stop working on a noncritical item for one of these causes but to continue critical work, then the agreement should be noted in the records and weekly statements should be issued in the normal fashion.

The contract also gives the Engineer the right to suspend work on any part of the project when the Contractor is not complying with the contract's terms or the orders of the Engineer. This would be a significant action and, except in an emergency situation, should not be undertaken without the full and informed consent of the Region Construction Manager and the State Construction Office. If work is suspended under this contract provision, then weekly statements and the charging of workable days will continue in the normal fashion.

1-2.5D Extension of Time

In general time extensions are appropriate whenever the critical work is delayed due to an action or inaction of the contracting agency, or by a cause that is not the responsibility of the Contractor. Section 1-08.8 of the *Standard Specifications* includes a list of reasons that entitle the Contractor to a time extension, and a list of reasons for which no time extension will be granted. In all cases, the change or delay must delay critical work or an extension is not appropriate.

The contract requires the Contractor to identify a delay within 10 working days. If a delay is readily identifiable, the Project Engineer should enforce this provision. If the delay is not immediately apparent the time extension discussion should take place as soon as the delay is recognized. Before discussing a potential delay for which adequate notice was not given, the Project Engineer should discuss the situation with the Region Construction Manager to seek guidance. The Contractor should be encouraged to identify delays and bring them to the State's attention at the earliest opportunity. This allows the contracting agency to mitigate the delay by adding time, modifying the work or recovering the schedule. In the interest of actively managing a delay the project engineer may act unilaterally to address time if the contractor avoids the discussion.

If possible, all time associated with work added by change order should be addressed as part of the change order. If you are unable to come to agreement on the number of working days to add, the Region Construction Manager should be consulted concerning the need to unilaterally add time to the contract. Deferring the discussion of time in a change order to a later date should be a last resort. If the contractor is not granted time for an item, they are required to complete the contract in the number of working days that remain. This

may require that the contractor to accelerate their efforts, by adding additional crews, equipment or working longer hours or extra days. If these actions are taken as a result of the contracting agency not granting time extensions when the contractor is entitled to them, the cost for these items would be paid by the contracting agency. If you do choose to defer the time discussion to later, set a time frame during in which the decision will be made.

The State has a responsibility to inform the Contractor's surety whenever increased time is being considered and the current extension, combined with previous extensions, would exceed 20% of the original allotted time in the contract. This information could be represented by the Surety's signature on the change order that adds time, by a separate letter from the Surety, or by a notice letter direct to the Surety office. Such notice and surety consent is a legal requirement and will help maintain the State's rights to be protected by the performance bond.

Section 1-08.6 of the *Standard Specifications* provides under what circumstances the Contractor may be entitled to compensation. Anytime that a project is delayed for any cause, the Project Engineer and the Contractor should consider methods of mitigating the delay damage. A common approach is to pursue schedule recovery by allocating additional resources to the work to get the project back on schedule. When the Project Engineer suspects that the State may be responsible for the delay, then compensation for the mitigation efforts may be proposed.

Any time extension will be documented either in a change order with approval levels defined in Section 1-2.4C of this Manual or in a letter to the Contractor from the State Construction Office.

1-2.5E Substantial Completion

Substantial Completion may be granted when only minor, incidental items of work, replacement of temporary facilities or correction remain in order to physically complete the contract. In determining Substantial Completion, the Project Engineer should consider whether or not:

- The public has full use and benefit of the facility.
- Major safety features are installed and functional, including guardrail, striping, and delineation.
- Illumination, if required, is installed or a temporary system with equal functional capabilities is operating.
- Signals, if required, are installed or a temporary system with equal functional capabilities is operating.
- The need for temporary traffic control on a regular basis has ceased. Only minor traffic restrictions will be needed for the remaining work.
- The traffic is operating in its permanent configuration.

The Project Engineer is responsible for determining the Substantial Completion date. When this has been done, the Contractor will be notified by letter, specifically noting the date on which Substantial Completion was achieved. In order to be in concurrence with Section (9-1.5) - Compliance Review for Materials Certification Process, the project engineer will also provide notification of Substantial Completion to the Headquarters Materials Laboratory Documentation Section.

1-2.5F Date of Physical Completion

The date on which the Project Engineer determines that all physical work has been completed is noted and then established as the date of Physical Completion. The Project Engineer will immediately notify the Contractor by letter of the date determined for Physical Completion. Copies of the letter will be sent to:

- The State Program Management Office.
- The Railroad companies, if applicable.
- The State Accounting Services Office.
- The Regional Local Programs Engineer on all city and county projects.
- The State Roadway Data Office, MS 47380.
- Any other distribution that the Region deems appropriate.

Actions the Project Engineer should consider taking once Physical Completion has occurred include:

- Initiate a discussion of contract time.
- Identify any unresolved disputes and initiate discussions.
- Initiate a full review of item quantities, seeking contractor concurrence.
- Initiate a final review of materials documentation.
- On Federal-aid projects, initiate a Stewardship Final Inspection and Acceptance.

1-2.5G Liquidated Damages

Liquidated Damages must be resolved before the final estimate can be completed and processed. Guidance for assessing Liquidated Damages can be found in Section 1-08 of the *Standard Specifications*, and in some cases, in the contract provisions.

Any withholding or assessment made against the Contractor's payments, is to be preceded by a fair notice written communication to the contractor. For those issues that could be remedied with actions taken or initiated by the Contractor, this notice should also include a reasonable period of time that will allow the contractor to take action to mitigate or completely avoid the withholding or assessment.

The term "withhold" refers to a temporary deduction shown on a progress estimate. The term "assess" refers to a permanent deduction that could be shown on a progress estimate, but will be shown on the final estimate. Liquidated damages fall into two categories — one deals with contract time and the other deals with miscellaneous provisions such as ramp or lane closures. These two categories are described below.

1-2.5G(1) Contract Time Liquidated Damages

Section 1-08.9 of the *Standard Specifications* (and, at times, the contract provisions) establishes the amount of Liquidated Damages to be assessed the Contractor for overruns in contract time. These assessments are either: (1) the formula calculated liquidated damages, or the liquidated damages prescribed by the contract provisions; or (2) the direct

engineering and related costs. All temporary withholding or final assessment of these Liquidated Damages are to be shown as a below the line "Liquidated Damages" deduction on progress estimates and the final estimate.

The State Construction Engineer has not subdelegated to the Region the authority to assess time related damages on progress estimates or the final estimate. However, the authority to withhold below the line "Liquidated Damages" on progress estimates has been subdelegated to the Regions, and may be further subdelegated to the Project Engineer. See Section (5) of this manual. Liquidated Damages should be addressed whenever it is apparent that the number of working days provided in the contract will be used before Substantial Completion. It is emphasized once again that fair notice and communication is necessary as a legal requirement.

In some cases, there are legitimate reasons for time extensions which would preclude withholding liquidated damages on progress estimates. If the Project Engineer is aware of or anticipates a possible time extension that would preclude withholding liquidated damages on progress estimates, the Region and/or the State Construction Office should be consulted for guidance. If the Project Engineer determines that withholding of liquidated damages on progress estimates would not be appropriate, the reasons for not withholding are to be documented by a memorandum to the files. The following describes the procedures for addressing contract time related liquidated damages in the various stages or phases of the project:

- Phases (Interim Physical Completion Dates). Liquidated damages for phases will be shown in the special provisions. When the contract includes additional phases, and the time for physical completion of a phase has overrun, the overrun should be resolved as it occurs. This involves the Contractor either being granted an extension of time or being assessed liquidated damages by the State Construction Office.
- After Substantial Completion Date of the Contract. If substantial completion is granted after the expiration of contract time the formula for liquidated damages in Section 1-08.9 of the *Standard Specifications* will be assessed for that period of time between the expiration of contract time and the substantial completion date. Liquidated damages assessed after the date of substantial completion will be only those costs identified as Direct Engineering and related costs that have been incurred by WSDOT. The direct engineering and related costs are defined as field engineering and inspection time charges plus any vehicle, travel pay, per diem, or other charges connected with the delayed contract physical completion. Engineering costs such as computing grades, quantities, etc. which would have been incurred by WSDOT under normal conditions should not be included in the determination of direct engineering and related costs. If substantial completion is granted on or prior to the expiration of contract time, direct engineering costs will only be assessed for that period of time between the date contract time expired and the physical completion date.

- Before Physical Completion. If Substantial Completion has not been established, the formula for Liquidated Damages in accordance with Section 1-08.9 of the *Standard Specifications*, will be assessed for that period of time between the expiration of contract time and the Physical Completion date.

Working days added to the contract by time extensions when time has overrun shall only apply to the days on which Liquidated Damages or Direct Engineering have been charged, such as:

- If Substantial Completion has been granted prior to all of the authorized working days being used, then the number of days in the time extension will eliminate an equal number of days on which Direct Engineering charges have accrued.
- If the Substantial completion date is established after all of the authorized working days have been used, then the number of days in the time extension will eliminate an equal number of days on which Liquidated Damages or Direct Engineering charges have accrued.

1-2.5G(2) *Miscellaneous Liquidated Damages*

The contract provisions may provide for assessment of other liquidated damages, such as failure to open traffic lanes within the prescribed time or failure to open ramps within the prescribed time. Any temporary withholding or final assessment of these liquidated damages shall be shown as a below the line “miscellaneous” deduction on progress estimates and the final estimates. The State Construction Office has subdelegated the authority to the Regions to withhold and assess these types of liquidated damages on progress estimates and the final estimate. The Project Engineer shall notify the Contractor in writing when these types of liquidated damages are to be assessed.

1-2.5H *Completion Date*

Immediately after the Physical Completion date has been established, the Project Engineer is to notify the Contractor of all outstanding documents that are required in order to establish a project Completion Date. Once all the obligations of the contract have been performed by the Contractor, the Project Engineer will provide the Contractor written notice of project completion, identifying the Completion Date established for the contract.

In order for the project Completion Date to be established, all the physical work on the project must be completed, and the Contractor must have furnished all documentation required by the contract, contract provisions, and the *Standard Specifications*. This includes the signed Final Contract Voucher Certification. (Note: Establish the Completion Date as soon as the last item of paper work is received. The final estimate does not have to be processed in order to establish the Completion Date.) the notice to the Contractor should be prepared and mailed on the same day that is designated as the completion date. A copy of the completion letter must be e-mailed to: caps@wsdot.wa.gov, or faxed to the contract payments section of the WSDOT Accountability and Financial Services Office, (fax number (360)705-6804) on the day the letter is written.

If the Contractor refuses, or is unable to return, a signed FCVC or any of the required documents, the Project Engineer, the Region and the State Construction Office can work together to move the project towards closure by establishing a unilateral completion date allowing WSDOT Acceptance of the contract. See Chapter 1-3.1D for Unilateral Acceptance procedures.

1-2.6 *Enforcement of Wage Rate Requirements*

1-2.6A *General Instructions*

Section 1-07.9 of the *Standard Specifications* outlines prevailing wage responsibilities for the Contractor, subcontractors, lower-tier subcontractors, agents or any other persons performing work under the contract. Additionally, contracts financed in whole or in part with federal funds have the *Required Contract Provisions for Federal-aid Construction Contracts* (FHWA-1273) included in the contract documents. These provisions identify additional federal wage requirements.

Contracts that are financed by either state or federal funds, or both, will include specific Hourly Minimum Wage Rates and Fringe Benefit schedules from either or both the Washington State Department of Labor and Industries (State L&I) and the United States Department of Labor (USDOL). When both state and federal funds are involved and there is a difference between the two prevailing wage determinations, the Contractor, subcontractors, and lower-tier subcontractors must pay a wage of not less than the higher of the two in order to remain in compliance with both prevailing wage laws. Comparisons that are made between state and federal wage rates must include their corresponding fringe benefits as identified in their respective state or federal wage determinations.

1-2.6B *Monitoring of State Requirements*

The requirements for the Contractor’s compliance with State prevailing wages are noted in Section 1-07.9 of the *Standard Specifications*. Specific wage rate determinations for State prevailing wages are noted in the contract itself. Though certified payrolls can be requested regardless of the contract’s source of funds, these are a specific requirement for enforcement of federal wage laws only and are not routinely used for monitoring of State prevailing wage issues.

Requirements for State prevailing wages include:

- Section 1-07.9 requires that the Contractor submit a *Statement of Intent to Pay Prevailing Wages* (SI) prepared on the State L&I form and approved by that agency. Statements are required for the Contractor and for each subcontractor, agent and lower-tier subcontractor. The specification requires that no progress payments be released to the Contractor for work completed by the Contractor, or for portions of work completed by subcontractors, agents or lower-tier subcontractors prior to the Project Engineer’s receipt of the approved statement for the entity performing the work. State L&I will approve the statements and further certify that the documents meet the requirements of State laws.

- After the project has been accepted by WSDOT, the Contractor, all subcontractors, and all lower-tier subcontractors must submit an *Affidavit of Wages Paid* (AWP) prepared on the State L&I form and approved by that agency. (The form may be submitted earlier by a subcontractor or lower-tier subcontractor should that firm's work be completed prior to acceptance.) It is the Contractor's responsibility to obtain and provide all AWP to the Project Engineer for all subcontractor and lower-tier subcontractors performing work on the project. In the event a subcontractor or lower-tier subcontractor cannot or will not provide a completed AWP form, the Contractor should consult or seek guidance from State L&I. Failure to provide all required AWP for all contractors who worked on the project will result in continued withholding of the prime Contractor's retained percentage.
- A contractor or subcontractor may enter into an agreement with his or her employees to work 10 hours per day without having to pay overtime. This is provided that no employee work more than 4 calendar days a week.
- State L&I has also defined "Contractor" to include some fabricators or manufacturers who produce nonstandard items specifically for use on the public works project. Additionally some companies who may contract with the Contractor, subcontractors, or lower-tier subcontractors for the production and/or delivery of gravel, concrete, asphalt, or similar materials may perform activities that cause employees of these firms to be covered by state prevailing wage laws. Specific circumstances that may cause employees of these firms to be covered by State prevailing wage laws are described in State L&I publications. These publications are included in the provisions of each contract adjacent to the State Prevailing Wage listings. Where these firms are covered by State prevailing wage laws, an approved *Statement of Intent to Pay Prevailing Wages* and *Affidavit of Wages Paid* must be submitted to the Project Engineer on State L&I forms.

The Project Engineer should monitor the Contractor's efforts in regards to state prevailing wages by:

- Monitoring to ensure an approved Statement of Intent is received prior to releasing any progress payments for work completed by the Contractor, subcontractor or lower-tier subcontractors as well as any fabricators or suppliers of materials whom L&I may also determine as being covered.
- Monitoring to ensure that Affidavits of Wages Paid have been received for the Contractor as well as each subcontractor or lower-tier subcontractor who performed work on the contract. In addition, AWP are also required of each fabricator or supplier who was also covered by state prevailing wages. Ensure that the company name on the Affidavit of Wages Paid matches the company name on the Statement of Intent to Pay Prevailing Wages. If this is not the case, the Affidavit is not acceptable; unless the Contractor or subcontractor can supply a copy of their business license showing both names (i.e. Company Name and Trade Name).
- Monitoring by observing concerns of employees of the Contractor, subcontractors, or lower-tier subcontractors. In particular, the Project Engineer should note any employee complaints regarding specific state prevailing wage violations by the employer.

In the event the Project Engineer identifies or receives a complaint from any employee of the Contractor regarding improper application or nonpayment of state prevailing wages, or improper application of overtime pay, the Project Engineer should immediately notify the Contractor requesting prompt corrective action. All issues of noncompliance involving either the Contractor, subcontractor, and any lower-tier subcontractors are to be addressed through the Prime Contractor for resolution.

Once the Contractor has been informed that an apparent violation of state prevailing wages has occurred, it is expected that a satisfactory correction or explanation will be made within a reasonable period of time. If this does not happen, the Project Engineer should inform the Contractor that the matter may be referred to the Washington State Department of Labor and Industries (L&I) for further action. If the failure to act continues, the Project Engineer should refer the issue to the Region Construction Manager.

Except as noted for missing Statements of Intent, routine monthly progress payments made to the Contractor for work completed should not be deferred for enforcement of state prevailing wage laws. The State Construction Office will refer the matter to State L&I for further investigation that may be appropriate. Should State L&I choose to investigate, L&I will establish the amount of any unpaid wages due employees of the contractor. In order to recover these wages for employees, L&I may choose to file a claim against the Contractor's retainage held under the contract. State L&I may also choose to recover unpaid wages by requesting that the Project Engineer withhold funds from monthly progress estimates for work completed by the Contractor.

1-2.6C Enforcement of Federal Prevailing Wage Provisions

In addition to the requirements of Section 1-07.9 of the *Standard Specifications*, all contracts financed with Federal-aid funds include the *Required Contract Provisions for Federal-aid Construction Contracts* (FHWA-1273). These provisions identify federal wage requirements. The federal prevailing wage requirements included in these provisions are also commonly referred to as Davis Bacon and Related Acts (DBRA). It is the responsibility of the Project Engineer to both monitor and enforce these provisions to the degree necessary to ensure full compliance. In order to comply with these requirements, the Contractor must:

- Submit weekly certified payrolls to the Project Engineer for themselves, each subcontractor, and each agent or lower-tier subcontractor. These consist of copies of weekly payrolls along with a signed Statement of Compliance.
- Post wage rate posters.
- Post the wage determinations of the United States Secretary of Labor. These determinations consist of the listing of Federal Wages that are included in the provisions of each contract.

- Allow interviews of employees during working hours by authorized representatives of WSDOT, the Federal Highway Administration, and the U.S. Department of Labor.

The prime Contractor is ultimately responsible for all subcontractor, agent, or lower-tier subcontractor compliance with the requirements for federal prevailing wages.

1-2.6C(1) Federal Prevailing Wage Rates

The Contractor must post the federal wage determination, consisting of the wage listing included in the contract provisions, in a prominent place where it can easily be seen by workers. Standard posters (forms FHWA 1495 and FHWA 1495A) are also to be posted and are available to the Region from the Support Services Supervisor, FHWA, Olympia, Washington. Form FHWA 1495A is printed in Spanish and is to be posted when the project is in an area where there is a possibility that some workers may speak only Spanish.

1-2.6C(2) Certified Payroll Inspection

The “Contract Provisions for Federal-Aid Construction Contracts” (FHWA-1273) require the Contractor, subcontractors, agents or lower-tier subcontractors to submit certified payrolls. These are to be checked by the Project Engineer to ensure the required information has been included and is correct. The Project Engineer should accomplish this by making a complete check of the first payroll submitted on the project by the Contractor, each subcontractor, and each lower-tier subcontractor. Once satisfied that these first payrolls are correctly prepared, subsequent payrolls for that project may be accepted by a random spot checking of approximately 10 percent of the payrolls submitted. If errors are found during any spot-checking of the payrolls, a more complete or thorough check should occur until the Project Engineer has determined that the errors detected have been corrected and monitoring can be returned to a spot checking basis. The *Contract Provisions for Federal-Aid Construction Contracts* (FHWA-1273) identify the required items to be included in certified payrolls. A complete payroll inspection by the Project Engineer should confirm that the following items are present:

- The contract number and contract name noted on the payroll form, together with the payroll number and payroll period. The name of the employer, identifying the Contractor, subcontractor, or lower-tier subcontractor, must be shown.
- A specific minimum wage rate is to be identified for each worker. The *Standard Specifications* require the Contractor to use word descriptions for the labor classifications that are included in the contract provisions identifying federal wage rates, and are to be used on all payrolls. Section 1-07.9 of the *Standard Specifications* permits the Contractor to use an alternative method to identify or correlate the labor descriptions used in order that they may be compared to the contract provisions.
- Each employee’s Social Security number and permanent address must appear on the first payroll on which their name appears, or on a separate list attached to the payroll. Changes in address must be reported.
- Payroll deductions must conform to the “Anti-Kickback” Act noted in the *Required Contract Provisions for Federal-aid Construction Contracts* (FHWA-1273). If payroll deductions are questionable, contact the State Construction Office for assistance.
- Every laborer or mechanic working on the contract must be classified for the proper minimum prevailing wage in accordance with the designated wage determination. If a classification of worker is used that does not appear in the contract special provisions, Section 1 07.9 of the *Standard Specifications* makes it the Contractor’s responsibility to contact the U.S. Department of Labor for a determination of the proper wage rate. The *Required Contract Provisions for Federal-aid Construction Contracts* (FHWA-1273) provides a method for resolving this.
- All payrolls must have a statement of compliance signed and in the form prescribed by Section V of the *Required Contract Provisions Federal-aid Construction Contracts* (FHWA-1273).
- The Contractor, subcontractor, or lower-tier subcontractor, in accordance with the requirements of DBRA, must certify all payrolls. This certification contains four elements:
 - That the payroll copy furnished is a true copy;
 - That the payroll is correct and complete;
 - That the wage rates contained therein are not less than those determined by the Secretary of Labor, and that the classification set forth for each laborer or mechanic conforms with the work being performed; and
 - That the appropriate fringe benefits due each employee have been paid in full.

Subcontractors and lower-tier subcontractors are required to submit payrolls through the Prime Contractor to the Project Engineer. Any payrolls which do not comply fully with the requirements outlined above must be corrected by a supplemental payroll.

1-2.6C(3) Employee Interviews

The Project Engineer must conduct periodic employee interviews. The purpose of these spot interviews is to establish, with reasonable certainty, that the provisions for federal prevailing minimum wages are being complied with and that there is no misclassification of workers or disproportionate employment of laborers, helpers, or apprentices. The occupation description must be shown on the form used for the employee interview noted under current duties. The occupation description is noted in the wage listing included in the contract provisions.

Some employees may refuse to reveal their rate of pay. This is acceptable and should be noted in the remarks column. Many employees do not know or may guess at the rate. If possible, a determination of the accuracy of the stated rate should be made, and any uncertainty noted in the remarks column to reduce the need for follow up interviews. If either the stated rate (from the employee) or the record rate (from the certified payroll) is below the minimum rate (from the contract wage listing), an investigation by the

Project Engineer must be conducted. The investigation may be as simple as a follow up interview with the employee or a more in depth investigation may result in a requirement for a supplemental payroll. In any event, the matter must be resolved so that the employee interview report describes what corrective action was taken to ensure that the employee has been paid the minimum prevailing wage rate. This corrective action is to be reported under remarks on the form or by attached memo if more space is needed. All discrepancies found must be resolved.

The frequency and extent of these interviews should be sufficient to ensure a representative sampling has been made for all classes of workers employed on the contract. A minimum sampling should include employees of the Contractor and all major (30 percent or more of the contract dollars) subcontractors. The interviews should be made with such frequency as may be necessary to ensure compliance. Employee Interview Report, Form 424-003, is used to record and report interviews.

1-2.6C(4) Complaints

Any complaints regarding violations of minimum wage rate regulations that are referred to the Project Engineer by employees of the Contractor, subcontractor, or lower-tier subcontractors should be treated as confidential, and should be promptly investigated by the Project Engineer. If there are questions regarding complaints and the application or interpretation of the federal prevailing wage provisions, the Project Engineer should consider referring the issue to the Region Construction Manager or contacting the State Construction Office for further assistance.

1-2.6C(5) Federal Prevailing Wage Violations

In the event the Project Engineer identifies or receives a complaint from any employee of the Contractor regarding improper application or nonpayment of federal prevailing wages, improper application of overtime pay, or any other requirement noted in the *Required Contract Provisions for Federal-aid Construction Contracts* (FHWA-1273), the Project Engineer should immediately notify the Contractor requesting prompt corrective action. All issues of noncompliance involving either the Contractor, subcontractor, and any lower-tier subcontractors are to be addressed through the prime contractor for resolution.

If the Project Engineer determines the Contractor is in violation of the provision noted in the FHWA 1273 or Section 1-07.9 of the *Standard Specifications*, the Contractor should be immediately informed and requested to make the necessary corrective actions. Once the Contractor has been informed that an apparent violation has occurred, it is expected that a satisfactory correction or explanation will be made within a reasonable period of time. If this does not happen, the Project Engineer should withhold an appropriate portion of payment (see 1-3.1B(9)). If the failure to act continues, the Project Engineer should refer the issue to the Region Construction Manager.

1-2.6C(6) Department of Labor Investigation

The U.S. Department of Labor may investigate compliance with the DBRA and the Contract Work Hours and Safety Standard Act (CWHSSA) when conducting any investigations relative to compliance with the Fair Labor Standards Act or any other acts under its enforcement authority. Investigative action taken by the U.S. Department of Labor with respect to DBRA and CWHSSA do not, in any way, change the degree of authority or responsibility of WSDOT for enforcement of these Acts. Any actions taken by the U.S. Department of Labor should be considered as services we may use to assist us in our enforcement activities but, should not be considered to relieve us of our basic responsibility to investigate fully all potential violations and to apply such sanctions as are deemed applicable under our enforcement authority to ensure compliance.

1-2.6C(7) Fraud Notice Poster

Fraud Notice, FHWA 1022, Title 18 USC 1020, must be displayed on all Federal-aid projects during the course of the work. This notice points out the consequences of any impropriety on the part of any contractor or WSDOT employee working on the project.

1-2.6C(8) Request For Authorization of Additional Classification and Rate

The U.S. Department of Labor (DOL) issues wage determinations under the Davis-Bacon Act (DBA) using available statistical data on prevailing wages and benefits paid in a specific locality. On occasion, the data does not contain sufficient information to issue rates for a particular classification of worker needed in the performance of the contract. Because of this, DBA provisions contain a conformance procedure for the purpose of establishing an enforceable wage and benefit rate for the missing classification (reference Standard Specification 1-07.9(1) and FHWA 1273).

Contractors are responsible for determining the appropriate staffing necessary to perform the contract work. Contractors are also responsible for complying with the minimum wage and benefits requirements for each classification performing work on the contract. If a classification considered necessary by the contractor for performance of the work is not listed on the applicable wage determination, the contractor must initiate a request for approval of an additional classification along with the proposed wage and benefit rates for that classification.

The Contractor initiates the request by preparing form SF1444, Request for Authorization of Additional Classification and Rate, at the time of employment of the unlisted classification. (Reference FAR 22.406-3 and 52.222-6(b), and Title 29 CFR Part 5, Section 5.5(a)). The Contractor completes blocks 2 through 15 on the form. Standard Form 1444 is readily available via the internet and is accessible at <http://www.wdol.gov/library.html>, under the heading "Conformance".

The Contractor submits the request to the Contracting Officer (HQ Construction) via the Project Engineer's office. The Contracting Officer reviews the request for completeness and signs the form designating the contracting agency's concurrence or disagreement with the Contractor's proposal. If the Contracting Officer indicates disagreement with the Contractor's proposal, a statement must be attached supporting a recommendation for different rates. The Contracting Officer then submits the proposal with all attachments to DOL for approval. The Contractor is obligated to pay the proposed wage and benefit rates pending a response from DOL.

1-2.7 EEO, D/M/WBE and Training

1-2.7A Overview

Differences between State and Federal laws require a variety of guiding requirements. As a result individual contracts may have different guiding requirements depending on what laws were in place at the time the contract was executed and how the project is funded. The special provisions, *Standard Specifications*, and amendments determine the specific requirements for each project. The *Construction Manual* is one of many resources available for general information on the obligations and policy of WSDOT with regard to external civil rights. Other resources include:

1. Office of Equal Opportunity (OEO): OEO monitors, maintains, and updates WSDOT Equal Employment Opportunity (EEO) policies and commitments to FHWA. As part of that effort they maintain the following documents which are available through the OEO homepage:

- Equal Employment Opportunity Compliance Program (EEO and on the Job Training)
- Disadvantaged Business Enterprise Participation Plan (contract goals, if included in a project, will be mandatory)
- Title VI Plan (nondiscrimination)

2. *Standard Specifications*, as follows, apply to all projects:

- 1-07.11 Requirements for Nondiscrimination
- 1-08.1 Subcontract Completion and Return of Retainage Withheld

3. General Special Provisions as may be included in the contract include:

- Minority and Women's Business Enterprise (MWBE) Participation (included in projects financed with only State funds)
- Requirement for Affirmative Action to Ensure Equal Employment Opportunity (included in projects with FHWA participation)
- Disadvantaged Business Enterprise Participation (included in projects with FHWA participation)
- Special Training Provisions (included in projects with FHWA participation and only if the contract is selected for training)
- Indian Preference and Tribal Ordinances (TEROs) (only if the project includes work on the reservation and only if the ordinances exist)

While some requirements and provisions apply to all projects, others apply to projects with State funds only and others yet apply to projects that are partially or fully financed with Federal funding.

1-2.7B EEO (Federally Funded Projects)

WSDOT has committed to FHWA to perform comprehensive construction compliance reviews to ensure that the requirements of Section 1-07.11 have been adhered to. This review is performed by the OEO on a selected number of FHWA funded projects and may take place at any point during the life of the project or after the project has been completed. A contractor that is found in violation of the contractually required affirmative action good faith efforts will be invited to a compliance conference to develop a corrective action plan. Failure to accept and comply with a corrective action plan may result in sanctions. The records that have been maintained at the Contractor's office will be utilized for these reviews. The FHWA also retains the authority to review the Contractor's records for EEO compliance. These reviews do not normally involve the project office other than notification of their occurrence and the resulting findings.

1-2.7B(1) Prompt Return of Retainage to All Subcontractors

As a condition of receiving Federal funding, WSDOT is required to ensure prompt payment to all subcontractors on all contracts regardless of funding. State statutes (Revised Code of Washington, RCW) pertaining to prompt pay require that the contracting agency make prompt payment to the prime contractor and that the prime contractor, in turn, pass these payments on to subcontractors in a timely manner.

Return of the subcontractor's retainage held by the prime contractor is required by the *Standard Specifications*. This is a race neutral effort intended to support and encourage all small businesses. Therefore, in accordance with the contract provisions, the prime contractor is required to release any and all retainage to the subcontractor within a designated time period after subcontract completion. The Project Engineer has no role in this process other than to respond to allegations of non-compliance with this contract requirement as with any other. We need to keep in mind that our contract is with the prime contractor and as a result, we are not a party to the prime contractor's subcontract documents. We should avoid becoming involved in prime's relationship with their subcontractors.

In the prime contractor's effort to determine completion of subcontract work, as required by the contract provisions, the Project Engineer may be asked to determine completion of a portion of the work. While we need to work with the Contractor to comply with the requirements of the specification, we should also take specific care to not issue partial punch lists or to place ourselves in a position of "accepting" portions of the work. In some cases we may provide the Contractor relief under certain conditions as described in Section 1-07.13 of the *Standard Specifications*, "Contractor's Responsibility for the Work."

1-2.7C EEO (State Funded Projects)

The Contractor is required to comply with the EEO requirements detailed in the *Standard Specifications* Section 1-07.11, Requirements for Nondiscrimination. In general, these requirements include having an EEO officer, developing, maintaining, making known, and utilizing an EEO program. The Project Engineer should be alert for and respond to any indications or accusations of discrimination and if substantiated, take appropriate actions. The Office of Equal Opportunity and your regional OEO staff are available for guidance and assistance in these types of situations.

1-2.7D EEO (Federally Assisted Projects)

The requirements for EEO and nondiscrimination for federally assisted contracts are similar to what's required for State funded projects. However, additional monitoring, reporting, and authority are mandated by Federal laws as noted in the Federal contract requirements known as the "FHWA 1273." the "FHWA 1273" is included in every Federally assisted contract. These requirements are reiterated in the *Standard Specifications* Section 1-07.11, Requirements for Nondiscrimination.

Reporting

- Federal-Aid Highway Construction Contractors Annual EEO Report, Form FHWA - 1391 — This form is required for all Federally assisted projects provided the prime contract is equal to or greater than \$10,000 and for every associated subcontract equal to or greater than \$10,000. Each contract requires separate reports be filed for the prime contractor and each subcontractor (subject to the above noted criteria.) These forms are due by August 25th each year in which work was performed in the month of July.

The payroll period to be reflected in the report is the last payroll period in July in which work was performed. A contractor who works on more than one Federally assisted contract in July is required to file a separate report for each of those contracts. For multi year projects, a report is required to be submitted each year work was performed during the month of July throughout the duration of the contract. A responsible official of the company must sign the completed report.

Upon receipt, the Project Engineer will forward this annual report to the Region's EEO Officer by September 5th. The Region EEO staff at the direction of the OEO will compile and report the information noted on the forms. The figures reported must reflect the number of employees, not hours, in each category, with subtotals broken out for women and minorities and grand totals for the category. Tables A through E reflect both apprentices and on the job trainees that were also utilized within each trade. The form must also include the corresponding subtotals in each category, A through E, broken out by both women and ethnicity.

- Summary of Employment Data Report, Form FHWA - 1392 — As a part of the WSDOT Office of Equal Opportunity (OEO) Equal Employment Opportunity Contractor Compliance Program, WSDOT

is required to submit a summary of employment data to FHWA for each Federal fiscal year. This Summary of Employment Data Report, FHWA-1392, is prepared from forms FHWA-1391 (project specific annual reports) that have been submitted to the Region by the Project Engineer's offices. This summary is prepared by the Region EEO lead or other Region designee for each Federally assisted project. This reporting also includes Local Agency projects administered through the Region's Highways and Local Programs offices. The completed FHWA-1392 summary reports, including all forms FHWA-1391, are then submitted by the Region EEO lead to the WSDOT Office of Equal Opportunity by September 15th each year.

- Monthly Employment Utilization Reports, WSDOT Form - 820-010 — This form, or approved substitute, is required for all federally assisted projects if the prime contract is equal to or greater than \$10,000 and for every associated subcontract equal to or greater than \$10,000. This report includes the total work hours for each employee classification as well as the total number of employees, broken out by ethnicity, in each trade, for each WSDOT project. Instructions for completing the form can be found on the back of the form itself. These monthly reports are to be maintained by the Contractor in the respective prime or subcontractor's records for a period of three years from acceptance of the contract, and available to WSDOT and/or Federal reviewers upon request.

The information required by WSDOT Form 820-010 may be accepted in an alternate format provided that format contains all of the data required by and is completed in accordance with the instructions for WSDOT Form 820-010. The Region EEO staff should be consulted regarding the acceptability of any alternate format proposed by the Contractor.

Records Retention and Reviews

The Contractor is required to maintain all project records, including the aforementioned EEO records, for three years following completion of the contract.

1-2.7E Minority and Women Owned Business Enterprise (MBE, WBE)

MBE, WBE is the designation for holding State certification as a minority or women owned business enterprise. The State Office of Minority and Women's Owned Business Enterprises (OMWBE) certifies businesses as either a minority owned business (MBE), a women owned business (WBE), or a combination of both (M/WBE). On projects funded in whole or in part with State funds, the contract provisions will include a MBE, WBE special provision. This provision may specify voluntary goals for the Contractor's utilization of M/WBE. The provision also includes suggested methods for encouraging M/WBE participation. As noted, these requirements are indeed voluntary and there are neither preferences for accomplishment nor sanctions for noncompliance.

MBE/WBE Reporting

- Annual Report of Amounts Paid MBE/WBE Participants (Form 421-023). In accordance with Section 1-08.1 of the *Standard Specifications*, an Annual Report of Amounts Paid MBE/WBE Participants (Form 421-023) is required from the prime Contractor for all projects funded entirely by State funds. When a project contains Federal assistance, the Federal quarterly reporting requirements for DBE utilization override the State requirements, eliminating the need for the State's annual report of amounts paid.

This Annual Report of Amounts Paid MBE/WBE Participants report reflects the State fiscal year, July 1 through June 30, and is to be submitted to the Contracting agency by the 20th of July each year and/or upon physical completion of the contract. The dollar amounts shown in the report are those amounts paid to the MBE/WBE firms during the reporting period. The final report is to show only the dollar amounts paid since July 1st through the Physical Completion date. The Region is responsible for entering this data into CCIS. The Region Documentation/Equal Employment Opportunity (EEO) Officer needs to verify the information has been entered and validate the information. The completed form is maintained as a part of the project records and becomes a part of the temporary final records upon completion.

1-2.7F Disadvantaged Business Enterprise (DBE)

DBE is the designation for holding Federal certification as a Disadvantaged Business Enterprise. On Federally funded projects there will normally be a DBE requirement of some sort specified by the contract special provisions. This special provision will be one of two types:

1-2.7F(1) GSP Includes No Goal

When *No Goal* is specified, the contractor is encouraged to take actions that promote DBE participation. The goal is intended to draw the bidders attention to the opportunity to subcontract with DBE's. However, these requirements are indeed voluntary and there are neither preferences for accomplishment nor sanctions for non-compliance. They do contribute to the overall goal established by the Department. It is therefore important that the Department capture the work that is being performed. This can be done through "Quarterly Report of Amounts Credited as DBE Participation".

1-2.7F(2) GSP Includes Condition of Award (COA) Goal

When a *Condition of Award Goal* (COA) is specified, the Contractor is required to employ DBE participation to at least the extent identified in the contract special provisions. This is a Condition of Awarding the contractor the contract and a project can not be considered successful unless a good faith effort has been made to deliver on the Condition of Award. These specifications are placed in contracts as a condition of continued Federal Funding for the Department.

- As a *Condition of Award*, the Contractor must commit to and follow through on; subcontracting at least the work and the amount identified by the COA to certified DBE firms or make a good faith effort to do so.
- Measurement of attainment is not simply the payments made to the DBE. Attainment is measured in accordance with the provisions of the "DBE Participation" section of the contract special provisions.
- Changes to the amounts specified for COA must be made in accordance with the procedures outlined in this section.

1-2.7F(3) Additional Execution Documents

Successful bidders will be required to provide a "Bidders List" to the Department. This list is to include the names and addresses of every firm that submitted a bid or quotation to the Prime, whether or not that bid was used as part of the overall proposal. The Contractor is directed to send this list directly to the WSDOT Office of Equal Opportunity in Olympia and normally the Project Engineer will have no involvement.

1-2.7F(4) DBE Reporting

The contract special provisions require the Contractor to submit to the Project Engineer a "Quarterly Report of Amounts Credited as DBE Participation" for each quarter and upon completion of the project. Again, the measurement is not simply the payments made to the DBE, rather it is in accordance with the "DBE Participation" section of the contract special provisions. This report should contain all DBE's utilized on the contract not just the COA DBE's. The information is used to track the Departments attainment of our overall goal and as such it is important to insure that they are received and processed. The Region Documentation/EEO Officers shall track and verify that the affidavits are being received and entered for all applicable contracts. The Region Documentation/EEO Officers shall also compare the affidavits with the Condition of Award requirements.

1-2.7F(5) On Site Reviews

- **Contract Includes Condition of Award Goal** — on site reviews shall be conducted on contracts that include COA goals when the COA subcontractor starts work, during the peak period of the subcontractor's work, and whenever there is a change in the nature or methods of the work. On site reviews are also required when a COA subcontractor is replaced. On site reviews are conducted on all DBE firms on the contract, not just the DBE firms subcontracted work under the COA. The intent of the overall program and hence the review is to document that the DBE is indeed in control of the work and performing a "*Commercially Useful Function*" (CUF) as described by the specification. The on site review is a "snapshot in time" and should record personal observations, documentation reviews, and personnel interviews as applicable. A copy of the completed on site review form (272-051) should be forwarded to the WSDOT Office of Equal Opportunity (OEO). On Site Reviews may lead to a Commercially Useful Function (CUF) review being

conducted by OEO. The Office of Equal Opportunity will also select DBE firms for CUF review on a periodic basis. The Office of Equal Opportunity will contact the Project Office directly to schedule these reviews. The fact that the OEO is going to conduct a review shall be kept in confidence, in order to insure that the review reflects a sampling of the typical work of the DBE firm. The CUF review includes observations of the work as well as interviews of key staff of all parties to the contract in addition to the DBE firm. The Condition of Award letter requires that the identified DBE firms perform specific item(s) of work for the estimated dollar amounts included in the proposal. The letter also identifies whether a firm performs as a “subcontractor,” “manufacturer,” or “regular dealer.” DBE compliance issues should be brought to the attention of the Office of Equal Opportunity and the State Construction Office.

- **Contract Includes No Goal** — the state has an obligation to make sure the quarterly reports are accurate. Taking credit for DBE accomplishments in the reports requires that the DBE perform a commercially useful function. At least one on site review should be performed on all DBE firms.

1-2.7F(6) Changes to the Condition of Award (COA)

The Contractor is required to utilize the COA subcontractors, manufacturers, etc., to perform the work as listed in the COA letter. Substitution of another DBE is allowed if:

- A COA DBE firm becomes decertified, or
- The contractor proposes a change to the contract that reduces DBE COA participation, or
- The prime contractor provides documentation that a DBE firm is unwilling or unable to perform the work.

Exceptions to the substitution requirement may be allowed under any of the following circumstances:

- WSDOT deletes the COA firm’s intended work.
- The COA work accomplished under runs the original planed quantity.
- The contractor can show substantial financial loss if a substitution is required.
- The work has progressed to the point where no other work remains to be subcontracted.
- The DBE subcontractor has taken the positive step of graduating from the DBE program.

The State Construction Office must approve any substitution with concurrence from the Office of Equal Opportunity.

1-2.7F(7) Substitution

Substitutions must meet the following requirements:

- The new firm must do an equal dollar value of work on the contract.
- The change order does not increase the dollar amount of the original goal.

1-2.7F(8) Condition of Award (COA) Change Orders

Changes to the contract COA amounts must be made through a change order executed by the Headquarters Construction Office. Approval is granted after consultation with the Office of Equal Opportunity. This approval shall be accomplished ahead of the work being changed under the contract and any related work be accomplished. The amounts shown in the COA change order should be limited to the credit necessary to accomplish the original contract goal amount. The request for approval and the change order as well as the change order package needs to contain the following information:

- An explanation of why the change is necessary.
- Identification of both the deleted work and the added work.
- Revised subtotals for all COA DBE firms. The change order only needs to address each affected DBE firm, not all COA DBE firms.
- Revised total attainment for DBE participation.
- Documentation of a good faith effort to substitute should go in the change order file, (if required, see 1-2.7F(6)).

1-2.7F(9) Consulting with the Office of Equal Opportunity

The Department’s DBE program is managed by the External Civil Rights Branch of the Office of Equal Opportunity (OEO) at Headquarters. The Project Engineer must communicate extensively and continuously with that office about any aspect of the DBE activities on the project. Any questions received from the Contractor or subcontractor about DBE provisions or enforcement should be answered only with full knowledge of the opinions and directions of the OEO. The OEO phone number at Headquarters is 360-705-7085.

The Office of Equal Opportunity is also required to approve DBE firms that are manufacturers and regular dealers.

The State Construction Office must execute any change orders that revise the COA commitment. When preparing the change order in CCIS pending CO’s menu use option 3, “Condition of Award Items.” Include the first three items listed above in the change order document. When submitting the change order to the Contractor for signature, the Project Engineer should also send copies to the affected DBE firms and should advise the Contractor that this has been done.

1-2.7G On-the-Job Training (OJT)

1-2.7G(1) On-the-Job Training Special Provisions — General

The requirements for training are made a part of the contract by the special provision, Special Training Provisions. The amount of training is set by the WSDOT Office of Equal Opportunity based on the opportunities presented by the work and the needs in the geographical area involved. The requirements for trainee, training plan approval, and trainee payment are all specified in the contract special provisions.

1-2.7G(2) OJT Required Reports

The contract provisions allow the Contractor to accomplish training as part of their work activities, or through the activities of their subcontractors or lower-tier subcontractors. However the prime contractor is designated as being solely responsible for the completion of the training requirements as they are outlined in the contract provisions.

- Form DOT 272-049 Training Program — A training program is to be completed by the Contractor. The program must be submitted to the Engineer for approval prior to commencing contract work. The Project Engineer's office may approve Bureau of Apprenticeship Training (BAT) or the State Apprentice Training Committee (SATC) programs provided they meet the requirements specified in the contract provisions. The Region will review any non-BAT/SATC training plans submitted under section III of the form for compliance. If the plan appears to be in compliance, the Region will sign it, check "Approval Recommended", and submit it to the WSDOT Office of Equal Opportunity (OEO) for concurrence. If concurrence is granted, OEO will note this on the plan and will submit the plan to FHWA for approval.
- Form 272-050 Apprentice/Trainee Approval Request — Approval of an individual trainee cannot be authorized until an approved Training Program is filed with the Region. This form is to be submitted by the Contractor for each trainee to be trained on the project. When a BAT/SATC apprentice/trainee is first enrolled, a copy of the apprentice/trainee's certificate showing apprenticeship/training registration must accompany the Trainee Approval Request. Trainees are approved by the Project Engineer's office based on the criteria in the special provisions.
- Form 226-012 EF Trainee Interview Questionnaire — One trainee interview is to be conducted for each craft designated on an approved training program for contracts which have 600 or more training hours or on projects otherwise designated by the Region EEO. The Region EEO shall designate additional contracts on which trainee interviews are to be completed in conjunction with those that meet the criteria above to insure that trainee interviews are conducted on at least one fourth of all the contracts that have training hours established for any given construction season. The intent of these training interviews is to document that the trainees are working and receiving proper training consistent with their approved programs. DOT form 226-012EF should be used to document these spot checks.
- Form DOT 272-060 Federal-aid Highway Construction Annual Training Report — This report is to be completed annually by the Project Engineer summarizing the training accomplished by the individual trainees during the reporting period beginning January 1 and ending December 31 of the calendar year. This report is due at the Regional EEO Office by December 20th of the same calendar year as the reporting period. The "gap" between the reporting deadline (December 20) and the end of the reporting

period (December 31) is not significant enough to adversely affect the data, and should not be a source of concern for the project staff.

1-2.7G(3) Payment for "Training"

At progress estimate cutoff time, the Contractor shall submit a certified invoice requesting payment for training. The invoice must provide the following information for each trainee:

- The related weekly payroll number
- Name of trainee
- Total hours trained under the program
- Previously paid hours under the contract
- Hours due for current estimate
- Dollar amount due for current updated estimate

Retroactive payment may be allowed provided:

- The Training Program is approved
- There are no outstanding issues or circumstances that would have prevented approval of the apprentice/trainee

Increases in training hours are allowable and may be approved on a case by case basis by the Project Engineer in consultation with the Regional EEO Officer.

1-2.7H Apprentice Participation

1-2.7H(1) Apprentice Participation Special Provision – General

The requirements for apprentice utilization are made a part of the contract by the special provision "Apprentice Utilization". The use of this provision, and the percentage of required apprentice participation, will be determined by meeting the date and dollar thresholds as follows:

- 10% On contracts advertised on or after July 1, 2007 but before July 1, 2008 and estimated to cost five million dollars or greater.
- 12% On contracts advertised on or after July 1, 2008 but before July 1, 2009 and estimated to cost three million dollars or greater.
- 15% On contracts advertised on or after July 1, 2009 and estimated to cost two million dollars or greater.

Only apprentices enrolled in and apprenticeship program approved by the Washington State Apprenticeship Council may be counted toward attainment of the apprentice utilization requirement. The Contractor may attain the apprentice utilization goal as part of their work activities, or through the work activities of subcontractors or lower-tier subcontractors. Attainment of the requirement will be calculated by comparing the total labor hours worked by all the enrolled apprentices performing work for the Contractor and any subcontractors, in all trades, with the total labor hours performed on the project, in all trades.

It is important to note that the Apprentice Utilization Requirement is a separate program from the Federal Training requirements included in all contracts which contain federal monies. The two programs are not mutually exclusive. The intent of the federal program is to increase the availability of women and minorities within the construction trades; where

as the Apprentice Utilization Requirement (state program) is promoting the use of apprentices in general. The state program will generally be much larger than the federal training program. Federal training goals are set on approximately 25% of all federally funded contracts and the state program will be required on all contracts estimated to cost two million dollars or greater. The state program will ultimately require that 15% of all labor hours on a project be performed by enrolled apprentices; this could range from 700 to 10,000 hours. Training hours on federal contracts range as high as 3,000 hours for a similar sized contract.

1-2.7H(2) Apprentice Utilization Plan

The Contractor is required to submit an apprentice utilization plan, on WSDOT Form No. 422-115 EF, to the Project Engineer within 30 days of execution of the contract. This plan is not submitted for approval; but to inform the Project Office as to how the Contractor will attain the utilization goal. The intent of the plan is to provide the Project Engineer with enough information to track the Contractor's progress in the utilization requirements. If the plan does not indicate that the Contractor will attain the goal, a revised plan should be requested and/or the Contractor should be notified that "Good Faith" documentation will be required, as specified.

1-2.7H(3) Reporting

For each contract with an apprentice utilization requirement, the Contractor is required to submit a monthly **Statement of Apprentice/Journey Participation** (WSDOT Form No. 422-110 EF) to the Project Office. This report shall be a consolidated report, and include data from the Contractor's work activities, as well as from the work activities of all subcontractors. This report will include the total hours and number of apprentices and journeymen working on the contract during the reporting period. The report will list the apprentices by name, registration number, and craft or trade; as well as the name of the Contractor or subcontractor for whom the apprentice is working. The reporting period starts on the first day of the month and runs through the last day of the month, and will be reported on the last working day of the following month. The Project Office should use this report and the apprentice utilization plan to measure the Contractor's progress toward attainment of the utilization goal. If apprentices are not being reported on the project when the plan shows that they should be working, the Project Office should contact the Contractor and request a revised plan. The Project Office should forward copies of all apprentice utilization plans to the Headquarters Construction Office, and the Region. The original apprentice utilization plan should be kept in the project file. A copy of all reports, and any "Good Faith" documentation submitted, should also be submitted to the Headquarters Construction Office, and the Region.

1-2.7H(4) "Good Faith" Procedures

"Good Faith" is the action taken by the Contractor to meet the Apprentice Utilization requirement. Documentation of the Contractor's "Good Faith" efforts is only required if the Contractor fails to attain the goal. "Good Faith" documentation may arrive with the monthly report or at the completion of the contract. The need to provide "Good

Faith" documentation should be stressed if it is determined that the monthly reports show a level of attainment that significantly differs from that in the Apprentice Utilization Plan. If this should occur, the Project Office should request a revised Apprentice Utilization Plan and/or "Good Faith" documentation from the Contractor. "Good Faith" documentation is basically written correspondence form approved program sponsors indicating that apprentices are not available to the Contractor. All apprentice programs must be approved by the Washington State Apprenticeship Council. A listing of approved programs can be found at the Department of Labor and Industries web page.

1-2.8 Control of Work

1-2.8A Authority of the Project Engineer

The Project Engineer is given considerable authority to enforce the provisions of the contract under Section 1-05.1 of the *Standard Specifications*. This authority is tempered by WSDOT's policies and delegation of authority from the Engineer to the Project Engineer. Accordingly, considerable care and professional judgment must be exercised by the Project Engineer in order to avoid exceeding the authority as delegated and to avoid decisions or actions that may be contrary to WSDOT policy. Should there be any doubts as to the limits of authority, the Project Engineer should consult the Regional Construction Manager.

Standard Specifications Section 1-07.16(1) *Private/Public Property* restricts the contractor from using Contracting Agency owned or controlled property other than property directly affected by the contract work without the approval of the Engineer. The Engineer has the authority to allow the use of Contracting Agency owned or controlled property within the project limits and any other property specifically listed for use in the contract. The use of any other Contracting Agency owned or controlled property would require a lease agreement as detailed in Chapter 11 of the *WSDOT Right of Way Manual*, M26-01.

In many cases, the courts have held that where the Project Engineer has exceeded the authority provided in the plans and specifications or the authority delegated by the Engineer, the actions of the Project Engineer are binding upon WSDOT. Because of this, it is important that the Project Engineer make no instructions, verbally or by written memoranda, that are outside the scope of the plans, specifications, contract provisions, or the authority delegated by the Engineer.

In advance of or during the course of the project, in the interest of economy and efficiency, noncritical items of work may be identified for which the Project Engineer may choose to modify the normal inspection or testing procedures. In taking these actions, the Project Engineer is acting under the professional responsibility inherent in all actions as a representative of the Department and a Licensed Professional Engineer. Full accountability of such incidents is expected. The scope of such actions should not exceed \$10,000 for a single bid item, nor exceed \$25,000 for an entire project.

The nature of the work to be accepted in this manner will generally be limited to minor and isolated items. Acceptance would typically involve dimensional conformance to

the plans and a visual determination that the materials are suitable, however, the Project Engineer may require some testing or other means to support a decision. In such action, the Project Engineer should be guided by the principle of achieving the intent of the contract, attaining reasonable expectations of service life proportional to cost, and protection of public safety. Typically, changes in acceptance procedures will only be made to work outside of vertical lines through the horizontal limits of the traveled way. Consideration should be given to the consequences of subsequent failure, ease of replacement, whether or not there is a high variability in the quality of similar work, or any other pertinent facts. Actions taken in accepting such materials should be identified in the project records with acknowledgment by signature of the Project Engineer. Materials accepted in accordance with this guidance should be identified in the Project Engineer's preparation of the Certification of Materials under Chapter 9-1.5 of this manual.

The use of this process is not intended to retroactively justify deficiencies discovered after the completion of work.

1-2.8B Contractor's Equipment, Personnel, and Operations

The Contractor is required to furnish adequate equipment for the intended use. The Contractor's equipment must also be maintained in good working condition. Prior to the start of work, the Project Engineer should ensure, by inspection, that the Contractor's plant, equipment, and tools comply with the specifications.

Whenever the specifications contain specific equipment requirements, the Project Engineer should verify that the equipment provided meets these specifications. This should be documented in project records such as the Inspector's Daily Report. The Contractor is required to furnish, upon request, any manuals, data, or specialized tools necessary to check the equipment.

It is most important that the operation of automatically controlled equipment be checked carefully and that the Contractor be advised immediately whenever the equipment is not performing properly.

The Contractor's supervisory personnel must be experienced, and able to properly execute the work at hand. If, in the Project Engineer's opinion, the Contractor's supervisory personnel are not fully competent, the Project Engineer should immediately notify the Regional Construction Manager of the facts in the matter, seeking assistance and advice.

It is expected that, consistent with WSDOT's policies and delegated authority, the Project Engineer will assist the Contractor in every way possible to accomplish the work under the contract. However, the Project Engineer must not undertake, in any way, to direct the method or manner of performing the work. Contrary to popular legend, this statement is true of force account work as well. Should the Contractor select a method of operation that results in substandard quality of work, non-specification results, a rate of progress insufficient to meet the contract schedule, or that otherwise violates the contract specifications or provisions, the Contractor should be ordered to discontinue that method

or make changes in order to comply with the contract requirements. Where cooperation cannot be achieved, the Project Engineer should notify the Regional Construction Manager of the facts in the matter, seeking assistance and advice.

1-2.8C Defective or Unauthorized Materials or Work

Contract Final Acceptance for all work completed on a project is made solely by the Secretary of Transportation acting through the State Construction Engineer. However, the Engineer relies heavily on the actions and professional opinions of others, involved throughout the course of work, in determining acceptability. Because of this, it is expected that the Project Engineer, working with the assistance of the Regional Construction Manager, as well as making full use of the many resources available at both the Regional level and Headquarters, particularly the office of the State Construction Engineer, will ensure that sufficient inspection is conducted in order to determine that the work performed or the materials utilized to construct the project comply with the requirements included in the contract plans and specifications. When inspections or tests are performed that indicate substandard work or materials, the Project Engineer should immediately notify the Contractor, rejecting the unsatisfactory work or material. When a review of the Contractor's work or materials used indicate questionable acceptability with regard to the specifications, the Contractor should be notified as quickly as possible so that changes in materials or work methods can be made in order to avoid materials or work being rejected.

1-2.8C(1) Defective Materials

The contract plans and specifications for construction of a project require that specific materials and/or work practices be utilized in completing the work. The Project Engineer may reject any materials not conforming to the requirements of the specifications. The rejected materials, whether in place or not, are to be immediately removed from the site of the work unless the following guidelines for acceptance of non-specification materials are followed:

Material Not in Place

1. Nonconforming materials that are within the defined tolerance limits noted in Chapter 9-5.6 of this manual may be accepted for use on the project in accordance with the guidance in Chapter 9-5.4.
2. There may be situations where WSDOT determines the use of nonconforming materials is acceptable. This requires prior approval of the State Construction Engineer and a change order modifying the project specifications.

Except for 1 and 2 above, materials that are known in advance as failing to comply with the Specifications are not to be incorporated into the work.

Material in Place

1. Price adjustments have been developed and are referenced in the contract for acceptance of certain materials whose properties cannot be determined until they are in place. Items this policy applies to include: concrete

compressive strength, Portland cement concrete pavement thickness, hot mix asphalt mixture and density, and pavement smoothness.

2. Material incorporated into the work that is subsequently found to be in nonconformance with the specifications and for which price adjustments for acceptance are not included in the contract, must be reviewed to determine acceptability. The determination of acceptability should be made only when, in the Project Engineer's judgment, there is a possible service or benefit to be obtained from its use. If it is determined that no benefit or service is obtained from the material's use, the Project Engineer may direct that the material be immediately removed and replaced at no cost to WSDOT.

The Project Engineer may consult the State Construction Office, State Materials Laboratory, the State Bridge and Structures Office, or other design organizations for assistance in determining the usefulness of the nonconforming material. If consulted, these offices will offer technical advice to the extent that information is available. It is not intended to enter into extensive research to assess material which could be removed and replaced under the contract terms.

If the material is acceptable for continued use, a determination shall be made by the Project Engineer of the possible reduced service life caused by the material substitution and the resulting credit assessed by change order.

This determination of acceptability and the resulting credit must meet with the Region Construction Manager's approval for execution of the change order. In addition, prior review and approval must be obtained from the State Construction Engineer with a recommendation from the State Materials Engineer for the intended application of the material. With this determination for acceptance of non-specification material, discussions should be initiated with the Contractor and a change order completed.

If it is determined that the specification violation will not compromise the performance of the material and the nature of the violation is considered to be more of a technical infraction of the specification, the material may be accepted with a change order, possibly including a price reduction. If there is sufficient data and if the nature of the material makes analysis feasible, a pay factor may be determined using QC/QA methods similar to those described in the *Standard Specifications*, Section 1-06.2(2). If QC/QA can not be applied, the Project Engineer may determine an adjustment subjectively, using whatever information is available. This assessment or price adjustment is typically based on the unit bid price and may vary from no price adjustment up to the total contract unit bid price for the item involved. If it is determined that the violation is serious enough that the material can not be accepted for use on the project, the Project Engineer may direct its complete removal and replacement at no cost to WSDOT.

All change orders for acceptance of nonconforming materials are Contractor proposed and WSDOT is under no obligation to accept or approve any of them.

1-2.8C(2) Defective or Unauthorized Work

The following types of activities will be considered unauthorized work and will be completed solely at the risk and expense of the Contractor:

- Work performed contrary to, or regardless of, the instructions of the Project Engineer.
- Work and materials that do not conform to the contract requirements.
- Work done beyond the lines and grades set by the plans or the Engineer.
- Any deviation made from the plans and specifications without written authority of the Project Engineer.

Until all issues of material acceptance and conformity to the contract plans and specifications can be resolved, unauthorized work will not be measured and paid for by WSDOT. The Project Engineer may direct that all unauthorized or defective work be immediately remedied, removed, replaced, or disposed of. In correcting unauthorized or defective work, the Contractor will be responsible to bear all costs in order to comply with the Engineer's order.

For additional guidance, see Section 1-05.7 of the *Standard Specifications*. If the Contractor fails or refuses to carry out the orders of the Engineer or to perform work in accordance with the contract requirements, the Project Engineer should immediately notify the Regional Construction Manager of the facts in the matter, seeking assistance and advice.

1-2.8C(3) Material Acceptance by Manufacturer's Certificate

All material is to be accepted for use on the project based on satisfactory test results that demonstrate compliance with the contract plans and specifications. All work demonstrating compliance is to be completed prior to the material's incorporation into the work. In many cases, this testing has already been completed in advance by the manufacturer. A Manufacturer's Certificate of Compliance is a means to utilize this work in lieu of job testing performed prior to each use of the product. While this provides for a timely use of the material upon arrival to the job site without having delay in waiting for the return of test results, it creates potential difficulties in obtaining and assessing the adequacy of a certificate.

Section 1-06.3 of the *Standard Specifications* describes the procedures for acceptance of materials based upon the Manufacturer's Certificate of Compliance. Division 9 of the *Standard Specifications* describes those materials that may be accepted on the basis of these certificates. Since a certificate is a substitute for prior testing, it is intended that all certificates be furnished to the Project Engineer prior to use or installation of the material.

However, there are some circumstances where the Contractor may request, in writing, the Project Engineer's approval to install materials prior to receipt and submittal of the required certificate. The Project Engineer's approval of this request must be conditioned upon withholding payment for the entire item of work until an acceptable Manufacturer's Certificate of Compliance is received. Examples of materials that *shall not* be approved by the Project Engineer for installation prior

to the Contractor's submittal of an acceptable certificate are: materials encased in concrete (i.e., rebar, bridge drains, etc.); materials under succeeding items where the later work cannot be reasonably removed (i.e., culvert under a ramp to be opened to traffic); etc. The Project Engineer's approval or denial shall be in writing to the Contractor, stating the circumstances that determined the decision. If the requirements of this provision are followed, including the written request by the Contractor and the written approval by the Project Engineer, then the remedy for failure to provide the Certificate is the withholding of 100% of the cost of the material and the cost of the work associated with the installation of the material.

At the conclusion of the contract, there may still be some items that are lacking the required certificates. These items must be assessed as to their usefulness for the installation, prior to payment of the Final Estimate and subsequent Materials Certification of the contract. The review of these items may include:

- Comparison with the suitability of other shipments to the project or other current projects.
- If possible, sampling and testing of the items involved or residual material from the particular lot or shipment.
- Independent inspection on site of the completed installation.

If it is determined that the uncertified material is not usable or is inappropriate for the completed work that incorporates the material, the Contractor should be directed to immediately remove the material, replacing it with other certified materials. If the material is found to be usable and is not detrimental to the installation it was incorporated into, it may be left in place but, if the provisions of Section 1-06.3 were followed, with a reduction to no pay. The reduction in pay will be the entire cost of the work (i.e., unit contract price, portion of lump sum, etc.) rather than only the material cost. The Contractor should continue to have the option of removing and replacing the uncertified material in order to regain contract payment for the installation. If the provisions of Section 1-06.3 were not followed, then there can be no withholding beyond the value of the missing work itself (the preparation and submittal of the Certificate.)

1-2.8D Contractor Submittals

Missing submittals is a principal source of delays in closing out the project and processing the final estimate. As the project proceeds toward completion, the Project Engineer and the Contractor should attempt to obtain all submittals as the need arises. These might include such things as materials certificates, certified payrolls, extension of time requests, or any other item or document that might delay processing the final estimate. Attention is needed to assure the receipt of these items from subcontractors as they complete their work.

1-2.8E Guarantees/Warranties

As specified in Section 1-05.10 and 1-06.5 of the *Standard Specifications*, the Contractor shall provide to the Project Engineer all guarantees, warranties, or manuals furnished as a customary trade practice, for material or equipment incorporated into the project. The Project Engineer should

transmit the originals of any such guarantees / warranties or manuals to the organization that will be maintaining the items covered by the guarantee/warranty or manuals. The Project office should maintain a copy of the guarantee/warranty, and a letter of transmittal for manuals, with the materials documentation file for the project.

1-2.8F Contractor's Performance Reports

The procedures for completing and submitting the Prime Contractor's Performance Report are included with the report, Form 421-010, and the *Prime Contractor's Performance Report Manual*, M 41-40. The requirement for this report and other direction can also be found in WAC 468-16-150 and WAC 468-16-160.

Should the Contractor's typical performance on a contract become below standard, the Project Engineer should immediately notify the Regional Construction Manager of the facts in the matter, seeking assistance and advice.

1-3 Estimates and Records

1-3.1 Estimates

1-3.1A General

Payment for work performed by the Contractor and for materials on hand must be made in accordance with Section 1-09 of the *Standard Specifications*. To facilitate payments to the Contractor and ensure proper documentation, WSDOT utilizes an automated computer system to record project progress in terms of bid item quantity accomplishment. This is then used to pay the Contractor for actual work performed during each designated pay period or for materials on hand. The automated system that completes this task is called the Contract Administration and Payment System (CAPS). CAPS utilizes an electronic tie between each project office's computer system and the mainframe computer. This system provides access to a large volume of corporate data and facilitates the maintenance of this data by different groups in different locations. Some of these different activities include:

- Contract Initiation — A Headquarters action whereby new contracts are created and stored in a computer file. The information consists of the names of the Contractor and the Project Engineer, project descriptive data, accounting identifier numbers, preliminary estimate, proposal date, bid opening date, award date, execution date, accounting groups and distributions, and an electronic ledger.
- Project Ledger — An updating process by the Project Office which keeps track of work performed on the contract as it is completed.
- Estimate Payments — A Project Office action whereby progress estimates and Regional final estimates are processed directly from the Project Office. The Headquarters Final Estimate process activates the Region Final when all the required paperwork is in place. Supplemental final estimates are processed by Headquarters only. Complete instructions for use of the CAPS computer system are included in the manual titled *Contract Administration and Payment System* (M 13-01).

1-3.1B Progress Estimates

Progress estimates are normally processed on the 5th of the month for odd numbered contracts and on the 20th of the month for even numbered contracts. Where the Project Engineer deems it appropriate, estimates may also be run on other dates.

Estimates may also be run on other dates if the progress estimate or parts of the progress estimate were withheld to encourage compliance with some provision of the contract and the Contractor resolves the issue that caused the withholding. These estimates should be paid immediately upon resolution by the Contractor.

Within the CAPS system, the basis for making any estimate payment is information from the project ledger. Every entry in the ledger is marked by the computer as either paid, deferred, or eligible for payment. Before an estimate can be paid, a Ledger Pre-Estimate Report (RAKD300C-PE) must be produced. In constructing this report, the CAPS system gathers all the ledger entries that are identified as eligible for payment, prints them on the report summarized by item, and shows the total amount completed to date for that item but not yet paid for by progress estimate. The report also shows any deferred entries or exceptions if they exist and includes a signature block for the Project Engineer's approval.

If there are errors or omissions in this report, the ledger must be changed to reflect the correct data. After corrections are made, the Ledger Pre-Estimate Report must be run again in order to get the corrections into the report and made available for payment by progress estimate. Once the Ledger Pre-Estimate Report is correct, an actual estimate can be paid. The report containing the Project Engineer's signature should be retained in the project files.

The estimate process is then accomplished with a few keystrokes in option 2, estimate payments, in the CAPS main menu. At this point, the CAPS system will automatically calculate mobilization, retainage, and the sales tax. The warrant will be produced, signed, and sent to the Contractor along with the Contract Estimate Payment Advice Report and two different sales tax summary reports. Copies of these reports will also be sent to the Project Office. When the Project Office receives their copy of the Contract Estimate Payment Advice Report, the total amount paid for contract items should be checked against the Pre-Estimate Report. This helps to verify that the amount paid was what the Project Engineer intended to pay. In addition, the ledger records that produced the estimate will now be marked by the CAPS system as being paid.

Up to the point of actually producing the warrant, the entire process for making a progress estimate payment is initiated and controlled by the Project Office.

Particular attention should be given to the comparison of the plan quantities and the estimate quantities for the various groups on the project as shown on the Ledger Pre-Estimate Report. Overpayments on intermediate progress estimates are sometimes difficult to resolve with the Contractor at the conclusion of the project.

New groups which do not change the termini of the original contract or changes in groups should be accomplished by memorandum from the Region to the State Accounting Services Office.

An additional estimate may be prepared if considerable work has been done between the date of the last progress estimate and the date of physical completion when the Engineer anticipates delays in preparing the final estimate. Should this circumstance occur, the additional estimate should show the work done to date no later than the day before the date of physical completion.

1-3.1B(1) Payment for Lump Sum Items

The Contractor is required to submit a detailed Lump Sum price breakdown for those items specified as Lump Sum for which there is no specified payment described in the payment clause of the applicable specification. Estimate payments for items specified as Lump Sum will be a percentage of the price in the Proposal, based on the Project Engineer's determination of the amount of work performed. Consideration will be given to, but payment will not be based solely on, the Contractor's Lump Sum breakdown. The Project Engineer should verify that the price breakdown is based upon a reasonable proportioning of the work, and detailed enough to allow a determination of the work performed on a monthly basis.

Payment of the first 80 percent of the Lump Sum price for Type B Progress Schedules will be made on the next progress estimate following the submittal and approval of the Type B Progress Schedule. The payment will be increased to 100 percent of the Lump Sum price when the Contractor has attained 80 percent of the Original Contract Award amount, as shown on the CAPS Pre-Estimate Report (inclusive of payments made for Material on Hand).

On WSDOT contracts for which payment is made through CAPS (Contract Administration and Payment System), payment for mobilization is calculated and paid automatically by the system. On contracts that do not use CAPS, the Project Office must calculate, and make payment for, the Contract item "Mobilization". Payment will be made in accordance with *Standard Specification 1-09.7 - Mobilization*. Based on the lump sum Contract price for "Mobilization", partial payment will be made as follows:

1. When 5-percent of the original Contract amount has been earned from other Contract items, excluding any amounts paid for materials on hand, the Contractor is also entitled to a partial payment of the Bid item "Mobilization". This payment, which is in addition to payment for contract work performed, will be calculated as 50-percent of the amount bid for "Mobilization" or 5-percent of the original Contract amount, whichever is the least.
2. When 10-percent of the original Contract amount has been earned from other Contract items, excluding any amounts paid for materials on hand, the Contractor will be paid 100-percent of the amount bid for "Mobilization" or 10-percent of the original Contract amount, whichever is the least. This payment is in addition to payment for contract work performed.
3. When the Substantial Completion date has been established for the project, payment of any remaining portion of the lump sum item "Mobilization" will be made.

1-3.1B(2) Payment for Material on Hand

Payment for material on hand (MOH) may be considered for materials intended to be incorporated into the permanent work. The requirements for payment of MOH are noted in Section 1-09.8 of the *Standard Specifications*. Payments for MOH are made under the 900 series of item numbers as ledger entries and need to be backed out as items are utilized such that 900 series entries are zeroed at close out of the contract. Therefore logically payment for MOH shall not exceed the value of the corresponding bid item. It is the responsibility of the project engineer to devise procedures that assure this is done correctly.

Payments may be made provided the contractor submits documentation verifying the amounts requested, the materials meet the requirements of the contract and the materials are delivered to a specified storage site or stored at the suppliers/fabricators as approved by the project engineer. Materials shall be segregated, identified and reserved for use on a specific contract or project. Payments commensurate with the percentage of completion may be paid for partially fabricated items.

All materials paid for as MOH must be readily available for inspection by the owner. Steel materials must be available for inspection but this availability need not be immediate. Reasonable notice should be given to allow the contractor to locate and make the material available for inspection. The project engineer may accept a higher level of risk that steel material may not be reserved for our use. The contractor's obligation to perform the work and the surety's guarantee of this obligation serve to offset the risk that reserved materials are diverted to other projects.

When materials paid for as MOH are stored in areas outside the general area the region shall make arrangements for inspection as deemed necessary prior to making payment. The region may utilize other regions or the State Materials Laboratory in doing so.

When contracts are estimated to cost more than \$2 million and require more than 120 working days to complete, a General Special Provision (GSP) will be included in the contract provisions, requiring documentation from the contractor as the basis for MOH payments and deductions. When this GSP is included in the contract provisions, the following procedure is used to determine how much of the MOH payment should be deducted from an estimate:

- Each month, no later than the estimate due date, the contractor will submit a document and the necessary backup to the Project Engineer that clearly states:
 - The dollar amount previously paid for MOH,
 - The dollar amount of the previously paid MOH incorporated into the various work items during the month, and
 - The dollar amount that should continue to be retained in MOH items.

If work is performed on the items and the contractor does not submit a document, all previous associated MOH payments may be deducted on the next progress estimate.

1-3.1B(3) Payment for Falsework

On those projects which include a lump sum item for bridge superstructure, payment may be made on request by the Contractor for falsework as a prorated percentage of the lump sum item as the work is accomplished. The Project Engineer may require the Contractor to furnish a breakdown of the costs to substantiate falsework costs. For any given payment request, the Contractor may be required to furnish invoices for materials used and substantiation for equipment and labor costs.

1-3.1B(4) Payment for Shoring or Extra Excavation

When Shoring or Extra Excavation Class A is included as a bid item, payment must be made as the work under the bid item is accomplished, the same as for any other lump sum bid item. When Shoring or Extra Excavation Class B is included as a bid item, measurement and payment shall be made in accordance with Sections 2-09.4 and 2-09.5 of the *Standard Specifications*. RCW 39.04 provides that the costs of trench safety systems shall not be considered as incidental to any other contract item, and any attempt to include the trench safety systems as an incidental cost is prohibited. Accordingly, when no bid item is provided for either Shoring or Extra Excavation Class A or Shoring or Extra Excavation Class B and the Engineer deems that work to be necessary, payment will be made in accordance with Section 1-04.4 of the *Standard Specifications*.

1-3.1B(5) Payment for Asphalt and Fuel Cost Adjustment

Selected projects may include the specifications for Asphalt Cost Adjustment or Fuel Cost Adjustment (or both) as a General Special Provision. Not all projects will contain these provisions, since their use depends on the type of work, the duration of the contract, and Region preference. For those contracts containing either of the cost adjustment bid items, an adjustment (payment or credit) will be calculated monthly for qualifying changes in the index price of the commodity. No adjustment (payment or credit) shall be made if the 'Monthly Cost' is within 10 percent of the 'Base Cost', and only those items that are included in the provision are eligible for adjustment.

It is important to understand that the adjustments provided by these provisions are not a guarantee of full compensation for changes in the contractors cost, and that they are intended only to absorb some of the risk of severe cost escalation during contract performance. Because of this, the method of computing the adjustment has been simplified to eliminate tedious considerations that would otherwise be required to provide precise reimbursement of actual costs.

The provisions for this item are prescriptive, and should result in the correct adjustment if they are followed to the letter. Regardless of whether the estimate cutoff is the 5th of the month or the 20th of the month, any adjustment will apply the most current monthly index value to the current quantity paid in the current estimate. This applies to payments that are deferred from one estimate to a later estimate as well.

The provisions for both cost adjustments are silent in regard to changed work because there are other contract clauses that address how the Department will pay for changed work. Should changes occur in bid items that are eligible for adjustment, equitable adjustments should adhere to the guidance provided in Section 1-2.4C of this Manual. Under no circumstances should eligible items that were not included in the specifications at the time of bid be added by change order after award and execution of the contract. Likewise, these provisions should not be added by change order and applied to work that was performed prior to the change order agreement. FHWA will not participate in the cost of these retroactive price adjustments.

1-3.1B(6) Payment for Surplus Processed Material

When excess aggregate is produced by the Contractor from a WSDOT furnished source, the Contractor will be reimbursed actual production costs if the excess materials meet the requirements of Section 1-09.10 of the *Standard Specifications*. If more than one type of aggregate is involved, the provisions of Section 1-09.10 apply to each type.

If WSDOT has a need for the excess aggregate for either maintenance or future construction contracts, the material may be purchased into the appropriate inventory account. The Project Engineer should contact Region Maintenance and Accounting for guidance. If aggregates are to be disposed of as surplus, the Project Engineer should contact the State Administrative Services Office, Purchasing and Inventory Section, for additional assistance.

1-3.1B(7) Liquidated Damages

Liquidated Damages and Direct Engineering, or other related charges, are to be addressed as described in the contract specifications, Section 1-08.9 of the *Standard Specifications*, and Chapter 1-2.5G of this manual. Direct Engineering charges are a form of Liquidated Damages and must be listed on the monthly progress estimates on the line for Liquidated Damages. Traffic related damages as described in Chapter 1-2.5G(2) of this manual are to be listed under Miscellaneous Deductions. The Project Engineer must evaluate potential Liquidated Damages that have accrued as a result of the expiration of contract time before the damages are withheld from moneys due the Contractor. The work and circumstances that have occurred over the course of the project should be reviewed to determine if there is potential entitlement for granting additional contract time. Liquidated Damages that have accrued should be adjusted for this evaluation. Liquidated Damages deemed chargeable should then be withheld from moneys due the Contractor each monthly progress estimate as Liquidated Damages accrue. While the Project Engineer takes the action to withhold damages as the work progresses, only the State Construction Office may actually assess those damages.

1-3.1B(8) Credits

Dollar amounts may be deducted as a “Below the Line Miscellaneous Deduction” from progress or final estimates when WSDOT is due a credit from the Contractor. Routine credits from the Contractor to WSDOT include, but are not limited to, the following items:

- Engineering labor costs when due to Contractor error or negligence, additional engineering time is required to correct a problem. This includes the costs of any necessary replacement of stakes and marks which are carelessly or willfully destroyed or damaged by the Contractor’s operation.
- Lost and/or damaged construction signs furnished to the Contractor by WSDOT. The Contractor should be given the opportunity to return the signs or replace them in kind prior to making the deductions.
- Assessment to WSDOT from a third party that is the result of the Contractor’s operations causing damage to a third party, for example, damage to a city fire plug. Actual costs will be deducted from the estimate.
- Other work by WSDOT forces or WSDOT materials when the Contractor cannot or will not repair damages that are the responsibility of the Contractor under the contract.
- Liquidated damages not associated with contract time, i.e., ramp closures, lane closures (see Chapter 1-2.5G).
- As provided for in the specifications, specific costs or credits owed WSDOT for unsuccessful contractor challenged samples and testing.

The authority to withhold and assess routine “Below the Line Miscellaneous Deduction” on progress and final estimates has been delegated to the Regional Construction Manager, and may be further subdelegated to the Project Engineer. The Project Engineer must give written documentation to the Contractor describing the deduction and provide sufficient notice of the impending assessment.

Credit items which are specifically provided for by the *Standard Specifications* or contract provisions, such as non-specification density, non-specification materials, etc. may be taken through the contract items established for those purposes. A change order is required for credit items which are not specifically provided for by the contract provisions.

Occasionally a Contractor will send a check directly to a Project Office for payment of money due WSDOT. (The Project Office should not request payment.) Whenever a Project Office or WSDOT employee receives a check or cash directly from a Contractor, it is very important that the guidance found in Directive 13-80, Control of Cash Receipts, be followed.

1-3.1B(9) Railroad Flagging

All dollar amounts actually incurred by the Railroad Company for railroad flagging, under the terms of the typical railroad agreement, will be paid by WSDOT. The Contractor will incur no costs for railroad flagging unless the flagging is for the Contractor’s benefit and convenience. In this case, the Project Engineer will deduct this cost on monthly progress estimates as a below the line item in the Contract Administration and Payment System.

1-3.1B(10) Payment for Third Party Damages

Section 1-2.4I of this manual details when WSDOT assumes responsibility and pays for third party damages. The *Risk Management Manual, M 72 01*, provides detailed guidance on procedures, including lines of communication. Payment should be made under the item “Reimbursement for Third Party Damages”. This item is only intended to be used for costs that are the responsibility of the contracting agency. If this item was not included in the contract, it may be added by change order using a separate group for each Control Section in which an incident occurs. On some items such as “Repair Impact Attenuator” there has been a conscious decision by the contracting agency during design to assume a risk which is otherwise the contractor’s. It would not be appropriate to assume this risk for other items of work by adding a similar pay item through a change order.

The next step is for the Project Engineer to determine if an incident warrants an attempt to recover costs based on cost effectiveness. If so, a memo is necessary to provide notice and information to the risk management office. Basically, they need the information necessary to investigate the incident, find the responsible party, determine the amount of the damages and obtain reimbursement for the State. The risk management office needs the following information:

- Contract Number, Project Description
- Names of Witnesses
- Documentation Related to the Damage
 - Change Order Number
 - Field Notes
 - Police Reports
 - Work Order Coding
- Summary of Repair Costs

1-3.1B(11) Withholding of Payments

Withholding payments for work the Contractor has performed and completed in accordance with the contract should not be done casually. There must be clear contract language supporting the action. The authority to withhold progress payments is subdelegated to the Regions. Further delegation to the Project Engineers is at the discretion of each Region.

There are very few occasions when it would be appropriate to withhold the total amount of a payment for completed work. If a minor amount of cleanup remains, if a portion of the associated paperwork has not been submitted, or if minor corrective measures are needed, then the correct action is to pay for the work and defer an amount commensurate with the needed remaining effort.

The concept of “allowing the Contractor to proceed at his own risk” and then withholding payment is not often supported by the contract. There is a contractual obligation to finish the work correctly, there would certainly be a “moral obligation” on the part of the Contractor to live up to the bargain, but there is no contract language that allows such an action. Specific exceptions to this rule are listed below.

Once a decision to withhold any part of the monthly payment has been reached, then it is imperative that the Contractor receive fair notice of this action. The method of this notice can be negotiated with the Contractor and could be a listing at the time of estimate cutoff, a copy of the pre-estimate report or other mechanism. Once notice has been provided, then it is also necessary to allow a reasonable time for corrections to be made.

No Payment for the Work

Standard Specification 1-06.3, “Manufacturer’s Certificate of Compliance” is unique in that this is a situation, specified as part of the contract, where the contractor may request permission to assume the risk for no certificate and end up never being paid for the related work.

Progress Payment Deferral

In the following situations, the contract specifies that the contracting agency has the authority to defer the entire progress payment:

- The contracting agency may not make any payments for work performed by a Prime/Subcontractor until the contractor performing the work has submitted a Statement of Intent to Pay Prevailing Wages approved by Labor and Industries (RCW 39.12.040)
- Failure to submit the “*required reports*” by their due dates (*Standard Specification* 1-07.11(10)B)

Wage Administration in General

The administration of wages and payment for the work are separate issues. Holding a force account payment for certified payrolls is not appropriate. Withholding payments on the contract is suggested as a method to achieve compliance under the *Standard Specifications* pertaining to wages (1-07.9(1)). This remedy should not be used without approval of the Headquarters Construction Office. Routine enforcement of wage requirements should be done on their own merits utilizing the sanctions specified as follows:

State Wage Administration

Labor and Industries is the enforcement agency for state prevailing wage administration. The State (WSDOT) is protected under the contract from wage claims by reserving 5 percent of the moneys earned as retained percentage. This 5 percent is made available for unpaid or underpaid wages liens among other claims. Contract payments should not be deferred due to a contractor’s failure to pay the State minimum prevailing wage.

Federal Wage Administration

FHWA 1273 specifies that the State Highway Administration (SHA) is in the enforcement role for federal prevailing wage administration. Under Section IV “*Payment of Predetermined Minimum Wage*” subsection 6., “*Withholding*,” the State Highway Administration (contracting agency) is authorized to withhold an amount deemed necessary to make up any shortfalls in meeting Davis Bacon prevailing wage requirements. It goes on to authorize the deferral of all payments, under certain conditions, until such violations have ceased. This is only for federal wage requirements and the amount “deemed necessary” must be based on the amount of the underpayment.

Application of the *Standard Specifications*

Under 1-05.1 Authority of the Engineer reads in part as follows: “If the Contractor fails to respond promptly to the requirements of the contract or orders from the Engineer:
2. The Contracting Agency will not be obligated to pay the Contractor, and”

Under Section 1-09.9 Payments reads in part as follows: “Failure to perform any of the obligations under the contract by the Contractor may be decreed by the Contracting Agency to be adequate reason for withholding any payments until compliance is achieved”.

Sounds good and we can do so, but withholding of payments owed the contractor must not be done on an arbitrary basis. Other than the previously noted exceptions, money is normally withheld because work/work methods are not in accordance with contract specifications. Also, the amount withheld must have a logical basis. We cannot penalize the contractor by withholding more than the out of compliance work is worth.

Withholding payments should not be used routinely as a tool for forcing compliance on general contract administration requirements. The State is protected against nonperformance by requiring a performance bond. In the event that lack of contract compliance puts the State at substantial risk monetarily or safety wise, it may be appropriate to inform the contractor of the compliance problem and suspend work under *Standard Specification* 1-05.1 “*Authority of the Engineer*” until corrections are made.

When withholding money, remember that delaying the contractor’s cash flow may damage the contractor’s ability to perform work. Before doing so, the State should be able to demonstrate:

- specifically what was not in accordance with the contract and where the requirement is specified in the documents
- that the amount withheld is commensurate with the amount of the unauthorized, uncompleted or defective work
- that the contractor was notified in a timely manner (within 8 days per prompt pay laws) and given a chance to make corrections
- that the State has worked with the contractor to mitigate corrections to non-specification work in order to minimize the cost

The State is required to pay the contractor in a prompt manner within 30 days after receipt of the work or after recognition of entitlement to additional compensation. The Project Engineer must keep an eye on the calendar when scheduling monthly estimate payments.

Regions are not authorized to withhold amounts that are greater than the estimated cost of the missing or incorrect portion of the work. Any such excess withholding must be approved by the Headquarters Construction Office.

1-3.1C Final Estimates — Regions

The final estimate for a project is processed in the same manner as a routine monthly progress estimate. The *Work Done to Date* entry on a final estimate is the physical completion date. When the Region final estimate is completed and is run in CAPS at the Region, it will not generate a warrant for the Contractor. Instead, the Region final estimate will produce several reports: a final Comparison of Quantities; the Contract Estimate Payment Advice; the Contract Estimate Payment Total; and the Sales Tax Summary.

These reports should be carefully checked to verify the accuracy of items, quantities posted, and the costs that have accumulated through various progress estimates during the life of the contract. Where necessary, corrections can be made to the ledger and the Region final estimate rerun as many times as it takes to make it correct before proceeding with the final estimate process.

If the final estimate shows an overpayment has been made to the Contractor, the estimate should still be processed in the same manner as a normal final estimate. If this occurs, the Contract Estimate Payment Totals report will show a minus amount due the Contractor. When the State Accounting Services Office receives the accepted final estimate package, that office will request any reimbursement due from the Contractor. The Project Engineer should not request reimbursement from the Contractor.

Once the Project Engineer has validated the final estimate amounts, a copy of the Comparison of Quantities Report, the Contract Estimate Payment Advice Report, and the Contract Estimate Payment Totals Report should be forwarded to the Contractor along with the Final Contract Voucher Certification. The Project Engineer might remind the Contractor that the person signing the Final Contract Voucher Certification must be authorized to do so. Authorized signatures are submitted by the contractor at the beginning of each contract.

Once the project has been physically completed, the final estimate package described above should be submitted to the Contractor for signature as soon as is reasonably possible. The final estimate package and request for the Contractor’s signature should be transmitted to the Contractor formally. The effort to prepare the final estimate package will vary in nature and magnitude, depending on the project. In some cases, this work will conflict with field work on other projects. It is expected that final estimate preparation will be scheduled and accomplished as soon as possible, but not later than six months after physical completion.

Once the signatures and all necessary documents have been obtained, the final estimate package should be assembled by the Region and submitted to the State Construction Office. If any needed recommendations for assessment of liquidated damages associated with contract time have not already been submitted, this submittal should include them. The State Construction Office must resolve all issues of liquidated damages before the final estimate can be accepted and submitted to the State Accounting Services Office.

1-3.1D Final Estimates — Headquarters

The final estimate package submitted to the State Construction Office consists of the following:

- Project Status Report — the Project Status Report should address contract time and recommendations for liquidated damages related to contract time, amount of railroad flagging used if any, Miscellaneous Deductions identified, etc. In addition, the report should indicate whether or not all Affidavits of Wages Paid have been received for the Contractor, and all subcontractors, agents or lower-tier subcontractors.
- Final Contract Voucher Certification — Form 134-146, original only.
- If an assessment of liquidated damages has been made previously, include a copy of the letter from the State Construction Engineer to the Contractor assessing these.
- If an assessment of miscellaneous damages or liquidated damages resulting from causes other than time, include copies of letters from the Region to the Contractor for assessment of these.
- Contract Estimate Payment Totals — RAKC300F-EA.

The final estimate package is reviewed by the State Construction Office and submitted to the State Construction Engineer for acceptance of the contract. The date on which the State Construction Engineer signs the Final Contract Voucher Certification becomes the final acceptance date for the contract itself. The final estimate package is then submitted to the State Accounting Services Office.

1-3.1D(1) Final Estimate Claim Reservations

Should the Contractor indicate a claim reservation on the Final Contract Voucher Certification, it must be accompanied by all of the requirements of Section 1-09.11(2) of the *Standard Specifications* (provided these have not been met in a previous claim submittal). The Project Engineer must assure that the requirements have been met prior to submitting the final estimate package to the State Construction Office. If the claim package is incomplete, return the voucher to the Contractor with notice of the missing parts.

1-3.1D(2) Unilateral Acceptance of Final Estimates

The Project Engineer cannot establish a completion date for the contract if the Contractor is unwilling or unable to submit one or more of the required documents noted in Section 1-08.5 of *Standard Specifications*. However, the Region can request that the State Construction Engineer accept the contract by signing the Final Contract Voucher Certification (FCVC) in spite of the missing documents.

If the Contractor has not signed the FCVC, the Region can request that the State Construction Engineer accept the contract without the Contractor's signature. The Region is responsible for notifying the Contractor before such a request is made. The State Construction Office will generate the certified letter notice mentioned in the *Standard Specifications*, Section 1-09.9. The date of the State Construction Engineer's signature of the FCVC becomes both the acceptance date and the completion date of the contract, both established unilaterally.

1-3.1E Supplemental Final Estimates

A Supplemental Final Estimate is a payment adjustment made to a contract after the Final Estimate has been processed and the project has been accepted by the State Construction Engineer. A Supplemental Final Estimate may be necessary to correct an inadvertent under payment or where a claim settlement may require additional payment be made to the Contractor. In order to complete a Supplemental Final Estimate, the Project Engineer should complete and assemble the following items, routing them through the Region to the State Construction Office for review and further processing:

1. Complete any corrections or additional postings necessary in CAPS, including any postings to change order items added to CAPS for the settlement of a claim. (Please note, where additional CAPS postings are necessary after the Physical Completion date has been established, the "Work Done To" date in CAPS must be entered as the Physical Completion date or prior.)
2. Complete a Pre-Estimate report including the Project Engineer's recommendation for payment.
3. Assemble the backup information supporting the necessity and substantiating the cost of the changes to be made.
4. Complete a supplemental Final Contract Voucher Certification (WSDOT Form 134-146 EF) reflecting the changes made and showing the new total "*Final Amount*".

After review, the Pre-Estimate report will be signed by the State Construction Engineer authorizing payment to proceed.

While postings and corrections to CAPS may continue, once the Completion date has been established for a contract, CAPS will no longer allow the Project Engineer or the Region to process further payments to the Contractor. As a result, payment of the Supplemental Final Estimate will need to be completed for the Project Engineer by the WSDOT HQ Accountability and Financial Services Office.

If this process requires a more timely response, the above documentation may be scanned and e-mailed to the State Construction Office and CAPS; and the contract payments section can be requested to print out the pre-estimate report to be taken to the State Construction Engineer for signature prior to processing the supplemental final estimate. Once the supplemental payment is completed, the signed and executed Pre-Estimate report will be returned to the Project Engineer where it can be maintained as a part of the project payment files and made a part of the Region Temporary Final Records.

While a new Final Contract Voucher Certification is completed as a part of the Supplemental Final Estimate, the Acceptance date will remain the same as established by the State Construction Engineer's signature on the original Final Contract Voucher Certification.

The above process may not be used when there has been an inadvertent over payment to the Contractor, the Final Estimate has been processed, and the project has been accepted by the State Construction Engineer. In this case, the Project Engineer must work with the Region, the contract payments section of the WSDOT Accountability and Financial Services Office, and the State Construction

Office to make the correction. All dates in the system will be deleted, the correction made, and the Final Estimate process will begin again with the Region Final Estimate (see Chapter 1-3.1C of this manual).

1-3.1F Retained Percentage

Retained percentage withholding is based upon RCW 60.28, which provides that:

- A sum not to exceed 5 percent of the money earned by the Contractor on estimates be retained by the Contracting Agency.
- The Contractor may submit a bond for all or any portion of the amount of funds retained by WSDOT.

When a contract is awarded, the State Accounting Services Office or the Region Plans Office sends a package of contract documents to the Contractor.

This package of contract documents also includes the necessary instructions for the Contractor to make application for a bond to replace all or any portion of the retainage. The bond form will be processed by the State Accounting Services Office without involvement from Project Engineer's Office.

The Contractor, at any time during the life of the contract, may make a request to the Project Engineer for the release of all or any portion of the amount of funds retained. This request does not need consent of surety since the retainage bond form, for this purpose, requires their consent. The Region must forward this request by transmittal letter to the State Accounting Services Office. The Accounting Office will furnish the appropriate bond form to the Contractor for execution. The Contractor may return the executed bond form directly to the Accounting Office for final approval and signature by WSDOT.

- For projects that include landscaping, the Contractor may request that, 30 days after physical completion of all contract work other than landscaping work, WSDOT release and pay in full the amount of funds retained during the life of the contract for all work except landscaping.

In order to initiate this release of funds, Form 421-009 should be completed by the Contractor and submitted to the Project Engineer. In signing the request, the Project Engineer will confirm that all work, except landscaping work, is in fact physically completed. For any landscaping work that may have been completed, the Project Engineer will designate the amount of landscaping moneys, if any, that have been earned to date by the contractor. In the space designated for remarks the Project Engineer will identify the landscaping or plant establishment work that remains to be completed and its approximate value. Except for landscaping work, the Project Engineer will determine if all Statements of Intent and Affidavit of Wages Paid have been received for the work that has been physically completed. WSDOT will continue to withhold a 5 percent retainage of any moneys earned for landscaping work that may have been completed to date and will continue to retain 5 percent of the moneys that are to

be earned for landscaping that is yet to be completed. A bond is not required.

The completed request along with the Project Engineer's cover memo confirming receipt of Statement of Intent and Affidavit of Wages Paid for the Contractor, subcontractor, and any lower-tier subcontractors who were involved in the completed work, is then forwarded to the State Construction Office for approval. Once approved, the Construction office will submit the request to the State Accounting Services Office for further processing. If no claims against the retainage for unpaid taxes, labor, or materials have been received within the designated 60 day period, the Accounting Office will release the designated retainage to the Contractor.

1-3.2 Final Records for Projects Constructed by Contract

The Project Engineer is responsible for preparing all necessary records in order to document the work performed on the contract. Detailed instructions on the records required and methods of preparing them are covered in Chapter 10 of this manual.

1-3.3 Disputes and Claims

1-3.3A Claims By the Contractor

1-3.3A(1) Disagreement, Dispute, Protest

During the course of a contract, differences of opinion may arise over decisions and plan interpretations that benefit one party at the expense of the other. It is the policy of WSDOT to pursue resolution of these differences at the earliest possible time and to fully recognize all of the contractual rights of the Contractor during the resolution process.

Disagreements, disputes and protests are the responsibility of the Project Engineer until a formal claim is filed in accordance with Section 1-09.11(2). Contact the Headquarters Construction Office for concurrence before taking any issue to a Disputes Review Board. The Project Engineer may employ a variety of techniques and procedures to pursue resolution of these issues. With the high potential for cost impact, it is strongly recommended that all disagreements be identified and tracked.

When a protest occurs during a contract, the Contractor shall pursue resolution through the Project Engineer as outlined in Section 1-04.5 of the *Standard Specifications*. The Specification contains specific requirements which, if not followed, may result in a waiver of the Contractor's claim. The Project Engineer should monitor whether the Contractor is meeting these requirements. If all of the requirements have been met, the Project Engineer shall evaluate the merits of the protest and take whatever appropriate action is needed to resolve the issue. If it appears that the Contractor has failed to meet any of the requirements set forth in 1-04.5, the Project Engineer should advise the State Construction Office and request guidance. Pending such guidance, the Project Engineer may continue to discuss the protest with the Contractor with the qualification that no final evaluation of the protest will be made until permission is received from the State Construction Office.

1-3.3A(2) Claims

If the Contractor has pursued and exhausted all the means provided in Section 1-04.5 to resolve a dispute, the Contractor may file a formal claim. A formal claim, filed in accordance with Section 1-09.11(2), is a much more structured device and demands a high level of conformance with the contract requirements. The objective is to utilize the rights that WSDOT has under the contract to identify the issues, obtain a sufficient level of information from the Contractor and limit the discussion to a defined subject matter. To accomplish this, and to maintain the Department's rights in a situation that may lead to court action and expensive lawsuits, the Project Engineer must insist on rigid conformance with the requirements of the provision. In fact, the first evaluation must not be of the claim's merit, but rather of the claim's structure and content. If the package fails the specification requirements in any way, it should be returned to the Contractor immediately with a written explanation. Conversely, if the package meets the contract requirements, then the Project Engineer must comply with the demands for WSDOT actions that are included in the same specification.

The existence of a formal claim does not diminish the responsibility of the Project Engineer to pursue resolution. The only difference is that Headquarters final approval of a proposed settlement is required. The change order settling a formal claim must include waiver language similar to the following:

"The Contractor, (company name), by the signing of this change order agrees and certifies that:

Upon payment of this change order in the amount of \$ _____, any and all claims set forth in the letter(s) to the Department of Transportation, dated _____ and signed by _____ of (company name) in the approximate amount of \$ _____, have been satisfied in full and the State of Washington is released and discharged from any such claims or extra compensation".

If the settlement is intended to close out all dispute discussions for the contract, use language similar to:

"The Contractor, (company name), by the signing of this change order agrees and certifies that:

Upon payment of this change order in the amount of \$ _____, any and all claims in any manner arising out of, or pertaining to, Contract No. _____, (including but not limited to those certain claims set forth in the letter(s) to the Department of

Transportation, dated _____ and signed by _____ of (company name) in the approximate amount of \$ _____, have been satisfied in full and the State of Washington is released and discharged from any such claims or extra compensation in any manner arising out of Contract No. _____".

1-3.3A(3) Legal Filing

Once the Contractor has submitted a formal claim in acceptable form and the State has either denied the claim or failed to respond in the time allowed, the Contractor is free to seek judicial action by filing a lawsuit or, in some cases, demanding binding arbitration. Note that the Contractor must fully comply with the provisions of Section 1-09.11 before it can seek judicial relief. Once any legal action has been started, the Project Engineer may only continue with settlement efforts if the Attorney General's office has given specific permission to do so. Such permission may be sought through the State Construction Office. Settlements of claims which have resulted in a judicial filing need review and approval by the Attorney General's office and different waiver language similar to the following:

"The Contractor, (company name), by the signing of this change order agrees and certifies that:

Upon payment of this change order in the amount of \$ _____, any and all claims in any manner arising out of, or pertaining to, Contract No. _____, (including but not limited to those certain claims set forth in the complaint filed under Thurston County Cause No. _____ (Contractor's name) vs. State of Washington), have been satisfied in full and the State of Washington is released and discharged from any such claims or extra compensation in any manner arising out of Contract No. _____".

1-3.3A(4) Final Contract Voucher Certification

In some cases, of course, the Contractor will not have been so cooperative as to participate in resolution efforts. After a protest has been disallowed, there may have been no formal claim filed and the Project Engineer really doesn't know if there is a continuing problem. The way to resolve this after the project is physically complete is to assemble the final estimate and send it to the Contractor with a Final Contract Voucher Certification (FCVC). The FCVC is the Contractor's last chance to formally file a claim. If there is no exception above the Contractor's signature on the FCVC, there is no claim. The contract will be over as soon as the State Construction Engineer accepts it. If the Contractor does not return the FCVC in a reasonable time, WSDOT may unilaterally set the completion date and process the final estimate without the Contractor's signature. Proposals to unilaterally accept a contract should be discussed with Region managers before any action is initiated.

1-3.3B Claims Against the Contractor — Damage

The Department has a claims office, now known as the Washington State Department of Transportation Risk Management Office (RMO). All receptionist job descriptions, all Region operations manuals, and all telephone training is set up to refer citizens with damage claims related to construction to the RMO and to provide the toll free number (1-800-737-0615). The RMO will react to the call, issuing claims forms, contacting the contractor, and following up on the actions taken.

The Project Engineer's role is to appropriately advise the RMO, if needed. There may be confusion about which contract is involved. Field office knowledge about the incident and the surrounding circumstances may be solicited. The contractor's insurance and the insurance provided by the Contractor for the State may be involved and information about the policy will, most likely, be requested.

If, in spite of the Department process, the claimant contacts the field office directly, the Project Engineer should refer the claimant to the State Risk Management Office (1-800-737-0615).

1-3.3C Claims Against the Contractor — Money

Claims received by the Region for money owed by the Contractor should be referred to the Contractor. A claimant should be advised of the legal right to file a lien against the retained percentage for claims involving labor, equipment, or materials used on the project and be referred to the State Accounting Services Office for obtaining the necessary lien forms.

1-3.3D Claims Against Officials and Employees

The statutes provide that claims may be filed against the State of Washington, State officers and employees, for damages resulting from their conduct and prescribes the manner in which the action must be taken. Whenever this occurs, the state will furnish the legal defense and pay any judgments if the act which caused the alleged damage was within the scope of the person's duties, was in good faith, and without negligence.

1-3.4 Stewardship

Webster defines "steward" as "one who acts as a supervisor or administrator, as of finances and property, for another or others." the designated steward of all federal highway funds is the United States Department of Transportation, acting through the Federal Highway Administration. In Washington State, FHWA is represented by its Washington Division. Washington Division has delegated a portion of its stewardship responsibility (and the corresponding authority) to the Washington State Department of Transportation through the Federal-Aid Highway Program Stewardship and Oversight Agreement, signed on February 19, 2008.

This section describes further agreement between FHWA and WSDOT concerning the details of the part of the stewardship agreement that applies to construction (Section V c. Construction and Contract Administration and VII Appendix B Construction Monitoring Plan). The subject matter of this sub-agreement is monitoring of construction performed on behalf of WSDOT by independent contractors.

Scope of Construction Monitoring Plan

This plan deals specifically with federally-financed construction performed under contracts with WSDOT and administered through the WSDOT Headquarters Construction Office. It is not intended to be all-encompassing. WSDOT Ferries Division contracts for construction of vessels and facilities are not included.

Contracts for work through local agencies are not included. Federally-financed utility agreements are not included. Emergency Relief work performed by contractors and administered by WSDOT Maintenance is not included.

Project Responsibility

FHWA, Washington Division, has delegated to WSDOT (and through the WSDOT delegation of authority to the Headquarters Construction Office) stewardship responsibility and authority for all federally-funded construction except new construction and re-construction on the Interstate system and certain specially-selected areas of high interest. The special selections are made by FHWA and include significant demonstration projects, special funding agreements and projects of very high national interest.

The Construction Office has further delegated the stewardship reporting responsibility for projects with a contract value less than \$6.0 Million to the various WSDOT Regions. The delegation of stewardship authority from Headquarters to the Regions is through the *Construction Manual*.

FHWA has also delegated to WSDOT the authority to accept projects on the Interstate system that are not new construction or re-construction. This authority has been further sub-delegated to the Regions for projects with a contract value less than \$6.0 Million.

FHWA Review/Approval Actions & Related Processes

With the pre-approval of specifications and processes and the extensive delegation of stewardship authority, there are relatively few approval actions needed from FHWA during actual construction.

For new construction and re-construction on the Interstate system, FHWA has retained the oversight role of interim, or project, inspections, final inspections and acceptance, and the approval of certain high-value change orders.

The following processes will apply:

For project inspections, the WSDOT Project Engineer and the FHWA Area Engineer shall agree on the timing of such inspections. Typically, project inspections will take place quarterly, however, the Area Engineer may select other frequencies. The Project Engineer will advise the Area Engineer when agreed milestones or completion stages have been accomplished and the Area Engineer will schedule the review and prepare the report. (A similar process will be followed between the Project Engineer and the Headquarters Construction representative for delegated projects when the delegation has been retained at Headquarters. Regions will develop processes for those jobs delegated to them.)

For final inspections and acceptance, the review will be conducted in two parts. The first part will be a field review of the work and will be conducted at about the time of physical completion, when the contractor is still available to make corrections or changes identified during the review. The second part of the process will be the final acceptance review. This will be conducted after WSDOT has accepted the contract and has assembled all cost and materials documents. The second part of the review (acceptance) may be conducted with an exchange of documents and without a physical visit to the site. The Project Engineer will notify the

Area Engineer when these times have arrived and the Area Engineer will schedule the reviews and will prepare one final report summarizing both reviews. (A similar process will be followed between the Project Engineer and the Headquarters Construction representative for delegated projects when the delegation has been retained at Headquarters. Regions will develop processes for those jobs delegated to them.)

Change orders on FHWA stewardship projects (for which FHWA has not delegated stewardship responsibility to WSDOT) may be approved by WSDOT unless they alter the terms, character or scope of work of the contract or unless they have a net value of more than \$200,000.

Note: Changes that adjust quantities without changing the work may be approved by WSDOT regardless of value. FHWA approval will normally be a written formal response, but may be verbal if the public interest is served by the more timely action. In all cases, the FHWA approval of a change order shall be obtained through the Headquarters Construction Office.

The FHWA Area Engineer may also choose to accompany the WSDOT reviewer during the review of any federal-aid project. Such participation will be random and will be initiated by the Area Engineer. This participation by the FHWA will not change any delegation of oversight responsibility or authority in any way. When the Area Engineer has participated in a review, a copy of the summary report will be provided directly to the Area Engineer.

Stewardship Summary Reports

It is important to note the difference between a steward and a stewardship reviewer/reporter. Stewardship on WSDOT federal-aid projects is provided by a wide cross-section of employees who make stewardship decisions according to the requirements of the *Construction Manual* and their own delegated responsibilities and authorities. From the field inspector who observes contract work and prepares pay instructions, to the Project Engineer who reviews and approves a monthly progress payment, to the Region Construction Manager who executes a change order, to the Headquarters Construction Engineer who negotiates and approves a claim settlement, all are acting as stewards in their own job descriptions and assignments.

The stewardship reviewer/reporter, on the other hand, is acting as an overseer, observing and collecting information about all of the stewardship activities, evaluating that information, making recommendations concerning the qualification of the covered work for federal funding and preparing reports to summarize the activities. Reviewers may be FHWA Area Engineers, Headquarters Construction Engineers, Region Managers or subordinate Region specialists in documentation or contract administration. For the reports that it prepares, WSDOT may assign any person of the classification of Transportation Engineer 3 or above to this duty. The only restrictions are that the reviewer must not have been involved in the project-level administration and the report must be signed by someone with supervisory authority over the Project Engineer or management responsibility over the contract itself.

• Types of Reports

Interim Reports (also known as Project Reports) are intermediate summaries of stewardship activities on an uncompleted project. These will be performed on multi-season jobs at least annually. Interim reports may be submitted at a greater frequency or for a special purpose at any time, at the discretion of the stewardship reviewer. Interim reports may be submitted on single-season projects for special purposes, again at the discretion of the reviewer.

Abbreviated Final Inspection/Acceptance Reports are single page closeout reports for projects between \$1.00 and \$500,000 that summarize the project in more of a checklist format with opportunity for comments. It will still be necessary for the Stewardship reviewer to evaluate the project documentation and procedures, but the reporting will not be to the same level of detail as a Final Inspection and Acceptance of Federal Aid Project for a project over \$500,001. Final Inspection/Acceptance Reports are single close-out reports that summarize the results of reviews conducted in two parts at the completion of all projects. The first part is a review of the field work conducted at a time when the contractor is still available to perform additional work or corrective work. The second part is after acceptance, when the final cost figures are known and the materials certification is available. For FHWA-retained projects, the final inspection and acceptance will be conducted by the FHWA Area Engineer. For delegated projects with a greater value than \$6.0 Million, the final inspection and acceptance will be conducted by a representative of the Headquarters Construction Office. For projects further delegated to a Region, the final inspection and acceptance will be conducted by a Region representative. The final acceptance portion of the final review may be done without a site visit, working from documents and computer data only.

• Timing of Reports

At least once per year, Headquarters Construction will publish a list of all projects that have been started and not closed out for federal funding. The list will be divided to show the responsibility for stewardship reporting for each project. In the past a Final Inspection and Acceptance of federal-aid project report was required for each project financed in part or in whole with federal dollars. In an effort to expedite contract closure and move unused obligated funds back into the various highway programs sooner, stewardship reporting will take the following course:

- For projects with values between \$1 and \$500,000: 25% of the projects will be selected from each project office from each Region and an abbreviated Final Inspection and Acceptance of Federal-Aid Project will be required.
- For projects with values between \$500,001 and \$6,000,000: 50% of the projects will be selected from each project office from each Region and a Final Inspection and Acceptance for Federal-Aid Project (WSDOT Form No. 421-101 EF) will be required.

- For projects with values greater than \$6,000,000: 50% of the projects will require a Final Inspection and Acceptance of Federal-Aid Project form.

Interim reports will be performed at times that are appropriate for the nature and progress of the work and the seasonality of the project. These times will be determined through the judgment of the reviewer. The objective for all reviewers will be to prepare and submit interim reports within 30 calendar days after the field review.

For Abbreviated Final Inspection/Acceptance Reports, final inspection will be conducted around the time of physical completion, while the contractor is still mobilized and able to perform corrective or added tasks. Final acceptance review of the project will be conducted after the State Construction Engineer's final acceptance of the contract itself and after receipt of the Region's Materials Certification. The objective for all reviewers will be to prepare and submit the Abbreviated Inspection/Acceptance Report within 30 calendar days after project final acceptance. Final inspections for projects over \$500,001 will be conducted around the time of physical completion, while the contractor is still mobilized and able to perform corrective or added tasks. The Project Engineer is in the best position to identify this time and shall advise the reviewer that a final inspection is needed. Final acceptance reviews will be conducted after the State Construction Engineer's final acceptance of the contract itself and after receipt of the Region's Materials Certification. The objective for all reviewers will be to prepare and submit the final inspection/acceptance report within 60 calendar days after project final acceptance.

Copies of reports prepared by FHWA will be sent to the Headquarters Construction Office. Copies of reports prepared by any WSDOT reviewer will be collected by the Headquarters Construction Office and forwarded to FHWA.

- Content of Reports:

Stewardship reports provide a high-level overview for those who may not know the project intimately, but may need to be aware of the more significant details of the contract. Communicating those details in a concise and comprehensive manner is a critical aspect of the report. Any individual reading the report should be able to have a reasonable idea of how the project proceeded.

In addition to providing an objective view of the project, a stewardship report should clearly identify what is unique to that project and what circumstances made it unique. Most of our projects are routine and the stewardship reports will reflect that. However, when a project has conditions that are out of the ordinary, the stewardship report should explain what occurred on the project to make those conditions significant.

The ability to write a practical report in a clear and concise manner is a mark of a good engineer.

Job Description: A description of the major elements of the work. Include a narrative about the job. Include the contractor's name, the award date and the amount of the bid.

Time and Damages: On an interim report, discuss the present status of time and its relationship to the completion status. If behind, describe what is being done to catch up. Describe any suspensions or time extensions. On a final report, discuss the final time result. If overrun, discuss liquidated damages. Subjectively, comment on the amount of time set up. If working days are extended by 10% of the original contract amount, describe the cause(s) that warranted the increase.

Change Orders: Confirm that each change was approved according to the checklist before the work started. Evaluate the preparation of the change order and the justification. For all changes, include a statement of federal participation eligibility. Include more detailed discussions of major or significant changes (e.g. Scope Change, Claim Settlements, Significant Actions, and Changes over \$100,000).

Cost: List the final payment, the original amount, the net effect of change orders and the mathematical calculation of net overruns/underruns. Obtain and include a general explanation of the overs and unders.

Materials: On an interim report, review a process in progress by checking for submittals and approvals of RAMs, any drawing or catalog submittals, the testing method and frequency, adjustments to the ROM, observe field tests and include a summary report. Comment on the overall status of materials testing, documentation and adequacy. On a final report, review the Region Materials Certification, comment on any missing items and mention the resolution of the certification for participation purposes. If material deficiencies warrant withholding of Federal participation, define the deficiencies and the amount of Federal participation being withheld. Refer to the following section, "Quality Improvement and Accountability," in the Stewardship and Oversight Agreement, for a discussion on selection of processes for review.

Disputes, Claims: On an interim report, note any claims or major disputes presently underway. Note how previous issues have been resolved. On a final report, note any exceptions to the final voucher certification and describe the issue.

Traffic Control: Comment on the adequacy of the traffic control plans. Discuss the project's use of flagging, devices, pilot cars, etc. and any unusual events during the project.

Training: On an interim report, determine that a plan has been submitted and approved. Also, note the comparison between accomplished training and the completion status. Report any efforts to recover if behind. On the final report, list the amount of training originally included, any changes made to this requirement and the total amount of training accomplished.

Subcontracting: Discuss the level and nature of subcontracted work. Note any DBE requirements and any change orders modifying these requirements by deleting, adding or substituting DBE

commitments. Make reference to any Condition of Award requirements. Assure that mandatory DBE contracting did happen and that the DBEs performed a commercially useful function (review the On-Site reports). Review on-site reports for any DBE firm utilized, whether or not its utilization was mandatory.

Other: Talk to the Project Engineer. Look for special notes. If there was an experimental specification or process, discuss it. If there was an unusual event or happenstance, discuss that. Describe the overall impression of the contractual relationship. Describe any evidence of successful collaboration between the parties. Include any other information of interest.

Note: As a significant part of any review, the reviewer must visit the jobsite and confirm that a project of approximately the nature and magnitude of that shown on the plans actually does exist. This is true for all stewardship reporting.

Communication

Much of the day-to-day communication between WSDOT and FHWA is informal in nature. Verbal discussions, telephone consultations and e-mail notices (including digital photos when needed for clarity) are used extensively. Except where formal written notices are specifically required, staff from both agencies will attempt to utilize the simplest form of communication that accomplishes the needed communication in the least time. All reports and correspondence related to a project shall bear both the WSDOT contract number and the FHWA project number as identifiers.

1-4 Utility and Railroad Relocation

1-4.1 Work Performed Under Utility Agreements

Utility agreement work associated with a contract exists in two categories. The first is work done for a utility by WSDOT that is included in the contract and performed by the WSDOT contractor. The second is work done, either by the utility or the utility's contractor, that is associated with and done near the WSDOT project.

If the utility work is included in the contract, the plans will show the work and will include pay items exactly as if the work was part of the transportation improvement. The responsibility of the Project Engineer is to treat this work the same way that "normal" work is handled. There will be a necessity for communication with the utility itself, inviting comments and joint reviews and inspection of the work. In many cases, the utility will provide materials or equipment to be incorporated into the work. The utility will also provide certification that provided material meets the requirements of the contract. If problems arise and changes are considered, there are additional paperwork demands. The Project Engineer should consult with the Utility and the Region Utility Engineer.

If the work is associated with the project, or if unrelated work is being done nearby, and the utility or its contractor is performing the work, the Project Engineer should treat the neighboring work in the same manner that adjacent WSDOT work would be treated. (See *Standard Specifications*, Section 1-05.14 and Section 1-2.2H of this manual.)

1-4.2 Work Performed Under Railroad Agreements

Railroad work associated with a contract exists in three categories. The first is work done for a railroad by WSDOT that is included in the contract and performed by the WSDOT contractor. The second is work done, either by the railroad or the railroad's contractor, that is associated with and done near the WSDOT project. The third category is railroad protective services. Protective services, such as flagging, are typically provided by the railroad.

If the railroad work is included in the contract, the plans will show the work and will include pay items exactly as if the work was part of the transportation improvement. The responsibility of the Project Engineer is to treat this work the same way that "normal" work is handled. There will be a necessity for communication with the railroad itself, inviting comments and joint reviews and inspection of the work. In many cases, the railroad will provide materials or equipment to be incorporated into the work. The railroad will also provide certification that provided material meets the requirements of the contract. If problems arise and changes are considered, there are additional paperwork demands. The Project Engineer should consult with the Railroad Company and the Region Utility Engineer.

If the work is associated with the project, or if unrelated work is being done nearby, and the railroad or its contractor is performing the work, the Project Engineer should treat the neighboring work in the same manner that adjacent WSDOT work would be treated. (See *Standard Specifications*, Section 1-05.14 and Section 1-2.2H of this manual.)

Protective services may be called for when the Contractor is performing work on railroad facilities (first category above) or when the Contractor's work is conflicting or adjacent to a railroad facility that is not being changed. Typically, the railroad will determine the need for service, provide the protective services, and send the bill to WSDOT. There may be an agreement in place, or the railroad's actions may be unilateral. On all projects including railroad flagging, the Project Engineer will notify the Railroad Company when all work involving the railroad is physically complete.

The addition or revision of agreements with the railroad can be lengthy processes. The Project Engineer should stay alert for possible changes and the need for revisions to the agreement. When these arise, the Railroad Company and the Region Utility Engineer should be contacted early and often.

1-5 Surveying

1-5.1 Site Surveying

1-5.1A Permanent Monuments

Most permanent monuments which are in the construction zone are relocated by the establishing agency. Normally these monuments are relocated prior to beginning of construction, but if monuments are found within the construction zone, they must be preserved until they can be moved. If the urgency of construction does not allow time for the relocation of the monument, it must be properly referenced so it may be reset or relocated at a later time. When a monument is found within the construction area, the proper agency shall be notified promptly and requested to relocate the monument.

1-5.1B Property Corner Monuments and Markers

It is imperative that land plats and property corners be preserved. The 1973 Legislature enacted a Survey Recording Act, RCW 58.09, to provide a method for preserving evidence of land surveys by establishing standards and procedures for monuments and for recording surveys as a public record. When a general land office corner, plat survey corner, or property line corner exists in the construction zone, it is necessary to properly reference it and reset it after the construction work has been done. RCW 58.09.040 requires that, for all monuments that are set or reset, a record of the monument be filed on a Monumentation Map with the County Engineer in the county in which the corner exists and the original sent to the State Right of Way Plans Branch. Headquarters will forward a copy to DNR for their records.

1-5.1C Alignment Monumentation

During construction, alignment monumentation may be altered to fit field conditions. Such changes may include:

- Normally all PCs and PTs are to be monumented. Additional point on tangent (POT) monuments are necessary where line of sight is, or may in the future be obstructed by the horizontal or vertical alignment, buildings, or other barriers.
- When the right of way and the construction alignment do not coincide, the monumentation shall be such that the exact right of way as acquired can be positioned in the field. This will generally require, as a minimum, that the right of way alignment be monumented.
- When safety of the survey crew or survival of the monuments is an issue, monuments may be offset from the true alignment. An extra effort in accuracy must be made when setting offset monuments to ensure an accurate reestablishment of the true alignment. The monumentation, including monument locations, reference distances, stations, and bearings, is to be shown on the as built plans.

1-5.2 Construction Surveying

1-5.2A Surveying Provided by the State

Unless the contract states otherwise, the Project Engineer is responsible for providing all surveying needed to locate and define the contract work. The staking done in construction surveying must assure that the work will conform to the plans and must also conform to the Contractor's approach to the work. There are numerous survey techniques that will accomplish these objectives. Prior to each phase of the work, the Project Engineer must reach agreement with the Contractor concerning the method, location, and timing of construction staking. Once this agreement is reached, it must be shared with all WSDOT, Contractor, and subcontractor personnel who place or use construction stakes.

1-5.2B Contractor Surveying

If the contract requires the Contractor to provide some or all of the construction surveying, the Project Engineer is required to provide only the primary control points staked, marked, and verified in the field and the coordinate information for the main alignment points in the plans. The plan alignment and the field control points must be referenced to the same grid coordinate system.

The provisions for contractor surveying are intended to provide the stakes needed to inspect the work, as well as the primary function of locating and defining the work. If the survey stakes required by the contract do not provide the reference data needed for inspection, then the Project Engineer will have to provide additional survey work that is needed. As an alternative, a change could be negotiated with the Contractor to perform the added work.

The Contractor's survey work is a contract item, just like all other contract items. It must be inspected for adequacy and conformance with the contract. Once it is performed and inspected, it must be paid for.

The wise Project Engineer will inspect the survey efforts and check as much of the contractor's work as is practical. Any errors should be brought to the Contractor's attention for corrective action. The inclusion of contractor surveying in a project transfers the risk of survey errors to the Contractor. The Project Engineer must assure that the survey work of the Contracting Agency does not relieve the Contractor of that risk.

1-5.2C Grade Control

1-5.2C(1) Subgrade Tolerance

The finish required on roadway subgrades shall ensure a final grade in as close conformity to the planned grade and cross-section as is practicable, consistent with the type of material being placed. Subgrade blue tops shall be set 0.05 foot below subgrade elevation and be accurate to + or - 0.01 foot. The finished subgrade surface shall not deviate from the plan subgrade elevation by more than +0.00 to -0.05 foot. Where excessively rocky materials are being placed, deviations in excess of the above may be accepted where, in the opinion of the Engineer, closer conformance cannot be achieved by normal procedures and with a reasonable amount of effort and care on the part of the Contractor. Conformance to grade shall be checked by rod and level, straight-edging, or other appropriate engineering method as selected by the Engineer.

1-5.2C(2) Surfacing Tolerance

Red and Yellow tops for surfacing materials shall be set accurate to + or - 0.01 foot. The finish of the compacted materials shall conform to the grade established by the blue tops as closely as is practicable and in general, should not deviate from the established grade in excess of the following: ballast and base course, + or - 0.05 foot; top course for bituminous surface treatment, + or - 0.03 foot; top course for asphalt concrete, + or - 0.02 foot; surfacing under treated base course, + or - 0.03 foot; treated base under Portland cement concrete pavement, + 0.00 to - 0/02 foot.

Conformance should be checked by use of rod and levels from blue tops and/or by string-line or straight edge methods as determined appropriate by the Engineer. The above schedule refers to conformance both longitudinally and transversely to the traveled way. The outer shoulder line finished grades shall not exceed double the deviations outlined for the traveled way.

In the event that additional blue tops are not set for setting grade of surfacing courses, the grade of the surfacing shall be referenced to the earthwork subgrade blue tops and adequate controls shall be used to ensure the placement of the required thickness of surfacing and a final surface meeting the requirements outlined above.

1-6 Inspection of Course Thicknesses

Tabulated below are the permissible deviations in measured thickness for specified depths of surfacing and paving. While these are the maximum deviations that can be allowed, the Project Engineer may impose tighter requirements for conforming to the plan dimensions where there is a reason to do so.

Material	Specified Depth	Max. Allowable Deviation at Any	Average Depth Deviation for Entire
		One Point	Project
Untreated Surfacing and ATB	0 – 0.25'	-0.05'	-0.025'
	0.26 – 0.50'	-0.06'	-0.03'
	0.51 – 0.75'	-0.07'	-0.035'
	0.76 – 1.0'	-.08'	-0.04'
	Over 1.0'	-8%	-4%
Hot Mix Asphalt (HMA)			
(single-lift)	0.08 – 0.15'	-0.045'	-0.015'
(multi-lift)	0.00 – 0.25'	-0.03'	-0.01'
	0.26 – 0.50'	-0.045'	-0.015'
	0.51 – 0.75'	-0.06'	-0.02'
	Over 0.75'	-0.075'	-0.025'

For HMA overlays with a specified depth of less than 0.08 foot, it will be the responsibility of the Project Engineer to ascertain the adequacy of the overlay depth in conformance to the plan.

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2-3.5C Use of Photogrammetry Service

The photogrammetry service may be used to create a 3D Digital Terrain Model (DTM) files for use with the department's current design software in order to produce cross sections, contours, and quantity information. Photogrammetry can also provide Digital Ortho Photos as a by product instead of the DTM files. The Ortho Photo has the same accuracy characteristics as a map but without the elevation data. The type and size of the project and the amount of time that can be saved will be considerations in the selection of the method of obtaining the ground line cross-sections. The Project Engineer must also ascertain that the work schedule of the Photogrammetry Section will permit them to provide the DTM files and Digital Ortho Photos by the time they are required. If proper ground control was established on the project during the design stage, considerable savings in time may be realized by using this service.

It is recommended that the State Photogrammetry Office be contacted at the earliest possible date when it is determined that this service may be needed, since the process requires significant time and the weather and position of the sun (angle of the sun's rays) in Washington can affect Photogrammetric mapping schedules by weeks or even months.

The 3D DTM files and Ortho Photos are obtained from aerial photographs and will show the ground as it existed at the time the photographs were taken. This data is measured in the Stereo plotter and transferred to computer files. The State Photogrammetry Office will design each photo mission and mapping process to best fit the needs of the project as defined by the Project Engineer. The State Photogrammetry Office maintains an active archive of each new project's files and all DTM data produced since 1989. It is easily accessible via WSDOT LAN on a file server type computer. Contact the State Photogrammetry Office for specific information on past projects and archived data.

2-4 Haul

2-4.1 General Instructions

Haul is the transportation of excavated material. Measurement and payment for haul is made on material hauled.

The measurement of haul is expressed as a unit of one hundred cubic yards hauled 100 feet.

Haul quantities can be computed using the PC and associated programs on all earthwork projects and the limits of each segment of haul and the "Haul" units can be identified.

Haul shall be calculated and included in the section from which the material is hauled. Haul on roadway quantities, including borrow obtained by the widening of cuts and including waste deposited along roadway embankment slopes, will be computed on the basis of transporting material along the centerline or base line of the highway.

2-4.2 Vacant

2-4.3 Haul on Borrow or Waste

Quantities of material hauled from a borrow site to the roadway or from the roadway to a waste site are computed normal to the long axis of the borrow or waste site. When computing the amount of haul, determination of the direction of movement of the mass and the distance it is transported requires good, practical judgment by the Engineer. The size and shape of a borrow pit and egress from the pit to the highway improvement must be considered in the proper determination of the amount of haul. The same conditions are true in the case of waste sites. Instructions herein for computing haul from borrow pits shall be applicable to computing haul to waste sites.

The long axis of the borrow pit should be used for the base line of the cross-section which, theoretically, would pass through the centers of gravity of the sections; however, the base line may approximate the centers of gravity of the sections. Borrow pits which are provided by widening of the roadway cuts would be an exception to this since the *Standard Specifications* define them as "Roadway Excavation" and not "Borrow."

The measurement of the distance from the pit to the center line of the roadway should originate at the center of mass as measured in the pit and be computed via the most direct and feasible route to the nearest practical point on the center line of the roadway.

The route of haul will be indicated on the plans, and, where possible, will be via existing roads. If no road exists, provision will be made in the plans for constructing a haul road and for rights therefor.

If the Contractor chooses to haul over a route shorter than the computed or designated route, payment for haul will be based on the length of the actual haul route. If the Contractor chooses to haul over a longer route than the computed or designated route, payment for haul will be based on the length of the computed or designated route.

2-5 Slope Treatment

2-5.1 General Instructions

Earth cuts, soft or decomposed rock cuts, and overburden in all rock cuts shall have the tops of the slope rounded in accordance with *Standard Plan* H-8 to produce an aesthetic and pleasing appearance. The slope treatment shall be constructed at the time of excavation so the material resulting from the rounding of the slopes may be disposed of along with the excavation from the cut.

The Project Engineer should go over the slope treatment procedure with the Contractor at the beginning of the excavation operation to ascertain that proper rounding is being constructed and reduce extensive reworking.

2-5.2 Measurement and Payment

Slope treatment shall be measured and paid for in accordance with Section 2-03.3(5) of the *Standard Specifications*.

2-6 Subgrade Preparation

2-6.1 General Instructions

The subgrade shall be constructed in accordance with the lines, grades, and typical sections shown on the plans or as established by the Engineer and the *Standard Specifications*.

The subgrade should be uniformly compacted to the density specified rather than to have some areas just meeting the requirements while other areas are considerably above the minimum requirements. The subgrade shall meet the tolerance in Chapter 1-6 of this manual. On some separate grading projects where the surfacing Contractor will be required or elects to trim the subgrade with an automatically controlled mechanical trimmer, the tolerances for the subgrade must be changed to provide material for the subgrade trimmer to trim, but the trimmed subgrade must meet the tolerance stated above.

After the subgrade is prepared, the Contractor shall maintain it in the finished condition until the next course of work is preformed.

2-6.2 Measurement and Payment

The quantities of work involved in constructing and maintaining the subgrade shall be measured and paid for in accordance with the provisions of Section 2-06.5 of the *Standard Specifications*.

2-7 Watering

2-7.1 General Instructions

Water shall be applied as ordered by the Engineer, in accordance with the specifications, uniformly to the material so that all of the material will have approximately the same moisture content. It is more economical and effective to apply water at night or in the early morning hours when loss from evaporation is lower. In many instances, this is the only time that it is possible to increase the moisture content to that required.

The Inspector should be alert to see that the subgrade is not damaged from too much water being applied or that more water is being applied than is necessary. Usually light applications applied more frequently are more advantageous than heavy applications. The water should not be applied on surfacing materials with such force that it will wash the fine particles off the coarser ones causing segregation.

If water is a pay item, the Project Engineer shall verify the size of the water truck by measuring or weighing and if gauges are used, he should also verify the accuracy of the gauge. A record of measurements or weights, and calculations must be made for future references.

A Daily Delivery Record, Form 422-024, showing the time of each load and where it was placed should be maintained on the project. The Inspector will issue a ticket for the amount of water used.

2-7.2 Measurement and Payment

Water shall be measured and paid for in accordance with the provisions of Sections 2-07.4 and 2-07.5 of the *Standard Specifications*.

2-8 Vacant

2-9 Structure Excavation

2-9.1 General Instructions

Before starting structure excavation, stakes should be set to locate the structure and cross-sections should be taken to determine the quantities of material involved.

During the progress of excavation, the character of material being removed and exposed should be examined to determine if it is suitable for use as backfill and to ensure that acceptable foundation conditions exist. This should be done especially on streams subject to high velocity flood water and which carry drift. Open pit excavation or "glory holes" are not allowed without permission. This specification is of special importance in application to the construction of foundations in or adjacent to running streams, where the approval of the State Construction Office should be secured.

Material obtained from structure excavation may be used for backfilling over and around the structures, for building embankments, or it may be wasted. When this material is stockpiled for backfilling, the Contractor is required to protect it from contamination and the elements. If not properly protected, the Contractor must replace the lost material with acceptable backfill material at no expense to WSDOT. The backfilling of openings made for structures must be made with acceptable material from the excavation, other acceptable backfill materials indicated in the plans and special provisions, or as specified in Section 2-09.3(1)E of the *Standard Specifications*.

When specified in the Contract or approved by the Engineer, acceptable material may include Controlled Density Fill (CDF) – also known as Controlled Low-Strength Material (CLSM).

Before the CDF is placed, the Contractor is required to develop a mix design in accordance with Standard Specification Section 2-09.3(1)E and to submit the CDF mix design in writing to the Project Engineer on WSDOT Form 350-040. Section 2-09.3(1)E requires the Contractor to utilize ACI 229 and testing methods ASTM D 4832, ASTM D 6023 and WSDOT FOP for AASHTO T 119 in developing the CDF mix design. The ASTM and AASHTO tests required in Section 2-09.3(1)E are for use by the Contractor in developing the CDF mix design, and with the exception of providing the 28 day compressive strength test results on WSDOT Form 350-040, the test results are not required as part of the CDF mix design submittal. The Project Engineer must review the mix design before placement of the CDF will be allowed.

The Inspector should verify and document that each truckload of CDF is accompanied by the producer supplied Certificate of Compliance, meeting the requirements of Standard Specification Section 6-02.3(5)B. The Inspector

should also verify that the components, as listed on the Certificate of Compliance, conform to the mix design per Standard Specification 6-02.3(5)C. Acceptance of the CDF will be based upon an acceptable Certificate of Compliance. In accordance with Standard Specification Section 1-05.2, the Inspector may reject any load of CDF that does not conform to the mix design.

When water is encountered in the excavation area, it must be removed before backfilling. Cost for accomplishing this is considered incidental and is done at the Contractor's expense unless otherwise provided for in the contract.

All excavation 4 feet or more in depth shall be shored, or protected by cofferdams or shall meet the open-pit requirements of Section 2-09.3(3)B of the *Standard Specifications*. The Contractor must submit his shoring plans in accordance with Section 2-09.3(3)D of the *Standard Specifications*. The shoring design shall be in compliance with the WSDOT Geotechnical *Design Manual* (M46-03), and be designed for site specific conditions, which must be shown and described in the working drawings. These drawings must be approved before construction begins. WSDOT's approval, however, does not relieve the Contractor of responsibility of satisfactory results.

The contractor shall submit working drawings and calculations for open-pit excavation, showing the geometry and construction sequencing of the proposed excavation slopes in accordance with Section 2-09.3(3)B of the *Standard Specifications*. The excavation stability design shall be conducted in accordance with the WSDOT *Geotechnical Design Manual* (M46-03) and must be designed for site specific conditions, which must be shown and described in the working drawings. These drawings must be approved before construction begins.

The Contractor shall submit detailed plans of cofferdams for approval as required in the *Standard Specifications*, Section 2-09.3(3)D when their use is required. This requirement shall be strictly followed. When a cofferdam is required on a railroad right of way, excavation must not be commenced before the plans have been approved by the railroad company. The Contractor should be notified of this requirement well in advance of starting such work, as it usually takes several weeks to get plans approved by the railroads. See Chapter 6-1.5 of this manual for the number of copies to submit and distribution of approved plans.

Cofferdams, in general, must be removed to the bed of the stream, or to below the low water mark. In some cases, it may be advisable to leave the cofferdam in place. The Cofferdam is, however, the property of the Contractor.

Sheet piling, designed in accordance with the USS Steel *Sheet Piling Design Manuals*, may be used for shoring walls that do not support other structures and that are 15 feet in height or less. When sheet piles are used for cofferdams, the Project Engineer shall see that the sheets are held tightly together during driving and placing, so that no cracks or holes are left, through which water can flow. If timbers are used in the cofferdam, the use of wood preservatives needs to be monitored to be sure that all environmental constraints are met. Cofferdams should be built slightly larger than the neat size shown on the plans. This is to allow for inaccuracy of driving sheet piles.

Where bearing piles are to be driven, the excavation should be carried deeper to allow for upheaval of soil due to pile driving. This extra depth will depend on the character of the material. Usually in sand and gravel from 6 inches to 1 foot and in a river or tide mud from 1 foot to 1.5 feet is sufficient. Such over-excavation is the Contractor's responsibility. Over-excavation shall be backfilled with gravel backfill to the footing elevation if the upheaval is less than anticipated.

In soft mud, when the driving of piles tends to liquefy the foundation material, it is sometimes necessary to excavate below plan grade and backfill with gravel before concrete is placed. When the Engineer considers this to be necessary and approval of the State Construction Office has been secured, the additional excavation shall be paid for at the unit contract price for structure excavation and the gravel backfill shall be paid for on force account basis or at an agreed price.

Excavations shall be carried to the elevation shown on the plans or as established by the Engineer. The Project Engineer should take into consideration the fact that when a clamshell bucket is used, it is very difficult to clean the hole to an exact given elevation. For direct-bearing footings, the corners and sides of the excavation should be cleaned out as well as possible and there should not be an excess of loose material left in the bottom. If the character of the material found at plan elevation is questionable, consult the Regional Materials Engineer.

When the excavation for the footing has been completed, elevations to establish the footing elevation shall be taken in the corners of any footing and recorded in the project records.

The material on which spread footings are to be constructed must be adequate to support the design soil pressure per square foot (meter) shown in the plans. The Regional Materials Engineer should be consulted to review the foundation conditions if the bottom of the footing is materially different than what is identified in the contract plans. If a change of design or the lowering of a footing appears to be advisable, the State Construction Office must be advised.

Occasionally, foundations adjacent to large piers are founded at a higher elevation than the large pier foundation. In these cases, the Contractor must carry on operations so that the foundation at the higher elevation will not be disturbed when excavation is made for the lower pier.

Backfilling holes made for piers and column bents up to the surface of the surrounding ground may be done at any time after the forms are removed, providing the backfilling is brought up evenly on all sides of the pier or column.

Backfilling around piers and bents in streams shall be done carefully with material suitable to resist scour, and be brought up to a height not less than the original bed of the stream. Embankment backfill against abutments, piers, walls, culverts, or other structures shall not be placed until the concrete has attained 90 percent of its design strength and has cured for at least 14 days or as otherwise specified in the contract.

It is very important that drainage be provided in back of retaining walls, tunnels, and structures having wing walls or abutments to eliminate excessive soil pressure. Weep holes shall be placed as shown on the plans and as low as possible. Gravel backfill for walls or other suitable materials shall be placed directly behind the structure. If drainage is a major problem, it may be necessary to also construct perforated drain pipe or French drains behind the structure.

The construction of embankments and backfill around bridge ends shall be in accordance with Section 2-03.3(14)I of the *Standard Specifications*. The fill around bridge ends shall be brought up equally on all sides of the bracing, columns, and bulkheads to avoid distortion and displacement of these members.

In addition, Section 2-03.3(14)I of the *Standard Specifications* requires that the superstructure be in place before the backfill behind an abutment can be placed. It further states that this requirement can be waived by the Engineer provided the Contractor submits abutment stability calculations to back up their proposal. When designing the bridge, the designers check the abutment stability using the final condition which includes the dead load of the superstructure. This superstructure dead load increases the resistance to sliding and reduces the overturning moment of the abutment. Since placement of the backfill prior to placement of the superstructure is a condition not analyzed by our designers, we require that stability calculations be submitted for each bridge by the Contractor to reflect this unchecked condition. These stability calculations need to include a surcharge load of at least 2 feet to account for the live loading due to the backfill equipment weight.

Around structures and bridge ends, where rollers cannot operate, compaction shall be obtained by the use of mechanical tampers. Density tests shall be taken frequently enough to ensure that compaction is continued on each lift until the specified density is attained.

Structure excavation is classified into two classes. The excavation necessary for the construction of bridge footings, pile caps, seals, wing walls, and retaining walls is classified as Structure Excavation Class A. All other Structure Excavation is classified as Structure Excavation Class B. See Sections 2-09.3(2), 2-09.3(3), and 2-09.3(4) of the *Standard Specifications*.

2-9.2 Measurement and Payment

Structure excavation shall be measured and paid for in accordance with the provisions of Sections 2-09.4 and 2-09.5 of the *Standard Specifications*.

2-10 Ditch and Channel Excavation

2-10.1 General Instructions

Areas where open ditches are to be constructed shall be cleared and grubbed the same as areas for roadway excavation.

The excavated material may be used for the construction of dikes, berms, or otherwise disposed of as shown on the plans or as directed by the Engineer. The materials should not be placed in embankments unless it is suitable for embankment construction.

2-10.2 Measurement and Payment

Ditch and channel excavation shall be measured and paid for in accordance with the provisions of Sections 2-10.4 and 2-10.5 of the *Standard Specifications*.

2-11 Trimming and Cleanup

2-11.1 General Instructions

This work shall consist of dressing and trimming the entire roadway or roadways improved under the contract. The shoulders, ditches, and back slopes shall be trimmed to the specified cross-section to produce a neat and pleasing appearance. All channels, ditches, and gutters shall be opened up and cleaned to ensure designed drainage. This includes existing drainage within the project limits specified in the contract.

2-11.2 Measurement and Payment

Trimming and cleanup will be measured and paid for in accordance with the provisions of Sections 2-11.4 and 2-11.5 of the *Standard Specifications*.

2-12 Construction Geotextile

2-12.1 General Instructions

Construction geotextile fabric needs to be fully covered at all times until placement. It should be stored in a protected area off the ground and away from items that can cause damage such as sunlight, heat, precipitation, chemicals flames including welding sparks and any other environmental condition that may damage the physical properties of the fabric.

The area to be covered should be graded to a smooth, uniform condition free from ruts, holes, and protruding objects such as rocks and sticks. The fabric needs to be placed immediately ahead of the covering operation with as few wrinkles as possible. The material should not be dragged through the mud nor over sharp or protruding objects which could damage the material.

The cover material is to be placed in front of the placing equipment. This equipment should be sized to minimize the rutting that may occur during the placement. Turning of vehicles on the first lift of material may cause damage to the fabric and should not be allowed.

Sewing of seams is described in Section 2-12.3 of the *Standard Specifications*

Fabric damaged during placement needs to be repaired as soon as possible. The backfill material needs to be removed and the fabric repaired either as recommended by the manufacture or as listed in the contract. Visible evidence of damaged material may include subgrade pumping, intrusion of subgrade, or roadbed distortion.

2-12.2 Placement

Section 2-12.3 of the *Standard Specifications* lists the required placing and lapping requirements for each type of use of construction geotextile. Following is a short explanation for the placement types.

1. **Underground Drainage** — The fabric is used as a wrap around the drain rock and the pipe to not only separate the backfill material from the drainage material but also to act as a filter of fine sands and silts. This prevents the fines from flowing into the drain rock and clogging the drainage system.
2. **Separation** — The fabric is placed directly on a subgrade that contains a large amount of fine sand and silts. Normally the subgrade can be constructed during fair weather, however, almost any amount of moisture can make working on the grade impossible.
3. **Soil Stabilization** — Soft subgrade that cannot support the weight of equipment constructing the roadbed, is usually removed, a fabric placed and covered with backfill. This allows a stable enough surface to continue construction. Here the fabric not only separates the two materials but also adds strength to the roadbed.
4. **Permanent Erosion Control and Ditch Lining** — The fabric is utilized to reduce or minimize the ground surface's exposure to erosion. The material is placed directly on the surface to be protected and then backfill is placed over the fabric. Rock surfacing should not be placed in a lined ditch under the fabric as this would allow the water to erode the ground under the fabric thus eliminating its effectiveness.
5. **Temporary Silt Fences** — As the title states, the fabric is used to trap silt and other fine particles from continuing from the project site to open water.

2-12.3 Measurement and Payment

Construction geotextile will be measured and paid for in accordance with the provisions of Sections 2-12.4 and 2-12.5 of the *Standard Specifications*.

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5-5 Cement Concrete Pavement

5-5.1 General Instructions

Concrete paving is a highly complex, mechanized operation and proper organization and planning of the work is essential on the part of both Contractors and WSDOT. Cement concrete pavement has a relatively high initial cost and WSDOT expects many years of satisfactory service from this type of pavement. It is imperative that the Project Engineer and Inspectors are thoroughly familiar with the specifications and techniques applying to the work, if this objective is to be attained.

Before construction begins, the Project Engineer should review all phases of the work, and see that all members of the crew are familiar with the duties to which they are to be assigned. Advance planning and organization of the engineering and inspection teams will do much to eliminate the confusion and improper construction sometimes found during the first day's work. All inspection equipment and testing tools should be on hand in advance of beginning of paving, and WSDOT materials testers properly qualified to perform the necessary concrete testing.

The Project Engineer should make certain that all Inspectors are instructed in the proper methods of keeping notes, records and diaries. Accurate records of construction progress and test results are absolutely essential in evaluating pavement performance through the years.

5-5.2 Pre-Pave

5-5.2A Subgrade Preparation

The subgrade should be shaped and thoroughly compacted. Special attention should be directed to see that all parts of the subgrade are firm and unyielding. Soft spots should be removed and backfilled with suitable material. *Standard Specifications*, Section 5-05.3(6) requires that the subgrade be prepared and compacted a minimum of 3 feet beyond each edge of the area to receive the concrete pavement in order to accommodate the width of the slip form paving equipment. The 3 foot extensions on each side of the subgrade are tracklines that the slip form paving machines tracks will follow, and the smoothness of the tracklines directly affects the smoothness of the concrete pavement.

The subgrade must be trimmed to the proper subgrade elevation and shape. After trimming, the subgrade shall be thoroughly wetted and compacted to achieve a dense unyielding surface. The subgrade must be kept in this condition until the concrete is placed.

The elevation of the subgrade should be checked either by stretching a stringline between the control wires and measuring down to the surface or by another method that provides for a satisfactory check. Extra checks should be made through crown and super transitions to be sure proper adjustments were made in the machine through this area and that no high spots exist.

5-5.2B Controls

If control stakes have not been set for previous operations, they need to be installed at this time. If the control stakes have previously been set, the installation of the wire shall be checked to verify that it is set to the proper line and grade. This is especially important if the wire is offset from its original position.

5-5.2C Equipment

Before paving operations begin, the Inspector should check to see that all the required paving equipment is on the project; the equipment meets the requirements of the specifications, is in good working order, and is properly adjusted.

Inspection of Mixer

The following instructions apply primarily to portable mixing plants set up specifically for the project. Refer to Chapter 6-2.2 for inspection of permanent ready mix plants.

An inspection should be made of the mixing drum, to see that the mixing blades are not excessively worn. A worn blade will show wear at the center of the blade, while the ends receive very little wear. Since new mixing blades are generally straight, the amount of wear can be determined by use of a stringline or straightedge. Blades worn more than $\frac{3}{4}$ inch must be removed and new ones installed. Make sure the interior of the drum and the blades are clean, and that accumulations of hardened mortar are all removed.

The batch counter, or timer, should be checked to see that a batch receives the full specified period of mixing before the first part of the batch emerges from the discharge gate.

The water meter should be checked for calibration to ensure that the indicated quantity of water is delivered into the mixing drum. By diverting the discharge water into a suitable container and weighing the quantity delivered, the accuracy of the meter can be checked. This check of the calibration should be made at a minimum of three different settings of the meter control, covering a somewhat wider range than that expected to be used on the job. If the quantity of water delivered does not check with the setting on the gauge, a curve should be plotted, showing actual quantity delivered for a given gauge setting.

The Inspector should check to see that no water valves or lines are leaking, resulting in loss of control of water content of the mix and should make sure that no other means are available for the mixer operator to add unauthorized water.

A careful inspection of the mixer prior to beginning of work will pay dividends in better control of the mix once the job is underway.

Inspection of Batch Trucks

Nonagitating trucks are permitted to haul plant mixed concrete provided the concrete is delivered and discharged within 45 minutes after the introduction of mixing water to cement and aggregates, and the concrete is in a workable condition when placed. The trucks shall be inspected for tightness and ability to dump or empty. If square cornered truck beds are used, corners should be baffled to prevent bridging and hanging-up of concrete.

Inspection of Paver

The slip form paving equipment must be self-propelled and capable of placing, spreading, consolidating, screeding, and finishing the freshly placed concrete to the proper pavement elevation and cross-section within the specified tolerances. Sliding forms on the paver must be rigid to prevent spreading of the forms. The paving equipment must finish the surface in a manner which will minimize hand finishing.

Slip form pavers contain various combinations of all or some of the following components: auger spreader, spud vibrators, oscillating screeds, tamping bars, and pan floats. The equipment should be checked for calibration and satisfactory operation in accordance with the manufacturer's manual before paving is allowed to proceed.

Critical features include, checking all screeds with a stringline to ensure a true plane or crown, checking the height of the finished pavement elevation, checking vibrating frequency of the vibrators and screeds, checking the feelers or sensors for sensitivity, and the related stringline for tightness to ensure adequate control of line and grade. The paver should be checked to see that it can accomplish the desired crown break section and any transition adjustments required from this section to a one plane section.

If it is necessary to stop the forward movement of the paver, the vibratory and tamping elements should also be immediately stopped. No tractive force should be applied to the machine except that which is controlled from the machine.

Inspection of Miscellaneous Tools and Equipment

The power saws shall be checked to see that they are in proper running order and adjustment to the crown of the roadway and the required depth. Extra blades shall be on hand and sufficient lighting to operate at night.

The curing compound applicator shall be checked to see that it is capable of applying the curing compound as specified at a uniform rate.

5-5.3 Paving

5-5.3A Preparation

Ahead of the paving operation, the subgrade must be properly prepared with some type of "fixed" control template to accommodate the width of the paver. The subgrade must be properly dampened so as to have no water demand from the mix, but, also, the concrete must not be placed on subgrade on which pools of water have formed. If concrete is delivered by trucks on the grade, subgrade disturbance should be kept at a minimum.

A very important factor in obtaining a superior product with slip form paving is uniformity of operation. The Engineer should ensure that the plant, mixing facilities and hauling units are in quality and quantity balance to supply the paver with an adequate quantity of concrete for continuous operation at the recommended speed, without sacrificing uniform slump. Considerable pavement roughness can be attributed to spasmodic operation, and this should be held to a minimum.

It is very important that uniform consistency of the concrete be maintained with the water/cementitious ratio not exceeding 0.44 and the edge slump not exceeding 1/4-inch. The *Standard Specifications* requirements for the water/cementitious ration is in Section 5-05.3(2) and the edge slump requirement is in Section 5-05.3(11). The current requirements for water/cement ratio and edge slump are intended to control consistency.

5-5.3B Placing

As paving progresses, the Inspector should be alert to the wire position just ahead of the machine, since the most precisely set control can be disturbed by workers or equipment hitting it. If you notice anyone or anything bumping, touching, leaning on or otherwise in contact with the control wire, notify the Contractor immediately. It is much easier to correct a misaligned control wire than repair the pavement after it has been placed.

The unconsolidated concrete in front of the paver should be kept well distributed by spreading or by dumping. As the truck or mixer discharges the mix onto the grade in front of the paver, the forces delivered to the machine should be held to a minimum, with all systems functioning as designed. If the paver is not moving, the vibration should be off. When vibration is in progress, it is important that the concrete becomes uniformly plastic for the full slab width as it passes through the vibration area. A lack of consolidation at one position on the machine could cause a potential fracture line parallel to the direction of movement and also a rough and uneven finished surface. The head of material in front of the paving machine should always be in accordance with the manufacturer's recommendation.

It is possible that experimentation may be necessary at the beginning of paving. To start, no trailing forms should be used on the machine and all finishing equipment should be engaged. This could then be modified if problems occur. One of the prime contributors to edge slump is high slump concrete. This should not be tolerated. Another is tie bar insertion for abutting lanes, which should be installed ahead of the final finishing.

Edge slump of the unsupported sides behind the paver is one of the major problems to be combated on slip form paving. The surface should be immediately straight edged by the Contractor and methods corrected to deliver a consistently true edge. Trailing forms can be used to give support beyond the length of the paver, but this may not be the answer. It is possible that more damage than good is done by trailing forms in some cases, by drag resistance pulling down the edge, or by mechanical vibration transmitted through the paver linkage to the form. This comment is also applicable to a trailing finisher. Remember that the concrete is between the moving forms only a few minutes and does not take its initial set until long after the forms leave it.

If water is added to the surface from a spray bar at the rear of the machine it should be in the form of a fine fog spray to avoid washing of the surface and extreme care must be exercised to see that the amount of water added is held to a bare minimum. Addition of excessive amounts of water

during finishing will weaken the surface of the concrete and may result in hair checking or scaling of the pavement surface at an early date. If a considerable amount of water is continually required to finish the concrete, it may be better to add more water to the concrete mix to reduce the need for spraying water on the surface. Rain on a green unformed slab can cause disastrous edge slump and erosion. The Contractor should be encouraged to halt operations previous to this circumstance, and should be prepared to protect the pavement at all times.

Although the paver template was established true “dry”, soon after paving starts, and periodically thereafter, the slab template should be checked by stretching a line over the wires (transverse) and measuring down to see that the machine has not changed due to the concrete support. This check should also be made through curves and transitions to ensure that the proper section adjustments are being made.

The slip form paver behaves similarly to an asphalt paver with the front probe approximately $\frac{3}{16}$ -inch higher than the rear. This will probably vary with the machine, due to mass distribution, etc.

Slope of less than this produces an unstable characteristic and an undulating profile, slopes in excess of the correct one cause the machine to repeatedly build up and then slump down. If the symptoms occur, this is one place to check. The machine also has about $\frac{3}{4}$ -inch convergence in the sides, to encourage stability. Hand finishing, water adding, and other surface manipulation should be kept at a minimum.

5-5.3C Installing Tie/Dowel Bars

Tie/dowel bars must be installed where specified in the *Standard Plans (See Standard Plan Series A-40 and A-60)*. Tie bars must be placed so that equal lengths of the bars project into the two lanes of adjoining pavement. When paving two or more lanes at a time, the tie bars are placed at the juncture of the lanes by mechanical means. The Inspector must be alert to see that the bars are set at the proper spacing and depth and are properly centered between the two lanes.

When placing tie/dowel bars in the edge of a slab, the ends of the bars projecting from the forms should be protected against disturbance that might destroy the bond between the concrete and steel. The bars already in place shall be bent to lie close to the slab to permit preparation of the subgrade of the adjoining lane, and carefully straightened to their proper position before placement of concrete.

5-5.3D Finishing

After the concrete has been given the preliminary finish by the paving machine, minimal hand finishing may be required before the Contractor checks the surface with a straightedge device not less than 10 feet in length. High and low areas indicated by the straightedge shall be corrected. The requirements of checking the surface with the straightedge may be waived if it is demonstrated that other means will consistently produce a surface that meets the requirements for surface smoothness.

The pavement shall be given a final finish by texturing with a comb perpendicular to the center line of the pavement. The comb shall produce striations approximately $\frac{1}{8}$ -inch to $\frac{3}{16}$ -inch in depth in the fresh concrete with random spacing of the striations from $\frac{1}{2}$ -inch to $1\frac{1}{4}$ -inch. It is important that the comb be used when the concrete is at the proper consistency. If the concrete is too soft, it will not retain the proper texture obtained by the comb, and if the concrete is too hard, the proper texture will not be achieved. The comb should be set up and ready to use well in advance of the time it will be required.

5-5.3E Curing

Immediately following final finishing of the concrete, or after free water leaves the surfaces, the curing compound should be applied. The purpose of curing, whatever method is used, is to prevent the loss of moisture required to hydrate the cement so that the concrete will gain its proper strength and durability. It is essential that a complete coverage of curing compound be applied to seal the exposed surface of the pavement.

On most paving work, specifications will call for machine application of the curing compound. It should be seen that the spray nozzle is adequately protected from the wind by shielding so that the compound is not blown off the pavement surface. The Inspector shall check to see that the specified rate of coverage is obtained.

The efficiency of the curing compound in preventing escape of moisture from the concrete is dependent upon the thickness of the membrane. For this reason, it is essential that the compound be evenly applied over the exposed surface at a rate of 1 gallon to not more than 150 square feet. Refer to *Standard Specification, Section 5-05.3(13)* for additional requirements for curing.

The curing membrane must be protected from damage by foot traffic or equipment. There is a certain amount of foot traffic required in sawing joints, operating the profiler and other operations. This traffic should be held to a minimum, and if damage from undue scuffing or other causes does occur, the area shall be re-sprayed with the required amount of curing compound. Care must be exercised so that curing compound is not sprayed into saw cuts, as the joint sealing compound will not adhere to the concrete in the joints if the curing compound is present.

When pavement is being constructed in early spring or late fall, the Engineer must be alert to predictions of freezing weather, and see that the Contractor is prepared to protect the fresh concrete from freezing, as required in Section 5-05.3(14) of the *Standard Specifications*.

When special protection against freezing is required, the protective earth or straw covering must be placed against the sides of steel forms, if used, as well as on the surface of the pavement, since steel offers poor insulation to the change in temperature.

5-5.3F Joints

Contraction Joints

As concrete cures and hardens, a change in volume occurs due to loss of moisture and cooling. This shrinkage results in tensile stresses being set up in the pavement, causing cracks to develop. History has shown that transverse cracks will develop at about 15 foot intervals along the length of a slab, and that a slab wider than 15 feet may crack longitudinally. The spacing for transverse contraction joints is a maximum of 15 feet; see *Standard Plan A-40.10-00* for more information on spacing of transverse joints.

The purpose of contraction joints is to control the cracking of the concrete, thereby preventing ragged random cracks that spall and require expensive maintenance. Good construction of these joints is of the utmost importance, and inspection of this work is one of the most important phases of the Engineer's duties.

Contraction joints are weakened planes that collect the cracking into a controlled joint. These joints are made by sawing and pouring a hot or cold filler into the joint. The purpose is to create a maintainable joint in the slab and cause the crack to form along the plane of the joint.

This type of joint is constructed by sawing a groove in the hardened concrete to create a plane of weakness along which the crack will form. The saw cuts are made with the circular saw blades edged with diamonds. On full width construction, a gang sawing machine using several blades simultaneously is generally used to saw the transverse joints. When the gang sawing machine is used, the Inspector must see that the individual blades are properly aligned and set to cut the required depth.

It is necessary to control the time of sawing transverse joints very carefully, so that sawing may be done when concrete has hardened as much as possible without delaying so long as to allow development of random cracks. It is impossible to state a sawing schedule that will be ideal for every job, since curing conditions vary a great deal from job to job. Some generalizations can be made concerning sawing, but the Contractor on each job must determine from experience the most suitable schedule for that job.

It is desirable to delay sawing as long as possible to allow the concrete to gain enough strength to resist raveling adjacent to the saw cut. Sawing green concrete produces excessive wear on the saw blades, and causes washing, raveling, and other structural damages to the concrete near the joint. However, it may be necessary to make some early cuts to control cracking.

In general, a program of sawing control joints should be followed, sawing every fifth joint, not to exceed 64 feet, as soon as the concrete hardens sufficiently to resist excessive raveling. The beginning of sawing may vary depending on the type of base, concrete mix characteristics and weather. Sawing of the intermediate joints should follow the sawing of the control joints. It will usually be found possible to delay sawing of the final joints until the day following placement of the concrete (see *Standard Plan A-40.10-00* for more information).

By observing the frequency of cracking and opening of joints the next day, it will be possible to lay out a sawing schedule that will give best results. If only the control joints are cracked, the sawing of the intermediate joints can be delayed further, given fairly constant weather conditions.

The Contractor should mark off the locations of the transverse joints and the inspector should check the spacing and frequently check to see that the specified depth of cut is sawed. The locations of the dowel bar baskets need to be marked on the grade prior to the dowel bar baskets being covered by the concrete pavement in order to correctly locate the transverse joint saw cut in the middle of the dowel bars. Since much of the sawing will be done at night, the Inspector should be equipped with a good flashlight to properly examine the condition of saw cuts and to watch for random cracks.

When paving a lane adjacent to a previously paved slab, an early morning examination of joints in the existing lane will show the joints that are open and working. These locations should be marked for sawing control joints in the second lane. Friction at the construction joint and the tie bars will transmit stresses to the new slab and may cause random cracking to occur. For the same reason, uncontrolled cracks in the first lane should be matched with a control joint in the second. In addition, when cement concrete pavement is placed adjacent to existing cement concrete pavement, the vertical face of all existing working joints shall be covered with a bond breaker, such as polyethylene film, roofing paper or other material as approved by the Engineer to prevent uncontrolled migration of the crack into the adjacent slab (See *Standard Specifications, Section 5-05.3(8)A* for more information). If the Contractor proposes to use material other than polyethylene film or roofing paper as a bond breaker, the Project Engineer shall consult with the State Construction Office on the suitability of the proposed bond breaking material.

Construction Joints

A construction joint shall be made at the end of each day's paving by placing a header board transversely across the pavement. Uncapped dowel bars should be installed in the joint, seeing that the dowels are parallel with the centerline and profile of the pavement. The ends of the dowels projecting from the header should be protected so that they will not be disturbed or moved from their correct positions.

Prior to beginning paving the following day, any broken curing seal on the end of the previous day's work must be re-sprayed with curing compound, and exposed dowel bars shall be coated with a parting compound, such as curing compound or grease to allow for future slab movement.

5-5.3G Smoothness

In general, the paving contractor is responsible only for the pavement placed by them. This includes the smoothness of the pavement on both sides of any and all joints constructed. On the other hand, the Contractor would not be responsible for pavement placed by another contractor or if the work abuts a bridge or approach slab constructed on a separate contract. When leaving or approaching such joints, the center of the profiler will be started or stopped on the pavement to

be profiled at a point approximately 15 feet from the joint. The remaining areas that are unprofiled would be checked for smoothness with the 10 foot straightedge in accordance with current practices used on bridge decks.

Since the primary goal is to obtain a smooth pavement, it would be advisable to run the profiler over the joints at the beginning and end of the project, as well as any intermediate joints as described above, and exclude these readings from the profile index. Should these areas meet straightedge tolerances, but not that for the profiler, consideration should be given to grinding which would be performed at WSDOT's expense.

Section 5-05.3(12) of the *Standard Specifications* requires that the pavement smoothness be checked with equipment furnished and operated by the contractor, in the presence of the Engineer, within 48 hours following placement of the concrete to determine whether the equipment and methods used by the contractor are producing a pavement meeting the smoothness required by the specifications. A computerized recording profiler meeting the requirements of Section 5-05.3(3)E of the *Standard Specifications*, is required to be used. For the purposes of determining the "daily profile index", two or more profiles may be averaged together (see example in WSDOT Test Method 807). The "daily profile index" may also be used to identify those areas having high points in excess of 0.3 inches which must be reduced by abrasive means until reruns of the profiler indicate the area does not exceed the allowable deviation. The longitudinal "profile index" of the pavement is based on the elevation of any point on the pavement relative to the elevation of points 12.5 feet ahead of and behind the point. This is measured by a 12 wheeled vehicle having a 25 foot wheelbase and a reference wheel, free to move in a vertical direction, suspended midway between the outer wheels. The vehicle is calibrated to record longitudinal travel and vertical variations in elevation on a continuous strip chart as it traverses a section of pavement. The "profile index", which is determined from the recorded chart of each 0.1 mile section, is defined as the cumulative total of recorded elevation extremes above or below a standard variation of ± 0.1 inch.

For example, if the chart for a 0.1 mile section showed all elevation extremes to be within the $+0.1$ inch standard, except for 2 points which measured $+0.2$ inch and $+0.3$ inch respectively, the "profile index" would be 0.3 inch per 0.1 mile, or 3 inches per mile.

The "daily profile index" may be used for acceptance purposes should the various individual indexes used to determine the "daily profile index" not exceed 0.7 inches per any 0.1 mile section or 7 inches per mile.

Grinding depths should be limited to $\frac{3}{8}$ inch. If the specifications cannot be met with this, the section should be removed. Low areas which grinding cannot feasibly remedy shall be sandblasted, filled with epoxy bonded mortar and textured by grinding. The epoxy bonding agent shall meet *Standard Specification* Section 9-26.1(1)B for Type II epoxy. Areas which exhibit improperly finished surfaces and would require extensive patching should be removed at the Engineer's discretion.

5-5.4 Post Paving

5-5.4A Repair of Defective Pavement Slabs

Prior to completion of joint sealing broken slabs, slabs with random cracks, nonworking joints near cracks, edge slumping and spalls along joints and cracks must be replaced or repaired. Areas of concrete pavement that are identified as needing replacement or repair need to be reviewed by the Project Engineer to determine if a repair or replacement of the concrete is most appropriate in accordance with Section 5-05.3(22) of the *Standard Specifications*. There are times that small defects or spalls in the concrete should not be repaired as the repair is worse than leaving small defects or spall alone. The Project Engineer shall consult with the State Construction Office in making the determination on which areas should be repaired, replaced or leaving small spalls or defects alone.

5-5.4B Sealing Sawed Contraction Joints

Prior to opening of the pavement to traffic, sawed joints must be sealed with an approved type of filler material. Before application of the filler material, the joints must be thoroughly clean and dry. The saw shall be free of dirt and dust and may be cleaned with a jet of compressed air. It is important that the saw cut be completely filled to within $\frac{1}{4}$ inch to $\frac{3}{8}$ inch below the top of the concrete surface with the joint filler material. The Inspector can check this by probing the joint after sealing with a stiff wire and watching for sagging of the filler below the top of the joint.

5-5.4C Thickness

Section 5-05.5(1) of the *Standard Specifications* outlines procedures for thickness determinations and provides penalties when prescribed tolerances are exceeded. Before final payment, the pavement thickness will have to be determined in order to calculate the quantities.

5-5.4D Opening to Traffic

Standard Specifications Section 5-05.3(17) covers the requirements for opening cement concrete pavement to traffic. During the curing period designated for the concrete mix, the pavement must be properly barricaded to close it to all traffic. If necessary, the Contractor may be required to furnish a person to prevent traffic from using the pavement.

When the pavement has developed a compressive strength of 2500 psi, as determined from cylinders made at the time of placement, it may be opened to traffic. The pavement should be cleaned either by brooming or a pickup sweeper prior to opening.

5-5.5 Stationary Side Forms

5-5.5A Forms

Metal side forms or other forms approved by the Engineer, conforming to the requirements of Section 5-05.3(7)B of the *Standard Specifications*, shall be used for the construction of cement concrete pavement when a slipform paving machine is not used unless the Contractor requests to use an approved slip form machine.

It is essential that the base of the forms used have full, equal bearing upon the subgrade throughout their length and width. The forms should be set true to alignment and grade and firmly staked with steel pins to avoid movement. The forms must never be set on blocks or pedestals. After the forms are firmly staked in place, a final inspection of line and grade should be made by sighting along the tops of the forms. Minor adjustments in grade can be accomplished by tamping additional subgrade material under the form base by an approved mechanical form tamper or by inserting small leveling wedges under the forms. It is important that the leveling wedges do not protrude into the cement concrete pavement so as to prevent uncontrolled cracking in the concrete pavement at the locations of the wedges. A small amount of concrete may seep under the forms and this concrete needs to be removed flush with the vertical face of the existing concrete pavement prior to placing new cement concrete pavement next to existing concrete pavement.

If major changes in alignment or grade are required, the forms should be removed and the subgrade reshaped to the proper elevation and recompact before resetting the forms.

5-5.5B Joints

Longitudinal and transverse contraction joints will be provided by saw cutting the surface in accordance with Standard Specifications Section 5-05.3(8) to the depth specified in Standard Plan A-40.10-00. The joints shall match transverse joints on adjacent concrete pavement and be at 15 foot intervals transversely on other areas.

5-5.6 Testing Equipment/Reports

5-5.6A Testing Equipment

Specified screens, sieves, and scales

Air meter

Straightedges and stringlines

Thermometers

Cylinder molds for casting concrete test specimens

Stop watch

Flashlights

5-5.6B Records

The Project Engineer is responsible for the keeping of proper records that must include the following information:

- Record of cement received and used
- Record of batches weighed and mixed
- Record of daily yield
- Screen analysis of aggregates (see Chapter 9)
- Record of cement factor
- Record of density of fresh concrete
- Air-entraining agent used, and air meter test results
- Rate of application of curing compound
- Inspector's diaries
- Record of surfacing depth determinations (see Chapter 4-4.4)

5-5.7 Check Lists

For the convenience of the Inspector, some of the most important inspection duties on concrete paving work are listed below:

Pre-Pave

1. Review contract requirements (plans, standard specifications, amendment to the standard specifications, and special provisions)
2. See that all testing tools and equipment are on hand and in good condition. Working with the Contractor, determine location(s) for the Contractor provided curing box(es) used for initially curing concrete test cylinders (See *Standard Specifications* Section 5-05.3(4)A).
3. Inspect Contractor's paving equipment; see that all deficiencies are corrected before paving is begun, Section 5-05.3(3).
4. Check preparation of subgrade; watch for soft spots. Check subgrade elevations to ensure there are no high or low spots, Section 5-05.3(6). If HMA pavement placed on subgrade prior to PCCP, refer to Section 5-04 for HMA requirements.
5. Check that forms are in good condition and are set securely, true to line and grade, Section 5-05.3(7)B. If a slip form paver is used, check position of wire, string line across the wire and check the depth to subgrade or HMA pavement in at least three locations across the proposed paving area at each pin location.
6. Check that subgrade or HMA is moist before the concrete is placed, Section 5-05.3(6).

Paving

7. Watch for variations in slump of mixed concrete batches, Section 5-05.3(2). In the case of slip-form paving, make frequent checks of the condition of the wire and edge slump, Section 5-05.3(11).

8. Make tests of air content, temperature, compressive test cylinders, and make complete, accurate records of test results and computations, Section 5-05.3(4)A, 5-05.3(5)A and Chapter 9. If maturity meters are used, document locations and periodically check output against maturity curve
9. Check tie bars and dowel bars for rust and defects, that they are installed properly, and secured to the grade if placed in baskets. Ensure that dowel bars receive a bond breaker if they are not precoated, Section 5-05.3(10).
10. Watch for excessive movement of forms under weight of concrete paving equipment.
11. Check frequently to see that vibrators are operating properly, Section 5-05.3(7). If a dowel bar inserter is used, check spacing and alignment of dowel bars. Ensure that PCCP is consolidated after the bar is inserted and that slurry does not fill the insertion point.
12. Watch finishing operations to make sure excessive amount of water is not added to surface; allow fine spray only to be used, Chapter 5-5.3B
13. Check the surface texturing operation to see that proper, uniformly textured surface is obtained, Section 5-05.3(11).
14. See that curing compound is placed uniformly, at the required rate, and at the proper time. The curing compound needs to completely coat the surface of the concrete, Section 5-05.3(13)A. Note other curing methods are allowed in *Standard Specifications*.
15. See that concrete is consolidated properly at night headers, Section 5-05.3(8)C.

Post Pave

16. Inspect joint sawing operation to see that required depth is cut, and that the best possible saw cuts are obtained, Section 5-05.3(8)A.
17. Watch removal of forms; see that damage to pavement does not occur; require curing compound to be applied on edge of slab immediately following form removal, Section 5-05.3(7)B.
18. See that additional curing compound is applied over areas scuffed by foot traffic.
19. Check that pavement is protected from traffic with necessary barricades, lights, etc, Section 5-05.3(16).
20. Check that sawed contraction joints are sealed properly with joint sealant filler. Fill to between 1/4-inch and 5/8-inch below the surface of the concrete and minimize any overflow, Section 5-05.3(8)B.
21. Review surface smoothness tests each day, Section 5-05.3(12).

Note: "Section" references are to the *Standard Specifications* and "Chapter" references are to the Construction Manual.

Chapter 7 Drainage Structures, Sewers, and Conduits

7-1 Drains

7-1.1 Roadway Subdrainage

Underground streams and seepage zones which require installation of water collection systems may be encountered in roadway excavation. The gradation of gravel used in water interception channels is of prime importance. Gravel backfill for drains has been developed for this use. This drain material is an open graded gravel which will become plugged with infiltrated fines if not protected with a filter. It should always be used with a filter cloth which has proven effective in inhibiting the infiltration of fines.

When installing perforated drain pipe, the perforations should be in the lower half of the pipe. This will minimize infiltration of fine material and ensure longer service.

Where a subdrain installation is intended to pick up flow from intermittent seepage zones, nonperforated pipe should be used between the seepage areas to avoid possible loss of water into otherwise dry areas. In some cases, it may be necessary to supplement the pickup system with a carrier pipe system.

The Project Engineer's attention is directed to the fact that control of water during construction is the responsibility of the Contractor. See Chapter 2-3.4 of this manual for temporary water pollution/erosion control.

7-1.2 Installation of Drains

Most of the instructions for the installation of culverts covered in Chapter 7-2.4 of this manual are equally applicable to the installation of drains.

7-1.3 Measurement and Payment

Measurement and payment for structure excavation is covered in Sections 2-09.4 and 2-09.5 of the *Standard Specifications*. Measurement and payment for drain pipe and gravel backfill for drains is covered in Sections 7-01.4 and 7-01.5 of the *Standard Specifications*.

7-2 Culverts

7-2.1 General Instructions

The life of the roadway depends largely upon proper drainage, and it is essential to give diligent attention to adequacy as well as to quality of construction. In addition to providing for the passage of existing natural drainage channels through the project, a highway drainage system must provide for the collection and disposal to natural drainage channels of all rainfall on the right of way and of all ground water flow that may be intercepted during roadway construction.

It is attempted during location and planning to provide for necessary drainage systems, however, particularly with respect to underground water flow, it is impossible to foresee all drainage problems that may result from the construction of the highway. It is the responsibility of the Project Engineer to evaluate the sufficiency of the provided drainage systems and to initiate action for changes or additions where necessary.

The Project Engineer should carefully review all provisions of the applicable Environmental Impact Statement, right of way agreements, and other commitments made by the Washington State Department of Transportation (WSDOT) which have direct bearing on the project. Many of these commitments involve drainage matters. Although such elements should have been incorporated into the design, in some cases, they have been overlooked or require revision. Such a lack of oversight which directly affects adjacent property or individuals is sure to trigger an immediate negative response reflecting on WSDOT integrity.

The Project Engineer should go over the project, particularly during severe storms, closely observing the quantity and action of the storm water runoff to determine the sufficiency of openings and ditches or the need for larger openings and ditches than those contemplated, reporting the results of this observation to the Regional Office. Any changes made in the size of drainage openings must be approved by the Regional Office before the Contractor is advised of the change.

Tables showing the allowable heights of embankments over the various types of pipes are in the *Standard Specifications* and the *Hydraulics Manual*. Quite often, upon locating culverts to fit the drainage conditions, the height of embankment is more than was anticipated during the location work. After the culverts are staked, a check should be made to see that the allowable embankment height for the particular type of pipe is not exceeded.

Pipe arches shall not be constructed until the site has been investigated by the Regional Materials Engineer and the materials and methods for the construction have been approved by the Regional Materials Engineer.

7-2.2 Roadway Surface Drainage

Curb and gutter systems must be constructed in such a manner that water will not pond on the roadway or flow at random over fill slopes. Manholes, catch basins, and spillways should be checked for location, size, and number to ensure efficient removal of collected water. Controlled drainage should be carried to a point beyond the roadway to where damage to the roadway cannot occur.

Water pockets are very apt to be formed in superelevation transitions and roadway width transitions, especially where the roadway grade line is quite flat. It is necessary that the Project Engineer investigate these areas to be sure that proper drainage is installed.

In placing the grates for catch basins and gutter inlets, it is imperative that they are placed at the proper elevation. If they are placed too low, they constitute a traffic hazard and if they are placed too high, they will not intercept the water. In keeping with design safety requirements, many culvert entrance structures utilize catch basins or grate inlet facilities. Such installations are particularly susceptible to deciduous debris and roadside trash. Grate opening size allowing passage of such debris is very critical in rural and mountainous locations.

Surface ditches may be necessary above cut slopes to prevent water from flowing over the cut face. Roadside ditches at the ends of cut sections should be diverted well away from the adjacent embankment to avoid erosion of the fill material.

7-2.3 Design of Culverts

Present standard design practice permits the Contractor to select the type of culvert and drain pipe to be installed except in those instances where a specific type is called for in the plans. Approved types are detailed in the contract plans and specifications.

When changes or additions are determined necessary by the Project Engineer, consideration must be given to the type of pipe being furnished to the project. Specific types should be required only when engineering considerations substantiate that preference should be given to one type or another.

Corrugated metal pipe arches fill a need where headroom above the invert is restricted and where more capacity and wider clearance for discharge of debris is required than would be afforded by a multiple pipe installation. Due to the method of forming the pipe arches, it is usually more difficult to obtain a well-fitting joint. The construction of the joints must receive careful attention when the installation is in material susceptible to erosion.

7-2.4 Installation of Culverts

The ability of the culvert to withstand the height of cover as shown in the tables is based on the culvert being constructed in accordance with the *Standard Specifications* and the *Standard Plans*. All phases of culvert installation should receive thorough attention and inspection to achieve that end.

7-2.4A Grade and Flow Line

Unless shown otherwise in the plans, the flow line grade of a culvert should match the stream channel which it replaces. Where the flow line grade of a culvert is relatively steep, debris and sediments tend to pass more easily through the culvert, but increased abrasion in the invert and increased erosion potential at the outlet can be expected. Where the flow line grade is relatively flat, sediment deposition within the culvert can become a problem. This is especially true with culverts that are placed on a flatter grade than the existing stream channel.

When necessary to construct an inlet channel to the culvert, the channel shall provide a smooth transition into the culvert without constricting the flow.

The destruction of vegetation, and rip rap resulting from the modification of culverts will lead to an increase in erosion around the culvert. The outlet side of the culvert is particularly susceptible to increased damage, even under normal flow. If you disturb or change either the culvert inlets or outlets during construction, consideration needs to be given to providing protection. This protection should extend upstream or downstream as needed. At the completion of the work all culvert inlets, outlets, and the channels leading to and from them shall present a neat and workmanlike appearance. At the completion of the contract, they shall be open and ready for operation.

7-2.4B Foundation

Care must be taken to ensure that the ground upon which pipes are to be laid has sufficient stability to support the pipe without excessive or nonuniform settlement. Where the underlying soil is soft or spongy, or subject to excessive consolidation under load, adequate support shall be obtained by excavating and removing the unstable soil and replacing it with satisfactory (usually granular) material, provided this procedure is feasible. In some cases, installation of the pipe should also be laid with a slight camber to overcome anticipated settlement. Where the unstable foundation soil is of such depth that the above procedure is not practical, other means must be used. This may involve the use of partial backfill of granular material to spread the load, placement of a timber or brush mat, the construction of a pile and timber cradle, or other such means. Before selecting a method, the Regional Materials Engineer should be consulted.

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8-0 Introduction

Although many items of construction in this chapter are specialized, procedures for sampling materials, documenting construction, and requiring that work be done in accordance with the specifications is not different from other types of highway construction work.

Federal, state and local water quality regulations prohibit sediment and other pollutants associated with construction activity from impacting air and water quality. All projects must comply with these laws and the required permits. WSDOT creates Temporary Erosion and Sediment Control (TESC) plans to prevent erosion and any damage to the site, adjacent properties, and the environment. Section 8-01 of the *Standard Specifications* covers the requirements for controlling erosion and water pollution on projects. Applicable provisions are included in the contract and must be enforced by construction staff to ensure effective erosion prevention and water quality protection.

The National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit is one of the most common permits on WSDOT projects. It requires erosion prevention when vegetation is removed, when soil is disturbed, or when water flow has the potential to cause erosion. In addition to the required TESC planning, the NPDES permit requires site inspections, water quality monitoring (both turbidity and pH), and record keeping.

It is important to partner with environmental agencies during construction. Early, open communication sets up a good working relationship that may prove invaluable later on if problems occur. Permit requirements normally require notification to environmental agencies prior to conducting construction activities. On some projects it may be advisable to invite representatives from regulatory agencies to part of the preconstruction meeting when environmental issues are discussed.

When working around sensitive areas, applicable permits are typically attached to the contract as appendices. These permits must be carefully reviewed to ensure that, among other things, the Temporary Erosion and Sediment Control (TESC) plan meets permit requirements. It is important to remember these permits are sometimes obtained after the main design work was done. If the original TESC plan does not meet permit requirements, the plan must be modified with the assistance of the Region Environmental Office.

8-1 Erosion Control

8-1.1 TESC Planning and Implementation

A TESC plan consists of a narrative document and plan sheets. The narrative document includes an analysis of erosion risk and a list of *Standard Specifications*, General Special Provisions (GSPs), and special provisions used to mitigate the risk. The plan sheets show the locations of BMPs and other features such as topography and location of sensitive areas for multiple project stages. Chapter 6 of the *Highway Runoff Manual* M31-16 provides guidance on creating thorough TESC plans. Appendix 6A describes all erosion control BMPs. Contact Region Environmental or the Statewide Erosion Control Coordinator for more information.

WSDOT develops the TESC plan and tries to account for all inherent risks on each site and plan to minimize these risks through the use of design, procedural, and physical BMPs. The effectiveness of TESC plans will vary based on how well designers assessed risks and selected contractually enforceable tools for addressing those risks. Unpredictable elements such as the weather also impact effectiveness of the TESC plan. Although we try, it is truly impossible to account for all risks associated with a project before construction begins.

There may be times when it is necessary to exceed the maximum acreage exposure limits allowed by *Standard Specification* 8-01.3(1). If the Engineer grants the Contractor's request to exceed these limits, the Contractor must provide to the Engineer a revised TESC Plan stating what measures will be used to protect the project from erosion damage, how water quality and sensitive areas will be protected, and include the schedule of methods employed to regain adherence to 8-01.3(1). The Construction Stormwater General Permit (NPDES) prohibits the Engineer from authorizing changes to the time restrictions of 8-01.3(1) for working erodible soil.

The Contractor can either adopt WSDOT's TESC plan or provide suggested revisions. These suggestions may lead to additional costs, but if they properly identify the risks that we missed or suggest more practical solutions, those ideas should be adopted. However, some suggestions weaken plans and put WSDOT at greater risk of problems. Such proposals should be rejected. Encourage the contractor to help develop solutions that are compatible with their construction activities. Getting everyone involved early in the process will help you come up with effective solutions that can be agreed upon by everyone.

It is important to clearly understand the TESC plans prior to construction. The actual site conditions may not match those described in the original plan due to development in the area, changed construction dates, and inaccuracies in the original plan. Newly paved areas or housing developments located up gradient from the project site may increase surface water flows to the site. An accurate evaluation of current site conditions is essential for preventing erosion.

When conducting an initial evaluation, the inspector should walk through the site with the TESC plan in hand. If available, the designer should go along on the walk through. It is important to verify the current site conditions and determine whether any plan changes are necessary. Mark any needed changes on the plan sheets so that necessary changes can later be shown to the contractor.

Some of the most important factors leading to erosion control problems include: offsite runoff, groundwater, unstable slopes, poor soils, and exposing too much soil during the wet season. **Therefore, the responsiveness of construction staff to changing conditions is the most important determining factor in whether or not the plan is effective.**

Knowledge of soil types in the project area is quite important. If erodible soils are present, special consideration must be given to reducing erosion when these materials are encountered in cuts or used in embankment construction on the project. If problems are encountered during construction, contact Region Environmental staff or Geotechnical staff for assistance.

Frequently, infiltration can be used when other BMPs fail to make site runoff meet water quality requirements and to reduce stormwater volumes. Infiltration should be considered whenever conditions allow. On sites with highly permeable soils and large undisturbed areas, infiltration should be used as one of the main storm water management BMPs. When no runoff leaves the site the possibility of water quality exceedence is eliminated and smaller volumes of stormwater reduce the overall potential for erosion.

As a project progresses, new risks emerge and must be addressed in order for the TESC plan to remain effective. Prevention is better, cheaper, and easier than repair or mitigation after a plan fails. Many problems can be prevented in the initial stages of construction if the Contractor protects the roadway as work progresses. In the long run, poor construction practices can cost the contractor additional money to correct the damage.

By maintaining an effective TESC plan, WSDOT will save money, time, and prevent environmental problems. Should an environmental non-compliance event occur, i.e. an action not in compliance with environmental standards, permits, or laws during construction refer to Section 1-2.2K(1) for the appropriate notification and corrective action procedures.

Upon project completion and final stabilization, most temporary BMPs are removed and removal is paid for using the force account item when it is included in the contract. It is the responsibility of the inspector to ensure that the contractor removes temporary BMPs in such a way that we do not impact water quality or increase the potential for erosion. Some temporary BMPs, such as inlet protection, must be removed or they may cause problems in the function of the facility. Others, such as wattles or compost socks, may be allowed to remain until they biodegrade if they are serving a useful purpose and do not pose an impediment to safety or function. However, some BMPs such as silt fence may need to remain in place and be removed after the need for them has passed, even if the duration extends beyond

contract completion. Inspectors must determine when the site is adequately stabilized and the temporary BMPs can be removed. The Project engineer may need to coordinate with State Maintenance forces to arrange for silt fence or other BMP removal occurring after the contract is completed.

8-1.2 TESC Inspections

The contractor must identify their certified Erosion and Sediment Control (ESC) Lead for the project and include the ESC Lead on the Emergency Contact List. The ESC Lead must have, for the life of the contract, a current Certificate of Training in Construction Erosion and Sediment Control from a course approved by the Washington State Department of Ecology. Information on approved training can be obtained at: <http://www.ecy.wa.gov/programs/wq/stormwater/cescl.htm>.

The Contractor's ESC lead is obligated to perform erosion control inspections using a standard WSDOT form. *Standard Specification* 8-01.3(1)B provides additional guidance on site inspections including the standard form number. Inspections completed using the form meet NPDES Construction Stormwater General Permit requirements. WSDOT staff should verify the Contractor is inspecting the site, maintaining records, and showing plan revisions. WSDOT must keep a copy of all inspection reports on-site in a Site Log Book in order to be in compliance with the NPDES requirements.

If WSDOT can identify potential erosion areas early, we can prevent problems such as stop work orders and fines from Ecology, construction delays, and unfavorable publicity. Site inspections allow us to verify that the Contractor is implementing the plan and that it is working effectively. You should walk through the site with the TESC plan in hand to evaluate whether BMPs were installed as specified on the plan drawings. You may need to assist the Contractor with identifying appropriate locations to ensure the site is always prepared for a storm. Inspections must also be made during storm events to evaluate how well BMPs are performing.

The effectiveness of BMPs must be evaluated in the field. If installed BMPs are ineffective, replacement BMPs must be selected and installed. If the quality of installation or lack of maintenance is responsible for a failure, the contractor should repair the BMPs at no cost to WSDOT. If the failure is a result of faulty BMP selection, we must identify a new BMP. Any changes to BMPs in the field must be recorded or drawn onto the TESC plan sheets and documented on the site inspection form. For recommended erosion prevention practices see Chapter 6 of the *Highway Runoff Manual* M31-16. For site-specific recommendations, contact Region Environmental or Environmental Services Erosion Control Coordinator.

Everyone on the construction site should know what to do when an environmental agency representative visits the site. The Contractor's ESC Lead is trained to direct the agency representative to the project engineer or the inspector delegated in charge of erosion issues. All Contractors working on the site must know who is in charge of erosion control for WSDOT. Contractors should be directed

to help resource agency staff locate this person. When contractors direct resource agency staff to the person in charge problems are solved more quickly and a positive image is established. If there is a general difference of opinion with an agency representative, the issue should be immediately elevated to the Project Engineer, or Regional Engineering or Environmental Staff who can help develop an effective solution.

8-1.3 Water Quality Monitoring

Water quality monitoring is a permit requirement on many WSDOT construction projects. Sampling frequency and location, and compliance triggers vary, depending on the type of permit issued. WSDOT staff are responsible for collecting water quality samples, and to meet this requirement, WSDOT has developed protocols in Chapter 6 of the *Highway Runoff Manual* (M31-16) that dictate when, where, and how these samples are collected. Turbidity, defined as the visual clarity of the water, is a measure of how much mud is in construction site runoff water, and is the most common pollutant for which WSDOT is required to sample. The second most common pollutant is water pH, a measure of the acidity or alkalinity of water, and is measured to determine if the runoff is too acidic or alkaline. Water that is too acidic or alkaline will kill fish. Construction activities involving concrete may alter the pH of stormwater in a manner that will harm fish, if the runoff is not treated.

Projects that involve in-water work, and are issued a 401 Certification (certification from the state that the proposed project will meet state water quality standards and other aquatic protection regulations) are required to collect both upstream and downstream samples for turbidity, and for pH if concrete work is occurring. The monitoring protocols in Chapter 6 of the *Highway Runoff Manual* must be followed. Upstream sample values are compared to downstream sample values to verify that water quality standards are achieved. WAC 173-201A, defines the required standards as follows:

Turbidity shall not exceed 5 nephelometric turbidity units (NTU) over background turbidity when background turbidity is 50 NTU or less, or more than a 10 percent increase in turbidity when background turbidity is more than 50 NTU.

pH shall be within the range of 6.5 to 8.5 with a human-caused variation within the range of less than 0.2-0.5 units, depending on the class of the waterbody.

The NPDES General Construction permit requires that all projects with greater than 5 acres of soil disturbance sample for turbidity. After October 1, 2008, all projects with greater than 1 acre of soil disturbance will be required to sample for turbidity. Samples must be collected at all outfalls (locations where construction stormwater or authorized non-stormwater) discharges off-site or into state waters). These samples are intended to verify that a TESC plan is well

implemented and that BMPs are working effectively. Outfall sample values must be compared to benchmark values for turbidity, and pH if applicable, to verify that WSDOT is in compliance with the permit. Compliance with benchmark values presumes compliance with state water quality standards. If samples exceed benchmark values, adaptive management must be performed as described in Chapter 6 (Section 6-8) of the Highway Runoff Manual.

Samples for determining pH must be collected on projects with greater than 1 acre of soil disturbance if more than 1000 cubic yards of concrete is curing simultaneously during a less than 30 day period, if more than 1000 cubic yards of recycled concrete is on site, or if cement or kiln dust amended soils are present. Process water or wastewater (nonstormwater) that is generated on-site, including slurry and water generated during concrete grinding, rubblizing, washout, and hydrodemolition activities, cannot be discharged to waters of the state under the NPDES General Construction Permit. Offsite disposal of concrete process water must be in accordance with the *Standard Specifications* or contract provisions. Under limited circumstances, infiltration of process water may be acceptable. As standards for dealing with process water are still evolving, contact region environmental and Headquarters Stormwater and Watershed Program to determine if infiltration is an acceptable option.

Sometimes neighboring sites or projects cause increases in turbidity that can be falsely blamed on WSDOT. It is important to document such events and report them so that we are not unfairly blamed for other people's water quality problems.

We are required by law to report any water quality exceedence to the Department of Ecology. WSDOT has developed Environmental Compliance Assurance Procedures (ECAP) that must be implemented immediately to report any permit non-compliance. These procedures are contained in Section 1-2.2K(1) of this manual.

It is important that environmental agencies hear about a problem from us as soon as it happens rather than from the public or by discovering it themselves. Enforcement actions rarely occur when projects self-report non-compliance events. Self-reporting sends a message that we are making a good faith effort and have nothing to hide. Not reporting suggests that we are covering up a problem or simply do not care.

As part of ECAP, all certified Contractor ESC Leads have been trained to notify the project engineer immediately upon discovery of a water quality exceedence or situation that may lead to a exceedence. Nevertheless, it is our responsibility to be watching ourselves. If a problem is identified, we should notify the project engineer and immediately take all measures possible to reduce impacts of the problem. The project engineer or a designee reports non-compliance events to resource agencies.

8-1.4 Record Keeping

The NPDES Construction Stormwater General Permit requires that water quality data be submitted monthly for all projects greater than 5 acres of soil disturbance after October 1, 2006. HQ Environmental Services Office will batch send data to Ecology monthly via the Water Quality Monitoring database. Therefore, all projects must enter water quality data into the database.

WSDOT is also required to maintain a Site Log Book for each project that is to remain on-site. This Log Book must contain copies of all site inspection reports performed by the Contractor's ESC Lead, copies of water quality monitoring data (collected by WSDOT), and any information pertaining to installation and maintenance of Best Management Practices (BMPs).

WSDOT must retain documentation of compliance with permit requirements during the life of the contract and for a minimum of three years following the termination of the contract. This includes: the Site Log Book, water quality monitoring results, inspection reports, TESC plans and any other documentation.

8-1.5 Final Stabilization

The permanent protection of earth cut and fill slopes should be accomplished as soon as possible. When provided in the contract, topsoil should be evenly placed on the slopes at the specified depth for areas to be seeded. After placement of top soil, large clods, hard lumps, rocks 2 inches (50 millimeters) in diameter or larger, and litter shall be raked up, removed, and disposed of by the Contractor. Refer to *Standard Specification 8-02.3(4)* for more information.

Areas to be seeded without top soils are to be prepared after final grading so that the soil surface is rough and loose, with ridges and furrows (narrow depressions) perpendicular to the slope or to the natural flow of water. This will slow the water velocity, increase water detention and infiltration, decrease runoff, and promote grass growth. This can be done through the use of a cleated roller, crawler tractor, or similar equipment. Refer to *Standard Specification 8-01.3(2)A* for more information.

Seed and fertilizer are to be uniformly applied on the slopes at the rate and mixture specified in the contract. Application shall be by an approved hydro-seeder, blowing equipment, properly equipped helicopters, or power drawn drills or seeders. Where areas are inaccessible for this equipment, or when specified, approved hand seeding will be permitted.

In order for the Contractor to order the proper amount of materials for the project and to provide the Inspector a method of checking the rate of application of the seed and fertilizer, the Project Engineer should measure the areas to be seeded and fertilized as soon as they can be determined and inform the Contractor of the anticipated acreage. If, in

the opinion of the Engineer, the seeding and fertilizing areas can be accurately determined using digital terrain modeling or other design data, the Engineer has the option of using this data in lieu of field measuring. During the seeding and fertilizing operation, the Inspector shall see that the material is placed at a uniform rate and compare the amount of seed and fertilizer applied, by counting the number of bags of material, with the area covered to verify that the proper rate of application is being placed.

The seed and fertilizer may be applied in one application provided the seed and fertilizer are not mixed more than 1 hour prior to application. Mixing more than 1 hour prior to application will damage the seed. Otherwise, the seed shall be applied in a separate application prior to fertilizing and mulching. Lime should be applied separately from the seed and mulch.

Wood Cellulose fiber may be applied with seed and fertilizer West of the summit of the Cascade Mountain Range and only upon written request by the Contractor and approval of the Engineer East of the summit of the Cascade Mountain Range. Consult with the Regional Landscape Architect, the State Regional Liaison Landscape Architect, or the State Horticulturist.

Mulch must be uniformly applied to the seeded areas within 48 hours after seeding. Straw mulch is to be applied with a forced air spreader. Straw mulch may not be practical in windy areas. Wood cellulose fiber is normally applied with hydraulic equipment. Checks are also necessary to determine that the mulch is applied uniformly and at the required rate. In areas, which cannot be reached by a mulch spreader, hand methods resulting in uniform application may be used.

In some areas, it may be desirable to anchor the mulch with an application of tackifier. The *Standard Specifications* are quite complete in the method of applying tackifiers see Section 9-14.4(7). The rate of application is varied from area to area to obtain the best results. Check with the Regional Landscape Architect, the State Regional Liaison Landscape Architect, or the State Horticulturist for advice on the proper application rate.

In order to control the possible erosion resulting from fast runoff on steep slopes, Erosion Control Blanket or matting is often used (see Chapter 6 of the *Highway Runoff Manual* M31-16). It also has its use on flatter slopes where erodible soils are encountered. The purpose for using Erosion Control Blanket is to provide a quick temporary protection until the grass has grown enough to be permanent protection for the soil, but the Erosion Control Blanket cannot be expected to cope with water other than rainfall that falls on the exposed slope. Ditching or drains should control drainage from above or beyond the raw slope. The Inspector is charged with being alert to this potential problem and making every effort to ensure that this kind of runoff is diverted away from the slope.

8-1.6 Measurement and Payment

Measurement and payment instructions for Temporary Erosion and Sediment Control work are covered in Section 8-01.4 and 8-01.5 of the *Standard Specifications*. In some cases, a separate bid item will be established for extra fertilizing to permit additional applications on a seeded area during the life of the contract. In these cases, payment for the acreage fertilized will be made for each application.

8-2 Roadside Planting

8-2.1 General

Inspection of all roadside plantings should be performed by trained and experienced personnel. Recognizing that this is not always possible, this section is written to serve as a guide for project personnel. It is not intended as a substitute for professional assistance. Project personnel will find the *Roadside Manual*, M 25-30, and in particular Sections 700, 710, 720, 800, and 820 useful. When questions of adequacy of planting stock and procedures are encountered, or when differences of opinion concerning the acceptance or rejection of plants occur and the answers are not readily found in this section, the Inspector should request the assistance of the Regional Landscape Architect, the State Regional Liaison Landscape Architect, or the State Horticulturist. In cases where insect damage and diseases are suspected, the services of an entomologist or plant pathologist may be required.

Construction activities, especially clearing, grubbing and excavation, may damage existing trees and shrubs that are scheduled to remain. If this happens, or if pruning of live vegetation is required, the Inspector may contact the State Liaison Landscape Architect or the State Horticulturist for assistance. Early identification and remediation of the damage will minimize shock to the vegetation.

The highway right of way is largely a construction disturbed environment, lacking in natural soil profiles and subject to unusual runoff, abnormal air turbulence, pollutants, temperature variations, and other extremes. In this environment, the designer is faced with providing appropriate highway vegetation.

Plants are living things in contrast to concrete, steel, and stone, which are inanimate materials. Plants change in shape, size, color, and texture from season to season and from year to year, while inanimate materials remain constant except for slight changes in color and texture due to weathering or wear.

Functional plantings serve to improve traffic guidance, reduce headlight glare, provide safety features, reduce pollution, prevent erosion, provide screening, minimize impacts to streams, and contribute to improved aesthetics. Plantings can also be used to create a smooth transition from rigid geometric cross-section and structural forms to nearby natural vegetation and land forms. They also provide gateways to communities.

Plants are also used in soil bioengineering. This practice is being used more frequently in WSDOT projects. Soil bioengineering is used to stabilize and revegetate slopes and stream banks and is often used in conjunction with traditional

“hard” geotechnical fixes. For more information on the uses of soil bioengineering, see Chapter 1350 of the *Design Manual* and Chapter 740 of the *Roadside Manual*.

The survival of plantings under the conditions imposed by the construction process and the environmental conditions of the site should always be a concern of the Project Office. The best conceived and designed planting may not produce the desired results if the quality of plants and the planting procedures fail to meet the requirements of the contract specifications.

Before commencing any work on the project, there should be a meeting with the Project Engineer, the inspectors, and the Landscape Architect. The agenda for the meeting scheduled by the Project Engineer should include but not be limited to the following:

- The basic concept of what is to be achieved with each individual area and the project as a whole. (Revegetation, open forest, screening, soil bioengineering, focal attention, and all other aspects to be discussed must be understood if the ultimate concept of design is to be accomplished.)
- Discuss construction issues such as mixing of soil amendments into the soil and compaction requirements. Compaction efforts for roadside plantings are different than the compaction effort required for road and bridge foundations. The ideal soil for plant growth is a loose soil with the right balance of organic matter, microorganisms, and minerals. In contrast, roadway construction requires highly compacted soils with low organic matter content for stability. These differences result in different compaction requirements. For example, soils for road foundations are compacted to 95 percent density, where as soils for plant establishment typically require a density less than 80 percent.
- The growing characteristics, weaknesses, and strong points of each plant should be discussed especially as they relate to the environment over which the Inspector has some control (drainage, exposure, etc.). Modifications of the plans should be discussed with the Regional Landscape Architect or the State Regional Liaison Landscape Architect. The list of plants should be reviewed to ensure that only plant varieties that will grow in the area have been listed. Typically, only native plant varieties should be used.
- Discuss possible maintenance problems with the maintenance personnel. Conditions that were unexpected during the design stage may lead to modifications in the plans. At the initial layout stage, the maintenance personnel may be better qualified to discuss the project. Any modifications to the plans should be coordinated with the Landscape Architect to ensure the functions are maintained.
- Discuss ongoing coordination between Project Engineer, Inspectors, and Landscape Architects to assist in the successful completion of the Project.

8-2.2 Landscape Terminology

Acid Soil/Alkaline Soil

The pH is a measure of hydrogen ions in the soil. Various plants respond differently to pH variations. Generally, the soil west of the Cascades is acidic, while east of the Cascades is more basic. The pH scale ranges from 0 to 14. A pH of measurement of 7 indicates a neutral soil. A pH measurement below 7 indicates an acidic soil. A pH measurement above 7 indicates an alkaline soil or basic soil. Generally, plants are selected for a particular area without a need to change the pH of the soil. When a pH change is desired, a soil test is taken, analyzed, and the pH is changed appropriately upon recommendations from Regional Landscape Architect or the State Horticulturist.

Balled and Burlapped (B&B)

Plants are prepared for transplanting by digging them so that the soil immediately around the roots remains undisturbed. The ball of earth and root is then bound in burlap or similar mesh fabrics. An acceptable B&B root ball should contain 90 percent (visual estimate of volume) of the earth material held together with root system when removed from the burlap.

Bare Root (BR)

Most deciduous plants are dug when dormant. The roots are cleaned, pruned, and usually stored in moist material. Roots must remain moist and not allowed to dry out.

Botanical Name

The botanical name is the plant name, written in Latin, that is used universally. The common name is the name used in a local area, and is not necessarily the same name used in other areas. The correct botanical name is usually found in "Standardized Plant Names", available from the Landscape Architect. The botanical name usually consists of two names, Genus and Species, but may include additional names.

Genus: 1st word
 Species: 2nd word
 Variety: 3rd word (if appropriate)
 Example: Sambucus racemosa melanocarpa
 Genus: Sambucus
 Species: racemosa
 Variety: melanocarpa

Branch

An offshoot from a trunk or main stem. It could be also called a bough or a portion of a main stem.

Bud

A small protuberance on a stem, branch or cutting containing an undeveloped shoot, leaves or flowers.

Caliper

The diameter of the trunk of a deciduous tree is measured 6 inches (150 millimeters) above ground level, up to 4-inch (100-millimeter) caliper size. If greater caliper than 4 inches (100 millimeters), it is measured at 12 inches (300 millimeters) above ground level.

Cane

A primary stem which starts from the ground of a shrub or at a point not higher than $\frac{1}{4}$ the height of the plant. A cane generally only refers to growth on particular plant material, such as roses, etc.

Clumps

Plants with at least double the number of canes required for standard material; trees with three or more main stems starting from the ground. Vine maples are sometimes sold by the clump.

Collected Material

Trees, shrubs, or other plant material collected from native stands, including Christmas tree stock and plants from native stands or forest plantings. After one growing season at the nursery, they are no longer considered collected material.

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9-1 General

9-1.1 Introduction

The quality of material used on the project will be evaluated and accepted in various ways, whether by testing of samples, visual inspection, or certification of compliance. This chapter details the manner in which these materials can be accepted.

9-1.2 Requirements

Requirements for materials are described in Section 1-06 and Division 9 of the *Standard Specifications for Road, Bridge and Municipal Construction* (M 41-10). Tolerance limits and a procedure for acceptance of certain materials are given in Chapters 9-5.4 and 9-5.6. For inspection of course thickness, the maximum deviations for measured thickness of surfacing and paving see Chapter 1-6 of this manual.

9-1.3 Sample and Test Numbering

A separate series of numbers, starting with No. 1 in each instance, shall be used for acceptance, independent assurance, and verification samples for each type of material for which there is a separate bid item. Verification samples shall be referenced to the corresponding Manufacturer's Certificate of Compliance.

9-1.3A Preliminary Samples and Tests

Preliminary samples are intended to show the general character of the materials available or proposed for use. The sample may be taken from a natural deposit, the general stock of a dealer, or elsewhere. The material sampled may require further treatment before it will meet the specification requirements. Preliminary samples are a basis for approving which aggregate site or brand of material will be considered for use. Deliveries cannot be accepted on the basis of preliminary samples unless the samples represent an identified lot of materials.

Unless specified for a particular purpose, preliminary sampling and testing of materials from a potential source are not mandatory functions. It is to be performed when requested by the Project Engineer, Region Materials Engineer or the State Materials Laboratory on the Request for Approval of Material (DOT Form 350-071).

For aggregate sources that have been identified as having variable quality, contact the Regional Materials Engineer prior to use. It has been demonstrated that some of these sources can provide quality material through diligent production and stockpile management. The Regional Materials Engineer may approve these aggregate sources by the stockpile(s) or on a project-by-project basis. To determine aggregate approval status, consult the 'Aggregate Source Approval Report' generated from the ASA database prior to use.

In order to insure consistency in sampling of aggregate sources for preliminary testing, the sampling must be witnessed or taken by a designated representative of the Regional Materials Engineer.

Before sampling, check to see if the source that is proposed is currently approved for the intended use. If current preliminary test reports are available and confirm that the material meets the contract requirements, additional tests may not be needed. If in doubt, contact the State Materials Laboratory for assistance.

9-1.3B Acceptance Samples and Tests

Acceptance samples and tests are defined as those samples tested for determining the quality, acceptability, and workmanship of the materials prior to incorporating the materials into the project. The results of these tests are used to determine conformance to the contract documents. The minimum frequency for sampling and testing of acceptance samples is detailed in Chapter 9-5.7 of this manual.

9-1.3C Vacant

9-1.3D Verification Samples and Tests

Verification samples and tests are used for making checks on the reliability of a manufacturer's test results when acceptance of the material is based upon a Manufacturer's Certificate of Compliance.

9-1.4 Form Letters

A number of form letters have been prepared as an aid to the Project Engineer in transmitting information to the laboratory. In order to minimize delays to completion of material testing, transmittal letters should include all the information that is pertinent to the sample in question. In order to assist the laboratory, copies of the transmittal letters should be retained in the Project Engineers Office. The following is a list of the forms that may be used for transmittal of samples and/or information to the materials laboratory:

350-009 EF	Concrete Test Cylinder Transmittal
350-016	Asphalt Sample Label
350-026 EF	Preliminary Sample Transmittal
350-040 EF	Concrete Mix Design
350-041 EF	Request for Reference HMA Mix Design
350-042 EF	HMA Mix Design Submittal
350-056 EF	Sample Transmittal
350-067 EF	Thickness Measurement and Core Transmittal
350-071 EF	Request for Approval of Material
350-073 EF	Hot Mix Asphalt Test Section Report
350-074 EF	Field Density Test
350-074A EF	Field Dry Density Test
350-092 EF	Hot Mix Asphalt Compaction Report
350-114 EF	Summary Report of Acceptance Sampling and Testing
350-115 EF	Contract Materials Checklist
351-015 EF	Daily Compaction Test Report
410-025 EF	Project Engineer Transmittal

9-1.5 Project Material Certification

The Project Engineer is responsible for obtaining all required materials documentation or otherwise ensuring that all required materials testing is completed, all with satisfactory results, prior to the materials being incorporated into the project. The Project Engineer is also responsible for maintaining a successful accounting for the materials incorporated into the project in order to support the Region's Certification of Materials. Management and accounting for materials used in the construction of a project are to be administered in the same manner regardless of its funding source; Federal, State, or a combination of both.

The Region is responsible for periodic reviews of each project's materials documentation at the Project Engineer's office. Upon completion of the project the Region will prepare a Region Materials Certification letter listing all variances that were identified and their resolution. On projects that involve Federal participation where material deficiencies are documented, these deficiencies must be resolved with the State Construction Office through the Region before the Region Certification of Materials can be completed. On projects that involve State Funds only, documented deficiencies must be resolved with the Region prior to the Region Certification of Materials. The Regional Administrator or their designee is responsible for signing and distributing the certification letter.

The State Materials Laboratory will also perform compliance reviews on a sampling of completed projects statewide where the materials have been certified.

Definitions

Certification: A Region Materials Certification based on a documented evaluation of the project's materials inspection, sampling, testing, and other materials acceptance activities for their conformance to the contract documents, *Standard Specifications* and this manual. The certification reflects the project's conformance with the Record of Materials as adjusted by the Project Engineer for:

1. Actual project quantities utilized,
2. Acceptance practices as provided for in this manual, including Chapters 1-2.8 and 9-5.2, and Non-critical items,
3. Adjusted sampling/testing frequencies as provided for in Chapter in 9-5.2, and
4. Work added by Change Order.

Variance: An identified difference between the materials acceptance requirements noted in this manual, the contract documents, the *Standard Specifications*, and a review of the completed projects Record of Materials. All variances must be noted. Such notations will need to include the basis by which the material was accepted and how the requirements for that material were met. Any variance between the recognized acceptance requirements and the Project Engineer's use of the material must be resolved with either the Region, State Construction Office, and/or State Materials Laboratory, as appropriate.

Project Material Certification Process

Environmental and Engineering Programs Division (EPPD)

1. State Materials Laboratory (Documentation Section)
 - a. Prepare the initial Record of Material for all major items of materials listed in the contract.
 - b. Provide technical support, certification guidelines, format, and suggested documents. See Figure 9-1 for Project Materials Checklist (DOT Form 350-115, latest version). See Figure 9-2 for examples of the Region Materials Certification letter and its distribution.
 - c. Conduct Compliance Reviews on a sampling of completed projects statewide where the Region has certified the materials.
2. The State Construction Office
 - a. Receives variances for federal aid projects identified during the Region's materials certification review.
 - b. Coordinates FHWA and Region to determine funding eligibility for variances.
 - c. Prepares response to Region identifying degree of participation (Letter of Resolution).
3. Accounting Office
 - a. The federal aid section will make the appropriate transaction as necessary upon receipt of the Letter of Resolution.
 - b. Voucher a federal project only after receiving a copy of the Project Materials Certification, the Letter of Resolution and assure that the appropriate credit has been made to FHWA.
 - c. Attach a copy of the Letter of Resolution to the Journal Voucher sent to FHWA.

Region

1. Project Engineer
 - a. Sets up and maintains a materials documentation system.
 - b. Maintains and monitors a current Record of Material ensuring materials certification throughout the course of the project.
 - c. Identify, document, and justify all materials variances including determination and acceptance of noncritical items in accordance with Chapter 1-2.8 of this manual. Justification may be any of the following:
 1. Follow requirements of Section 1-2.8C(3) if the deficiency is a lack of manufacturer's certification.
 2. Satisfy the deficiency through additional testing or documentation.
 3. Demonstration that the existing documentation is adequate (for example, 19 out of 20 test were taken).



**Washington State
Department of Transportation**

Contract Materials Checklist

Contract Number	Sign Route	Federal Aid Number(s)			
Project Title					
		Yes	No*	N/A	Item No(s).
1. All materials/products used in the construction of this project, including items added by Change Order, have been approved & are listed on the Record of Materials.			**		
2. The actual materials/products used along with the actual basis for acceptance of those materials and products has been documented.			**		
3. All uses of proprietary items, including those listed in the Special Provisions and/or contractor provided QPL items, are documented.					
4. When required, change of material/product letters and a revised RAM were initiated by the contractor.					
5. A Change Order has been completed for all materials accepted and incorporated into the project, but which failed to meet the required specifications when tested.			**		
6. An appropriate credit has been received for all non-specification materials used.			**		
7. Modifications to testing/inspection procedures, including CM 1-2.8A, have been explained and documented by the Project Engineer prior to construction of the item.					
8. Acceptance based on Sampling and Testing for Small Quantities has been documented. CM Chapter 9-5.2C.					
9. Where Manufacturers Certifications were not provided prior to material or product installation, the Project Engineer has provided specific prior approval for the work to continue in accordance with 1-06.3 of the Standard Specifications.					
10. All required acceptance actions and documentation were completed and satisfactory test results demonstrated before payment was made on each item.					
11. Acceptance sampling & testing frequencies for each item accepted is adequate for the total quantities of those items incorporated into the project.			**		
12. All Acceptance Sampling and Testing completed by the Project Engineer utilized Qualified Testers and Certified Testing Equipment in accordance with the Qualified Tester program.					
13. All fabrication inspected items have been accepted in accordance with CM 9-1.5D			**		
14. The contractor has submitted all required Manufacturer Certifications and Mill Certifications, the Certifications represent the specification requirements noted in the contract, and quantities represented by the certifications match or exceed the final quantities used.			**		
15. All required catalog cuts have been approved and are on file.			**		
16. All required Certificates of Materials Origin have been received and are on file. (Fed Aid projects only)			**		
<p>* Checklist items marked "No" constitute a Materials Certification deficiency. Each "No" requires the contract item number for the affected item to be shown along with an attachment to the Materials Checklist detailing the circumstances of use, the method used for acceptance of the material, the Project Engineer's evaluation of the material, suitability for it's application, and determination as to whether or not it may have met the specification in spite of the materials documentation oversight. If the project is Federally funded, the Project Engineer should also include a recommendation for Federal participation in light of the use of undocumented materials.</p> <p>** These specific materials deficiencies on Federal Aid projects must be resolved through State Construction Office and may result in the loss of Federal participation.</p>					
_____		_____		_____	
Project Engineer		Date			
_____		_____		_____	
Region Construction Engineer/Operations Engineer/Area Engineering Manager		Date			

DOT Form 350-115 EF
Revised 3/2002

Figure 9-1



Washington State
Department of Transportation

Memorandum

Linea Laird, P.E.
State Construction Engineer
P.O. Box 47354
Olympia, WA 98504-7354
MS: 47354

Cont. No.: SR-
F.A. No:
Section:

Date Completed:

Dear Linea:

This is to certify that:

The results of acceptance sampling and testing completed for the project referenced above, confirm that the materials incorporated into the project were found to have met the requirements as outlined in the contract plans, provisions, and Standard Specifications.

There were no exceptions

OR:

This is to certify that:

The results of the tests on acceptance samples indicate that the material incorporated in the construction operations controlled by sampling and testing were in conformance with the approved plans and specifications.

Exceptions to the plan and specifications are explained on the attached sheet(s).

Very truly yours,

Regional Administrator or designee

XX:xx
Attachment:

cc: FHWA, 40943 (F.A. Projects Only)
State Materials Engineer, 47365
Regional Oper./Const. Engineer
Project Engineer

DOT Form 700-008 EF
Revised 5/99

Figure 9-2

4. Demonstration that the cost of obtaining the missing documentation will not be justified by the benefits received.
 - d. Identify and document the determination and acceptance of all non-critical items in accordance with Section 1.2-8A of this Manual.
 - e. Prepares the Region Materials Certification package, which includes the Region Materials Certification letter, identified variances, Letters of Resolution for all identified variances on federal aid projects and resolution actions taken. This package also includes a completed Contract Materials Checklist (DOT Form 350-115). The certification package is submitted to the Region Construction Manager for review. The certification letter is to be addressed to the State Construction Engineer.
2. Regional Operations/Construction Office
 - a. The Region shall review projects according to Chapter 10-5 of this manual for documentation requirements including materials.
 - b. Resolve materials variances identified by the Project Engineer and the Region's review of materials documentation at the Region level for State funds only projects. Resolve materials variances on Federal aid projects through contact with the State Construction Office.
 - c. Review certification package for completeness.
 - d. Submit certification letter to Regional Administrator for signature.
 - e. Distribute signed Region Materials Certification letter. The original is submitted to the State Construction Engineer, with copies sent to FHWA (for F.A. Projects) and the State Materials Engineer. A copy of the Letter of Resolution shall be attached if there are any variances.
 3. Regional Administrator, or designee
 - a. Signs the certification letter.
 4. State Construction Administration and Support Accounting Office
 - a. Completes the necessary paperwork.

Compliance Review for Materials Certification Process

Compliance reviews will be performed by the State Materials Laboratory to document how well project records conform to materials certification standards.

The compliance review will normally be conducted at the Project Engineer Office unless arrangements are made for it to be conducted elsewhere.

The goal is to perform a compliance review on at least one project per Project Engineer Office every two years. Compliance reviews may be conducted more frequently as appropriate. Projects will be selected with consideration given to project size and complexity.

Reviews may be performed either prior to or after receipt of the Region Certification of Materials letter. If the review is performed prior to receipt of the Region Certification letter, the review will occur after Substantial Completion. Compliance reviews are performed in order to assist the Project Engineer Office in verifying that all required materials documentation and testing has been completed in accordance with established requirements and standards. If the review is to be performed at the receipt of the Region Materials Certification Letter, the State Materials Laboratory will notify the Region within 60 days of intent to perform a compliance review on that project. Compliance reviews performed prior to receipt of the Region Materials Certification Letter will occur at any time after Substantial Completion.

The goal is to perform a compliance review on at least one project per project office every two years. Compliance reviews may be conducted more frequently as appropriate. Projects will be selected with consideration given to project size and complexity.

The records maintained and developed by the Project Engineer for approval, acceptance and, field verification of the materials placed and paid for on the contract and the identification of variances will be reviewed.

Upon completion of the review, the findings will be discussed with the Project Engineer and/or their representative. A draft report of the findings will be prepared and sent to the Project Engineer after the review. The Project Engineer Office will be given time to rectify any possible deficiencies before the final report is written. A copy of the final report will be sent to the Regional Documentation Engineer, Construction Manager, State Construction Office, and the FHWA Division Office.

In addition to addressing material documentation deficiencies, the Project Engineer/Construction Manager will correct any such discrepancy in the Project Engineer Office material documentation process noted during the Compliance review.

The following items of documentation must be made available for the review:

1. Record of Materials, as revised and amended by the Project Engineer Office (ref. 9-1.5A)
2. Approval Documents:
 - a. Request for Approval of Material (ref. 9-1.5B)
 - b. Qualified Products List pages (ref. 9-1.5B)
3. Acceptance Documents:
 - a. Test Results
 1. Acceptance Test Reports
 2. Assurance Test Reports (where applicable)
 3. Independent Assurance Test Reports (where applicable)
 4. Verification Test Reports (Cement and Liquid Asphalt)

- b. Manufacturer's Certificate of Compliance (ref. 9-1.5E)
 - 1. Concrete Pipe Acceptance Report (ref. 9-1.5F)
 - 2. Lumber Grading Certificate
 - 3. Certification of Cement Shipment
 - 4. Notice of Asphalt Shipment or Certified Bill of Lading
 - 5. Any other certificates required by the contract documents
- c. WSDOT Fabrications Inspected Items (ref. 9-1.5D)
- d. Catalog Cuts (ref. 9-1.5H)
- e. Proprietary or Agency Supplied Items (ref. 9-1.5B)
- f. Visual Inspection Items (ref. 9-1.5C)
- g. Small Quantity Acceptance Documentation
- h. Reduced Frequency Testing Documentation
- 4. Field Verification Documentation (ref. 9-1.5C)
 - a. Inspectors Daily Reports
 - b. Field Acceptance Reports
 - c. Field Note Records (individual materials information initialed and dated by the inspector in the field)
- 5. Inspectors Daily Reports
- 6. Field Note Records
- 7. Comparison/Summary of Quantities
- 8. List of Change Orders
- 9. Project Engineer Office Signature/Initial List

9-1.5A Record of Materials (ROM)

A Record of Materials (ROM) listing of all major construction items is provided by the State Materials Laboratory for each project. For these major construction items, the ROM identifies the kinds and quantities for all materials deemed to require quality control testing. It further identifies the minimum number of acceptance and verification samples that would be required for acceptance of those materials. The minimum number of acceptance tests is based on the planned quantities for the project and should be adjusted for the actual quantities used. Also listed are those materials requiring other actions, such as fabrication inspection, Manufacturer's Certificate of Compliance, shop drawings, or catalog cuts.

The acceptance action and/or numbers of samples listed are the minimum requirements for the Project Engineer's acceptance of those materials and the minimum requirements necessary for the Region's certification for the materials used on that project. The State Materials Laboratory will forward the Record of Materials electronically to the Regional Materials Engineer, and Project Engineer shortly after the contract is awarded. The copy submitted to the Project Engineer is intended as a tool to assist the project

office in tracking the samples approved, samples tested, Manufacturer's Certificate of Compliance, shop drawings, catalog cuts received, and other pertinent data necessary for the Project Engineers and the Regions certification of materials.

The acceptance requirements shown on the Record of Material may be modified by the Contractors specific Requests for Approval of Material. In addition the ROM is based on the State Material Laboratory's review of the major items of construction identified by the contract Summary of Quantities. Reviewing the contract plans and provisions may also identify additional materials documentation requirements as well as major construction items that require additional materials not accounted for in the State Material Laboratory's initial review of the project. These additional materials documentation requirements should be added to the ROM and tracked for completion throughout the course of the project work.

The accuracy of the ROM and Certification of Materials is largely the responsibility of the Project Engineer.

Where the ROM is not clear or there appear to be opportunities to adjust the acceptance requirements that have been identified, the Project Engineer is encouraged to contact the Region Materials Engineer or the State Materials Laboratory for assistance.

In order to ensure clarity upon completion of the work and to allow for easy certification of the project by both the Project Engineer and the Region, it is important that the project ROM be accurate and actively maintained throughout the course of the project. Any changes to the acceptance requirements, additional materials used, or any additional materials added to the project by change order should be accurately documented and tracked in the project Record of Materials.

9-1.5B Approval of Materials

To fulfill the requirements of *Standard Specifications* Section 1-06.1, the Contractor must notify the Engineer of all proposed permanently incorporated materials prior to use. Some temporary items may require approval if required by the Contract Documents. This may be accomplished by a Qualified Product List (QPL) submittal or by submitting a Request for Approval of Material (RAM) (DOT Form 350-071).

When the materials are approved, it does not necessarily constitute acceptance of the materials for incorporating them into the work. Additional acceptance actions, as noted by the code on the RAM or QPL must be completed prior to the materials being used in the work.

Qualified Products List — Submittals

Products listed in the QPL have been found capable of meeting the requirements of the *Standard Specification*, General Special Provision, Bridge Special Provision and Standard Plans under which they are listed and, therefore, have been "Approved." These products may be "Accepted" by fulfilling the requirements of the Acceptance Code and any notes that apply to the product. Instructions are given in the QPL for processing QPL submittals. It is encouraged

that Contractors and Project Engineer Offices use the QPL database for submittals. The QPL database is constantly updated with additions and/or deletions and can be accessed @ www.wsdot.wa.gov/biz/mats/QPL/QPL.cfm.

The Engineer shall review the submittal of the material for consistency with the Bid Item and shall promptly notify the Contractor of any concerns, working toward resolving these with the Contractor. QPL submittals inconsistent with the intended use for the Bid Item should be marked “unacceptable for intended use” and returned to the Contractor. Copies of QPL pages for materials that are to carry a WSDOT Fabrication Inspection ‘Stamp/Tag’ or Sign Inspection ‘Decal’ shall be forwarded to the WSDOT Headquarters Fabrication Inspection Office.

Request for Approval of Material — Submittals

The Contractor shall submit all Request for Approval of Materials (RAM) to the Project Engineer Office using RAM for DOT 350-071 EF.

If a RAM is submitted with a material that is found on the QPL, the Project Engineers office may code the RAM as defined below.

If a RAM is submitted with a material not identified under the ‘Project Engineer’s Office Approval Coding’ area, the Project Engineer’s Office shall submit the RAM to the State Materials Laboratory Documentation Section for coding.

The coding of the RAM is to determine if the proposed material on the RAM is capable of meeting the established standards and defining the acceptance criteria. Acceptance determines if the material being placed on the contract does meet the established standards.

When unable to approve a RAM as outlined below, the Project Engineer’s office will sign, date, and code the items with a “7” – ‘Approval Pending’ and forward it to the State Materials Laboratory Documentation Section. If the RAM is not filled out correctly it will be returned to the Project Engineer’s Office prior to any action being taken. It is recommended that the RAM submittal should be submitted in a timely manner. The RAM may be forwarded by mailing, electronically transferring or faxing. A copy should also be returned to the Contractor at this point to inform them that the RAM has been sent to the State Materials Laboratory for approval. Submit any additional documentation, including appropriate transmittals, that may assist the RAM Engineer in approving the proposed material; such as Test Reports, Catalog Cuts, Manufacturer’s Certificate of Compliance, etc. The page number of the Special Provision or Plan Sheet will also aid in expediting the approval process.

The State Materials Laboratory Documentation Section may elect to delegate approval of some specialty items.

All RAMs shall be signed and dated by the Engineer. All copies of the RAM’s processed through the Project Engineers Office shall be sent to the State Materials Laboratory Documentation Section. Copies shall be distributed as indicated at the bottom of the RAM form. Acceptance requirements should be noted on the maintained ROM and/or Materials Tracking Program (MTP). This is especially important since the maintained ROM and/or MTP will be used for auditing purposes.

Project Engineer’s Office Approval Coding

- QPL Reference Materials:

The Engineer may code the RAM if the product listed on the RAM is identified in the QPL by make, model, batch, color, size, part no., etc. The product must also be listed in the QPL under the appropriate *Standard Specification* for the intended use as indicated by the Bid Item and Specification Reference shown on the RAM. The RAM should be coded with the 4-digit QPL acceptance code and any notes and/or restrictions restated as “Remarks” on the RAM.

- Aggregates:

Aggregate Sources will be approved by consulting the Aggregate Source Approval database for the use intended. The RAM should be coded when there is a sampling frequency in Section 9-5.7 of this Manual with a “1” – “Conditionally Approved: Acceptance based upon Satisfactory Test Report”. Aggregates that do not have sampling frequency should be coded per requirements of the ASA database. Print the ASA Report and attach it to the approved RAM.

- Proprietary Materials:

Where the Contract Documents state “shall be...” and list products by specific name and model, the Contractor needs only to complete the RAM indicating to the Engineer the intended choice. The Engineer shall approve the RAM, coding with an “8” – “Source Approved” and note the page number where it is listed in the Contract Documents as a proprietary product. Occasionally some proprietary materials will have additional acceptance criteria and these criteria need to be noted on the RAM. On occasion the Subject Matter Expert for the material being placed may ask for additional documentation.

- Agency Supplied Materials:

An approved RAM is not required for Agency Supplied Materials. If a RAM is submitted to the PEO, then the Engineer shall approve the RAM, coding with an “8” – “Source Approved” and note the page number where it is listed in the Contract Documents as an Agency Supplied Material. Addition acceptance criteria may be required if listed in the Contract Special Provisions or Plans.

- Concrete and Asphalt Batch Plants

For Concrete Batch Plants, the Project Engineer Office shall ensure submittals and requirements of 6-02.3(4) of the *Standard Specification are met* prior to approving the RAM.

For Asphalt Mixing Plants, the Project Engineer Office shall ensure requirement of 5-04.3(1) of the *Standard Specification are met*. There is no approval of Asphalt Mixing Plants required, however coding the RAM with an “8” – “Source Approved” would be appropriate.

Low Risk Materials

There are low risk materials that may be used in the project without contractor identification per Section 1-06 of the *Standard Specifications* or any other documentation unless stipulated in the Contract Documents. The following is a listing of these materials. Other items can be considered for addition to this list. We encourage anyone with suggestions to contact the Construction Office or the State Materials Laboratory.

- Electrical tape, friction tape, and Moisture proof varnish for friction tape
- Duct tape for bridge approach slab anchors
- Galvanized wire mesh and hardware for screens on sign bridges and cantilever sign structure bases
- Grout for cosmetic purposes
- Nails
- Pea gravel for decorative purposes
- Pipe wrap and spacers for electrical conduit
- Polypropylene rope for induction loop centralizers
- Premolded joint filler for expansion joints in sidewalks
- PVC solvent cement
- Spacers for rebar columns
- Straw bales not used as mulch
- Silicone sealant for electrical service cabinets

9-1.5C Field Verification of Materials

All materials permanently incorporated into a contract shall be field verified and documented by the inspector. The field verification or visual inspection shall occur prior to or during placement of materials by means of a note in the Inspector's Daily Report (IDR), a note added to the Field Note Record, a completed Field Acceptance Report, by completing the QPL page, or notes kept in a pocket notebook or other form developed by the PE office. Field verification documentation should contain sufficient information to identify what was used including manufacturer and/or source, product identity, quantities, Fabrication Inspection information and retainage of additional documentation if required per the contract documents. The field verification documentation needs to be initialed or signed and dated by the inspector at the time of verification. The field verification information should be the link between what was placed and paid for to what was approved on the RAM or QPL and its proper acceptance criteria.

Material that has acceptance criteria of 'visual inspection' only requires that the field inspector sign and date the Field Note Record representing each pay quantity identified. When the project inspector signs/initials the FNR for payment, they are also affirming that items requiring visual inspection have been checked and have been found to be acceptable. All other forms of acceptance criteria require normal Field Verification documentation per this section.

If the Field Note Record is used for field verification, the materials documentation on the record has to be adequate to verify what was used and approved. For lump sum or large items of work, it may necessitate the field inspector to 'field verify', sign, and date the Field Note Record more than once over the duration of the work on the bid item. This would show that each 'component' of the bid item was verified prior to or during the time it was placed.

For DOT fabrication inspected items, the field verification required is the quantity, the Tag/Stamp ID number, and Materials Origin, Foreign or Domestic (F or D) designation.

For signs, the field verification shall document the quantity, and a notation that all signs had the WSDOT inspected decal. The field inspector will need to document that the sign mounting hardware package supplied by the sign fabrication facility bears a "WSDOT INSPECTED" stamp, is 'sealed' and the contains either a Materials Origin F or D.

Field Verification for Traffic Control Cabinet will be by a passing test report and the documentation of the date and name of the region electrical inspector approving the cabinet for turn on. Field Verification for Electrical Service Cabinet will be the documentation of the date and name of the region electrical inspector approving the "turn on".

9-1.5D Materials Fabrication Inspection Office — Inspected Items Acceptance

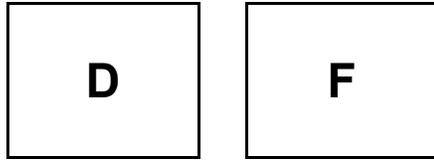
Items that are inspected and found to meet contract documents by the Materials Fabrication Inspection Office are identified by a tag or stamp. This type of inspection is generally performed at the manufacturing or fabrication plants. There are various types of stamps or tags used for acceptance of inspected items, which attest that the item was in full conformance with the specifications at the time of inspection. The inspected items along with the type of stamp designation is covered under Section 9-1.5D(1) of this manual.

The following is the process for the acceptance of inspected items.

1. The manufacturing or fabrication plant must be approved via the "Request for Approval of Material," (RAM) or the *Qualified Products List* (QPL)
2. The Materials Fabrication Inspection Office Inspector, who will obtain the necessary mill tests or other documentation from the manufacturer and reference them to the stamp or tag shown in Figures 9-3 through 9-7, must inspect the item of work. This number can be used for tracking of the item.

Steel and iron items containing Foreign steel will be stamped with an "F" identifier, and steel and iron items that do not contain foreign steel will be stamped with a "D" identifier. See figure 3A and 3B. This stamp is in addition to the appropriate acceptance tag or stamp in figures 9-3, 9-4, 9-5, and 9-7. The "F" or "D" identifier will be stamped next to the acceptance stamp. For those items with an acceptance tag, the "F" or "D" stamp will be stamped on the back of the tag.

In all cases, the project office will be responsible for securing the Certificate of Material Origin and tracking the quantities.



**Domestic or Foreign Identifier Stamp
Figure 3A and 3B**

3. Once the fabricated item arrives on the job, check for approval stamp or tag.
 - a. If there is an approval stamp or tag, record the type of tag or stamp along with the ID number when applicable, quantity, and brief description of the item for project records. The Project Engineer’s representative should note in a report that the material was in satisfactory visual condition when installed and forward all information to the project office. In case of questions concerning an inspected item, contact the appropriate Materials Fabrication Inspection Office. The offices are:

State Materials Laboratory, Tumwater,
Mail Stop 47365

Seattle Inspection Office, Mail Stop NB-82,
Northwest, MS-501

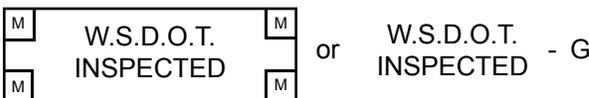
Spokane Inspection Office, Mail Stop Eastern,
Materials Lab

Vancouver Inspection Office, Mail Stop Southwest
S-15, Materials Lab

- b. If there are no stamps or tags, inform the Contractor that the item may not be acceptable, and contact the Materials Fabrication Inspection Office to determine the status of the inspection. Items lacking tags or stamps or damaged during shipping should be rejected and tagged or marked appropriately.

9-1.5D(1) Inspected Items, Stamps and Tagging Identification

The following are examples of the types of stamps and tags used by the Materials Fabrication Inspection Office. The letter on the stamp or tag represents the inspector who performed the inspection.



**Stamps
Figure 9-3**

The stamps shown in Figure 9-3 identifies inspection and the inspector of the following items:

1. Precast Concrete Barrier
2. Precast Concrete Catch Basins, Manholes and Inlets. This includes all sections and risers 6 inch and above.
3. Concrete Utility Vaults
4. Concrete Junction Boxes
5. Galvanized Steel

All Documentation associated with these stamps in Figure 9-3 will be reviewed and approved by the Materials Fabrication Inspection Office and kept at the point of Manufacture, with the exception that they will not track the quantities of foreign materials used on the project. Steel items containing foreign steel will be stamped with an “F” identifier in addition to the appropriate stamp. Steel items that do not contain foreign steel will be stamped with a “D” identifier in addition to the appropriate stamp.

**APPROVED FOR SHIPMENT WASH.
DEPT. TRANSP. N001234**

**Stamp
Figure 9-4**

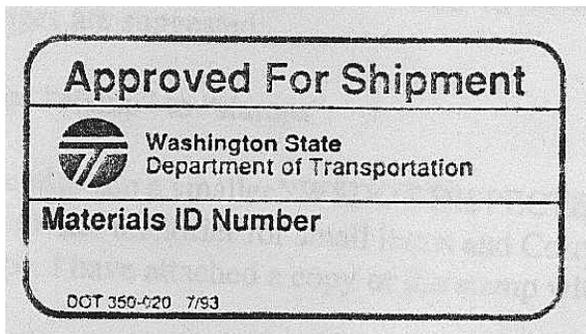


**Tag
Figure 9-5**

The stamp shown in Figure 9-4 or tag shown in Figure 9-5 identifies inspection and the inspector of the following items:

1. Concrete Wall Panels — Stamped or tagged
2. Three Sided Structures — Stamped or tagged
3. Prestressed Concrete Products — Stamped or tagged
4. Steel for Bridges — Stamped or tagged
5. Signal, Luminaire, ITS and Strain Poles — Stamped or tagged
6. Miscellaneous Welded Shop Items (see RAM or QPL for special items) — Stamped or tagged
7. Sign Structures and associated hardware — Stamped or tagged
8. Anchor Bolts for Luminaires, Signal Poles and Sign Structures –A representative number of bolts shall be stamped with the inspector’s I.D. # and the shipment will be accompanied by an “Approved for Shipment Tag”.
9. Epoxy Coated Reinforcing Steel Bars for Concrete — Representative bundles of rebar shall be tagged per shipment to the project
10. Metal Bridge Rail — Each bundle of rail shall be tagged
11. Concrete Culvert, Sewer Pipe (30 inches and above) — Stamped
13. Sign Mounting Hardware – stamp

All Documentation associated with the stamp in Figure 9-4 or the tag in Figure 9-5 will be reviewed and approved by the Materials Fabrication Inspection Office and kept at the Materials Fabrication Inspection Office, with the exception that they will not track the quantities of foreign materials used on the project. Steel items containing foreign steel will be stamped with an “F” identifier in addition to the appropriate stamp. Steel items that do not contain foreign steel will be stamped with a “D” identifier in addition to the appropriate stamp.



Tag
Figure 9-6

The tag in Figure 9-6 identifies inspection and inspector of Treated Timber, Piling and Poles

1. Bundles of treated timber may be randomly tagged “Approved for Shipment” referencing the inspector’s identification number.
2. Treated Piling and Poles shall be individually tagged “Approved for Shipment” referencing the inspector’s identification number.

All Documentation associated with the tag in Figure 9-6 will be reviewed and approved by the Materials Fabrication Inspection Office and kept at the Materials Fabrication Inspection Office.

WSDOT-A

Stamp
Figure 9-7

The stamp shown in Figure 9-7 identifies inspection and inspector of the following items:

(This stamp is impressed on the casting and will be circled with spray paint for ease of visibility of the stamp.)

1. Gray-Iron Castings, Steel Castings, Ductile-Iron Castings — Stamped
2. Rectangular Frames and Grates — Each set shall be stamped aligning the adjacent mating surfaces to each other. This alignment is critical as the leveling pads are ground to prevent rocking of the grates in the frames.

All Documentation associated with the stamp in Figure 9-7 will be reviewed and approved by the Materials Fabrication Inspection Office and kept at the Materials Fabrication Inspection Office, with the exception that they will not track the quantities of foreign materials used on the project. Steel and Iron items containing foreign steel will be stamped with an “F” identifier in addition to the appropriate tag or stamp. Steel and Iron items made entirely of domestic steel and iron will be stamped with a “D”.

9-1.5E Manufacturer’s Certificate of Compliance

As designated by the specifications and contract special provisions, certain materials may be accepted on the basis of a Manufacturer’s Certificate of Compliance. This acceptance is an alternate to job site sampling and testing. The submitted Qualified Products List page or approved Request for Approval of Material shall stipulate the items for which a compliance certification is an acceptable basis of acceptance. The Manufacturer’s Certificate of Compliance is required prior to installation of the material. See Section 1-2.8C(3) of this manual for guidance on allowing material to be placed without certification.

Acceptance by Manufacturer’s Certificate of Compliance will be permitted where designated by the contract documents. The original Record of Material will provide a summary of requirements combining the special as well as general requirements of the contract.

The form of the Manufacturer’s Certificate of Compliance will vary considerably based on both the material and the origin and may take the form of standard state certificate forms, individual letters from manufacturers, or overstamps on bills of lading. Certain information is required and is designated by the specifications. This information includes the identity of the manufacturer, the type and quantity of material being certified, the applicable specifications being affirmed, and the signature of a responsible representative of the manufacturer. Supporting mill tests or documents may also be required. A Manufacturer’s Certificate of Compliance is required for each delivery of material to the project and the lot number, where lot numbers apply, of material being certified shall be identified.

Upon receipt of the Manufacturer’s Certificate of Compliance at the project office, it shall be reviewed for compliance with the specifications requirements using the preceding guidelines and the checklist for Transmittal of Manufacturer’s Certificate of Compliance Check List – DOT Form 350-572. The manufacturer of the material must make the certification. A supplier certificate is not acceptable except as evidence for lot number and quantity shipped and can only be accepted when accompanied by a certificate from the manufacturer, which meets the requirements of Section 1-06.3 of the *Standard Specifications*. The Project Engineer’s Office is required to retain the signed and dated Manufacturer’s Certificate of Compliance Check List Form for each submittal.

9-1.5F Concrete Pipe Acceptance Report

Fabrication inspection is periodically performed at approved sources of concrete pipe. During this inspection, samples of each type, size, and class of pipe are inspected and tested to verify compliance with the *Standard Specifications*. For a 90-day period of manufacture from the date of inspection, concrete pipe less than 30 inches diameter may be shipped and accepted based on “Concrete Pipe Acceptance Reports.” This report is prepared by the Fabrication Inspector and copies are thereafter supplied by the fabricator to accompany each shipment of pipe.

The Acceptance Report will indicate the date and original test results as performed by the Fabrication Inspector and will bear appropriate certification from the fabricator. Verify the conformance of the shipment with the contract requirements and examine the manufacture and shipping dates of the pipe for conformance with specifications and with the Acceptance Report.

9-1.5G Sign Fabrication Inspection

The Sign Fabricator Inspector is to verify that signs for an individual contract were inspected and approved for shipment to the project by having a “FABRICATION APPROVED” decal, see Figure 9-8.



Figure 9-8

Pre-approval of the Sign Fabricator is required by Traffic Operations and /or the Materials Fabrication Office. The Sign Fabricator is approved via the Request for Approval of Material (DOT Form 350-071).

Sign Fabrication Inspectors

Seattle, Yakima, Tacoma, and other Western Washington area — Contact the State Materials Lab- Seattle Inspection Office, Mail Stop NB82-501, (206) 464-7770.

Vancouver-Portland area — Contact Vancouver Inspection Office, Mail Stop S15, (360) 905-2193.

Spokane-Eastern Washington area — Contact the Eastern Region Materials Lab, Spokane, (509) 324-6169

Sign Inspection documentation requirements:

1. **Sign blanks or panels:** Manufacturer’s Certificate of Compliance with accompanying mill certifications will be kept at the Sign Fabrication facility.

2. Reflective Sheeting and Cutout

Legend: Manufacturer’s Certificate of Compliance, this certificate will verify that the product(s) meets all the requirements of *Standard Specification 9-28.12*. The Manufacturer’s Certificate of Compliance will be kept at the Sign Fabrication facility.

3. When sign mounting hardware is supplied by Sign Fabrication Facility, a Manufacturer’s Certificate of Compliance is required to verify that the product(s) meet all the requirements of *Standard Specification 9-28.11*. The Manufacturer’s Certificate of Compliance will be kept at the Sign Fabrication facility. For high strength sign mounting hardware supplied by the contractor, a certification will be required that shows the hardware meets *Standard Specification 9-28*. A 307 bolts, where allowed, will not require certification.

4. The Project Engineer Representative will accept for installation and payment only those signs which have a “FABRICATION APPROVED” decal affixed. The representative will also verify the sign mounting hardware package supplied by the sign fabrication facility bears a “WSDOT INSPECTED” stamp or that contractor supplied high strength mounting hardware for overhead and large multiple post roadside signs are certified to meet the requirements of *Standard Specification 9-28.11*. In the event there is no “FABRICATION APPROVED” decal on the signs, or if the hardware does not have “WSDOT INSPECTED” stamp or Manufacturer’s Certificate of Compliance as described in section 3 above, they may be rejected. Contact the appropriate Sign Fabricator Inspector for status, or have the Contractor ship the signs back to Sign Fabricator, if this does not delay the project.

Double-faced signs, which do not receive decals, will be approved on visual inspection at the fabricator’s facility and in the field.

A list/invoice of all inspected and accepted signs will kept in the Sign Fabricator Inspector’s files.

9-1.5H Catalog Cuts

As designated by the contract documents, certain materials may require the acceptance criteria be based on a Catalog Cut. A Catalog Cut may also be required in support of approving a Request for Approval of Materials (RAM) per 9-1.5B. The approved Catalog Cut is required prior to installation of the material.

Upon receipt of the Catalog Cut information at the project office, an initial review for compliance with the established specifications and contract documents should be performed. All information shall be accompanied by the ‘Transmittal of Catalog Cuts’ form generated with the Record of Materials. The project office shall follow the directions

on the ‘Transmittal of Catalog Cuts’ form and submit the package to the State Materials Lab Documentation Section for approval, or as per the original Record of Material. The ‘Transmittal of Catalog Cuts’ form and catalog cuts for those materials listed in Section 9-14 and 9-15 of the *Standard Specifications*, and accepted based on approved catalog cuts, should be submitted to the Region Landscape Architect or to the Landscape Liaison for approval.

The Catalog Cut may be forwarded by mailing, electronically transferring or faxing.

9-1.6 Control of Materials

The succeeding parts of this chapter on materials outline the detailed method to be used in the control of materials. The expenditure made for materials is a large item in construction costs. If faulty materials are permitted to be incorporated into the project, the cost of replacement may exceed the original cost.

Chapter 9-4, Specific Requirements for each type of material, includes the following information:

1. Approval of Material
2. Preliminary Samples
3. Acceptance Samples
4. Field Inspection
5. Specification Requirements

Chapter 9-5, Guidelines for Job Site Control of Materials, provides the Engineer with additional information to assist in determination of the point of acceptance for materials from WSDOT and Contractor sources, the basis of acceptance, verification sampling and testing, tolerance limits, and the sampling and testing frequency guide.

Chapter 9-6, Radioactive Testing Devices, explains policy on the administration of radioactive testing devices.

Chapter 9-8, WSDOT Test Methods/Field Operating Procedures, are the testing procedures that are used in the field.

9-2 Vacant

9-3 Vacant

9-4 Specific Requirements for Each Material

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9-4.1 Portland Cement or Blended Hydraulic Cement

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, product is listed under appropriate specification.

2. **Preliminary Samples:** Preliminary samples will be required only if requested on Request for Approval of Material (DOT Form 350-071).

3. Acceptance/Verification

a. Acceptance

(1) **Bulk Cement:** Bulk cement will be accepted upon receipt of a Manufacturer's Mill Test Report Number, which shall be reported on each certified concrete delivery ticket.

(2) **Bagged Cement:** If the quantity of bagged cement exceeds 400 bags, then it will be accepted by "SATISFACTORY" test reports from the State Materials Laboratory. If a sample is needed, acquire a 10-pound sample from one of every 400 bags and ship to the State Materials Laboratory for testing. Allow a minimum of 14 days from receipt of the sample at the Laboratory for testing. DO NOT permit the use of bagged cement until a "SATISFACTORY" test report has been received from the State Materials Laboratory.

b. **Verification:** Manufacturing mills will provide samples directly to the State Materials Laboratory on a quarterly basis to compare with the manufacturing mill test report. The Engineer may take samples for testing as described in *Standard Specification* Section 9-01.3.

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual.

5. **Specification Requirements:** See *Standard Specification* Section 9-01. Review contract documents to determine if supplemental specifications apply.

9-4.2 Bituminous Materials

1. **Approval of Material:** Approval of the materials are required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification.

2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071). A preliminary sample consists of two 1-quart cans.

3. Acceptance/Verification

a. **Acceptance:** Bituminous materials may be used after receipt by the Engineer of Asphalt Supplier's Certification of Compliance incorporated in their Bill of Lading with the information required by the *Standard Specification 9-02*. Examine these certificates to make sure the material is of the grade required and that it comes from the approved supplier and point of shipment.

b. **Verification:** Samples for verification conformance will be taken based on the frequencies as stated in Section 9.5-7 of this manual. Because the entire sample may be used in testing, it is necessary to take a backup for each sample. The samples shall be taken and labeled in duplicate by the Engineer with both samples forwarded promptly to the State Materials Laboratory. Asphalt Binder's (PG, AR, etc.) shall be taken at a frequency corresponding to every other HMA

acceptance sample. The first, third, fifth, and every fifth sample thereafter will be tested. Emulsions and cutbacks (such as MC and RC grades) shall be sampled from every other shipment. Emulsion used exclusively for tack coat (such as STE-1 and CSS-1) do not require sampling.

Consult the FOP for AASHTO T40 for detailed sampling procedures. Samples shall be taken as close as possible to the point where the material is to be used; i.e., pug mill, distributor, etc. In the case of cutback asphalt's, sampling may be from the distributor itself, by opening a valve or one of the nozzles. If a hand nozzle is available, the sample may be drawn off there. Asphalt binder for use in a plant should be sampled by drawing from either the supply line between the storage tank and the mixer or the storage tank. Specifications require the Contractor to install a valve for this purpose.

If samples cannot be taken from the distributor, as outlined above, they may be taken from the storage tank. Samples taken directly from storage tanks must be taken with a "thief," so that they do not include surface material and are from near the middle of the asphalt in storage. They may be taken by the grab method — that is, the full amount of the sample will be taken at one time or at one spot in the car.

Samples of emulsified asphalt shall be taken as close as possible to the location the materials are used, but they must be taken before any dilution of the material takes place.

The containers for all liquid asphalt products except emulsions will be approximately 1-quart cans with 1¼-inch screw caps. Containers for emulsions shall be 1-quart plastic. Always use new, clean containers that are free of rust, dents, or other weaknesses that may cause leaking or contamination. Containers previously used for any other purpose will not be satisfactory regardless of how well cleaned they are considered to be. The outside of the containers must not be cleaned by immersion in kerosene or other solvent because of the danger of contaminating the sample. Containers must not be cooled by immersion in water or other liquid as contraction may draw contaminants into sample. Enter complete data on gummed label DOT Form 350-016 and attach to each of the two cans. Complete a Sample Transmittal (DOT Form 350-056) and attach it, in its envelope, to the container. If tape is used to attach envelope to container, or the containers together, be sure the tape is not contacting the label(s).

4. **Field Inspection:** Check the "Bill of Lading" that the liquid asphalt delivered complies with the requirements of the approved mix design. Check temperature to which material is heated to make sure specified limits are not exceeded, see *Standard Specification* 9-02.3.

5. **Specification Requirements:** See *Standard Specifications* Section 9-02. Review contract documents to determine if supplemental specifications apply. In addition, refer to project mix design.

9-4.3 Hot Melt Traffic Button Adhesive

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification.

2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071). Submit Manufacturers Certificate of Compliance meeting the requirements of *Standard Specifications* Section 1-06.3, including supporting tests reports to State Materials Laboratory for evaluation.

3. **Acceptance/Verification**

a. **Acceptance:** Field Verify per Section 9-1.5C of this manual.

b. **Verification:** Submit a sample of each lot of material to the State Materials Laboratory for testing.

4. **Field Inspection:** Field Verify per Section 9-1.5C of this manual. Verify correct heating of product per manufacturers recommendations.

5. **Specification Requirements:** See *Standard Specifications* Section 9-02.1(8). Review contract documents to determine if supplemental specifications apply.

9-4.4 Concrete Aggregates

1. **Approval of Material:** Consult the Aggregate Sources Approval (ASA) database for approval of material for each source prior to use.

2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on the Request for Approval of Material (DOT Form 350-071) or if the ASA database indicated that the aggregate source has expired. Contact the Regional Materials Office if preliminary samples are required. Preliminary samples for Concrete Aggregate shall be made up of 50-100 pounds of clean, washed coarse aggregate and 20-25 pounds of clean washed fine aggregate. The sample is to be shipped in increments, using satisfactory containers, not exceeding 30 pounds.

3. **Acceptance:** After the source has been approved, concrete aggregates may be accepted upon satisfactory field tests for grading, cleanliness and free from excessive organic matter, silt, and soft or foreign pieces. Acceptance samples shall be obtained, tested, and recorded in accordance with the *Standard Specifications* Section 9-03.1, the contract special provisions, and Chapters 9-5 of this manual.

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check for uniformity of plants within each lot and for representative sample lost based on the following:

5. **Specification Requirements:** See *Standard Specifications* Section 3-02 and 9-03.1. Review contract documents to determine if supplemental specifications apply.

5. **Specification Requirements:** See *Standard Specifications* Section 9-21. Review contract documents to determine if supplemental specifications apply.

9-4.56 Signing Materials

1. **Approval of Material:** Approval of the sign fabricator as well as the manufacturer of the sign blanks, panels and the reflective sheeting is required prior to use. Approval of the sign fabricator will be by a Request for Approval of Material (DOT Form 350-071). A RAM will not be required for sign mounting hardware provided by the sign fabricator. Mounting hardware from a source other than the sign fabrication facility will require approval by the or an approved Request for Approval of Material (DOT Form 350-071). Approval of the sign blanks, panels and the reflective sheeting may be by the Qualified Products List or by an approved Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that product is in fact qualified for its intended use; product is listed under appropriate specification. The fabrication facility will notify Sign Fabrication Inspector of need to provide Inspection Services.

2. **Preliminary Samples:** A preliminary sample of the material may be requested on the Request for Approval of Material (DOT Form 350-071), or as requested by the Sign Fabricator Inspector.

3. **Acceptance:** Materials and fabrication will be accepted on “FABRICATION APPROVED” decal (Figure 9-8).

a. **Sign Blanks:** As soon as the fabricator receives the materials, the Sign Fabricator Inspector will check the accompanying mill test certificates to ensure the materials meet contract requirements. These documents will be kept at the fabrication facility.

b. **Reflective Sheeting:** The Sign Fabricator Inspector will check the Manufacturer’s Certificate of Compliance for the reflective sheeting and the cutout legend to ensure the materials meet contract requirements. These will be kept at the sign fabrication facility.

c. Sign Mounting Hardware supplied by the Sign Fabricator will have the mounting hardware certifications verified at the sign fabricator’s facility by the Fabrication Inspector to ensure the materials meet the contract requirements. These records will be kept at the sign fabrication facility. Fabrication inspectors will verify sign mounting hardware as it is packaged for shipment and attach a “WSDOT INSPECTED” Tag to the sealed package.

Contractor’s who purchase sign mounting hardware separately from a source other than a WSDOT approved sign fabrication facility will be required to supply proper Manufacturer’s Certificates of Compliance and it will be the responsibility of the contractor to supply the certifications to the Project Engineer’s Office prior to use.

Where *Standard Specifications* 9-28.11 allows use of A307 bolts for roadside wood posts, field verify A307 lag bolts were used, no further certification will be required for A307 bolts.

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check for a “FABRICATION APPROVED” decal (Figure 9-8) on the back of the sign and document Inspector’s Daily Report. Check for a “WSDOT INSPECTED” stamp on sign mounting hardware and document. Check that all overhead signs are mounted with stainless steel bolts, u-bolts, washers, nuts, locknuts, mounting brackets and straps. Mounting hardware shall include bolts, nuts, washers, locknuts, rivets, post clips, windbeams, angles, “Z” bar, straps and mounting brackets. Check for damage due to shipping, handling, and installation.

5. **Specification Requirements:** See *Standard Specifications* Section 9-28, and Section 9-1.5G of this manual. Review contract documents to determine if supplemental specifications apply.

9-4.57 Concrete Curing Compounds

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification.

2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).

3. **Acceptance:** Material will be accepted based on “SATISFACTORY” test results from the State Materials. No curing compound shall be used on WSDOT work prior to testing of each lot. If the lot can be identified and proven to have prior satisfactory acceptance test results in the same calendar year in which it is to be used, it may be used without testing per Chapter 9-5.2 of this manual. Submit a one-quart sample taken by, or in the presence of, an agency representative for each lot. Samples must be submitted for testing 10 days prior to use of curing compound.

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check that the lots being used have “Satisfactory” test reports from the State Materials Laboratory.

5. **Specification Requirements:** See *Standard Specifications* Sections 9-23. Review contract documents to determine if supplemental specifications apply.

9-4.58 Admixtures for Concrete

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification.

2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).

3. **Acceptance:** Acceptance will be on the basis of Certified Concrete Delivery Ticket, *Standard Specifications* Section 6-02.3(5)B, indicating the brand/product and dosage of the admixture as shown on the concrete mix design.
4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check Concrete Delivery Ticket for proper admixture usage.
5. **Specification Requirements:** See *Standard Specifications* Section 6-02.3(5) B and 9-23. Review contract documents to determine if supplemental specifications apply.

9-4.59 Plastic Waterstop

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification.
2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).
3. **Acceptance:** Material may be accepted on basis of Manufacturer's Certificate of Compliance.
4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check for uniformity of product in lot, and for damage in shipment or handling.
5. **Specification Requirements:** See *Standard Specifications* Section 9-24. Review contract documents to determine if supplemental specifications apply.

9-4.60 Epoxy Systems

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification.
2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).
3. Acceptance/Verification
 - a. **Acceptance:** Material may be accepted for use on receipt of a passing test report from the State Materials Laboratory. For epoxy bonding agents, submit mix ratios, intended use and a representative sample of each component for each batch or lot number. A representative sample may consist of 1 pint of each component for bulk lots or a pre-packaged kit. Containers shall be identified as "Component A" (contains the Epoxy Resin) and "Component B" (contains the Curing Agent) and shall be marked with the name of the manufacturer, the date of manufacture and the lot number. If the material is to be used as an epoxy grout, mortar or concrete, include a 5-pound representative sample of aggregate. Samples shall be

submitted to the State Materials Laboratory. Epoxy Adhesive for Lane Markers does not require field sampling, but does require a Manufacturer's Certificate of Compliance. A period of 15 working days should be allowed for testing.

- b. **Verification:** Proper proportioning of Epoxy Adhesive for Lane Markers can be verified at the State Materials Laboratory if desired. Submit a 1 pint sample of the field mixed epoxy in question and a 1 pint sample of each component as is detailed under "Acceptance" above.

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check for uniformity of color and conformance to required mix proportions. Streaking is an indication of inadequate mixing. Check for set and hardness with your thumbnail. You should not be able to dent the properly mixed and cured material. Epoxies shall be mixed and applied in conformance to manufacturer's written instructions unless otherwise modified in writing by the manufacturer's agent.

5. **Specification Requirements:** See *Standard Specifications* Section 9-26. Review contract documents to determine if supplemental specifications apply.

9-4.61 Resin Bonded Anchors

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification.
2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).
3. Acceptance:
 - a. **Qualified Product Listed Product:** If Product is listed on QPL, the acceptance of the resin adhesive shall be by field acceptance procedures documenting that brand and model of the resin system. Threaded rod, nut and washer or other inserts shall be accepted on the basis of a Manufacturer's Certificate of Compliance with supporting Mill Test Reports indicating they meet the contract requirements.
 - b. **Non-qualified Product Listed Product:** Submit independent test lab data indicating resin system meets specifications when tested in accordance with ASTM E 488, and threaded rod, nut and washer or other inserts shall be accepted on the basis of a Manufacturer's Certificate of Compliance with supporting Mill Test Reports indicating they meet the contract requirements.
4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check for proper embedment depths. Check that holes are properly cleaned. Check that the installation is in accordance with the manufacturers written instructions.
5. **Specification Requirements:** Review contract documents to determine if supplemental specifications apply.

9-4.62 Gabion Baskets

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification.
2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071). The sample shall consist of the following:
 - a. One square yard of mesh including selvage and body wire.
 - b. Three feet of tie wire.
 - c. Three feet of lacing wire.
 - d. Six each wire clips, fasteners.
3. **Acceptance:** Acceptance is based on receipt of a Manufacturer's Certificate of Compliance with accompanying Mill Test Report.
4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check for damage.
5. **Specification Requirements:** See *Standard Specifications* Section 9-27.3. Review control documents to determine if supplemental specifications apply.

9-4.63 Sign Structures

1. **Approval of Material:** Approval of the fabricator is required prior to use. Upon receipt of the "Request for Approval of Material," the Materials Fabrication Inspection Office will inspect the fabrication shop to ensure it meets all contract requirements. A copy of the Request for Approval of Material will be sent to the Materials Fabrication Inspection Office.
2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).
3. **Acceptance:** The fabricated sign structure and associated hardware will be accepted on the basis of an "APPROVED FOR SHIPMENT" stamp (Figure 9-8) An "F" or "D" will be stamped to indicate the steel or iron is of foreign or domestic origin. When the structures are fabricated out-of-state and are shipped directly to the job site, arrangements must be made with the Materials Fabrication Inspection Office to have the structures and hardware inspected prior to erection. Manufacturer's Certificates of Compliance will be required to be delivered with the sign structures from out-of-state fabrication facilities.

Certificates of Material Origin will be the responsibility of the project office.

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check for "APPROVED FOR SHIPMENT" stamp (Figure 9-8) on the sign structure and associated hardware. Check for and the "F" or "D" indicator for foreign or domestic steel and document it. Check for damage due to shipping, handling and erection.

5. **Specification Requirements:** See design standards and *Standard Specifications* Section 9-28.15. Review contract documents to determine if supplemental specifications apply.

9-4.64 Conduit

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). Be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification. If approval action is being requested via the RAM process, attach Catalog Cuts or other appropriate documents along with the proper transmittal form (WSDOT Form 350-071 EF) to assist the RAM Engineer in the approval process.
2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).
3. **Acceptance:** Materials may be accepted as identified below in lieu of sampling:
 - a. QPL Acceptance: Rigid Galvanized Steel, Aluminum, PVC, PE, HDPE, Fiberglass Conduit and appurtenances (fittings, couplings, spacers, adapters, split internal expansion plugs, duct plugs, connectors, clamps, conduit bodies, and conduit supports), and Expansion Fittings, Deflection Fittings, Combination Deflection and Expansion Fittings – Visual Inspection per section 9-15C of this manual.
 - b. Non-QPL Acceptance: Expansion Fittings, Deflection Fittings, Combined Deflection and Expansion Fittings, Rigid Galvanized Steel, Aluminum, PVC, PE, HDPE, Fiberglass Conduit and appurtenances – Catalog Cuts per Section 9-1.5H and visual inspection per 9-1.5C of this manual.

The project office shall obtain a "Certificate of Material Origin" for all steel or iron products prior to incorporation of the material into the project.

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check for Underwriters Laboratories (UL) or Canadian Standards Association (CSA) approval labels. Check for damage to coatings in shipping and handling, and see that damaged areas and field cut threads are protected with an approved coating.
5. **Specification Requirements:** See *Standard Specifications* Section 9-29.1. Review contract documents to determine if supplemental specifications apply.

9-4.65 Electrical Conductors

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification.

2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071). A sample shall consist of 15 feet.
3. **Acceptance:** Conductors shall be accepted upon receipt of "Satisfactory" Test Report from State Materials Laboratory.
 - a. **Single Conductors:** If using the QPL, be sure to verify appropriate means of acceptance, see applicable Acceptance Code within the QPL. For wire manufacturers not listed in the QPL, submit a sample. A sample shall be a length of wire that shall include the complete printed/stamped designation: manufacturer, size, and insulation type.
 - b. **Multiple Conductors:** If using the QPL, be sure to verify appropriate means of acceptance, see applicable Acceptance Code within the QPL. For wire/cable manufacturers not listed in the QPL, submit a sample. A sample shall be a length of wire that shall include the complete printed/stamped designation: manufacturer, size, and insulation type.
 - c. **Fiber Optic Cable.** A sample of the Fiber Optic cables shall be a minimum 2 feet long.
4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. A visual inspection shall be made to ensure that no conductors with damaged insulation are incorporated into the project.
5. **Specification Requirements:** See *Standard Specifications* Section 9-29.3. Review Contract Documents to determine if supplemental requirements apply.

9-4.66 Signal, Luminaire, ITS, and Strain Poles

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification. Notify Materials Fabrication Inspection Office of need to provide Inspection Services.
2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).
3. **Acceptance:** The fabricated poles and associated hardware will be accepted on the basis on an "Approved for Shipment" tag or stamp (figure 9-8). If poles were inspected prior to shipment to job site, they will be stamped "APPROVED FOR SHIPMENT" (Figure 9-4) An "F" or "D" will be stamped to indicate the steel or iron is of foreign or domestic origin. Certificate of Material Origin will be the responsibility of the project office. Poles not inspected prior to shipment must be inspected and approved at the job site by the Materials Fabrication Inspection Office prior to installation. Acceptance will be based on approved shop drawings per Chapter 8-20.2B of this manual and Mill Test Certificates supplied by the manufacturer.

Certificates of Material Origin will be the responsibility of the project office.

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check for "APPROVED FOR SHIPMENT" stamp (Figure 9-4) and the "F" or "D" indicator for foreign or domestic steel and document it. Check for damage due to shipping, handling and erection. Arrange for inspection if not tagged.

5. **Specification Requirements:** See *Standard Specifications* Section 9-29.6. Review contract documents to determine if supplemental specifications apply.

9-4.67 Anchor Bolts for Luminaire, Signal Poles, and Sign Structures

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification. Notify Materials Fabrication Inspection Office of need to provide Inspection Services.
2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071)
3. **Acceptance:** Acceptance may be based on "APPROVED FOR SHIPMENT" tag and/or stamp (Figure 9-4 or 9-5). An "F" or "D" will be stamped to indicate if the steel or iron is of foreign or domestic origin. Certificate of material origin will be the responsibility of the project office. The ID number on the tags that is attached to the bundles of anchor bolts will be stamped on a representative number of anchor bolts.

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check and record the "APPROVED FOR SHIPMENT" tag and/or stamp (Figure 9-4 or 9-5) and the "F" or "D" indicator for foreign or domestic steel and document it. Check for damage due to shipping and handling.

Note: Special attention shall be placed on the proper installation of bolts. No adjustments (bending) of bolts will be allowed after placement in concrete.

5. **Specification Requirements:** See *Standard Specifications* Section 9-29.6(5). Review contract documents to determine if supplemental specifications apply.

9-4.68 Luminaires and Lamps

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification
2. **Preliminary Samples:** Preliminary samples will be required only if requested on Request for Approval of Material (DOT Form 350-071). Submit Manufacturers Certificate of Compliance and catalog cut to the State Materials Laboratory for evaluation if requested.

3. **Acceptance:** Verify the materials received on the job site, is in fact the same make, model, lot, batch, size, color, blend, etc. as approved for use, be it by QPL or via the Request for Approval of Material (DOT Form 350-071).

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual.

a. **Luminaires:** A visual inspection shall be made to ensure damaged equipment is not installed and that luminaires are mounted level. Confirm the socket position is the same as that noted on the catalog cut.

b. **Lamps for Luminaires and Signal**

Heads: Check that all lamps are of the proper wattage, see contract documents.

5. **Specification Requirements:** See *Standard Specifications* Section 9-29.10. Review contract documents to determine if supplemental specifications apply.

9-4.69 Water Distribution System

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval action is being request via the RAM process, attach Catalog Cuts or other appropriate documents, using proper transmittal, to assist the RAM Engineer in the approval process.

When approved, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification.

2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).

3. **Acceptance:** Material may be accepted upon receipt of an "Approved" document in lieu of sampling as shown below:

a. QPL Acceptance

1) Ductile Iron Pipe and Fittings, PVC Pipe and Fittings, Restrained Joints, Restrained Flexible Couplings, Gate Valves (3-inches to 16-inches), Butterfly Valves, Saddles, Corporation Stops – Visual Inspection per section 9-1.5 of this manual

2) Copper Tubing and Polyethylene Tubing – Manufacturer's Certificate of Compliance

b. Non-QPL Acceptance

1) Ductile Iron Pipe, Steel Pipe, Polyvinyl Chloride (PVC) Pipe, Polyethylene (PE) Pressure Pipe, Polyethylene Encasement – Manufacturer's Certificate of Compliance

2) Fittings for Ductile Iron, Steel, PVC, and PE Pipe. Restrained Joints, Bolted Sleeve-type Couplings for Plain End Pipe, Restrained Flexible Couplings, Grooved and Shoulder Joints, Fabricated Mechanical Slip-type Expansion Joints, Gate Valves (3-inches to 16-inches), Butterfly Valves, Valve Stem Extensions, Combination

Air Release/Vacuum Valves, Tapping Sleeve and Valve Assemblies, Hydrants, End Connections, Hydrant Extensions, Hydrant Restraints, Traffic Flanges, Saddles, Corporation Stops, Copper Tubing, Polyethylene Tubing, Service Fittings, Meter Setters, Bronze Nipples and Fittings, and Meter Boxes – Catalog Cut per Section 9-1.5H of this manual.

3) Valve Boxes, Valve Marker Posts, and Guard Posts – Visual Inspection per Section 9-1.5 of this manual.

It is the responsibility of the project office to obtain a "Certificate of materials Origin" for all steel or iron products prior to incorporation of the material into the project.

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check material delivered to the project for damage to the galvanized coatings in shipping and handling and conformance to the contract documents. See that damaged areas and field cut threads are protected with an approved galvanized repair paint formula, standard formula A-9-73. Water distribution pipe requires testing after installation in conformance with the *Standard Specifications* Section 7-11.3.

5. **Specification Requirements:** See *Standard Specifications* Section 9-30. Review contract documents to determine if supplemental specifications apply.

9-4.70 Elastomeric Bearing Pads

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071).

2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).

3. **Acceptance:** Material may be accepted on a Manufacturer's Certificate of Compliance accompanied by a certified test report identifying the specific batch of material and conforming to AASHTO M251.

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Make certain that material to be used is from the certified batch.

5. **Specification Requirements:** See *Standard Specifications* Section 9-31. Review contract documents to determine if supplemental specifications apply.

9-4.71 Fabric Bearing Pad

1. **Approval of Material:** Approval is required for the fabricator of the bearings prior to the start of fabrication. For approved plants in Washington State, or the need for inspection, contact the Materials Fabrication Inspection Office.

2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).

3. **Acceptance:** All Fabric Bearing Pads need to be inspected at the point of manufacture prior to shipping.

Documentation will be checked and accepted by WSDOT Fabrication Inspection at the point of manufacture. Certification will be maintained by Fabrication Inspection office. An “F” or “D” will be stamped to indicate the steel or iron is of foreign or domestic origin.

Certificate of Material Origin will be the responsibility of the project office.

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check and record the “APPROVED FOR SHIPMENT” tag and/or stamp (Figure 9-4 or 9-5) and the “F” or “D” indicator for foreign or domestic steel and document it. Check for damage caused by shipping and handling.

5. **Specification Requirements:** Review the contract documents to determine the specification requirements.

9-4.72 Precast Concrete Barrier and Wall Panels

1. **Approval of Material:** Approval of fabricator is required prior to the start of fabrication. Materials will be approved by the Request for Approval of Material (DOT Form 350-071). Notify Fabrication Office of need to provide Inspection Services, or to verify that the precast plants annual review and approval is current for wall panels only.

2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).

3. **Acceptance:** Accept only barrier sections that are stamped “WSDOT INSPECTED” (Figure 9-3). Accept only wall panels, which are stamped “APPROVED FOR SHIPMENT” (Figure 9-4). An “F” or “D” will be stamped to indicate the steel or iron is of foreign or domestic origin. Certificate of Material Origin will be the responsibility of the project office. The “WSDOT INSPECTED” stamp on barrier will include the connecting pins, which will be inspected at the barrier fabricator’s facility.

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check for shipping and handling damage. Check for “APPROVED FOR SHIPMENT” stamp or “WSDOT INSPECTED” stamp and the “F” or “D” indicator for foreign or domestic steel and document it.

5. **Specification Requirements:** See *Standard Specifications* Section 6-10, 6-02.3(25), and 6-02.3(28). Review contract documents to determine if supplemental specifications apply.

9-4.73 Safety Bars, Cattle Guards, Sign Mounting Brackets, Steel and Special Guardrail Posts, Steel Sign Posts

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If fabrication or welding of the item is needed, contact the Materials Fabrication Inspection Office for disposition and possible inspection.

2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).

3. **Acceptance:** Materials may be accepted on receipt of Manufacturer’s Certificate of Compliance for the base metal including Mill Test Certificates.

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check each lot of material delivered to the project for damage, and that accompanying Manufacturer’s Certificate of Compliance is present. Check galvanizing using procedures stated in FOP for ASTM D 1186. Identify lots with test reports. Check for handling or shipping damage.

5. **Specification Requirements:** See *Standard Specifications* Section 9-05.18, 9-16.3(2), 9-28.14(2) and *Standard Plans*. Review contract documents to determine if supplemental specifications apply.

9-4.74 Metal Bridge Rail

1. **Approval of Material:** Approval of fabricator is required prior to the start of fabrication. Materials will be approved by the Request for Approval of Material (DOT Form 350-071). Notify Fabrication Office of need to provide Inspection Services.

2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).

3. **Acceptance:** If rails were inspected prior to shipment to job site, they will be stamped or tagged “APPROVED FOR SHIPMENT” (Figure 9-4 or 9-5). An “F” or “D” will be stamped to indicate the steel or iron is of foreign or domestic origin. Certificate of Material Origin will be the responsibility of the project office. If not, rails must be inspected on job site by the Materials Fabrication Inspection Office prior to installation. Acceptance will be based on approved shop drawings per Chapter 8-20.2B of this manual, Mill Test Certificates supplied by the manufacturer.

4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check for “APPROVED FOR SHIPMENT” tags or stamp and the “F” or “D” indicator for foreign or domestic steel and document it. Check for damage caused by shipping and handling. Unless aluminum parts have been adequately wrapped, there may be damage to anodic and lacquer coating. Damaged parts shall be rejected.

5. **Specification Requirements:** See *Standard Specifications* Section 6-06.3(2). Review contract documents to determine if supplemental specifications apply.

9-4.75 Construction Geotextiles

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification.

2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).

3. Acceptance:
 - a. Satisfactory test reports from the State Materials Laboratory when quantities exceed the limits stated in *Standard Specifications* Section 9-33.4(4). Sample per WSDOT Test Method 914. A Manufacturer's Certificate of Compliance MUST accompany all samples submitted for testing.
 - b. Acceptance may be on Manufacturer's Certificate of Compliance when quantities are within the limits stated in *Standard Specification* Section 9-33.4(4).
4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check each roll of geotextile fabric for proper identification as shown on either the Manufacturer's Certificate of Compliance or on the State Materials Laboratory test report.
5. **Specification Requirements:** See *Standard Specifications* Sections 9-33. Review contract documents to determine if supplemental specifications apply.

9-4.76 Concrete

1. **Approval of Material:** Approval of all materials is required prior to use.

Cement – see Section 9-4.1

Fine Aggregate (sand) – see Section 9-4.4

Coarse Aggregate – see Section 9-4.4

Admixtures for Concrete – see Section 9-4.58

Water – see Section 9-4.77

Contractor must submit a concrete mix design on DOT Form 350-040. All concrete except commercial and Lean Concrete must come from a pre-qualified Batch Plant. Contact the Regional Materials Engineer to determine if plant is pre-qualified.

For mix designs proposed for cement concrete pavement the contractor is required to submit flexural and compressive strength test results in accordance with Section 5-05 of the *Standard Specifications* as part of the concrete mix design.

Note: If the Aggregate Sources Tacking System requires Alkali Silica Reaction (ASR) mitigation the concrete mix design submittal may include the use of either a low alkali cement per Section 9-01.3(3), or fly ash per 9-23.9, as approved by the Engineer. The contractor shall provide test results for ASTM C 1260 or AASHTO T 303 showing the mitigating measures are effective (see Section 9-03 of the *Standard Specifications*). Contact the General Materials Engineer of the State Materials Laboratory or the State Bridge Construction Engineer if the contractor is proposing to use other mitigating measures.

2. **Preliminary Samples:** Not Required
3. Acceptance:
 - a. **Commercial and Lean Concrete:** Is accepted based on a Certificate of Compliance to be provided by the supplier as described in Section 6-02.3(5) B of the *Standard Specifications*.

b. **Cement Concrete Pavement:** Is accepted based on satisfactory field tests for air content and compressive strength (see Section 9-5 of this manual for testing frequency).

c. **Structural Concrete:** Is accepted based on tests for Slump, Air Content, Compressive Strength, and Temperature (see *Standard Specifications* Section 6-02.3(5)G for testing frequency).

4. **Field Inspection:** The concrete mix provided shall match the mix the contractor submitted for review. The Mix design submittal shall include the Aggregate Correction Factor to be used in determining the Air Content, if the contractor fails to provide this information on DOT form 350-040 do not apply an aggregate correction factor.

5. **Specification Requirements:** See *Standard Specifications* Section 9-03.1, 5-05 and 6-02.

9-4.77 Water for Concrete

1. **Approval of Material:** Not required.
2. **Preliminary Samples:** Not required.
3. **Acceptance:** Is based on test results provided by the contractor. If the Contractor is using potable water that is clear and apparently clean, then no testing is required.
 - a. **Physical Requirements:** conducted on a weekly interval for the first four weeks and thereafter on monthly interval.
 - b. **Chemical Requirements:** conducted on a monthly interval.
4. **Field Inspection:** See Section 9-4.75 concrete.
5. **Specification Requirements:** See *Standard Specifications* Section 9-25.1.

9-4.78 Expansion Joints

1. **Approval of Material:** Approval is required for the fabricator and all material components of the expansion joints prior to the start of fabrication. Materials will be approved by the Request for Approval of Materials (DOT Form 350-071).
2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).
3. **Acceptance:** Expansion joint systems containing steel will be inspected by Fabrication Inspection at the jobsite.

All gland material will be accepted based on Manufacturer's Certificate of Compliance. Manufacturer's Certificates of Compliance for steel as well as the gland material will be approved and maintained by the project office. Certificates of Material Origin will be the responsibility of the project office. Expansion joints acceptable to the Fabrication Inspector will be stamped "WSDOT INSPECTED".

The Project Engineer shall collect all of the documentation from the fabricator for the various material items used in the Manufacturing of the expansion joints as listed below.

- a. Gland Strip — Manufacturer's Certificate of Compliance
 - b. Steel Plates and shapes including — Manufacturer's Certificate of Compliance and Certificate of Material Origin.
 - c. Coatings for steel parts — Manufacturer's Certificate of Compliance
4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Check for damage caused by shipping and handling.
 5. **Specification Requirements:** Review contract documents to determine if supplemental specifications apply.

9-4.79 Controller Cabinet Assembly

1. **Approval of Material:** Approval of all components in the Controller Cabinet Assembly are required. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification.
2. **Preliminary Samples:** A preliminary sample of the individual components will be required only if requested on Request for Approval of Material (DOT Form 350-071).
3. **Acceptance:** Final acceptance is based on a satisfactory test report. A satisfactory test report is defined as acceptable performance in the following tests:
 - WSDOT Test Method 421, Traffic Controller Inspection and Test Procedure
 - WSDOT Test Method 422, Transient Voltage Test (Spike Test) Procedure
 - WSDOT Test Method 423, Conflict Monitor Testing
 - WSDOT Test Method 424, Power Interruption Test Procedure
 - WSDOT Test Method 425, Environmental Chamber Test
 - WSDOT SOP 429, Method for Determining the Acceptability of Traffic Signal Controller Assembly
 - WSDOT Test Method T427, Loop Amplifier Test
 - WSDOT Test Method T428, Compliance Inspection and Test Procedure
4. **Field Inspection:** Field verify per Section 9-1.5C of this manual. Verify the controller cabinet assembly received on the job site, has satisfactory test reports if required. Check for damage due to shipping and handling.
5. **Specification Requirements:** See *Standard Specifications* Section 9-29.13. Review contract documents to determine if supplemental specifications apply.

9-4.80 Miscellaneous Temporary Erosion and Sediment Control Items

1. **Approval of Material:** Approval of materials is required prior to use. Materials will be approved by the Qualified Products List or Request for Approval of Material (DOT Form 350-071). If approval is by QPL, be certain to verify that the product is in fact qualified for its intended use, and the product is listed under the appropriate specification.
2. **Preliminary Samples:** A preliminary sample of the material will be required only if requested on Request for Approval of Material (DOT Form 350-071).
3. **Acceptance:** Material will be accepted by visual inspection. The exception to this will be Geotextile for Silt Fence, which will be accepted on basis of Manufacturer's Certificate of Compliance.
4. **Field Inspection:** Field verify per Section 9-1.5C of this manual.
5. **Specification Requirements:** See *Standard Specifications* Sections 8-01, 9-14, and 9-33.

9-4.81 Concrete Patching Material

1. **Approval of Material:** Approval of materials is required prior to use. This approval may either be by virtue of the inclusion of this material/product on the Qualified Products List or by approval of a Request for Approval of Material (DOT Form 350-071). If approval is by means of QPL, be certain to verify that product is in fact qualified for its intended use, and the product is listed under the appropriate specification. If the product is not listed on the QPL, submit test data from an accredited independent laboratory confirming that the concrete patching material meets specifications of Section 9-20.
2. **Preliminary Samples:**
 - A. **Prepackaged Concrete Patching Material:** If the concrete patching material is not on the QPL, submit test data from an accredited independent laboratory confirming that the concrete patching material meets the requirements of *Standard Specification* Section 9-01.2.
 - B. **Aggregate for Extension:** A preliminary sample of the material will be required only if requested on the Request for Approval of Material (DOT Form 350-071) or if the ASA database indicates that the aggregate source approval has expired. Contact the State Materials Office if preliminary samples are required. Preliminary samples for Concrete Aggregate shall be made up of 50-100 pounds of clean, washed coarse aggregate and 20-25 pounds of clean washed fine aggregate. The samples are to be shipped in increments, using satisfactory containers, not exceeding 30 pounds.
3. **Acceptance:**
 - A. The Contractor must submit a mix design meeting the requirements of *Standard Specification* 9-20 for the concrete patching material.

B. Acceptance for the aggregate extender shall be based on the material coming from an approved source, and a satisfactory gradation report supplied with the mix design.

4. **Field Inspection:** Field Verify the prepackaged patching material received on the job site is in fact the same as approved for use, be it by QPL or via the Request for Approval of Material (DOT Form 350-071). Verify that the amount of added water and aggregate extender complies with the contractors mix design.

5. **Specification Requirements:** See *Standard Specifications* Section 9-20. Review contract documents to determine if supplemental specifications apply.

9-5 Guidelines for Job Site Control of Materials

9-5.1 General

When in doubt as to sampling requirements, refer to Record of Materials, (ROM), Request for Approval of Material, (RAM), and Chapter 9-4 of this manual. All items for acceptance, except for sampling and testing PCC cores, testing concrete cylinder and cement and as shown in Chapter 9-5.7 of this manual will be sampled and tested by the Project Engineers representative.

In some instances, certain items usually sampled by Project Engineers representative may be sampled and tested by representatives of the State Materials Laboratory or other representatives. Such items as shown in Chapter 9-1 of this manual, when properly identified with an “Approved for Shipment” tag, may be accepted for use by the Project Engineer without any further sampling or testing.

9-5.2 Sampling and Testing Schedule

9-5.2A General

The intent of sampling and testing is to ensure that the material provided to the project conforms to the specifications. The frequency schedule in Chapter 9-5.7 of this manual covers the minimum requirements for sampling and testing at the project level. The Project Engineer is responsible for obtaining the number of samples necessary to ensure adequate control of the material being produced under the circumstances and conditions involved with the particular project. In some instances, good construction practice will necessitate more frequent tests to ensure adequate control of the quality of production. This will be the case where production is just getting under way, where source material is variable or marginal in quality. Also operations from commercial sources when small lots of material are being sampled (as for barge loads of aggregate) or when stockpiles are built and depleted may require more frequent sampling and testing.

The instructions listed in Chapter 9-5.7 of this manual, will be followed in the production of those surfacing materials covered therein. A minimum of one acceptance test is required except for small quantities as shown in Chapter 9-5.2C of this manual.

9-5.2B Reducing Frequency of Testing

In instances of uniform production where the material is running well within specification limits, the Project Engineer may initiate deviations from the schedule. Deviations exceeding a 10 percent reduction will require approval from the Construction Materials Engineer at the State Materials Laboratory and must be documented in the project records, and fully explained by the Project Engineer. Lack of personnel, equipment, and facilities will not be considered sufficient reasons for such deviation.

Authority for approval of frequency reduction may be delegated to the Regional Materials Engineer upon request. This authority may permit overall reduction of sampling frequency or selective relief of selected test properties. Examples of selective relief would be reduction/elimination of fracture determinations for production from quarry sources or reduction of frequency for sand equivalent determination. As a general principle, frequency reduction may be considered whenever five consecutive samples taken at the normal frequency indicate full conformance with the specifications.

9-5.2C Sampling and Testing for Small Quantities of Materials

The Project Engineer may elect to accept small quantities of materials without meeting minimum sampling and testing frequencies using the following criteria.

An item can be accepted as a small quantity if the proposed quantity for a specific material is less than the minimum required frequency. For mainline paving, less than one-half the required frequency as defined in Chapter 9-5.7 of this manual.

Materials that will not be considered under the small quantity definition are:

- Concrete with a 28 day compressive strength of 4000 psi or greater

Some issues that the Project Engineer may consider prior to use of small quantity acceptance are:

- Has the material been previously approved?
- Is the material certified?
- Do we have a mix design or reference mix design?
- Has it been recently tested with satisfactory results?
- Is the material structurally significant?

Small quantity acceptance could be visual, by certification, or other methods. Acceptance of small quantities of materials by these methods must be documented. Documentation of materials under these methods must be provided by the Project Engineer or representative accepting the material in accordance with section 1.2-8A of this manual. For visual documentation, an entry should be made in the project records as to the basis of acceptance of the material, and the approximate quantity involved.

The small quantity acceptance may be used for any quantity of the following uses:

- Curbs and Sidewalks,
- Driveways, Road approaches,
- Paved ditches and slopes

Where jobsite mixing of concrete occurs in accordance with *Standard Specification* Section 6-02.3(4)B, Jobsite Mixing, small quantity acceptance can be used for acceptance of packaged concrete meeting the requirements of ASTM C 387. The packaged concrete bag will state that the concrete meets the requirements of ASTM C 387.

9-5.2D Reference Test Report

When a Satisfactory Test Report is required, a Referenced Test Report may be used if allowed in Section 9-4 for a specific material. A Reference Test Report as listed below will not be allowed for HMA Mix Designs, or other materials unless allowed per Section 9-4.

A Reference Test Report may consist of one of the following:

- A copy of a previous WSDOT Satisfactory Test Report generated under another contract number as long as the manufacturer and lot number of the material to be used are the same as the material the test report represents.
- A printed copy of the electronic QPL database page showing 'referenced' lots previously tested. The lot number in the QPL must match the lot number of the material used. The information will be listed in the 'description' field for specific materials in the QPL.

All Referenced Test Reports must reflect the same specification as the material to be used and be received prior to installation of the intended material. A Reference Test Report for material can only be used in the same calendar year for when the material was incorporated into the contract.

9-5.3 Point of Acceptance

State Owned Source: Material produced from State owned source may be accepted either as it is placed into stockpile or as it is placed in hauling vehicles for delivery to the roadway. The sampling and testing frequency during stockpiling shall be in conformance with Chapter 9-5.7 of this manual.

In the event sample testing during stockpiling shows the material to be marginal (i.e., within tolerance limits) in any specification requirement, acceptance at this point shall be conditional and dependent on adherence to specifications at the time of removal from stockpile.

Contractor's Source: If stockpiled material is set aside exclusively for use on WSDOT projects it may be accepted the same as that for a state-owned source. If stockpiles are constructed for general use, then materials for WSDOT projects shall be tested for acceptance from samples taken by the Project Engineer representative in accordance with WSDOT FOP for AASHTO T 2. The Engineer will determine the exact point of acceptance. If an existing stockpile was built without acceptance testing during material production, and later set aside exclusively for use on state projects, the material may be accepted with appropriate test results from samples taken by the Project Engineer representative in accordance with WSDOT FOP for AASHTO T 2. The sampling and testing frequency shall conform to Chapter 9-5.7 of this manual.

9-5.4 Basis for Acceptance

The basis of acceptance of Hot Mix Asphalt and aggregates may be either by statistical evaluation or non-statistical evaluation methods. The method to be used is specified in *Standard Specifications* or Contract Documents.

The testing tolerances shown in Chapter 9-5.6 of this manual apply exclusively to the appropriate specifications as listed in the *Standard Specifications*. These tolerances do not apply to those "special" materials having requirements differing from those listed in the *Standard Specifications*. For these "special", materials usually described in the contract documents, tolerances will be provided by the State Materials Laboratory upon request from the Regional Construction Manager.

Material that has been produced prior to rejection (i.e., HMA in storage silo, crushed materials hauled to the job site) may be incorporated into the project provided the Contractor is made fully aware that the material may be subject to a price adjustment or, in extreme cases, to total removal. Every effort shall be made to place this material in structurally noncritical areas such as shoulders or gore areas.

All material produced between the time of rejection and the time an acceptable material is produced, as defined by WSDOT adopted testing procedures, shall not be incorporated in the work in any manner until it meets specifications.

9-5.4A Basis for Acceptance — Statistical Evaluation

For materials being accepted using statistical evaluation procedures, random samples will be evaluated to determine quality level within a defined tolerance band. Acceptance, bonus, and disincentive procedures are defined in the contract documents.

Test results with acknowledged errors or equipment deficiencies are to be immediately discarded without recourse and another sample run.

Test results for Hot Mix Asphalt may be challenged by the Contractor, as defined in the *Standard Specifications* Section 5-04.3(8)A. These specifications allow the Contractor to challenge results of any individual acceptance sample test in writing and within seven calendar days from receipt of the specified test results.

When the Contractor challenges a test, a split of the original field sample must be tested by different equipment and a different qualified tester. It therefore is necessary that a split of every field sample (i.e., opposite quarter from acceptance test) be saved in a secure area, accurately marked, and be available for challenge sample testing. The specifications require that the challenge sample testing be done in the Regional Materials Laboratory or the State Materials Laboratory. When the Contractor makes a challenge it is expected that the split sample be sent and tested as quickly as possible. This will require that testing of these samples be prioritized. By expediting the challenge sample testing, problems that may exist in testing or with the material being produced can be identified and corrected lessening the impact to both the Contractor and WSDOT.

Test	Normal Range of Deviation	Maximum Range of Deviation
Sand Equivalent	± 8 points	± 15 points
Fracture	± 5 percent	± 10 percent
Uncompacted Void Content of Fine Aggregate	± 1.0 percent	± 2.0 percent
Asphalt Binder Content (HMA&ATB)	± 0.3 percent	± 0.6 percent
Sieve Analysis — All Items: No. 4 sieve and larger	± 5 percent	± 8 percent
No. 6 sieve to No. 80 sieve	± 3 percent	± 6 percent
No. 100 sieve to No. 200 sieve	± 2 percent	± 4 percent

In the table above, “Normal Range” indicates an acceptable range of variation between test results and no action is required. Test results that fall in this category will be so indicated by the wording “*normal deviation*” on the independent assurance test reports.

Test results falling outside of the “Normal Range” but within the “Maximum Range,” will be indicated by the wording “*questionable deviation*” on the independent assurance test reports. For deviations falling into this category, the Project Engineer or a representative shall review the original test report form, advise the responsible test operator of the deviation, and review the test procedure at the next opportunity. The IAI will take the same actions relative to the test operator in the region laboratory.

Test results exceeding the maximum range will be indicated by the wording “*excessive deviation.*” For deviations falling in the excessive category, the Project Engineer or a representative will notify the IAI and/or Region Construction Trainer for their services in corrective action. Corrective action involving both the field tester and the region laboratory tester will include review of sampling procedures, sample splitting procedures, testing procedures, and testing equipment.

The Project Engineer will document actions and results of these investigations by a notation or attachment to the independent assurance sample test report. The Independent Assurance Inspector shall document the actions and results of these investigations on the individual’s checklist evaluation with notations as to his/her findings in reviewing region lab procedures. Lacking any other actions, these results shall be considered in scheduling repeat evaluations of a tester and entered into the individual’s qualification record. These may include comments or findings by the Region Construction Trainer.

The focus of Independent Assurance sampling is based on individual tester’s activity and is not intended to provide independent assurance sample reports on all projects or on all materials on any particular project.

9-5.6 Tolerance Limits

Crushed Screenings $\frac{3}{4}$" — $\frac{1}{2}$" for B.S.T.	Specification Limits	Tolerance Limits
% Passing 1"	100	95-100
% Passing $\frac{3}{4}$ "	95-100	90-100
% Passing $\frac{1}{2}$ "	0-20	0-25
% Passing $\frac{3}{8}$ "	0-5	0-10
% Passing No. 200	0-1.5	0-2.0
Fracture	<u>90%</u> Min.	<u>85%</u> Min.

Crushed Screenings $\frac{5}{8}$" — No. 4 for B.S.T.	Specification Limits	Tolerance Limits
% Passing $\frac{3}{4}$ "	100	95-100
% Passing $\frac{5}{8}$ "	95-100	90-100
% Passing No. 4	0-10	0-15
% Passing No. 10	0-3	0-7
% Passing No. 200	0-1.5	0-2.0
Fracture	<u>90%</u> Min.	<u>85%</u> min.

Crushed Screenings $\frac{1}{2}$" — No. 4 for B.S.T.	Specification Limits	Tolerance Limits
% Passing $\frac{5}{8}$ "	100	95-100
% Passing $\frac{1}{2}$ "	<u>97</u> -100	<u>92</u> -100
% Passing $\frac{1}{4}$ "	0-15	0-20
% Passing No. 4	0- <u>5</u>	0- <u>10</u>
% Passing No. 10	0- <u>2</u>	0- <u>6</u>
% Passing No. 200	0-1.5	0-2.0
Fracture	<u>90%</u> Min.	<u>85%</u> Min

Crushed Screenings $\frac{3}{8}$" — US No. 4	Specification Limits	Tolerance Limits
% Passing $\frac{1}{2}$ "	100	95-100
% Passing $\frac{3}{8}$ "	70-90	65-95
% Passing No. 4	0-5	0-10
% Passing No. 8	0-3	0-7
% Passing No. 200	0-1.5	0-2.0
Fracture	90% Min.	85% Min

Crushed Screening $\frac{3}{8}$" — No. 10	Specification Limits	Tolerance Limits
% Passing $\frac{1}{2}$ "	100	95-100
% Passing $\frac{3}{8}$ "	<u>95</u> -100	<u>90</u> -100
% Passing No. 4	<u>0-35</u>	<u>0-40</u>
% Passing No. 10	0-10	0-12
% Passing No. 200	0-1.5	0-2.0
Fracture	<u>90%</u> Min.	<u>85%</u> Min.

Crushed Screenings No. 4 — 0" for B.S.T.	Specification Limits	Tolerance Limits
% Passing $\frac{3}{8}$ "	100	95-100
% Passing No. 4	76-100	71-100
% Passing No. 10	30-60	26-64
% Passing No. 200	0-10.0	0-11.0
Fracture	<u>90%</u> Min.	<u>85%</u> Min.

Ballast	Specification Limits	Tolerance Limits
% Passing 2½"	100	<u>95</u> -100
% Passing 2"	65-100	60-100
% Passing 1"	50-85	45-90
% Passing No. 4	26-44	21-49
% Passing No. 40	16 Max.	20 Max.
% Passing No. 200	9.0 Max.	10.0 Max.
Sand Equivalent	35 Min.	30 Min.
Dust Ratio		$\frac{2}{3}$ Max.

Shoulder Ballast	Specification Limits	Tolerance Limits
% Passing 2½"	100	<u>95</u> -100
% Passing 2"	65-100	60-100
% Passing $\frac{3}{4}$ "	40-80	35-85
% Passing No. 4	0-5	0-6
% Passing No. 100	0-2.0	0-2.9
Fracture	75% Min.	70% Min.

Crushed Surfacing Base Course	Specification Limits	Tolerance Limits
% Passing 1¼"	100	95-100
% Passing 1"	80-100	75-100
% Passing $\frac{5}{8}$ "	50-80	45-85
% Passing No. 4	25-45	20-50
% Passing No. 40	3-18	3-20
% Passing No. 200	7.5 Max.	9.0 Max.
Sand Equivalent	40 Min.	35 Min.
Fracture	75% Min.	70% Min.

Streambed Sediment	Specification Limits	Tolerance Limits
<u>% Passing 2½"</u>	<u>100</u>	<u>95-100</u>
<u>% Passing 2"</u>	<u>65-95</u>	<u>60-100</u>
<u>% Passing 1"</u>	<u>50-85</u>	<u>45-85</u>
<u>% Passing No. 4</u>	<u>26-44</u>	<u>11-48</u>
<u>% Passing No. 40</u>	<u>16 max.</u>	<u>18 max.</u>
<u>% Passing No. 200</u>	<u>5.0-9.0</u>	<u>3.0-10.0</u>

Crushed Surfacing Top Course	Specification Limits	Tolerance Limits
% Passing ¾"	100	95-100
% Passing ½"	80-100	75-100
% Passing No. 4	46-66	41-71
% Passing No. 40	8-24	5-27
% Passing No. 200	10.0 Max.	11.0 Max.
Sand Equivalent	40 Min.	35 Min.
Fracture	75% Min.	70% Min.

Maintenance Rock	Specification Limits	Tolerance Limits
% Passing ⅝"	100	95-100
% Passing ½"	90-100	85-100
% Passing No. 4	45-66	40-71
% Passing No. 40	10-25	8-30
% Passing No. 200	7.0 Max.	8.0 Max.
Sand Equivalent	40 Min.	35 Min.
Fracture	75% Min.	70% Min.

Gravel Base	Specification Limits	Tolerance Limits
% Passing 2"	75-100	70-100
% Passing No. 4	22-100	17-100
% Passing No. 200	10.0 Max.	11.0 Max.
Sand Equivalent	30 Min.	35 Min.
Dust Ratio	⅓ Max.	

Gravel Backfill for Walls	Specification Limits	Tolerance Limits
% Passing 4"	100	100
% Passing 2"	75-100	70-100
% Passing No. 4	22-66	17-71
% Passing No. 200	5.0 Max.	6.0 Max.
Sand Equivalent	60 Min.	55 Min.
Dust Ratio	⅓ Max.	

Gravel Backfill for Pipe Zone Bedding	Specification Limits	Tolerance Limits
% Passing 1½"	100	100
% Passing 1"	75-100	70-100
% Passing ⅝"	50-100	45-100
% Passing No. 4	20-80	15-85
% Passing No. 40	3-24	2-29
% Passing No. 200	10.0 Max.	11.0 Max.
Sand Equivalent	35 Min.	30 Min.

Gravel Backfill for Drains	Specification Limits	Tolerance Limits
% Passing 1"	100	95-100
% Passing ¾"	80-100	75-100
% Passing ⅝"	0-40	0-45
% Passing No. 4	0-4	0-5
% Passing No. 200	0-2	0-2.5

Gravel Backfill for Drywells	Specification Limits	Tolerance Limits
% Passing 1½"	100	95-100
% Passing 1"	50-100	45-100
% Passing ¾"	0-20	0-25
% Passing ⅜"	0-2	0-3
% Passing No. 200	0-1.5	0-2.0

Backfill for Sand Drains	Specification Limits	Tolerance Limits
% Passing ½"	90-100	85-100
% Passing No. 4	57-100	52-100
% Passing No. 10	40-100	35-100
% Passing No. 50	3-30	2-35
% Passing No. 100	0-4	0-5
% Passing No. 200	0-3.0	0-3.9

Sand Drainage Blanket	Specification Limits	Tolerance Limits
% Passing 2½"	90-100	85-100
% Passing No. 4	24-100	18-100
% Passing No. 10	14-100	9-100
% Passing No. 50	0-30	0-35
% Passing No. 100	0-7	0-8
% Passing No. 200	0-3.0	0-3.9

Gravel Borrow	Specification Limits	Tolerance Limits
% Passing 4"	100	95-100
% Passing 2"	75-100	70-100
% Passing No. 4	50-80	45-85
% Passing No. 40	30 Max.	33 Max.
% Passing No. 200	7.0 Max.	9.0 Max.
Sand Equivalent	50 Min.	45 Min.

Select Borrow	Specification Limits	Tolerance Limits
% Passing 6"	100	95-100
% Passing 3"	75-100	70-100
% Passing No. 40	50 Max.	55 Max.
% Passing No. 200	10.0 Max.	12.0 Max.
Sand Equivalent	30 Min.	25 Min.

Foundation Material Class A	Specification Limits	Tolerance Limits
% Passing 2½"	98-100	93-100
% Passing 2"	92-100	87-100
% Passing 1½"	72-87	67-92
% Passing 1¼"	58-75	53-80
% Passing ¾"	27-47	22-52
% Passing ⅜"	3-14	2-16
% Passing No. 4	0-1	0-2

Foundation Material Class B	Specification Limits	Tolerance Limits
% Passing 2½"	95-100	90-100
% Passing 2"	75-100	70-100
% Passing 1½"	30-60	25-65
% Passing 1¼"	0-15	0-17
% Passing ¾"	0-1	0-2

Hot Mix Asphalt	Specification Limits	Tolerance Limits
Asphalt Binder-Performance Grade (PG)	AASHTO M320	±10% of spec
Fracture	90% min.	85% min.
Uncompacted Void Content of Fine Aggregate < 3 million ESAL's	40% min	35% min
≥ 3 million ESAL's	44% min	39% min
Sand Equivalent	45 min.	40 min.

SOP 729	WSDOT	In Place Density of Bituminous Mixes Using the Nuclear Moisture-Density Gauge FOP for WAQTC TM 8
SOP 730	WSDOT	Standard Operating Procedure for Correlation of Nuclear Gauge Determined Density with Hot Mix Asphalt Cores
SOP 731	WSDOT	Standard Operating Procedure for Method for Determining Volumetric Properties of Hot Mix Asphalt
SOP 733	WSDOT	Standard Operating Procedure for Determination of Pavement Density Differentials Using the Nuclear Density Gauge
SOP 734	WSDOT	Standard Operating Procedure for Sampling Hot Mix Asphalt (HMA) after Compaction (Obtaining Cores)
SOP 735	WSDOT	Standard Operating Procedure for Longitudinal Joint Density
<u>C</u> 805	WSDOT	Rebound Hammer Determination of Compressive Strength of Hardened Concrete
T 813	WSDOT	Field Method of Fabrication of 2-in. Cube Specimens for Compressive Strength Testing of Grouts and Mortars
T 914	WSDOT	Practice for Sampling of Geotextiles for Testing
<u>C</u> 939	WSDOT	FOP for ASTM for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method)
D 1186	WSDOT	Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base
<u>C</u> 1611	WSDOT	FOP for ASTM for Slump Flow of Self-Consolidating Concrete
<u>C</u> 1621	WSDOT	FOP for ASTM for Passing Ability of Self-Consolidating Concrete by J-Ring
D 4791	WSDOT	FOP for ASTM for Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate

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10-1 General

10-1.1 Introduction

This chapter is intended to provide a reference and to act as guidance for the project office in the keeping of Construction Contract Records. While there may be differing needs or circumstances that must also be met within each project office, it is intended that this guidance be used to help identify the minimum requirements that are necessary in order to establish an adequate method of record keeping. These minimum requirements also help to establish a basic level of uniformity among all project offices statewide. This can help to facilitate the review of records by others and promotes greater efficiency when engineering personnel are transferred or reassigned between different projects or even different project offices. If a clear method of record keeping can be identified prior to the beginning of work, then original field notes and records can be easily prepared and maintained as the work progresses. This will also help to reduce the effort required to produce the final contract records upon completion of the project.

Successful contract documentation requires that measurements and calculations supporting contract payments are accurate and that records of these actions are complete. Contract records and documentation must be sufficiently detailed and maintained in a manner that will withstand an audit and be clear enough to be read and understood by anyone unfamiliar with the project. The Project Engineer is responsible to ensure that these accurate and complete records are maintained for all construction project work. If questions arise or assistance is needed, the statewide Documentation Engineer and the Regional Documentation Engineer are both available as resources for the Construction Project Office's use.

It is recommended that original field notes be kept in a form that can be filed and retained as basic documentation. Field notes taken on scratch paper and then passed to the office should not be considered as acceptable documentation. Transcription of field notes to final record form should be avoided due to the possibilities of error and the unnecessary cost of duplication.

All personnel are responsible to ensure that notes are made correctly and are complete with all pertinent information. Sample notes have been included with this chapter and are intended as a guide or reference in preparing final record notes.

Facsimile machines, scanned documents, and electronic mail are normal business practices in most state and private offices. It is acceptable to take action on these types of correspondence; however, in order to properly document and follow the conditions noted in the contract, exchanging or mailing original copies of the documents should follow up all facsimile, scanned documents, and electronic mail. This is especially true for any item that requires a commitment

by either the Contractor or the Washington State Department of Transportation (WSDOT). Follow up mail copies are required for all issues that require an original signature.

Documents which must stand up in a court of law or meet the requirements of a State or Federal Audit require a signature.

A signature, whether digital, electronic, or hand-written, is primarily a symbol signifying intent and identifying those who worked on the documentation record. Now that we are conducting a substantial portion of our business via the computer, each individual should become familiar with those documents which require an original signature and which are acceptable with a printed/computer generated name.

Chapter 11 of the *Construction Manual* lists the various electronic construction forms made available by WSDOT. These forms may be used to record, document, and make payment for construction activities and materials on WSDOT construction projects. The forms are categorized by:

- those persons responsible for completing the form (e.g. project office, Contractor, Materials Lab, etc.) and;
- whether an original signature is required or a printed/computer generated signature is acceptable.

The State Construction Office encourages the project offices to utilize electronic resources to aid them in their work, and does not wish to stifle creativity in the use of those electronic media. However, it is important to be able to identify an original document, who created it, and to maintain a consistent approach to documentation throughout the State in order to meet the requirements of the contract, an audit or a court of law. Keep in mind that as much as we may wish to have a paperless project, it is very unlikely to occur in the near future. The use of electronic records and signatures is voluntary. Government agencies that accept electronic records and signatures must also accept paper documentation from citizens and businesses, unless otherwise provided by statute.

10-1.2 Requirements for Notes

Documentation of contract items that are not specifically covered by the sample field notes can, in most instances, be created using the examples as a guide for similar items. The following notations should be carefully observed for correct procedure:

1. Each set of notes should contain the date when they were made and the initials of the persons making them.
2. Each set of notes, except staking notes, should contain the date when the phases of work are accomplished, the initials of the persons who compute and check the quantities noted, the dates when the quantities were computed, the dates when the computations were subsequently checked, the locations where the work was performed, and the corresponding group number.

3. When field notes are used as the basic source document in supporting a payment to the Contractor, they must include the date and initials of the person making the entry into the project ledger, the person verifying the entry, and the six-digit entry number.
4. Each pay quantity identified in the field notes should be designated with the corresponding item number and correct item name listed in the contract.
5. It is recommended that the correct field book or loose leaf sheet always be used for the particular kind of work being staked or measured.
6. The degree of accuracy required for computing unit quantities should be consistent with standards established in Chapter 10-2.1B.
7. It is recommended that sets of field notes and field books be numbered and titled in order to prevent their loss and to aid in tracking payments and their supporting information.

10-1.3 Source Documents

Field notes are one of the many items that might be considered as a Source Document. It is recommended that all field notes, base line notes, centerline notes, and grade books be recorded in bound books. If looseleaf books are to be used, care must be exercised to prevent lost pages.

Notes should be recorded in a manner that is neat, clear, uncrowded, and in sufficient detail so as to be easily understood.

Original entries later determined to be in error must Not be obliterated by erasing, application of correction fluid, taped over, or in the case of computer generated documents, deleted. Instead, a line should be cleanly drawn through the mistaken entry and corrections entered directly above with the initials of the person making the change. This is very important, as erasures, or deletions will destroy the legal standing of notes. When revisions require abandonment of a considerable portion of notes, they shall be crossed out and a cross reference made of the book and page number where the revised notes may be found.

Each Final Records book should be labeled and contain a title page using Forms 422-009 EF and 422-009B EF. Each book is to be numbered and a table of contents included on the first page following each book's title sheet. It is essential that original field notes and documents be carefully organized, kept, recorded, and maintained in safe filing facilities during the active stage of a project. These documents should be transferred to safe, adequate, and recoverable storage after the contract is completed. At all times, when not in use, all source documents, reports, survey notes, etc., should be kept in fire resistant files where possible. Additional information on source documents can also be found in Section 10-4.2 of this chapter.

10-2 Measurement of Items of Work

10-2.1 General

10-2.1A Introduction

It is essential that the Project Engineer ensure proper controls are exercised when measuring items of work. The Project Engineer should also ensure that payments are not made for any item that cannot be substantiated by the project records regardless of the work's stage of completion. Items that are paid on the basis of weight or truck volume require measurement of the quantities involved, evidence for receipt of the materials, and documentation for both of these operations through the use of item quantity tickets or other delivery records.

10-2.1B Quantity Details

The number of significant decimal places to which quantities should be measured and/or computed varies with the value or unit bid price of the respective items involved. Unless advised otherwise, the Project Engineer should use the following guidelines.

Bid Price	Significant Decimal Per Unit
Less than \$10 per unit	1.
From \$10 to \$100 per unit	0.1
Over \$100 per unit	0.01

Quite often, good practice would dictate that the various parts of a particular quantity be calculated to a higher significant decimal place or in some other unit, a unit other than that used for payment, and then be converted to the payment unit in the summation. Good judgment should be used in selecting when to actually apply rounding to the quantity. In general, it is considered proper to apply rounding at the first summation of each isolated part. For example, at the summation of a day's item quantity tickets the quantity to be recorded should be rounded to the proper significant decimal place and the rounded quantity recorded into the project ledger.

10-2.1C Item Quantity Ticket

A three part Item Quantity Ticket (IQT), Form 422-021, has been developed for use as a tool in documenting the many items that are paid for on the basis of quantities of materials or other bid item services that are received at the project site. An example of an IQT can be found in Figure 10-1. When using either the State provided IQT or Contractor provided IQT, the Project Engineer should ensure that the items noted below, identified as minimum required information for documenting receipt of materials and for supporting payment of those materials, are completely filled out on each IQT utilized. Additional information may be added to the item quantity tickets at the option of the Project Office. However, this additional information would be intended only as a convenience for project staff in their work monitoring

material use. The Project Engineer should also ensure that the carrier transporting each load of material or the person responsible for the particular contract bid item or service is issued an item quantity ticket for each delivery of the material or service to the jobsite.

In lieu of using Form 422-021, tickets may also be furnished by the Contractor, commercial scale companies, or suppliers at commercial plants or material sources. These tickets are sometimes electronically produced. In some instances these tickets can be programmed in advance of the hauling to accurately print, on each ticket, the minimum required information as noted below. While this can be done by the contractor in an effort to cooperate with the Project Office towards successful completion of the project, the Project Engineer must ultimately ensure that the minimum required information is accurately noted on each ticket.

The following minimum required information is to be recorded on each State-provided IQT, Contractor provided IQT, or IQT's produced by fully automated scales:

- Contract Number
- Date
- Contract Unit Bid Item No.
- Initials of person accepting the item on the jobsite
- Unit of measure
- Identification of hauling vehicle, as appropriate
- Record of the gross, tare, and net weights. If the scale has a tare beam so that the net weight can be read directly or when using batch plants or storage silos with direct reading scales, only the net weight need be recorded. If the unit of measurement is cubic meters, cubic yards, hours, etc. only the net amount need be recorded.

In addition to this minimum required information, there are a number of other items that could also be included on the item quantity tickets. While this information is helpful to others who may also be using these same tickets for monitoring materials, materials placement, or other issues, this additional information is not required for documentation supporting payment for materials received. Placing this information on item quantity tickets can be helpful, but is solely at the option of the Project Office. Some of these optional items may include:

- The Group, Station, Mile, or Kilometer of material placement or use can be noted to help identify material's location on the jobsite. It can also be used to help identify group payment.
- Contractor/Subcontractor completing the work represented by the ticket noted.
- Cumulative totals for the day.
- Pit number identifying the source of the material.
- Time weighed and initials of the person issuing the ticket.
- Time materials or services are received on the jobsite.

- Description of the material that matches the unit bid item name.
- Ticket serial number, etc.

A representative of WSDOT should be assigned as a receiver at the delivery site or at the site where the item is to be placed. The receiver should collect the tickets from the carrier upon delivery of the ticketed material, record any required or additional information on the ticket as necessary, and retain the original copy for payment. When using Contractor or State provided multiple part tickets, the Contractor's representative should be provided the copy marked "Contractor" either upon delivery or at the end of each day's operation.

For materials or services that are not paid for by weight, the receiver should complete the ticket at the point of delivery. The appropriate items identifying the material or bid item service, the quantity, and its placement should then be filled in.

Payment and documentation of materials received should be based on the original tickets received at the project site. Any tickets that may be identified as missing should be reconciled immediately with the Contractor so they will not be in contention for payment at a later date. Unless the Project Engineer decides otherwise, when using the State provided item quantity tickets it is not necessary to retain the goldenrod or "Book" copy. Once the Contractor has been provided with the green copy of the ticket marked "Contractor" and the white copy of the ticket marked "Original" has been reconciled and approved for payment, the goldenrod or "Book" copy may be discarded.

10-2.1D Conversion Factors

Where the plans require a weight measurement for minor items of construction, the contractor may request permission to convert volume to weight. When approved by the engineer, an agreed factor may be used to make this conversion and volume may be used to calculate the corresponding weight for payment. The provisions for this conversion factor can be found in Section 1-09.2(5) of the *Standard Specifications*. When using a conversion factor the Project Engineer must perform adequate tests and retain supporting data establishing the conversion factor or new price quotation. A letter of agreement or change order for the conversion factor is needed.

10-2.2 Items Measured by Weight

10-2.2A General Instructions

All materials paid on the basis of weight are to be weighed in accordance with the provisions of the *Standard Specifications* by a representative of WSDOT or at commercial scales operated by a commercial scale operator. When commercial scales are used a representative of WSDOT will periodically observe the weighing operation and scale check procedures. These periodic reviews are to be unscheduled and not less than twice a week. Both WSDOT and commercial scale operators will record the necessary weights and information on Item Quantity Tickets in accordance with Chapter 10-2.1C of this manual.

In accordance with Section 1-09.2(1) of the *Standard Specifications*, WSDOT and commercial scale operators will test the scales at least once daily. Several times each day the operator will also make certain the scale balances and returns to zero when the load is removed. The results of scale testing conducted by both WSDOT and commercial scale operators including determination of scale variance, AM/PM tare weights where needed, and intermittent scale balancing are to be recorded for each day's production on the Scaleman's Daily Report Form 422-027 EF. These reports representing each day's production are to be submitted to the engineer daily.

When platform scales are used the scale platform shall be of sufficient length to weigh the entire hauling vehicle or combination of connected vehicles at one time. When needed for gross weight determinations, tare weights for each truck are to be taken at least twice daily and recorded on a tare sheet, scaleperson's diary, or shown on the Scaleman's Daily Report. When using a tare beam scale, the tare weight for each individual truck is to be set on the beam at the time of weighing.

For most materials, material and tare weights will be measured to the nearest 100 pounds (50 kilograms). In determining quantities for materials produced from batch type mixing plants, where individual components of each batch of materials are weighed before mixing, the batch weights are acceptable for measurement and payment.

When placing surfacing materials, gravel backfill, riprap, and other similar materials the preferred method for acceptance of quantity is by Item Quantity Tickets. However, where it is reasonably certain that no diversion or substitution of materials can occur, or where an alternative method of calculating the approximate quantity received can be devised, the requirement for issuing and receiving a weight ticket for each individual truckload can be waived. The Project Engineer must approve the use of this procedure in advance of the hauling operation and document to the file the reasons for doing so. In making this decision the Project Engineer should review the risks and the benefit/costs for altering the standard method for receipt of materials. Among other things, this review could include labor savings, the proximity of the scale location to the point at which the materials are to be received, the potential or risk for diversion or substitution of materials, efforts made to mitigate those risks, as well as the methods used to verify the quantities of materials that are received. If an alternate method for receipt of materials is approved it must include provisions for keeping a scale sheet where the weights for each load are recorded along with the other information normally required for an Item Quantity Ticket. The method must also include a procedure for validating the quantities indicated by the dispatch record as being received. This might be a tally sheet, maintained at the project site, showing the arrival of each load. Another method might be a calculation of neat-line volume, which could be compared with weighed quantity to disclose a reasonable conversion factor. In any method, an occasional random check of a loaded vehicle will be needed to provide validation of both the weigher and the scale.

10-2.2B Weighing of Small Quantities

It is recognized that there are certain instances involving small quantities of weighed materials where commercial scales are not reasonably available or where the Project Engineer is unable to staff a WSDOT scale operator to weigh materials at a contractor provided scale. In these instances where materials are received intermittently throughout the day and the quantities amount to less than 200 tons (tonnes) of untreated materials or 100 tons (tonnes) of treated materials per day, the Project Engineer may choose to receive the material on the basis of weights supplied by the Contractor or supplier. The Project Engineer should ensure that an Item Quantity Ticket is filled out completely and signed by the person who is the weigher of the material. A Scaleman's Daily report is not required for the weighing of these small quantities of materials. Under these conditions, the acceptance of the material will depend entirely on the judgment of the receiver. The receiver of the material should observe the load to ensure the quantity of material shown on the weight ticket appears to be reasonable. The receiver should note this observation in the remarks section on the weight ticket supplied by the Contractor.

The Project Engineer should use their professional judgment in limiting the use of contractor provided weights. This provision is provided to the engineer so that effective scheduling of WSDOT forces can be made in order to meet other project inspection demands. Every effort should be made to use either a WSDOT or a commercial scale operator while limiting the use of this provision to only those instances that require this action.

10-2.2C Weighing Equipment

Scales for the weighing of natural, manufactured, or processed highway and bridge construction materials that are required to be proportioned or measured and paid for by weight, are to be furnished, erected, and maintained by the Contractor, or be permanently installed, certified, commercial scales. All weighing equipment and scale operations must meet the specific requirements noted in Section 1-09.2 of the *Standard Specifications*.

10-2.3 Items Measured by Volume

10-2.3A Truck Measure

Except as noted below, when materials are measured and paid on the basis of volume delivered in trucks, the Project Engineer should ensure that a receiver is assigned at the point of delivery to issue or receive load tickets and to make periodic computations of yield where applicable.

Item Quantity Tickets (see Chapter 10-2.1C) should be used for recording the volume of materials paid on the basis of truck measure. The tickets should include all information previously noted as required for materials measured by weight, with the substitution of measured volume in place of measured weight to be shown as the quantity received.

Surfacing Material, Gravel, Topsoil, etc.

In lieu of issuing individual load tickets when surfacing materials, gravel backfill, top soil, etc., are measured and paid for on the basis of volume delivered in trucks, it is acceptable for the Project Engineer to maintain a field book record showing a recording for each delivery, issuing one ticket for the total amount delivered for each item at the end of each work shift. The field book record will show the truck number, time of delivery, and volume for each load. The ticket issued shall show all pertinent data including reference to the field book number.

In documenting the size of loads received, ensure the following procedures are followed:

1. The volume of the truck box of each hauling conveyance will be calculated and recorded for final records to the nearest 0.1 cubic yard (cubic meter) based on a struck or water level height for the leveled load. The volume may be calculated by using a measurement of the truck box (either from the interior or exterior of the bed) using any standard measurement method. This measurement may be performed by a representative of the Engineer or by the Contractor, as verified by the Engineer. The calculation may also be made based upon verified Manufacturer's truck bed dimensions supplied to the Contractor by the Manufacturer, or by filling the truck bed and measuring the volume of a full load after it is dumped. Although state law requires 6 inches (152 millimeters) of freeboard on loaded aggregate material trucks, the actual quantity hauled or calculated may exceed the measured capacity. This is due to the normal practice of heaping material in the center of the load.
2. The material receiver should have sufficient loads leveled at the point of delivery in order to judge consistency in the quantity being hauled.
3. Load volume will be recorded to the nearest cubic yard (0.5 cubic meter) for pay purposes using the volume computed in part (1) above. If the Inspector questions whether a truck is fully loaded, the load will be leveled. If the vehicle is not fully loaded, the Inspector will measure and document the actual load to the nearest cubic yard (0.5 cubic meter).

Water

In order to document the amount of water delivered to the project, a Water Delivery Record, Form 422-024, should be maintained showing all pertinent information including time, volume, location of delivery for each load, contract number, and truck number. If the driver maintains the Water Delivery Record, it should be signed by the truck driver or the Contractor and initialed by the Inspector. Daily spot checks should also be completed verifying the quantities being delivered. When performed, random spot checks should be noted on the Delivery Record itself. At the end of each work shift an Item Quantity Ticket should be issued to cover the water delivered to the project that day. The Water Delivery Record should be maintained in a manner that allows it to be easily referenced to the corresponding WSDOT copy of the Item Quantity Ticket used for payment.

The Project Engineer should ensure that the capacity of each water truck is determined by measuring or weighing, and is recorded in the project records. It is recommended that copies of the truck identification and capacity records be attached to the water ticket book to ensure the information is available to the field Inspector.

When water meters are installed at the discharge point for hydrants or water trucks, the Inspector should record the meter reading at the beginning and end of each shift and issue a ticket for the net quantity of water placed in accordance with contract specifications for the item. The Project Engineer should also ensure that the meters are checked for accuracy and that the checks are recorded in support of payment documentation.

10-2.3B Cross-Sections

Many excavation items are measured by field cross sections and/or template notes. The Project Engineer should ensure that the project is staked and measured accurately in accordance with guidance noted in the "Basic Surveying" manual and utilizing sound engineering practices. As a minimum, the field notes should show the date the data was taken, weather, Crewmembers, and their assigned duties. When re measurements are required, it is important that the same base line and elevation datum be used.

Documentation of volume measurement for excavation areas which require original and final measurements, should contain cross references between the original notes and the re-measure notes. Also references should be made to the transit notes and elevation datum for that excavation area.

10-2.3C Neat Line Measurement

Some items, such as concrete volumes, are paid based on dimensions detailed in the plans. For these items, the quantities need to be calculated and the calculations made a part of the record. If additional sketches or dimensions are also required in order to compute the quantities, these should be included in the records as well.

Other items, such as structure excavation and gravel backfill, are measured for payment using neat line volumes based on plan dimensions as a maximum limit. These items require field measurement to determine pay quantities that may be less than neat line maximums. Many times, sketches with the dimensions shown are desirable. The dimensions should show the limits of the actual work, except when these limits exceed the maximum allowed for payment, then the dimensions should be limited to the maximum allowed.

10-2.4 Items Measured by Hour/Day

When contract items are to be measured and paid for on an hourly or daily basis, the Project Engineer is to ensure that a WSDOT representative is assigned to verify the hours or days of payment, and issue Item Quantity Tickets or other verified field note records. At least one ticket should be issued at the end of each work shift or working period. The Project Engineer should ensure that tickets show all pertinent information for the item involved. Some items measured by the hour may be eligible for payment during non-shift hours; for example, a 24-hour flashing arrow used for lane closures

or detours in effect during nonworking hours. In these situations, an Item Quantity Ticket for one shift may show more hours for payment than are actually available within the shift.

In order to ensure agreement on the hours or days of work performed, Item Quantity Tickets for items of work measured by the hour or by the day should be initiated by the Inspector and signed by the Contractor's representative on a daily basis.

10-2.5 Items Measured by Lump Sum

For items that are to be paid on a Lump Sum basis, the project records should identify the item, the date that the material was received, and/or the date work was accomplished. This can be accomplished by ensuring that a field note record is made showing the dates work was performed, has the initial of the Inspector, and shows the work to be 100 percent complete. A field note should also be used to show any estimated portions for progress payment of a Lump Sum amount prior to 100 percent completion. It must include the basis on which any quantities used for progress estimate payments were calculated.

10-2.6 Items Measured by Other Units

10-2.6A Linear Measurement

Records for materials measured by length should show the length measured, initials of the persons making the measurements, and the date measured.

For features, such as guard rail and barrier, that are paid by length and which contain repetitive elements or units, the length may be "measured" by calculation. In other words, if the length of a single element is known, then the number of elements may be counted and multiplied by that amount and a total "measured" length determined. Care should be taken to account for odd length elements, such as end sections and custom-fabricated pieces, and for areas where elements overlap or gaps exist.

Records for measurement should also include the beginning and ending stations of the work, recorded by the Inspector or person making the measurement, tying the work to its location on the project. The dates of construction should also be recorded.

10-2.6B Area Measurement

Records for materials or work measured by area should show the length and width measured or otherwise determined, initials of the persons making the measurements, and the date measured. In many instances a sketch of the area with the measurements would be very helpful in showing the computed area. The dates of construction should also be recorded.

10-2.6C Per Each Measurement

Records for materials or work measured per each unit should provide a listing showing the location of each item constructed, dates constructed, and initials of the Inspector or person measuring the item.

10-2.7 Items Bid at "No Charge"

Normal documentation procedures are not required for items bid at "no charge" if the items do not physically constitute a portion of the finished work. However, notes in the diary or Inspector's Daily Report are necessary to show when the work was done. Examples of these items might include water, haul, and embankment compaction.

For items bid at "no charge" which physically constitute a portion of the finished work, normal documentation procedures, such as Item Quantity Tickets or cross sections, are required to show how the item was incorporated into the project. Examples of these items might include layering materials and prime coat aggregate.

10-3 Final Records for Projects Constructed by Contract

10-3.1 Records

These records consist of field books, Inspector's record of field tests, project and Inspector's diaries, Inspector's Daily Reports, invoices, weigh bills, contaminated material disposal bills, Item Quantity Tickets, receiving reports, project ledgers, mass diagrams, plotted cross-sections, computer listings, working profiles, and any other documents that could be considered a basis of payment for work performed or materials furnished. All records that are created during the administration of a construction project can be placed in one of two categories, *Permanent Records*, records kept by the Headquarters and State Archives for future reference, and *Temporary Records*, records kept by the Region for a limited period of time after which they are discarded by the Region.

10-3.1A Permanent Records

The Region should ensure that those records designated as *Permanent Records*, records that are to be permanently filed, are assembled as a portion of the overall project final records and are submitted to Headquarters, Engineering Records for filing. All final records sent to Headquarters for filing will be kept permanently as the Permanent Final Records for the completed project.

All final record books prepared for *Permanent Final Records* are to be numbered as outlined below.

Permanent Records consist of the following:

Records provided by Headquarters:

- Contracts
- Change Orders
- Contract Estimate Payments

Records provided by the Project Office in books numbered as follows:

- Final Record Book Number 1
- Project Engineer's Diary – Book Number 2
- Inspector's Daily Reports – Book Number 3

- Traffic Control Reports – Book Number 4
Contractors Daily Report of Traffic Control and Traffic Surveillance
- Pile Driving Records – Book Number 5
- Post Tensioning Records – Book Number 6
- Contaminated Material Disposal Bills – Book Number 7
- Miscellaneous Records – Book Number 8
- As Built Plans and Completed Contractor Provided Shop Drawings

10-3.1B Temporary Final Records

All records designated as *Temporary Final Records* are to be retained within the Region for a period of three years after which they may be destroyed. If a claim, lawsuit, or other circumstance is found to be pending at the end of this three year period, the Region should further retain those pertinent records until the issues have been resolved. The Region should ensure that those records designated as *Temporary Final Records* are also assembled as a portion of the overall project final records. The date for the beginning of this three year retention period for State-funded projects is the Acceptance Date; the date the State Construction Engineer signs the Final Contract Voucher Certification accepting the project. If Federal funds are involved in the project, the date for the beginning of this three-year retention period is the date that FHWA accepts the final payment voucher. The Headquarters Records Services will send a copy of Retention of Records on Federal Aid Projects (DOT Form 133-072) to the Region that specifically indicates the starting and ending dates for this period.

The following list contains some of the items that may be kept as *Temporary Final Records*. This listing is not a complete listing of all the possible items that could be grouped into this category. In short, *Temporary Final Records* consist of all project records that are not kept as *Permanent Final Records*. If *Temporary Final Records* are kept in numbered books then, in order to eliminate confusion with *Permanent Final Records*, these books are to be numbered consecutively beginning with Book Number 8. Examples of *Temporary Final Records* include:

- Item Quantity Tickets
- Project Engineer's Copy of Estimates
- Project Correspondence
- Inspector's Record of Field Tests
- Scaleman's Diary and Scale Checks
- Scale Test Reports
- Concrete Pour Records
- Record of Field Audits
- Approval of Source of Materials
- Quantity Computation Sheets
- Surfacing Depth Check Records
- Prints of Shop Drawings

- Contractor's Payrolls (Federal Aid Projects)
- Source document files
- Alignment (Transit) Book
- Grade Book
- Cross-Section Notes
- Drainage Notes
- Photographs
- Mass Diagrams
- Computer Summary Sheets
- Computer Listings
- Falsework and Form Plans
- Daily Report of Force Account Worked
- Quarterly Report of Amounts Credited DBE

Participation

- Annual Report of Amounts Paid as MBE/WBE Participation
- Washington State Patrol Field Check list

10-3.1C Electronic Documents Filed with Temporary/Permanent Records

Documents created electronically that do not require an original signature may be kept in an electronic file cabinet during the life of the contract, and if they are not part of the permanent records, they may be placed on a CD and included in the temporary files. No hard copies are necessary.

Documents created electronically that require an original signature and which are to be included in the permanent final records package may be kept in an electronic file cabinet during the life of the contract; however, original hard copies must be provided as part of the permanent records package. CDs are not acceptable.

Documents created electronically that require an original signature and which are not part of the permanent final records package may be kept in an electronic file cabinet during the life of the contract, placed on a CD for the temporary files and the original hard copies destroyed at contract Acceptance or at the end of the three-year retention period

10-3.2 Contracts

The original signed contract documents are maintained in the Contract Processing Section of the State Accounting Services Office during the active stage of a contract. After final payment has been made, Accounting sends these documents to Records Services for permanent filing.

10-3.3 Change Orders

Approved change orders are a legal part of the contract documents and are treated just like the original contract documents. For a complete discussion of change orders, see Chapter 1-2.4C.

10-3.4 Contract Estimate Payments

Documentation of contract estimate payments is facilitated by use of the electronic Contract Administration and Payment System (CAPS) which includes both the monthly progress estimates and the final estimate. For a complete discussion of the contract estimate process, see Chapter 1-3.1. Specific information on the final estimate package is found in Chapter 1-3.1D. After final payment has been made, Accounting sends these documents to Records Services for permanent filing.

10-3.5 Final Record Book No. 1

Final Record Book No. 1 is the first book of the *Permanent Final Records* for a construction contract. It contains indices to the records that have been compiled for both *Permanent and Temporary Final Records*. It also identifies the people who worked on the project and provides specific summary information. Final Record Book No. 1 is to be signed by the Regional Administrator or designee. Final Record Book No. 1 should contain a title sheet, Form 422 009 EF, and should be assembled with a semi rigid, water resistant cover.

The following records are to be incorporated into Final Record Book No. 1 in the order as arranged below. No other material is to be included in this book.

1. *Index*. There are two indices referred to within Final Record Book No. 1. The first is an index or detailed listing showing the various sections of Final Record Book No. 1 itself. An example of an index for Final Record Book No. 1 can be found in Figure 10-2. The second index is actually the first section of the book. It provides a detailed listing of all records that have been kept and assembled for the project, including both *Permanent Records* and *Temporary Records*. An example of this listing or index for Section 1 can be found in Figure 10-3.
2. *WSDOT Personnel List*. Section 2 of Final Record Book No. 1 contains a listing of all WSDOT personnel assigned to the project and their classifications. Each person noted should place their identifying signature and initials after their name on the listing in the same manner as it appears in other final record documents. The project office may use WSDOT Form 422-001 EF Project Personnel Signature Listing for this purpose.
3. *Comparison of Quantities*. Section 3 of Final Record Book No. 1 contains this CAPS report prepared from the Final Estimate.
4. *Final Estimate Sheets*. Section 4 of Final Record Book No. 1 contains a copy of the Final Contract Voucher Certification.
5. *Contract Estimate Payment Totals*. Section 5 of Final Record Book No. 1 contains a copy of this report obtained from the final estimate.
6. *Affidavit of Wages Paid*. Section 6 of Final Records Book No. 1 contains all Affidavit of Wages Paid received from the Contractor, subcontractors, lower tier subcontractors or suppliers performing work or providing certain products to the project.

7. *Change Orders*. Section 7 of Final Records Book No. 1 contains a listing of all Change Orders prepared for the completed project.

8. *Record of Construction Materials*. Section 8 of Final Records Book No. 1 contains a tabulation showing the source of all construction materials. If material of a certain type was obtained from two or more sources, the station limits or parts of a structure relative to each source should be shown. Depending on the size of project and the method used to record this activity, a copy of the completed Record of Materials (ROM) or a summary from the contract's ROM database may satisfy this requirement. This is an acceptable method as opposed to preparing a separate or duplicate listing.

When preparing the individual Final Record Books, other than Book No. 1, it is not necessary to label pages within each book. Where it is appropriate, a table of contents may be added to identify sections within a particular book.

10-3.6 Diary Records

Diary records consist of both the Project Diary(s) and the Inspector's Daily Report (IDR). Together they should provide a complete narrative picture of the project, covering both the normal work processes and anything unusual that might have occurred on the project. Diary records are to be included in the project's *Permanent Final Records*.

10-3.6A Project Engineer's Diary

A complete, well-kept Project Diary is a valuable administrative tool. It is a collection point for many of the project's pertinent facts arranged in any chronological order. It may show how questions were answered, how problems were solved, progress of the work, and unusual conditions pertaining to working days charged. It can provide data for analysis of both claims and requests for extensions of contract time. It is also available for reference long after the work is completed.

The Project Engineer should ensure that a Project Diary is kept current for every construction contract. It is recommended that the Project Diary be maintained primarily by the Project Engineer. However this responsibility may be delegated to the Assistant Project Engineer or to the Chief Field Inspector. At a minimum, one Construction Project Diary is required for each project. The Project Diary should be used to record all matters of importance which are not covered by other routine reports or may contain a record of routine matters if the circumstances are unusual, conferences with the Contractor or the Contractor's field representative, agreements made, special notes regarding equipment or organization, labor conditions, weather or other causes for delays if of any consequence, and any other matters that might have a bearing on the completion of the project. To avoid keeping separate diaries and to avoid duplication, the Project Engineer and the principal assistant(s) may make entries in the same diary. Each diary entry should include the date of the entry and be followed by a signature or initials on the line immediately under the entry to identify the writer. The Project Engineer is responsible for ensuring the existence of a Construction Project Diary for each project.

10-3.6B Inspector's Daily Report

The Inspector's Daily Report (IDR) is a record of operations for a specific type of work on the project, such as surfacing, grading, paving, bridge, etc., which is being inspected by the writer. Page one of the IDR is a structured sheet of questions addressing identification of work operations and the associated labor and equipment being used to accomplish the work. This page should be filled out completely for all questions that pertain to the specific type of work activity being inspected. Page two is a narrative portion that should include a notation of any orders given or received, discussions with the Contractor, unusual conditions, delays in the operations, and the presence of any visitors. If an operation is being inspected which results in the partial payment of an item, the item should be identified along with the basis for calculating the partial payment. It is also of value to note the Inspector or Engineer's activities in the daily report.

The Project Engineer should ensure that the Inspector's Daily Report, Forms 422-004 EF, 422-004A EF, and 422-004B EF, are utilized for completing this daily report of activities. Each page of these forms is printed separately in a tablet in duplicate on NCR paper. Both types of tablets have the instructions printed on the tablet cover. The original copy is to be submitted to the Project Engineer each day.

If necessary, the Project Engineer should add comments or remarks on the original copies of the Inspector's Daily Reports to clarify the report. The duplicate copy of the report should remain in the book for the Inspector's immediate information and may be discarded when it is no longer useful for that purpose. The original copies of the Inspector's Daily Report should be included in the Final Records for permanent retention.

IDR Content

The IDR is intended to document communication, progress of work, contractor workforce/equipment and materials sampling/acceptance. Keeping this in mind, the following are general rules for content of IDR's:

1. Remember that the IDR is part of the public record and may be called upon in case of litigation. The level of detail and professionalism exhibited may be of great benefit.
2. Do not make (or document) derogatory comments, as this is unprofessional behavior, and may be used to demonstrate that the inspector was hostile toward the Contractor and did not behave in a manner consistent with good faith.
3. All statements must be based on facts and requirements should reference the contract requirements.
4. All entries should be clear, neat, correctly spelled, and most importantly, legible.
5. Summarize key points of any discussion of work activities with the Contractor.
6. Be specific when recording information about work activities. Use drainage codes, exact bid item numbers, line and station limits, etc. Avoid referencing a co-worker's IDR, but if doing so, attach a copy.

7. Be specific when recording deliveries of materials to the project. Use bid item numbers, drainage codes, RAM number, etc. Record heat numbers, lot numbers, "Approved For Shipment" and "WSDOT Inspected" tags or stamps, etc. Using the IDR as materials documentation is acceptable. If used as documentation for acceptance, a copy of the IDR, with the appropriate items high-lighted, should be included with the materials documentation file.

8. Daily Equipment Status Reports should be complete and current.

- Record all equipment, including any trailer or transport used to deliver equipment to the project.
- Record the make, model and year of equipment. Request an equipment list from the Contractor and keep it updated. Photos make a good record of condition and configuration.
- Record the exact bid item on which the equipment was working.
- Understand the difference between down, idle and standby time; and use the correct term on the report.
- Record crew composition (once a week or whenever it changes) along with the hours worked where practicable. This can be done on a separate IDR or in the narrative portion (pg 2).

9. Record a chronology of events throughout the day, as they occur. Taking notes and transferring them to the IDR will work, but duplicates work and introduces and opportunity for error.

10. Record any potential delay, in as much detail as possible. Include start and end time, who was notified of the issue and when; along with any mitigating action by the Inspector or the Contractor.

11. Record every time the Contractor disagrees with a determination or protests a decision by the Engineer, and remind the Contractor to follow the process for protest as defined in the *Standard Specifications*.

Subject to the following, it is acceptable for inspectors to produce IDR's by recording information onto a recording device while at the job site for later transcription to a paper format.

1. All information required on the regular handwritten form must appear on the typed version.
2. The inspector must read and sign the typed document. (It is desirable for this to take place within 24-48 hours of the reporting period. However, it is recognized that certain situations may not permit this time frame and therefore it is not mandatory.)
3. The inspector may make and initial hand corrections to the typed document.

Please note that inspectors who use lap top computers can also produce electronic versions of the IDR document. The electronically produced document must be complete, including the Inspector identification block (the old signature block), consistent with the above criteria.

10-3.7 Record of Collisions and Traffic Control

10-3.7A Record of Collisions and Traffic Surveillance

In the past, all Record of Accidents (now known as Record of Collisions) received by the project engineer's office used to be included as part of the Permanent Records. Since collisions recorded by the WSP are now part of WSDOT's Transportation Data Office records (TDO), there is no need for a project office to keep Record of Collisions in either the Temporary or Final Records. If it is necessary to change traffic control as a result of a collision, the project office only needs to reference the record of collision report in either the Project Engineer's diary or Inspector's Daily Report. The Record of Collisions should only be used during the life of the project to augment decisions on changing traffic control plans during construction. It should be noted that Chapter 1-2.3E of this manual does not require a collision report to be obtained for every collision that may occur within the project limits.

A separate file should also contain the records of traffic control surveillance prepared in accordance with Chapter 1-2.3E of this manual. Information in this file should be kept current and upon completion of the contract, submitted to Headquarters Engineering Records as a part of the project's *Permanent Final Records*. When the Washington State Patrol provides the Project Engineer with traffic control assistance they also provide the Engineer with form 421-045 EF, WSP Traffic Control Checklist. While this form is a part of the traffic control operations, it can be kept separately and made part of the Temporary Final Records.

10-3.7B Contractor's Daily Report of Traffic Control

The Contractor's Daily Report of Traffic Control (DOT Forms 421-040A EF and 421-040B EF), completed by the Contractor's Traffic Control Supervisor, should also be included as part of the project's *Permanent Final Records*. The Contractor's Daily Report of Traffic Control is discussed in more detail in Chapter 1-2.3 of this manual.

10-3.8 Pile Driving Records

The Pile Driving Record Book, Form 450-004, should be included and made a part of the *Permanent Final Records*. The requirements for pile driving and pile driving records are further detailed in Chapter 6 of this manual.

10-3.9 Post Tensioning Records

The Post Tensioning Record Book, Form 450-005 EF, should be included and made a part of the *Permanent Final Records*. The requirements for post tensioning and post tensioning records are further detailed in Chapter 6 of this manual.

10-3.10 Miscellaneous Records

Miscellaneous Records are, in general, optional records and may be included in the permanent records at the Project Engineer's discretion. This part of the records is intended for items that might be considered of added importance. This might include photographs of special features or construction methods, information regarding opening to traffic, dedication activities, or other documentation of particular importance. Placing these in the *Permanent Final Records* will make them a matter of permanent record where they will be retained for future reference.

Records of environmental contamination issues, such as records of disposal of contaminated materials, are not optional and should be included in Miscellaneous Records.

10-3.11 As-Built Plans

As-Built Plans are a record of changes made to the originally intended physical product of the contract. As-Built drawings should reflect the same degree of detail as the original plan drawings. As-Built Plans are necessary as a way of preserving the historical detail of what occurred on the project. As-Built Plans can also be used as a basis to plan and design future projects in the same location and to make repairs to damaged structural components or other non-functioning facilities. In addition, state law requires that owners of "underground facilities" be able to locate these facilities within 24 inches (600 millimeters) of the outside dimensions. As-Built Plans offer a convenient means for recording these facilities.

Within two weeks after a contract has been awarded, the State Pre-Contract Administration Office or Printing Services Office will furnish the Region Office with one set of large size black line prints of the contract plans which will be marked "For As Constructed Plans Only." These plans shall be used by the Project Engineer solely for the purpose of preparing "As-Built Plans." All corrections, revisions, and additional sketches, necessary to depict the work as it was constructed should be shown on these plans. Corrections are to be made by lining out quantities or features that were changed during construction, then noting the correction or change in red ink. These corrections and revisions are to be noted on the plans in a manner that results in neat and legible sheets. A red pen that writes sharp, clear, and dark with a medium width line shall be used to mark these notations. Fine lined pens do not reproduce well when scanned and are not to be used. If electronic versions of these plans are available, corrections noted electronically and plotted in a manner that produces these same results are acceptable. Special care must be taken to ensure that changes in construction are noted on all contract plan sheets affected by the change. For instance, the change in location of a catch basin or manhole may affect the location listed in the structure note sheet, the drainage plan view sheet, and the drainage profile sheet.

If concrete foundations are partially removed, the remaining portions of the foundations should be shown on the As-Built Plans. It is not required that the As-Built, Summary of Quantities sheets be revised to reflect final estimate quantities. Summary of Quantity sheets are to be marked

identifying them as original plan quantities which are shown as preliminary estimates of work. It should also be noted that final As-Built quantities for individual unit bid items can be obtained from the final CAPS ledger for the project.

In order to help identify significant changes in work location or significant changes in the work completed at a particular location, the Quantity Tabulation sheets must be updated to show the actual physical feature items or the locations of installations where significant changes were made. Types of significant changes may include revisions to guardrail, guardrail termini, post types, anchors or anchor types, revisions to monuments, etc. The intent is to show what significant changes to the planned work were made. Except for significant changes to quantities of items used or items added at a particular installation, it is not necessary to update item quantities for actual quantities used. Final As-Built quantities for the individual unit bid items can be more accurately obtained from the final CAPS ledger for the project.

In order to help identify significant changes in work location or the significant changes in the structure work completed at a particular location, the Structure Note sheets must be updated to show the actual physical feature items or the locations of installations where these significant changes were made. Types of significant changes may include structure notes that were added or revised, pipe size and types that were changed, revised locations for catch basins manholes, etc. The intent is to show what significant changes to the planned work were made. Except for significant changes to quantities of items used or items added at a particular installation, it is not necessary to update item quantities for actual quantities used. Final As-Built quantities for the individual unit bid items involved can be more accurately obtained from the final CAPS ledger for the project.

Correction tape may only be used to complete corrections or revisions made to the Quantity Tabulation and Structure Note sheets. Correction tape is not to be used for noting corrections on any other plan sheet of the As-Built plans. If electronic versions of these sheets are available, corrections noted electronically that clearly depict that a change has been made and plotted in a manner that produces these same results, is acceptable.

In addition to the requirements outlined above for As-Constructed or As-Built contract plans, the *Standard Specifications* also require that the Contractor furnish the Engineer with original reproducible tracings or drawings suitable for scanning or for use in correcting contract plans for; shop drawings, schematic circuit drawings etc. for Illumination, Traffic Signal Systems, and Electrical for shop drawings, including approved revisions for prestressed structural elements and all other structural steel components fabricated from shop plans. Specific requirements for these plans are outlined in Sections 6-02.3(26)A, 6-03.3(7), 8-03.3(10) and 8-20.3(17) of the *Standard Specifications*.

Upon project completion, all "As-Built" plans are to be arranged in numerical sequence, including a cover sheet using Form 722-025, and submitted to the Headquarters Engineering Records office, where they will become a part

of the project *Permanent Final Records*. As-Built plans are being scanned to the Record Management Information System (RMIS). In order to achieve consistency, each Region shall:

- Submit as-built plan sheets with Form 722-025 EF attached
- Submit full sized plan sheets only
- Make corrections in red
- Attach photographs, when appropriate, in a .Jpg or .TIF format

Unless notified by the Region to do otherwise, Engineering Records will recycle (shred) the submitted as-built plans.

10-3.12 Final Record Field Notebooks

Field notebooks are bound books of notes that are used for specific kinds of work such as alignment notes, grading notes, pile driving notes, etc. Field notebooks can also consist of loose leaf field notes that have been bound together into books as well. Records that appear in the field books should not be duplicated and placed in other final record books. The only exception to this rule are copies of Field Note Records with multiple item numbers which may be copied as described in Chapter 10-4.3, Structure Notes.

Field notebooks should be consecutively numbered and each should have the pages numbered beginning with number one. Typing information in the field book is not necessary as hand lettering is preferred. As with other project records, erasure corrections of any kind are not permitted.

The quantities for payment for each item of work in the field notebook shall correspond directly to entries in the CAPS project ledger. Adequate cross-referencing must be made between the field notebook and the project ledger in order to trace item quantities and entries from one to the other.

The field notes should show the initials of the persons or person making them, the date, and the weather conditions if appropriate. In some cases, different stages of work will be noted on the same page, such as staking, measurement, and construction. This would require dates and initials at each stage of work. The notes shall also show the dates that quantities are computed and checked along with the initials of those persons doing the work. In all cases, field notes should be neat and legible and show all necessary information. Figures 10-4 and 10-5 show sample field notes and summary for clearing.

Sketches should be shown when necessary to compute a quantity that cannot be computed from the As-Built Plans. Sometimes structure excavation sketches are helpful for determining the pay limits and computing the volume; other sketches are helpful on special details.

Current business practices provide for electronic calculation and storage of all types of detailed surveying data, quantity calculations, etc. Data forms for template input, calculation setup, forms for direct recording of field information, storage media for electronic files, as well as output for the calculated data shall all be treated as an original source documents. See Chapter 10-3.13 for further direction in regards to electronic data.

Remeasure cross section notes, where a deviation from the established roadway section or slopes has occurred, should be indexed carefully so that they can be identified readily with the original cross section. For convenience of calculation on remeasure, plotted cross sections may also be used.

Structure and drainage notes in the Final Record Field Notebook should show the stationing, distance left or right, angle or skew if applicable, flow line elevation and grade in the case of culverts, drains and ditches, and all information necessary for computation of the pay items involved in the construction. For convenience, it is recommended that all pay quantities pertaining to the construction of items listed on the Structure Notes sheets of the plans, be shown in the field book with structure note number, item number, and quantities, and that cross-references be used to show where the totals were obtained. It should be remembered that quantities must be segregated by group number as shown in the summary of quantities contained in the contract plans.

For use as an example, Figures 10-6 and 10-7 show the front and back of a completed field note for the installation of a reinforced concrete sewer pipe.

10-3.13 Electronically Produced Documents

There are many computer applications available for use on a WSDOT highway construction project. Included are programs for earthwork quantities, mass diagrams, basic cut and fill, geometrics, surveying, and for determining structural quantities. In addition, there are many other “stand alone” applications created by individuals in each office for use on personal computers that are also recognized for these kinds of uses.

When electronic computations are used, the output generated must be bound together and identified with a title sheet for final record purposes. These documents are to be made a part of the three-year *Temporary Final Records* retained by the Region as explained in Chapter 10-3.1. When a computer program is used to calculate quantities for payment, the summary sheets containing the quantities entered in the project ledger must be treated as source documents with all required signatures, dates, ledger entry number, and sufficient cross-referencing to provide a good audit trail.

10-3.14 Photographs

A detailed photographic record is an important part of the project documents. A photographic record could consist of filmed photographs, digital photos, infrared photographs, video, etc. A photographic record should be taken of unusual equipment, construction methods, problem areas, areas of possible controversy, traffic control, and especially conditions in the area of an accident. In addition to these are “before” and “after” views taken from the same vantage point. These are particularly useful in documenting the progress of work. When photographs are to be maintained as a part of the project documents they must be fully identified. Photographs should clearly note when they were taken (date and time), where they were taken, and who took the picture. Although photographs are placed in the category of three-year *Temporary Final Records*, some Regions have extended

the Region retention period for photographs or have even included them as a part of the project’s *Permanent Final Records* for permanent retention.

10-3.15 Pre-Estimate Reports

A Pre-Estimate report prepares the CAPS system to make an estimate payment. This report provides the opportunity for the project office to preview the estimate and is a means to allow for any corrections or deferments to be made before actual payment. The corrected Pre-Estimate Report used to make a progress payment must be signed by the Project Engineer in order to indicate authorization for payment. The signed Pre-Estimate Report must be retained in the project files, and become a part of the three-year *Temporary Final Records*. For additional information regarding progress payments and the CAPS system, see Chapter 1-3.1B of this manual.

10-3.16 Estimate Reports

When a payment is made to the Contractor for a progress or Final Estimate, the project office receives a copy of all the reports that are sent to the Contractor along with the warrant. The Contract Estimate Payment Advice report and the Contract Estimate Payment Totals report should be compared to the Pre-Estimate report verifying that the amount actually paid is the same as the amount authorized. These estimate reports should be kept with the completed Pre-Estimate reports in the project files, and become a part of the three-year *Temporary Final Records*. For additional information regarding progress payments and the CAPS system, see Chapter 1-3.1B of this manual.

10-4 Project Ledger System

10-4.1 General

The Contract Administration and Payment System (CAPS) provides both an accounting and payment system, while also acting as an information collection system. The CAPS program uses an electronic project ledger that is maintained current throughout the life of the project as the backbone of the system. All items of work on a project for which payment is made must be entered into the electronic project ledger. Items posted in the ledger become the basis for payment and summary record document for dollars paid to the Contractor, quantity of work performed by the Contractor, status reports during the active life of the contract, and are also used as the basis for final reports when the project is completed.

As work is completed on the project, the project office continuously enters those quantities into the ledger, those records then become eligible for payment when the next progress estimate is due. Processing of monthly progress and project final estimates is further detailed in Chapter 1-3 of this manual. With the ledger entries completed, the application compiles all those records eligible for payment and transfers the data to the payment portion of the CAPS system. Because of the system’s ability to store information it is also used as an extensive resource for corporate information regarding the construction program and is used extensively by many other groups throughout WSDOT.

All electronic data incorporated into the CAPS system is stored on either an active file or a history file. These files are both permanently retained and are available for use whenever the need arises. It is not necessary, or intended, that paper copies of the project ledger be retained for final records.

Detailed instructions for the use of the CAPS system can be found in the *CAPS Manual*.

A key function of CAPS is to provide a complete accounting trail for every pay item. An accounting trail must be clearly maintained from the original source document through the actual payment to the Contractor. Audits are an effective tool used by both state and federal governments to ensure established procedures and processes are correctly used to maintain the most effective use of the public's funds. It is important that WSDOT maintain sufficient records and documentation to clearly identify an accounting trail that is capable of withstanding the test of audits.

In order to satisfy the requirements of an accounting audit, the following conditions must be met:

- There must be a source document for every ledger entry and vice-versa.
- There must be an orderly filing system to facilitate timely retrieval of source documents.
- Both Interim Progress Estimate and Final Estimate reports must be signed by the Project Engineer.
- The Contract Estimate Payment Advice report must be filed along with its corresponding Progress Estimate report.

10-4.2 Source Documents

Each ledger entry must be supported by a detailed source document, which specifically identifies the type, amount, and location of the work or material that is being entered into CAPS for payment. Source documents used to support these entries are intended to be complete documents, documents that stand alone, and fully support the payment that is being made. If information from other documents is used in the source document, these additional document(s) must be clearly identified in order to complete the audit trail.

Some examples of source documents include Item Quantity Tickets, Field Note Records, Inspector's Estimates, and Force Account sheets. Source documents are the beginning of the audit trail. They show that a WSDOT Inspector has observed and determined the amount of work performed by the Contractor. Also, the source document must show that all calculations have been checked by a second WSDOT employee to ensure they are correct.

Source documents must show four sets of dated initials as follows: (1) the person who does the original calculations; (2) the person who checks the original calculations; (3) the person who enters the payment quantity/amount in the CAPS ledger; and (4) the person who verifies the CAPS ledger entry. In addition, the source document must also show the ledger entry number.

Ledger entries for estimates of monthly progress quantities for grading, lump sum, or other such items must also be supported by a source document. Among other things, the source document must show the method used for determining the estimate. These methods and source documents must lead to an accurate measurement after the item of work has been completed. For lump sum items, the field notes or diaries can show an estimated percentage of work completed. If this percentage method is used, then a brief discussion outlining the basis for the calculation and any assumptions that were used should also be included.

Many project offices use electronic data collectors for surveying work. These data collectors eliminate the need for hand prepared field transit and field level books. Many project offices have also developed or routinely use other electronic programs or applications, which perform calculations and produce a report of the results. In using these applications there can be confusion regarding the need for checking data that has been compiled and reported electronically. In the absence of specific direction, when an electronically produced record or set of notes is used as a source document for a contract payment, the individual who originated the document should be noted. A second person can then check both input and output for both reasonableness and accuracy. This check may range from duplicating the process to verifying the input. Whatever the case may be, it is recommended that the dated initials of those two individuals be on the source document.

10-4.3 Source Document Filing Systems

Basic criteria for a good Source Document Filing System would include ease of set up, ease of use, and the capability to retrieve any specific document in a timely manner. The source document filing system should also be set up to coordinate easily with final records requirements. The filing system described here for source documents is not mandatory. However, it is presented as one alternative that works well with the CAPS electronic ledger system, the final records process, and is easy to use. The unique ledger entry number from CAPS makes this method work. Files are set up in two books or sets of notes. The first book is organized by Unit Bid Item Number and the second book is organized by Structure Note Number. Source documents are filed by Unit Bid Item Number except for drainage items, which are filed by Structure Note Number. With this method there is only one item per source document except for the drainage items. Drainage items are filed by Structure Note Number because their source document (field note record) normally has multiple items while the Structure Note Number is unique to a specific drainage facility. For all other items, if more than one item appears on a source document, a copy is made for each item noted, the desired item number is highlighted, and then the copy is filed behind their respective Unit Bid Item Number locations. This works extremely well if the source documents are placed in order by date in their respective files.

To look at the source document for a ledger entry, simply note the item number, entry number, and date; go to the file and look for the entry number within the item file. If files are maintained in order by date, this is made even easier. For ledger entries of drainage items, it is necessary to include the structure note number in the remarks section.

This system allows anyone to easily locate the source documents that support a contract payment. These records are retained in the Project Office until Final Record time when the source documents are bound into books with their respective titles and made a part of the three-year *Temporary Final Records*.

10-5 Region Project Documentation Reviews

10-5.1 General

The Region is responsible to ensure that reviews of record keeping and documentation procedures are completed during the progress of the work. This will help to ensure that the original field records and pay notes are being properly prepared and that proper procedures are being followed. The Region should review specific pay items for correctness of the payments made as well as for procedural requirements for documenting and processing of contract payments, acceptance of materials and other pertinent contract administration requirements. Reviews of specific pay items should be recorded on Form 421-014 EF. Reviews of procedural items should be recorded on either Form 230-036A EF or Form 230-036B EF. Version A should be used for the first review made on a project. Version B places more emphasis on individual pay items and should be used for the second review or on larger projects during the initial review phase where this emphasis is more appropriate.

On projects that are estimated to cost more than \$1,000,000, and require more than 35 working days to construct, the Region should conduct an interim documentation review when the project is approximately 50 percent complete. This review should be thorough and complete to ensure that the documentation records are adequate and are being properly maintained. This review should include both procedural checks for those items listed on Form 230-036A EF and detailed reviews of specific pay items for accurate documentation practices of contract payments completed to date. Audit work for pay items may also be started at this time in preparation for the Final Records Review at Physical Completion. This early audit work could consist of checking any individual items that have been fully completed. Reviews of completed items that are recorded on Form 421-014 EF, can be kept and then made a part of the Final Records check upon Physical Completion. Once the project has been completed, information from both procedural reviews and specific pay item reviews can then become a part of the *Temporary Final Records*.

On projects that are estimated to cost more than \$500,000 and require more than 100 working days to construct, the interim documentation review should be considered as early as 30 percent completion but, where possible, no later than 50 percent completion. On these larger projects, it is particularly important that the interim reviews be sufficient to verify both documentation and procedural practices. However, on many projects, the nature of the work completed at 30 percent may not provide an adequate representation of the documentation procedure to merit a documentation review. In these instances, the Region should exercise considerable judgment regarding the timing of interim documentation reviews.

The Region reviewer should also exercise considerable judgment in deciding whether or not to perform additional documentation reviews in conjunction with the reviews described above. In addition to cost and time, other criteria should also be used to evaluate the need for additional documentation reviews. This could include results of previous documentation reviews as well as the history, knowledge, and experience of the specific project office personnel involved. The Region reviewer should be satisfied on a case-by-case basis that each project's records are adequate and are being properly maintained.

It is recommended that each time a documentation review is performed on a project, that the Region reviewer discuss the results of the review with the project office staff, leaving a completed copy of Forms 230-036 EF and 431-014 EF to be included in the project temporary records.

10-5.2 Review Procedures for Final Estimates and Final Records

When work on the project is physically complete, it is important that the final records be completed and assembled in as timely a manner as possible. The final quantities should be checked and the final estimate or Final Contract Voucher Certification furnished to the Contractor as soon as is reasonably possible.

In order to facilitate this, the Project Engineer should ensure that the overall project final records, including the final contract quantities, are made ready for Region review as timely as can be and that the Region has completed their review work shortly thereafter.

The Region is responsible to ensure that the final records for the contract are complete, accurate and maintained in an orderly manner. The Region may exercise considerable judgment regarding the procedures used for this check. These procedures may include a complete check of all records or a representative sampling of records in order to validate all records maintained. If problems are discovered during the review of the representative sample, and if those problems indicate that the entire population might be flawed, then the entire population should be checked and corrected by the field office and a new representative sample taken. In conducting these final reviews the Region reviewer should mark the areas that have been checked, initialing and dating the records or portions of records that have been reviewed. The Examination Sheets for Contract Items, Form 421-014 EF, and Documentation Review (Procedures), Forms 230-036A & B EF, should be kept until the contract final records check is completed and then filed with the *Temporary Final Records* where they can be further reviewed should an audit occur.

11-1	Introduction	11-1
11-2	General Instructions	11-1
11-2A	Project Office	11-2
11-2B	Regional Office	11-3
11-2C	Fabrication Inspector	11-3
11-2D	State Construction Office	11-3
11-2E	Materials Laboratory (State or Region)	11-3
11-2F	Contractor	11-4

11-1 Introduction

This chapter of the manual is published to acquaint engineers and inspectors with the various forms provided by WSDOT for their use in keeping records of the construction activities and payment for the various phases of the work.

The following pages contain a list of forms to be used in reporting project progress. The sample forms listed in this manual in the past have been eliminated. Copies of the forms are available via four different methods:

- The WSDOT Internal website at <http://wwwi.wsdot.wa.gov/fasc/AdminServices/forms/>
- The WSDOT Microsoft Outlook in the following folder: *Public Folders/All Public Folders/WSDOT/Agency Forms/Filemaker Forms/WSDOT Forms*
- The WSDOT external website at <http://www.wsdot.wa.gov/forms/>
- By ordering the forms through your WSDOT Regional Stores personnel.

Both English and Metric versions will be available until the last metric project is completed.

11-2 General Instructions

Forms shown in Chapter 11 are categorized by those persons or offices responsible for completing the form(s) and alphabetically by form name.

It is recommended that the on-line version be utilized, which should be the most current copy of the form, during the administration of a project.

Unless otherwise noted, the previous version of a revised form may continue to be used until the existing supply is gone. However, if the supply of the older form is not exhausted at the end of six months after the revision date shown below, the supply of old forms should be discarded and the latest version used. The latest version may also be used immediately if desired.

Blank forms should be ordered or downloaded from one of the methods listed in Section 11-1 when supplies run low rather than photocopying an existing form. This will help ensure that the latest version of the form is used.

Form numbers followed by the letters "EF" indicate that an electronic version of the form is available.

*** Indicates only forms with the revised date shown are to be used. All older forms will be discarded.**

Signatures

The collection of information in the field has traditionally consisted of text-based documents which were intended to be "hand-signed" by the originator of the document. Now that these forms are available electronically, the question arises as to which forms will require an original hand-written signature and which will be acceptable with computer generated or printed signatures.

The electronic forms listed in Chapter 11 are further categorized into those forms requiring and original signature and which are acceptable with computer generated or printed signatures. Project Office personnel will need to review the forms to familiarize themselves with the signature requirement of each form. All computer generated forms are acceptable as a hard copy with a "handwritten" signature.

Signature Blocks

Any form, on which the word "Signature" appears in the block, requires an original handwritten signature in that block (e.g. Inspector's signature ____, Contractor's signature ____, Project Engineer's signature ____, etc.) Any form on which the signature block contains anything other than "Signature" may utilize a computer generate or printed signature (e.g. Completed by ____, Prepared by ____, Submitted by ____, Inspector ____, etc.) Signature blocks on these forms are "open" on the FileMaker Pro electronic forms in order to allow the originator of the form to type in their name.

When filling out and completing our construction forms, all signature or initial blocks must be completed. Leaving them blank is not acceptable.

Identifying Individual's Signatures

Project Offices will need to establish a procedure in which printed signatures or initials appearing on a document may be accepted as equal to a handwritten signature or initials. A WSDOT personnel signature list (Form 422-001 EF, Project Personnel Signature Listing) is available for Project Office use.

This list shall be included with the final records as defined in Chapter 10-3.5 of the Construction Manual. It is recommended that before work commences on a project, that all those who will be assigned a role on the project sign and initial this sheet. The list should be kept current throughout the life of the project.

NOTE: A handwritten signature is always acceptable on all forms.

11-2A Project Office

Form No.	Revised Date	Form Name
Administration		
410-025 EF	3/02	<u>Project Engineer</u> Transmittal
420-012 EF	1/96	Recommended Changes to Specifications and Construction Manual
421-005A EF	<u>3/08</u>	Change Order – Minor Change (2 page)
421-006 EF	5/06	Order to Suspend Work
421-007 EF	5/06	Order to Resume Work
421-010 EF	<u>3/08*</u>	Prime Contractor Performance Report
540-509 EF	3/02	Commercial Pesticide Application Record
722-025 EF	<u>6/07</u>	As Built Cover Sheet
750-001 EF	10/97	Fall Protection Plan
<u>750-001A EF</u>	<u>1/05</u>	<u>Tower and Bridge Fall Protection Plan</u>
Aggregates		
350-023 EF	4/02	Pit Evaluation Report
422-020	5/95	Inspector's Record of Field Test
Asphalt Testing		
350-016	4-02	Asphalt <u>Emulsion</u> Label
350-126 EF	8/97	Asphalt Plant Inspection
350-157 EF	4/02	Rice Density
350-161 EF	3-07	HMA Mineral Aggregates
350-162 EF	3-07	Volumetrics Worksheet
350-560 EF	5-02	Ignition Furnace Worksheet
Concrete Testing		
350-009 EF	7/02	Concrete <u>Test</u> Cylinder Transmittal
450-001 EF	1/96	Manufacturer's Certificate of Compliance for Ready Mixed <u>Concrete</u>
DBE/EEO		
272-051 EF	6/07	MBE/DBE/WBE On-Site Review
272-060 EF	12/04	Federal-Aid Highway Construction Annual Project Training Report
226-012 EF	5/06	Trainee Interview Questionnaire
424-003 EF	12/96	Employee Interview Report
Density (Asphalt / Soils)		
350-073 <u>EF</u>	1/07	Hot Mix Asphalt Test Section Report
350-074 EF	5/02	Field Density Test
350-074A EF	3/02	Field Dry Density Test
350-092 EF	6/07	Hot Mix Asphalt Compaction Report
351-015 EF	9/02	Daily Compaction Test Report
Documentation		
134-146 EF	<u>10/07*</u>	Final Contract Voucher Certificate
350-115 EF	<u>3/08</u>	Contract Materials Checklist
410-027 EF	4/02	Test Pile Record
422-001 EF	3/08	Project Personnel Signature Listing
422-007 EF	<u>3/08</u>	Report of Protested Work
422-008 EF	<u>3/08*</u>	Daily Report of Force Account Worked
422-009 EF	2/96	Final Record Notes Title Page
422-009B EF	2/96	Final Record Notes Title Page
422-010 EF	2/06*	Force Account Equipment Rate Request
422-012 EF	4/01	Title Sticker – Final Record Books
422-021	4/00	Item Quantity Ticket
422-024	7/95	Water Delivery Record
422-568 EF	4/01	Load Tally Sheet
422-635 EF	<u>3/08</u>	Field Note Record
422-636 EF	9/96	Field Note Record (Sketch Grid)
422-637 EF	<u>3/08</u>	Field Note Record for Drainage
422-700 EF	8/99	Daily Work Quantities
450-004	12/95	Pile Book

591-020 EFA	<u>9/07</u>	Daily Traffic Item Ticket (<u>Equipment</u>)
591-020B EF	9/07	Daily Traffic Item Ticket (Labor)
591-020C	9-07	Daily Traffic Item Ticket (Summary)

General Materials

350-026 EF	5/02	Preliminary Sample Transmittal
350-056 EF	9/02	Sample Transmittal
350-114 EF	4/02	Summary Report of Acceptance Sampling and Testing
350-130 EF	<u>3/08</u>	Field Acceptance/Verification Report (RAM/QPL)
350-564 EF	1/96	Gradation Chart – 0.45 Power
350-572 EF	6/04	Manufacturer's Certificate of Compliance Checklist
722-025 EF	<u>6/07</u>	As Built Cover Sheet

Inspection

421-045 EF	2/97	WSP Field Check List
422-004 EF	<u>3/08</u>	Inspector's Daily Report
422-004A EF	<u>3/08</u>	Inspector's Daily Report <u>Diary Page</u>
422-004B EF	<u>3/08</u> *	(Street) Inspector's Daily Report
422-027 EF	9/02	Scaelman's Daily Report
422-644 EF	12/95*	Daily Report of BST Operations
540-020 EF	3/02	Backflow Prevention Assembly Test Report

11-2B Regional Office

Form No.	Revised Date	Form Name
230-036A EF	4/07	Initial Documentation Review (Procedures)
230-036B EF	3/07	Follow-Up Documentation Review
272-061 EF	8/03	Federal-Aid Highway Construction Cumulative Training Report
420-012 EF	1/96	Recommended Changes to Specifications and Construction Manual
421-014 EF	1/97	Examination Sheet for Contract Items
422-100 EF	6/03	Interim Inspection of Federal-Aid Project
FHWA-1392	3/92	Federal-Aid Highway Construction Summary of Employment Data

11-2C Fabrication Inspector

Form No.	Revised Date	Form Name
350-004 EF	5/02	Fabrication Progress Report
450-005 EF	3/02	Post-Tensioning Record

11-2D State Construction Office

Form No.	Revised Date	Form Name
422-101 EF	6/07	Final Inspection and Acceptance of Federal-Aid Project
FHWA-1392	3/92	Federal-Aid Highway Construction Summary of Employment Data

11-2E Materials Laboratory (State or Region)

Form No.	Revised Date	Form Name
350-112 EF	3/02	Correlation — Nuclear Gauge to Core Density
350-514 EF	4/97	Moisture – Density Relationship Report
350-564 EF	1/96	Gradation Chart – 0.45 Power
351-021 EF	4/02	Statement of Receipt of Radioactive Material

11-2F Contractor

Form No.	Revised Date	Form Name
134-146 EF	6/07	Final Contract Voucher Certificate
272-049 EF	<u>9/07</u>	Training Program
272-050 EF	<u>9/07</u>	Apprentice/Trainee Approval Request
272-062 EF	6/98	Contract Compliance Review Request for Additional Information
350-040 EF	6/06	<u>Concrete</u> Mix Design
350-042 EF	2/07	HMA Mix Design Submittal
350-071 EF	3/07*	Request for Approval of Material
350-109 EF	<u>9/07</u>	Certification of Materials Origin
410-029 EF	<u>3/08</u>	Contractor's Construction Process Evaluation
420-004 EF	<u>3/08*</u>	Contractor and Subcontractor or Lower-Tier Subcontractor Certification for Federal-Aid Projects
421-009 EF	<u>3/08</u>	Release — Retained Percentage (Except Landscaping)
421-012 EF	<u>3/08*</u>	Request to Sublet Work
421-023 EF	4/00*	Annual Report of Amounts Paid MBE/WBE Participants
421-040A EF	4/04	Contractor's Daily Report of Traffic Control - Summary
421-040B EF	3/08	Contractor's Daily Report of Traffic Control - Traffic Control Log
422-102 EF	2/06	Quarterly Report of Amounts Credited as DBE Participation
<u>422-110 EF</u>	<u>2/08</u>	<u>Statement of Apprentice/Journeyman Participation</u>
<u>422-115 EF</u>	<u>2/08</u>	<u>Apprentice Utilization Plan</u>
540-509 EF	3/02	Commercial Pesticide Application Record
820-010 EF	6/99*	Monthly Employment Utilization Report
FHWA-1391	3/92	Federal-Aid Highway Construction Contractor's Annual EEO Report

Alphabetical Listing of Forms**Forms Requiring an Original Hand Written Signature**

(X) = Contractor's signature is desirable but not necessary to make payment.

(X)* = Contractor's signature is desirable but not necessary.

Cont.	PE	Form No.	Form Name
X		421-023 EF	Annual Report of Amounts Paid as MBE/WBE Participants*
X		272-050 EF	Apprentice/Trainee Approval Request
	X	540-020 EF	Backflow Prevention Assembly Test Report
X	X	350-109 EF	Certification of Materials Origin
X	X		CCIS Generated Change Order
(X)		421-005A EF	Change Order – Minor Change (2 page)
	X	540-509	Commercial Pesticide Application Record
X	X	272-062 EF	Contract Compliance Review Request for Additional Information
	X	350-115 EF	Contract Materials Checklist (pdf format)
X	X	420-004 EF	Contractor and Subcontractor or Lower-Tier Subcontractor Certification for Federal-Aid Projects*
(X)	X	422-008 EF	Daily Report of Force Account Worked*
X	X	FHWA-1391	Federal-Aid Highway Construction Contractors' Annual EEO Report
X	X	FHWA-1392	Federal-Aid highway Construction Summary of Employment Data
X	X	134-146 EF	Final Contract Voucher Certificate*
X		820-010 EF	Monthly Employment Utilization Report*
X	X	421-010 EF	Prime Contractor Performance Report*
	X	422-001 EF	Project Personnel Signature Listing
X		422-102 EF	Quarterly Report of Amounts Credited as DBE Participation
X	X	421-009 EF	Release – Retained Percentage (Except Landscaping)
X	X	422-007 EF	Report of Protested Work
X	X	421-012 EF	Request to Sublet Work*
X	X	351-021 EF	Statement of Receipt of Radioactive Material
X	X	272-049 EF	Training Program

Forms Suitable for Printed Signature

Cont.	PE	Form No.	Form Nam
		422-115 EF	Apprentice Utilization Plan
		722-025 EF	As Built Cover Sheet
(X)*		350-126 EF	Asphalt Plant Inspection
		350-016 EF	Asphalt Emulsion Label
	X	350-009 EF	Concrete Test Cylinder Transmittal
	X	350-040 EF	Concrete Mix Design
(X)*		410-029 EF	Contractor's Construction Process Evaluation
X		421-040A	Contractor's Daily Report of Traffic Control -Summary
X		421-040B	Contractor's Daily Report of Traffic Control -Traffic Control Log
	X	350-112 EF	Correlation – Nuclear Gauge to Core Density
	X	351-015 EF	Daily Compaction Test Report
(X)*	X	422-644 EF	Daily Report of BST Operations*
(X)	X	591-020A EF	Daily Traffic Item Ticket (Equipment)
(X)	X	591-020B EF	Daily Traffic Item Ticket (Labor)
	X	591-020C EF	Daily Traffic Item Ticket (Summary)
(X)*	X	422-644 EF	Daily Report of BST Operations
	X	422-700 EF	Daily Work Quantities
	X	424-003 EF	Employee Interview Report
	X	421-014 EF	Examination Sheet for Contract Items
	X	350-004 EF	Fabrication Progress Report
	X	750-001 EF	Fall Protection Plan
	X	272-060 EF	Federal-Aid Highway Construction Annual Training Report
	X	272-061 EF	Federal-Aid Highway Construction Cumulative Training Report
	X	350-130 EF	Field Acceptance/Verification Report (RAM/QPL)
	X	350-074 EF	Field Density Test
	X	350-074A	Field Dry Density Test
	X	422-635 EF	Field Note Record
	X	422-367 EF	Field Note Record for Drainage
	X	422-636 EF	Field Note Record (Sketch Grid)
	X	422-101 EF	Final Inspection and Acceptance of Federal-Aid Project
		422-009 EF	Final Records Notes Title Page
		422-009B EF	Final Records Notes Title Page
	X	230-036B EF	Follow-Up Documentation Review
		422-010 EF	Force Account Equipment Rate Request*
		350-564 EF	Gradation Chart – 0.45 Power
(X)*	X	350-161 EF	HMA Mineral Aggregates
(X)*	X	350-092 EF	Hot Mix Asphalt Compaction Report
	X	350-073 EF	Hot Mix Asphalt Test Section Report
(X)*		350-042 EF	HMA Mix Design Submittal
(X)*	X	350-560 EF	Ignition Furnace Worksheet
	X	230-036A EF	Initial Documentation Review (Procedures)
	X	422-004 EF	Inspector's Daily Report
	X	422-004A EF	Inspector's Daily Report - Diary Page
	X	422-004B EF	(Street) Inspector's Daily Report*
(X)*	X	422-020	Inspector's Record of Field Test
	X	422-100 EF	Interim Inspection of Federal-Aid Project
(X)	X	422-021	Item Quantity Ticket
	X	422-568 EF	Load Tally Sheet
	X	272-051 EF	MBE/DBE/WBE On-Site Review
	X	350-572 EF	Manufacturer's Certificate of Compliance Checklist
(X)*		450-001 EF	Manufacturer's Certificate of Compliance for Ready Mixed Concrete
	X	350-514 EF	Moisture – Density Relationship Report
	X	421-007 EF	Order to Resume Work
	X	421-006 EF	Order to Suspend Work
		450-004	Pile Book
	X	350-023 EF	Pit Evaluation Report
	X	450-005 EF	Post-Tensioning Record
	X	350-026 EF	Preliminary Sample Transmittal

(X)*	X	410-025 EF	Project Engineer Transmittal
	X	420-012 EF	Recommended Changes to Specification and Construction Manual
	X	350-071 EF	Request for Approval of Material*
	X	350-157 EF	Rice Density
	X	350-056 EF	Sample Transmittal
(X)	X	422-027 EF	Scaleman's Daily Report
		422-110 EF	Statement of Apprentice/Journeyman Participation
	X	350-114 EF	Summary Report of Acceptance Sampling and Testing
	X	410-027 EF	Test Pile Record
		422-012 EF	Title Sticker – Final Record Books
	X	226-012 EF	Trainee Interview Questionnaire
(X)*	X	350-162 EF	Volumetrics Worksheet
(X)	X	422-024	Water Delivery Ticket
		421-045 EF	WSP Field Check List

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