

## CHAPTER 2G - CONSTRUCTION PLANS

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## **CHAPTER 2G - CONSTRUCTION PLANS**

### **SECTION 2G-1-FINALIZING PLANS**

#### **REVIEWING REPORTS - PROGRAM/PROJECT MANAGEMENT SYSTEM**

A thorough review of all correspondence and reports relative to summaries must be made to insure incorporation of applicable items into the plans. Usually, appreciable time has elapsed between the date of the [Field Inspection](#) and [incorporation of the recommendations into the plans](#). Therefore, current nomenclature, basis of payment, and items affected by Instructional & Informational Memoranda are to be checked. [Type code number\(s\)](#), [federal numbers](#) (for Federally funded projects), bridge plan numbers, etc., on the title sheet should be verified.

If a change is made in the latter stages of plan development that affects the limits of a construction project or projects within the original right of way project termini, it can affect right of way acquisition, utility adjustments or railroad agreements. The Right of Way and Utilities Division should be advised accordingly, as soon as possible, in order that they can arrange to clear the desired segment and subsequently can certify to the Scheduling and Contract Division that a project is clear for advertisement. The methods of required notification (Plan Revision or Memorandum) are outlined in [Section 2F-6-FORMAL REVISIONS-MAJOR CHANGES](#).

The designer should review the parameters of the project's classification, size, and geographic location as shown on the report for the [Program/Project Management System](#). The correct alignment length, numbers, and elements of work should be reviewed for correctness.

#### **RESOLUTION OF PENDING CONSTRUCTION DETAILS**

Few problems occur during construction of standard items. When special design or modified items are called for in the plans, it would be prudent to review these with the Scheduling and Contract Division for inclusion of proper notes or special provisions. Minor construction problems resolved at this stage may prevent the need for major revisions later.

On complex projects, a sequence of construction plan is required to guide the contractor (See [Section 2E-10-SAFETY ITEMS AND SEQUENCE OF CONSTRUCTION](#) and [Road Design Manual, Volume 2, Section A-8](#)). [Safety devices](#) and/or [barriers](#) must be provided for the protection of the traveling public and construction personnel during the life of the

project. "Safety Guidelines for Construction Zones" (See IIM LD-93) delineate fully the warrants and treatment of potentially unsafe areas.

## **SPECIAL DESIGN DRAWING REQUEST PROCEDURES**

When road plans have been developed to the stage of right of way acquisition, requests shall be made to the [Standards/Special Design Section](#), by memorandum, to prepare the required special design drawings for minor structures and roadside appurtenances not included in the standard drawings for inclusion in the plan assembly. Exceptions to this procedure are requests for special design box culverts and special wing details, which are to be made to the Structure and Bridge Division.

All requests are to be made a minimum of nine (9) months to one (1) year prior to the date of [Advertisement Quality Control Review](#) of the project. The Hydraulics Engineer shall submit all requests for required special design drainage drawings (copy of memo to the Road Designer) to the Engineering Services Section. Completed special design drainage drawings will be furnished to the Hydraulics Engineer for their review and approval. The Hydraulics Engineer will submit the final drawing to the road designer for insertion in the plan assembly. Non-drainage drawing requests shall be made by the Road Designer. All requests shall include the scheduled advertisement date, complete project charge number and the name and telephone number of the Road Designer. Requests under specific time restraints should include a date desired. Special Design drainage structure drawing requests shall include the following:

1. Structure number, height, length, width, top elevation, invert elevation
2. Pipe size entering and exiting the structure
3. Prints of the pertinent plan, profile and x-sect sheets with structure clearly located

Retaining Wall drawing requests are made to the Engineering Services Section. When appropriate, standard walls will be recommended. Reviews requiring special designs will be forwarded to the Structure and Bridge Division, with a copy of the request sent to the road designer making the original request. The Structure and Bridge Division will respond directly to the original road designer. Retaining Wall drawing requests shall include the following:

1. Plans depicting the horizontal and vertical location of the wall
2. Road station for wall beginning and end
3. Boring log data for foundation design
4. Retaining wall and boring locations should be marked clearly on plan sheets

[Impact Attenuator](#) requests shall include the following:

1. Design speed
2. Propose location of the required attenuator, profile, and cross-section sheets with [structure](#) clearly located.

The Road Designer shall furnish the Engineering Services Section any additional data or information necessary for the design and preparation of the special design drawings. Special Design drawings must be in sufficient detail to construct the item and contain the basis of payment, reference to specifications and materials required for construction. Special design drawings normally follow the typical section sheets in the plan assembly.

Sound Barrier Wall requirements for location and profile elevations are determined by the Environmental Division who will provide the roadway designer with the requirements. The roadway designer will coordinate with the Environmental Division and include horizontal locations and profiles of the walls in the roadway plans. When sound barrier wall locations are determined, the roadway designer will immediately request foundation data from the Materials Division. A Boring Log Data Sheet is required for all projects having retaining walls and sound barrier walls whenever boring log data is available. Boring Log Data Sheet (in MicroStation format) will be furnished to the project designer by the Materials Division. The District Material Section will prepare these sheets or they will forward a request to the Geologist Supervisor at Elko. If assistance is needed in preparing these sheets, contact Location and Design Division's Engineering Services Section. The project contractor is responsible for the design and construction of the wall based on Special Provisions. These Special Provisions contain design and construction requirements, which become part of the roadway project specifications.

The request for special provisions should have the following information:

“Subject: Order No: A12 Project No. U000-1000-101, C501, AD Feb 2001 PPMS No. XXXX  
PS&E-YES”.

Special Provisions for sound barrier walls (designed by VDOT) are prepared by the Scheduling and Contract Division. The Project Manager will request [Standards/Special Design Section](#) to provide the Scheduling and Contract Division with a suggested draft of the provisions.

When sound barrier walls are designed by a consultant, the [Consultant Services Section](#) will advise the consultant to contact Engineering Services Section for input and direction prior to initiating the development of Special Provisions. When Engineering Services Section is made aware of the need for a Special Provision, it will coordinate with the Scheduling and Contract Division and provide Consultant Services a suggested draft of the provisions.

## **PLANS PREPARED BY OTHER DIVISIONS**

Plans prepared by other divisions are to be available approximately seven months prior to the scheduled advertisement date in accordance with the "Contract Document and Processing Cut-Off Dates for Advertisement" and are to follow the last roadway profile sheet in the plan assembly ([See Section 2E-6](#)).

## **SECTION 2G-2-SUMMARY SHEETS**

### **GENERAL**

Normal roadway construction projects prepared by the Location and Design Division are summarized into five categories: Grading, Drainage, Incidental, Pavement and Roadside Development/Temporary Erosion and Siltation Control. Each category must be separated with individual totals for each project and contract number. Projects with more than one type of financing will require separate totals for applicable items. These summaries are usually shown in tabular form.

An example of this is the case of a storm sewer system in an urban area wherein financing responsibilities are based on the run-off ratio, to be shared jointly with city, state, and/or federal funds.

Small projects or those of less complexity may be summarized in a list or "Streamline" summary. These projects will generally be limited to Minimum, No Plan, Safety, and Plant Mix Projects.

The items shown in summaries must agree with the description and pay unit shown in VDOT'S Road and Bridge Specifications as amended by contract provisions and plans. To alleviate the inconsistencies in denoting the use of Regular and Alternate Designs or Design Options on the plans, the following policy is to be adhered to:

1. When more than one design is shown on plans and it is practical to establish the same units of measurement to provide equitable payment for construction of either design, such designs are not to be designated as Regular, Alternate, or Option. The successful bidder will then be permitted to select the design he prefers, without having to designate which design he has selected at the time of bidding. As an example: separate designs are shown for guardrail consisting of concrete posts, and wood posts; however, one bid price is furnished for guardrail on a meter (L.F.) basis and the successful bidder constructs the design he prefers.
2. When more than one design is shown on the plans and it is not practical to establish the same units of measurement to provide equitable payment for construction of either design, such designs are to be designated as Design Option A, Design Option B, etc. The Scheduling and Contract Division will then incorporate a provision in the proposal, which advises that bidders have the option of bidding on any one of the design options and that award will be made on the basis of the lowest bid submitted.



3. Designs are not to be designated as Regular and Alternate except on those occasions when such designs are not considered to be equal or one is considered to be questionable, either from a performance standpoint or from a competitive cost standpoint. In such an event, the designation of Regular and Alternate designs must be approved by the Scheduling and Contract Division Engineer well in advance of plans being sent to the Scheduling and Contract Division for advertisement. When the Regular and Alternate design concepts are approved, the Scheduling and Contract Division will incorporate a provision in the proposal which advises that the Department will, at its option, award to the bidder submitting the lowest Regular or Alternate total bid, whichever is in the best interest of the State.

Pay item totals in summaries shall be shown to the nearest whole number, except in the following situations:

1. Concrete to be measured for payment by the m<sup>3</sup> (cubic yard), in which case the concrete total shall be computed to two decimal places and shown to one decimal in the summaries.
2. Metric culvert and storm sewer pipe lengths are shown to the nearest 0.5 m
3. Metric manhole and drop inlet heights are shown to the nearest 0.01 m.
4. Metric pipe cover is shown to the nearest 0.1 m.

## **GRADING DIAGRAM AND SUMMARY**

The notes shown in the legend should be used to clarify the method of arriving at the individual earthwork totals. Pay items should be designated and plan quantity items specified in accordance with Instructional and Informational Memorandum LD- 135. Show the plan quantity symbol for "Roadway Cut" as well as other applicable measured cut quantities in the Grading Summary. Because the "Total Regular Excavation" quantity is subject to change during construction as well as inclusion of some non-plan quantity times, do not show the plan quantity symbol with the "Total Regular Excavation" in the Grading Summary. The plan quantity symbol should not be shown on the "Regular Excavation" quantity in the engineer's estimate if any part of the total includes non-plan quantity items.

For instructions on computing and summarizing earthwork quantities see IIM LD- 138.

## **DRAFTING FINAL GRADING DIAGRAM & SUMMARY**

A base Grading Diagram and Summary Sheet is available as a CADD file. This sheet has all the applicable notes and symbols for a typical Grading Diagram and Summary. Designers should use only notes, which are applicable to their project.

## **DRAINAGE SUMMARY**

The Drainage Summary is usually set up with the identifying stations and lane down the left column, the description of the item including the pay unit across the top, and a "Remarks" column down the right side.

On projects where an agreement has been reached between the Department and city/county that the city/county will participate in the cost of storm sewer construction (See IIM LD-146), the following note must be shown under the drainage summary and the items referenced by an asterisk. \*Denotes items to be paid for on the run-off ratio basis according to Commonwealth Transportation Board Policy.

" % City/County Cost"

Separate quantity summaries (including all structure related items) are to be shown on the plans and estimates for structures, measuring over 6.1 m (20 feet) along the centerline, that are classed as major structures and assigned a separate project number, e.g., B-601, D-603, (See [Section 2E-6-Project Length Tabulation](#)). In cases where the roadway fill and pavement is carried over but is not a part of the structure, the roadway quantities are not to be segregated on the plans and estimates but are to be included in the roadway project summary.

## **PAVEMENT SUMMARY**

The Pavement Summary is usually prepared with identifying stations and lane down the left column, the description of the item and pay unit across the top, and a "Remarks" column down the right side (where necessary).

Instructional and Informational Memoranda must be checked for inclusion of all pertinent notes relative to pavement designs.

## PUG MILL MIX AGGREGATES

The following criteria must be observed when summarizing quantities:

Imperial Projects:

1. Aggregate base or subbase materials:  
The pavement recommendation will show an in-place dry weight of aggregate to be used in pounds per cubic foot.

For example: 145 lbs. per cubic foot

$$\frac{145 \times \text{Volume (Cu. Ft.)}}{2000} = \text{tons of Aggregate (dry weight)}$$

Add 6% to tons of aggregate for moisture correction.

2. If cement stabilized:  
To determine the amount of cement required (tons): Compute \*4% of the total dry weight of the aggregate in pounds and divide by 2000.

\*4% cement by weight is the usual rate but should another rate be recommended in the pavement design, it is to be used.

Metric Projects:

1. Aggregate base or subbase materials:

The pavement recommendation will show an in-place dry weight of aggregate to be used in kilograms per square meter per millimeter of depth.

For example: 2.4 kg/m<sup>2</sup>/mm

$$\frac{2.4 \times \text{Area(m}^2\text{)} \times \text{Depth(mm)}}{1000} = \text{Metric Tons of Aggregate (dry weight)}$$

Add 6% to metric ton(s) of aggregate for moisture correction.

2. If cement stabilized:

To determine the amount of cement required (metric ton):

Compute \*4% of the total dry weight of the aggregate in metric ton.

\*4% cement by weight is the usual rate, but, should another rate be recommended in the pavement design, it is to be used.

### **CRUSHER RUN AGGREGATE**

Where either No. 25 or 26 aggregate is recommended, both gradations shall be shown on the plans and summaries.

### **AGGREGATE BASE MATERIAL**

Whenever a material usually used as a base course is used in the subbase position (reference Section 101 of VDOT's Road and Bridge Specifications for definitions of "Base Course" and "Subbase"), it must be noted on the typical sections, summaries, and estimate as follows:

Aggregate Base Material Type (used as subbase)

If there is any question about the usage of nomenclature of a material, the designer is to contact the Materials and Scheduling and Contract Divisions for clarification.

### **WEIGHTS OF ASPHALT CONCRETE**

In computing weights of asphalt concrete, the weights in kg/m<sup>2</sup>/mm (pounds per sq. yd. per inch) of depth shall be used unless otherwise directed by the Materials Division. (Use rate provided by the Materials Division, when available.) See IIM LD-158 for specific weights used by each district.

### **COAL TAR PITCH EMULSION**

Due to damage done to asphalt concrete parking areas, it is necessary to provide a protective coating resistant to the deteriorating effect of gasoline and oil. The parking and maneuvering area of all rest areas and weigh stations being constructed with asphalt concrete surface, are to receive this treatment. The plan portion of the facility is to have a line drawn delineating the limits of the coating as in the example below. It is not to include exit and entrance roadways. This item is to be entered into the pavement summary under the heading of "Coal Tar Pitch Emulsion" in m<sup>2</sup> (Square Yards). A special provision will be included in the project assembly by the Scheduling and Contract Division.



## **INCIDENTAL SUMMARY**

The Incidental Summary is usually prepared with identifying stations and lane down the left column, the description of the item and pay unit across the top, and a remarks column down the right side.

## **SPECIALTY SUMMARIES**

### **ROADSIDE DEVELOPMENT**

Quantities relative to Roadside Development and Temporary Erosion and Sediment Control are summarized on the Roadside Development Sheet provided as a CADD file. This is a multi-purpose sheet providing types of seed mixtures, rates of application, and quantities. Quantities relative to temporary Erosion and Siltation Control, shall be summarized on the Roadside Development Sheet, with the exception of any necessary outfall pipe, which will be summarized in the drainage summary.

### **STORMWATER MANAGEMENT**

Quantities relative to stormwater management are summarized in a separate summary on or adjacent to the drainage summary sheet(s). See IIM LD- 195.

### **DEMOLITION OF BUILDINGS AND CLEARING OF PARCELS**

A Building Data Report lists buildings to be removed and parcels to be cleared and is furnished by the Right of Way and Utilities Division, when applicable, for inclusion in the contract. Appropriate identification and description of the buildings are to be included in the summary. These summaries may be combined.

## UTILITY ADJUSTMENTS

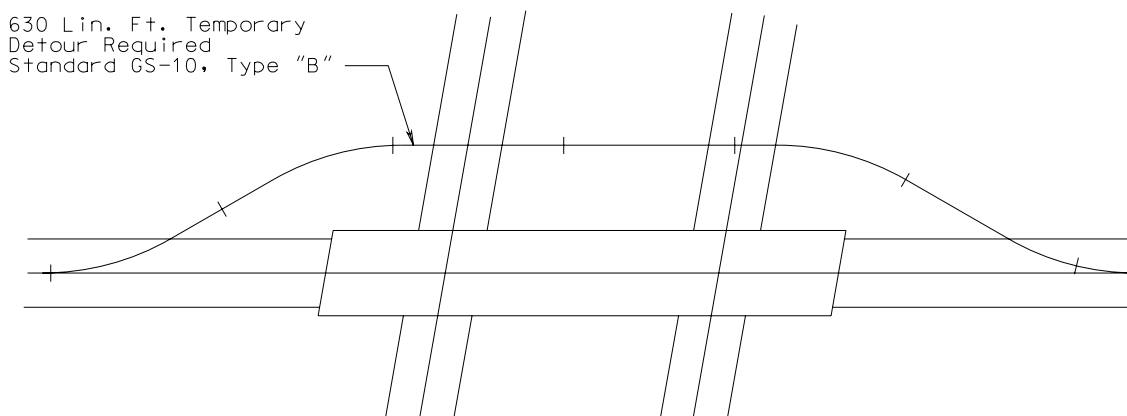
Sewer, water, or other utility adjustments which are not included in Utility Plans (Section 2G-1-PLANS PREPARED BY OTHER DIVISIONS) are summarized separately.

## SPECIAL DESIGN BRIDGES

All special design bridges applicable to the contract are to be listed. This will include project number, description, plan number, sheet number, clear roadway, and minimum vertical clearance, where applicable. Although this is not a summary of quantities, it helps to define the scope of the project. Bridge approach slabs are included in road plans with quantities summarized on the detail sheets.

## TEMPORARY DETOURS

Each Standard GS-10 detour road, Type "A" and Type "B", is to be shown on the plans by means of a construction baseline as noted below:



Detours on crossroads carrying over 750 ADT should have the complete alignment, grades, typical sections, drainage, etc., shown on the plans. Additional temporary construction easement lines should also be shown, if necessary.

If a type "A" or "B" Detour can be constructed within existing right of way, it will be necessary to only show the baseline of the detour.

If a type "A" or "B" Detour cannot be constructed entirely within the existing right of way, it will be necessary to show both line and grade of the detour, together with the temporary construction easement lines necessary to construct it.

The detours are to be set up in separate summaries as follows:

Type A and B

Temporary Detours, Standard GS-10

Location	Type "A" (Meters)	Type "B" (Meters)
Route 601 (Sta. 100+00)	165	
Route 602 (Sta. 150+00)		190
Route 604 (Sta. 250+00)	200	
Route 605 (Sta. 300+00)	170	
Totals	535	190

Type C through F

Temporary Detour St'd. GS-10 Type "E"

Route 606 (Sta. 350+00)

943 m<sup>3</sup> Regular Excavation

\* 68 m 450 mm Pipe

\* 34 m 750 mm Pipe

170 m<sup>3</sup> Aggregate Base Mat'l. Ty. I No. 21 or 21A  
(150 mm Depth)

91 Metric Tons Asphalt Concrete Type SM-2A @ 100 kg/m<sup>2</sup>

\*Set up pipes for payment only when recommended by the  
Drainage Section.

The quantities for a Type "C", "D", "E", or "F" detour are to be shown separately, as above, but are to be combined with the mainline quantities on the estimate and bidding proposal.

## **SECTION 2G-3-REVIEW OF PLANS**

### **CHECK FOR ACCURACY AND COMPLETENESS**

When the summaries have been completed, the computations are to be checked for accuracy and completeness. If conflicts in quantities are discovered, they are not to be changed until the discrepancies have been mutually resolved by compiler and checker.

Check plans for most recent insertable sheets. Review items on [Quality Control Checklist](#).

The [Hydrologic Data Sheet](#) is to be reviewed to determine if all information contained thereon is up-to-date.

The traffic data on the title sheet should be reviewed and if it is over two years old, an update should be requested. (See [Section 2A-4-REQUEST FOR TRAFFIC DATA](#) and [Section 2E-6-Functional Classification - Traffic Data](#).)

Computer Listings must be reviewed in accordance with IIM LD- 68.

Detailed instructions regarding checking, labeling, etc., can be found in IIM LD- 68.

### **PROGRAM/PROJECT MANAGEMENT SYSTEM**

By this stage, most entries on the Program/Project Management System (P/PMS) have been completed. A review is to be made to assure that the project limits shown in P/PMS are in agreement with those shown on the title sheet. After final submission of the project to the Scheduling and Contract Division, forward a copy of the Project Status Report (P/PMS POP 109) to the Central File.

### **RIGHT OF WAY NOTE ON TITLE SHEET**

In some instances, the proposed construction will be within existing Right of Way. Such is the case with some intersection improvements for the addition of turning lanes or on safety projects. When this situation occurs, the following note is to be shown on the title sheet in the area adjacent to the [Right of Way Approval signature block](#):

"All construction is to be performed within existing right of way."



## **SECTION 2G-4-COST ESTIMATE**

### **PREPARATION OF CONSTRUCTION COST ESTIMATE**

A Project Cost Estimate is required for each project to be advertised for construction. Each project must be coded separately, just as the summaries were split, e.g., C-501, C-502, D-601 (Box Culvert).

The Location and Design Division has the responsibility of compiling all project estimates. Prior to final submission to the Scheduling and Contract Division, estimates furnished to anyone outside of the Department are to be taken from the current Six Year Improvement Program (SYIP). If the scope of the project has drastically changed the estimate since the SYIP was updated, the designer must get approval from the Assistant State Location and Design Engineer before furnishing an estimate that differs from the SYIP. Exceptions are projects such as, but not limited to, roadway bridge maintenance, sign, signal, lighting, landscape, etc., developed exclusively by other divisions. (See IIM LD -183)

All estimates furnished outside of Location and Design prior to final submission to the Scheduling and Contract Division are to be approved estimates (by the applicable Assistant State Location and Design Engineer) for the applicable stage of project development. (See [Section 2E-7-CONSTRUCTION COST ESTIMATE](#))

The Project Manager reviews estimates (Preliminary Engineering and Construction) in PPMS at Scoping, Public Hearing, Field Inspection, Right of Way and Construction Stages, as well as at 90-day intervals between these milestones, for accuracy. If a project is significantly modified between these stages, the estimate must be adjusted and entered into PPMS and CES.

ALL Engineer's Estimates (Preliminary Engineering and Construction) will be reviewed by the Project Manager and updated, if necessary, for use by the Programming Division and Local Assistance Division in preparing the SYIP. At this time it is imperative that ALL estimates be reviewed for accuracy before incorporation into the new SYIP.

After final submission of the plans has been made to the Scheduling and Contract Division Engineer for project advertisement, any request for estimate information or any inquiries regarding project estimates from the press or others outside the department, are to be referred to the Scheduling and Contract Division's Estimate Engineer (Ph-804-786-2939).

The final construction estimate, prepared by the Scheduling and Contract Division for the purpose of determining whether or not acceptable bids are received, is not provided to anyone.

## **SECTION 2G-5-CONSTRUCTABILITY QUALITY REVIEW**

### **CONSTRUCTABILITY QUALITY REVIEW**

Constructability review is defined as the review of plans, specifications, and contract documents from a construction perspective to assure the documents propose an operation that is efficient, cost effective, and buildable. Its emphasis is primarily focused on “how” the documents propose the operation to be built and not on “what” gets built.

AASHTO defines constructability review as “a process that utilizes construction personnel with extensive construction knowledge early in the design stages of projects to ensure that the projects are buildable, while also being cost-effective, biddable, and maintainable”.

This analysis is normally performed at the Preliminary Field Inspection, Public Hearing, Field Inspection and Pre-Advertisement stage of plan development. Additional reviews can be performed as needed when the plans are further developed.

The constructability review includes the report of findings, a completed checklist, and cost savings report. This report is a detailed tabulation of any anticipated savings identified during the review.

## **SECTION 2G-6-QUALITY CONTROL CHECKING**

### **QUALITY CONTROL CHECKING PROCEDURE**

This review of the completed construction plans is conducted when all items have been checked in the Advertisement column of the checklist (approximately 60 days prior to the submission to the Scheduling and Contract Division). This review will be conducted by the Transportation Engineer Senior. There may be situations in which the Transportation Engineer Senior's peers will conduct this review.

It is the Project Manager's responsibility to coordinate with other disciplines involved (Structure and Bridge, Traffic Engineering, etc.) to insure complete plan assemblies for checking. It will be the other disciplines' responsibility to conduct their own internal plan reviews before submitting plans to the Project Manager for review.

[See Chapter 1E for Quality Control Checking Procedures.](#)

## **SECTION 2G-7-PRE-ADVERTISEMENT MEETING**

### **PRE-ADVERTISEMENT MEETING**

The Pre-Advertisement Meeting is an inter-disciplinary team milestone that allows managers from different disciplines to review the final plans. When plans are adequately complete and within a reasonable proximity to the advertisement date (approximately 90 days prior to submission to the Scheduling and Contract Division), the Project Manager will schedule a Pre-Advertisement Meeting. All concerned parties are advised of time and location. The Project Manager will inform all parties of the location, in Falcon, of the plans and how prints can be obtained. The EEO Manager is to always be invited to the Pre-Advertisement Meeting.

While the Scheduling and Contract Division Engineer is generally advised of this meeting by copy of the notification memorandum, the appropriate Scheduling and Contract Division person is to be contacted by the respective project manager to see if he/she plans to attend the meeting or send a representative. The project file is to be documented accordingly.

The meeting is held to determine if right of way and utilities will be cleared in time for the scheduled construction advertisement, to review maintenance of traffic during construction and items to be provided therefore, to discuss [sequence of construction](#), time of construction, special provisions, and any other items pertinent to the anticipated advertisement of the project. The Project Manager shall write a report on the findings of the meeting and distribute copies to all concerned.

The Project Manager shall discuss the report with the appropriate Scheduling and Contract Division person and obtain agreement or suggested revisions. This is done by the Local Assistance Division, on applicable projects, prior to their writing the report.

Following the Pre-Advertisement Conference the Environmental Division will conduct an Environmental Certification (Form EQ-103) on all projects to certify that all environmental activities are complete. A PS&E Re-evaluation (Form EQ-200) is conducted on the NEPA document when federal funds are used or when a federal action has occurred to verify that the scope and design are consistent with the NEPA document. . The [LD-442](#) Form must be completed and distributed by the Project Manager to the District Environmental Manager. This Form will initiate the EQ-103 and EQ-200 Forms. The District Environmental Manager will notify the Project Manager by email upon completion of this review. See Environmental Certification & Re-evaluation at PS&E Flow Chart:

<http://www.virginiadot.org/business/resources/PSERevaluationFlowChart.pdf>

## **SECTION 2G-8-PREPARATION OF PLAN ASSEMBLY FOR CONSTRUCTION**

### **FINAL PREPARATION OF PLANS FOR CONSTRUCTION**

The following procedure is to be adhered to by the Project Manager to ensure that the project complies with the advertisement schedule. After the Quality Control Review has been completed, and all necessary adjustments have been accomplished, the Project Manager is to proceed as follows:

- 1) Ensure that the project cost estimate and the estimate shown in PPMS are current.
- 2) Check the plans provided by other divisions/sections (Signs, Signals, Utilities, Landscaping, etc.) for correlation to the roadway plans (including sheet numbers, references, file names, etc.).
- 3) Make any necessary additions/corrections to the Index of Sheets. The Structure and Bridge Division will provide the designer with the number of sheets included in the bridge assembly to be shown in the Index of Sheets (the bridge plans, then the cross sections, are the last two assemblies in the total plan package). The bridge plans will be made available by the Structure and Bridge Division.
- 4) Remove the note that reads "THESE PLANS ARE UNFINISHED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION."

### **DATA REQUIRED FOR PRE-ADVERTISEMENT CONFERENCE**

Submit the following to the Plan Coordination Section in accordance with the Contract Processing Cut off Dates:

- a) Original Title Sheet, and all other original title sheets (Structure & Bridge, Environmental, etc.) for signatures approving the project for construction.
- b) Form LD-114 Completed Plans Form
- c) Form LD-426 (Federal Aid Interstate and Primary Projects)
- d) Form C-99, 2 copies (Minimum and No Plan Projects)
- e) Copy of Soil Analysis and Pavement Design
- f) List of any Government [Bench Marks](#) to be reset
- g) Copy of all correspondence pertinent to construction
- h) Copy of Pre-advertisement Report
- i) 3 Copies of the Cost Estimate
- j) Form LD-406 Certification of Plan Correctness (District Projects only)

Immediately upon signing, the original Title Sheet (right of way and construction stage) will be filed in the VDOT Central Office Plan Library. The **type written** names of the signers, and date signed (i.e. John W. Doe, signed October 29, 2003), will be inserted into the Signature Blocks of the .dgn version of the Title Sheet.

The complete official electronic .tif version of the plan assembly will be available through VDOT's Plan File Room internal Falcon web page.

For instructions on creating .tif files, see the "REFERENCE GUIDES" on the Location and Design Division website at <http://www.virginiadot.org/business/locdes/reference-guides.asp>.

The Project Manager is to ensure that the final electronic construction files on appropriate projects are made accessible through Falcon at final submission of the plan assembly to the Scheduling and Contract Division. The following files, in accordance with VDOT's CADD Manual, Chapter 8, "Electronic Deliverables" are required:

- 1) IGrds Files, if applicable
- 2) CAICE Files, if applicable
- 3) Microstation DGN files
- 4) Reports
- 5) Index of Files
- 6) .tif files
- 7) GEOPAK files, if applicable

All scanned signatures inserted into a .dgn file, or attached as a reference file to an existing .dgn file title sheet, must be removed.

The electronic .dgn version of the Title Sheet (including the typed names of the signers) will depict the latest version of the Title Sheet, from which the designer will create a .tif file for the "current drawings" folder on Falcon. At no point should a scanned signature be attached to a MicroStation file.

Note: In exceptional circumstances, applicable plans from other divisions may not be available at Pre-advertisement stage. In these circumstances, if permitted by the L&D Engineer/District L&D Engineer, the availability of these plans will be coordinated between the applicable Division Manager and the Plan Coordination Section. If plans for bridges, signs, signals, utilities, landscaping, etc. are not available, their absence must be called to the attention of the staff in the Plan Coordination Section by the Project Manager. It is the Project Managers responsibility to see that the necessary plans are submitted.

The Environmental Division will submit environmental documents and permits to the Scheduling and Contract Division. The Department of Rail and Public Transportation will submit any railroad agreements to the Scheduling and Contract Division.

## **BRIDGE ONLY CONTRACT**

When a bridge contract is to be let separately from the road contract, sufficient road plans must be included to establish the line and grade of the bridge. In some instances, such as widening of an existing bridge, road plans may not be necessary.

The road plan designer should coordinate the submission of the plan assembly with the Bridge Engineer according to the guidelines in the section on "DATA REQUIRED FOR PLAN SUBMISSION".

## **GOVERNMENT STREAM GAGING STATIONS**

If U.S. Geological Survey, Weather Bureau, Virginia Department of Conservation and Development, or other government stream gaging stations are located within the limits of construction, or will be destroyed or disturbed by construction, arrangements must be made to have these gaging stations moved before construction is started.

When plans have been submitted to the Scheduling and Contract Division for advertisement on which government stream gaging stations will be disturbed by construction, the Hydraulics Section must be notified by memorandum. The memorandum, accompanied by a print of each plan sheet on which such a gaging station occurs, shall give the description and location of each gaging station that has to be adjusted. Upon receipt of this data, the Hydraulics Section will notify the appropriate governmental agencies of the pending highway construction and of the necessity for the adjustment of the stream gaging stations.

## **PRE-ADVERTISEMENT CONFERENCE PLAN CHANGES**

During the review of the plans by the Scheduling and Contract Division (prior to Final Submission), "changes" may be made to the plans (with no formal revision) if there is sufficient time to make the changes and furnish prints of the sheets involved to the Scheduling and Contract Division prior to Final Submission.

## **SECTION 2G-9-PROJECT APPROVAL**

### **APPROVAL**

At this stage, the Plan Coordination Section will coordinate approval of the plan assembly through the office of the State Location and Design Engineer. Before the Chief Engineer signs the plans giving approval to construct the project, signatures recommending approval are required. The signature block should be located in the lower right corner of the title sheet. The Plan Coordination Section will record the date of approval.

### **BID PROPOSAL**

The Scheduling and Contract Division will check the cost estimate, prepare a Bid Proposal and review, with the designer, any discrepancies discovered during their review of the plans to insure total agreement between plans and specifications. The designer will make the changes on the plans requested by the Scheduling and Contract Division and revise the original computerized estimate in the Scheduling and Contract Division to indicate the revised quantity or material correction(s).

Each change to the estimate should be made with a different colored pencil and dated. Proper input forms with those changes for revising the estimate should be provided.



## **SECTION 2G-10-BIDDABILITY REVIEW**

### **BIDDABILITY REVIEW**

The Biddability Review is conducted at the Pre-Advertisement stage of the project development. This review looks at the details of the drawings and the quantities for the major cost items. The quantities stated in the summaries will be compared to the project special provisions and cost estimate to ensure that payment for all required work is addressed.

The goal is to insure that the project can be constructed for the bid amount by ensuring through biddability analysis that complete and accurate contract line items contain sufficient quantities to construct the project, thus preventing work orders and overruns. An estimate of the required quantities to perform the work is made from the Construction Plans. The plan quantities are then compared to the contract quantities to ensure accuracy.

The Specifications, Standards, Special Designs and Special Provisions are also reviewed to make sure they are appropriate and correct for the work to be performed.

A report is created after the review. It summarizes the review findings and gives recommendations as to adding or rewording notes to clarify pay items, working hours, specifications, etc.

**SECTION 2G-11-FINAL SUBMISSION OF APPROVED PLANS****PROCEDURES FOR FINAL SUBMISSION OF PLAN ASSEMBLY**

- 1) Project Manager makes any approved adjustments to the plans.
- 2) Project Manager submits the following to the Plan Coordination Section in accordance with the Contract Processing Cut Off Dates:
  - a) Form LD-377
  - b) Design Listings.
- 3) No revisions may be made to the plans between final submission and the project showing, generally 10 days after advertisement, unless approved by the Scheduling and Contract Division.

## **SECTION 2G-12- CONTACT WITH CONSTRUCTION PERSONNEL**

### **CONTACT WITH CONSTRUCTION PERSONNEL**

Communication between the designer and construction personnel should promote a superior product. Therefore, to avoid conflicts during construction, it is recommended that the project designer/coordinator contact the residency soon after the project is awarded to determine a field contact person. On large projects, an on site meeting held prior to construction, may be beneficial in answering questions regarding design intent that may prevent future revisions.

## **SECTION 2G-13-CONSTRUCTION PLAN REVISIONS**

### **FORMAL CONSTRUCTION REVISIONS**

After prints of approved plans have been made available at final submission, any change on the plans will require a formal revision and approval of Scheduling and Contract Division. When a proposed revision involves a change in quantities and the project has been turned in to the Scheduling and Contract Division but has not been advertised, the Scheduling and Contract Division may agree that the changes or revisions can be made before advertisement. If so, the summary sheet and estimate should be changed to reflect the revised quantity. Do not show a change in quantity on the Revision Data Sheet.

The designer or district/consultant coordinator will prepare the proper input forms to revise the computerized Engineering Estimate by coordinating all changes in the estimate with the Scheduling and Contract Division.

The designer or district/consultant coordinator must check all original plans to verify that the latest changes coordinated with the Scheduling and Contract Division have been made correctly prior to submitting the plan assembly to the Plan Coordination Section.

The Contract Engineer must always be notified of any proposed plan revision that is required between the time plans are received in the Scheduling and Contract Division (final submission) and the award of the project.

After advertisement of the project, and prior to bids being received, a "project showing" will be held. Any plan revisions requested at this time must be approved by the Scheduling and Contract Division, prior to incorporation into the plans.

After the contract has been awarded, the estimate or summaries will not be changed. The addition of new items and increases or decreases of current contract items are to be shown on the Revision Data Sheet only, with the revision data as shown in Figure 2G-3.

Electronic plan submission of formal construction revisions must follow the Electronic Plan Submission Process. See diagram on the web at: <http://www.virginiadot.org/business/locdes/e-plan-submission-index.asp> .

All revisions are submitted to the Plan Coordination Section for processing, accompanied by the Revision Data sheet and Revision Data Form LD-36. The appropriate blanks on Form LD-36 must be marked in the lower left corner to designate who is to receive prints of the revised plans.

The "Reason for Revision" part of the form should state: "See Revision Data Sheet No \_\_\_\_\_. The person responsible for making the revision is to sign the form and show his/her telephone extension at the bottom. Revisions should be submitted electronically in accordance with the Electronic Plan Submission Process.

The Plan Coordination Section will request the Plan Library to print and distribute the necessary copies of the revision. Revisions are updated electronically in the Falcon Plan File Room.

The changes must be described clearly and fully on the Revision Data Sheet. State and Federal Project numbers (including P.E. numbers), project descriptions, and P/PMS numbers are to be shown at the top of the sheet. For each revision, list the following information:

1. Revision date
2. State Project number
3. Sheets revised (excluding Bridge sheets)
4. Description of change to each sheet
5. Authorization for making the revision

For illustration, see Figure 2G-3.

In addition to the above, all instructions noted in Section [2F-6-FORMAL REVISIONS-MAJOR CHANGES](#) relating to utilities are applicable to this section.

During the life of a construction project, all construction revisions that will affect the final contract cost must be approved by the Scheduling and Contract Division before revising the plans.

In order to avoid plan revisions to work already under construction, the project designer/coordinator should contact the project engineer or inspector prior to making any formal plan revisions. Advance copies of revisions may be beneficial to field personnel and should be provided.

## **SECTION 2G-14-PROJECT ROUTE FILES AND DESIGN FILES**

### **ROUTE FILES AND CORRESPONDENCE**

One year after acceptance of a completed construction project, the route file may be discarded, except for original survey data.

For applicable projects:

All field books, original topography, profile, and property rolls are to be delivered to the Plan Library to be prepared for warehouse storage. Original rolls are not to be cut for printing but are to be delivered to the files intact.

All correspondence is to be discarded at this time. A final check should be made for any remaining originals, which should be forwarded to the Central File.

### **RETENTION OF DESIGN FILES**

From the preliminary to the final stages of a roadway design project, it is not unusual to have several design schemes developed utilizing the computer. Only one design scheme may be retained in computer storage. Alternate design schemes and studies will not be permanently stored, but may be reprocessed for the desired computer listing.

If/when it is necessary to use one of the alternate design schemes in lieu of the stored data or another copy of a listing is needed, the file can be retrieved and the desired output recreated to replace the existing data on file. If multiple design schemes, such as alternate sub-grade designs, must be considered at construction advertisement stage, the alternate design files will be retained.

The designer will be notified on Form C-5 when construction of the project has been completed.

Correspondence, computations, reports, etc. are to be retained in accordance with the table shown in Table 2G-10-1.

### **FINAL NOTEBOOK AND PROJECT RECORDS RETENTION**

The District Location and Design Engineer will retain all source documents, "project inspector" notebooks and/or project records for a period of five years, following payment of the final voucher, on all Federally funded, State, and Revenue Bond financed projects. Microfilming of these notebooks or records is not necessary.

At a time convenient to the district, the "As Built" plan assembly shall be sent to the State Location and Design Engineer with a request that the project records be microfilmed. After microfilming, the "As Built" assembly will be returned to the district for verification and filing.

If no audits, litigation or claims are in progress, all source documents, notebooks and/or project records can be disposed of after the five-year retention period. Otherwise, the retention period should be extended until such cases are resolved.

## **SECTION 2G-15-PREPARATION OF FINAL ESTIMATE**

### **PROCEDURE**

The review and preparation of final estimates, while requiring the coordinated effort of many divisions in the Central Office, is basically a responsibility of the District Administrator utilizing the District Design Units as focal points in fulfilling this obligation.

The primary objective during the review and preparation of the final estimate is to determine that the final records present a factual representation of the work performed by the contractor on the project.

Guidelines for review and preparation of final estimates may be found in the Post Construction Operations manual.

Completed final estimates are kept on file at the District Headquarters.



## **SECTION 2G-16-POST CONSTRUCTION REVIEW**

### **POLICY**

A Post Construction Field Review will be conducted on completed projects to evaluate the effectiveness of the various roadway designs and current design policy and to identify potential improvements.

This review should be held six to twelve months after completion so that the facility's operation and condition can be assessed. The Location and Design Division will schedule the review and notify the appropriate divisions.

The review team shall consist of the project engineer, representatives from appropriate divisions involved in the project's development, and others as necessary. On Federal Aid project's, a FHWA representative shall be requested to attend. The District Administrator should designate a representative familiar with the project's construction, operations, and maintenance.

The evaluation shall be for the purpose of determining the effectiveness of current design policy and to detect design features, which can be improved.

### **SCOPE**

The review process shall include the major component items of the project selected. The normal complete components would be:

- A. Roadway Design
- B. Safety Features
- C. Bridge Design
- D. Traffic Control Devices/Lighting

The review shall evaluate the functional/operational aspect of the items above contained in the project. Each of the items shall be evaluated in accordance with the current list attached that breaks the item into the component parts. These lists shall be revised at any time to add or delete items.

### **REPORTS**

A Post Construction Review Report, Form LD-416, shall be completed by the Location and Design Division. Other participating divisions may prepare reports relevant to their area of

involvement and submit them to the Location and Design Division. A supplemental report may be necessary. The reports should be formatted in a consistent manner by referencing to component (e.g. Safety), item number, and sub-letter for long term evaluation purposes (see Form LD-416).

The main focus of the evaluation process and the contents of the report should be safety, economy, and effectiveness of the features constructed.

Copies of the completed reports shall be provided to the District Administrator (and other applicable Division Administrators) for the review of policies, guidelines, procedures, etc. to determine if changes are necessary.

## **EVALUATION**

Each Division Administrator will review the reports to determine and implement necessary changes in policy and/or guidelines used to design and construct projects.





## REVISION DATA SHEET

STATE PROJECT: 0168-131-F04, PE-103, RW-202 FEDERAL PROJECT: M-5403 (217) (PE), M-RRS-5403 (242) (RW) FROM: 0.011 Mi. S. Int. Buckland Ave. TO: NCL City of Chesapeake PPMS: 1945	
Continued 4-28-95 <hr/> Sheet 8: Name change on parcels 058,060,128,176. Added new parcel numbers 177,178,179,181. Prop. u.g. utility ease. was added along west and east side of Campostella Rd. Added the wording "Proposed Acquisition Line" to parcel 058. P/L deleted on parcel 056. P/L symbol added to parcel 154. <hr/> Sheet 9: Name change on parcels 026,069. Adjusted P/L on parcel 069. Prop. u.g. utility ease. was added along west side of Campostella Rd. Dwelling removed on parcel 073. Conveyance symbol removed on parcel 026. Replaced P/L symbol with 'Z' mark symbol on parcel 068. <hr/> Sheet 10: Adjusted plus and distance for prop. R/W and prop. temporary construction easement on parcel 075.  This revision is made in accordance with various phone conversations with and memos from Mr. William Beaman, Suffolk District Right-of-Way Section. <hr/> Date: May 25, 1995 Proj. 0168-131-F04, RW-202 <hr/> Sheet 1: Sheet numbers revised. <hr/> Sheet 1D: Name change on parcels 008,034,036. <hr/> Sheet 1E: Name change on parcel 074. <hr/> Sheet 3: Name change parcel 008. <hr/> Sheet 4B: Revised location of existing bldg. on parcel 082.	Continued 6-28-95 <hr/> Sheet 7: Revised P/L to "Z" marks on former parcels 048,049,050,051,126. Added tax numbers to the former parcels. <hr/> Sheet 8: Proposed permanent utility easement pluses were adjusted to match utility easement line on parcel 061.  This revision is made in accordance with various phone conversations with and memos from Mr. William Beaman, Suffolk District Right-of-Way Section. <hr/> <div style="text-align: center; color: red; font-weight: bold;">                     THIS IS A PORTION OF A SAMPLE INSERTABLE SHEET, FOR A CURRENT VERSION, ACCESS THE CADD INSERTABLE DIRECTORY                 </div>

**FIGURE 2G-3 REVISION DATA SHEET**

DEMOLITION OF BUILDINGS / CLEARING OF PARCEL / CLOSING WELL / UNDERGROUND STORAGE TANK REMOVAL SUMMARY												
0058-070-103,RW-201												
Sheet Number	Parcel Number	Demolition Number	Landowner	Station Rt. or Lt.	Description	INCLUDED IN CONTRACT					NOT IN CONTRACT	
						Demolition of Buildings	Clearing of Parcel	Closing Well	Underground Storage Tank Removal			Items To Be Removed By Others
									Type A	Type B		
Lump Sum	Lump Sum	Each	Each	Each								
3	001	D-1	Vaxy, Tom Q.	103+40 Lt.	2 Story Frame Dwelling	L.S.						
3	001	D-2	"	104+58 Lt.	1 Story Frame Garage	L.S.						
3	001	D-3	"	104+71 Lt.	Well - 30" X 40"							
3	001	D-4	"	104+71 Lt.	Well House	L.S.		1				
3	001	D-5	"	105+05 Lt.	Shed		L.S.					
4	002	D-6	Tiger Oil Co.	109+62 Rt.	1 Story Brick Building	L.S.						
4	002	D700	"	109+68 RT.	Sign							
4	002	D500	"	109+72 Rt.	Underground Tank -700 Gal.				1		1	
4	002	D900	"	109+75 Rt.	2 Lights						1	
4	002	D-7	"	109+84 Rt.	10' X 20' Metal Sign	L.S.						
4	002	D-8	"	109+95 Rt.	Well			1				
4	002	D701	"	110+14 Rt.	2' X 2' Sign		L.S.					
4	002	D501	"	110+72 Rt.	Underground Tank - 1000 Gal.					1		
0008-070-106,RW-201												
7	019	D-9	Roe, Roger L.	138+94 Lt.	1 Story Stucco Dwelling	L.S.						
7	019	D901	"	139+02 Lt.	Fence						1	
7	019	D902	"	140+14 Lt.	Mobile Home		L.S.					
7	019	D-10	"	140+16 Lt.	Well - 30" X 55"			1				
TOTALS						LUMP SUM	LUMP SUM	3	1	1	(N.I.C.)	

**FIGURE 2G-4 DEMOLITION OF BUILDINGS/CLEARING OF PARCEL/CLOSING WELL/UNDERGROUND STORAGE TANK REMOVAL SUMMARY**

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# REVISION DATA SHEET

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Date June 12, 1999	0091-095-102 , RW-201 , C-501	
Changes in quantities as a result of revision dated June 12, 1999		
Increases		
403	Tons Asphalt Concrete Type SM-9.5A	
2250	Cubic Yards Borrow Excavation	
96	Tons Asphalt Concrete Type IM-19.0A	
85	Lin. Ft. 24" Pipe	
Decreases		
1	Each Guardrail Terminal St'd. GR-7	
63	Lin. Ft. GR-2A, 2B or 2C	
238	Lin. Ft. 48" Pipe	
New Items		
9	Lin. Ft. St'd. MH-2A	
1	Each Frame and Cover, St'd. MH-1	
Sheet 8 Revised to lengthen project limits from Sta. 368+50 to Sta. 384+78		
This revision was done in accordance with a memorandum from Mr. A. B. Carter District Eng. dated June 4, 1999.		
<b>THIS IS A PORTION OF A SAMPLE INSERTABLE SHEET, FOR A CURRENT VERSION, ACCESS THE CADD INSERTABLE DIRECTORY</b>		

**FIGURE 2G-5 REVISION DATA SHEET**

RECORDS RETENTION						
	Until Revised Or Voided	1	2	3	Permanent	Comments
		Year	Years	Years		
		After Completion of Project				
<b>SURVEY</b>						
Aerial Photography					X	
Aerial Survey Records				X*		* Retained until audit or 3 yrs., whichever is longer
Airport Clearance Files					X*	* Retained 20 years / longer if needed
Contour Mapping					X	
Flight Records					X*	* Retained 6 years / longer if needed
Photo. Mosaics	X					
Subsurface Utility Requests				X		
Survey Books/Control Files/Disks	X*					* Retain as long as Administratively necessary
Survey Files					X	
Survey Progress Reports		X				
Survey Requests			X			
Survey Rolls / U.S.G.S. Mapping	X					
<b>DESIGN</b>						
Design Route Files	X					
Dist. Coordination Project Files	X					
IGAES Testing Material	X					
Microfilmed Plans					X	
Preliminary Field Rev. / F.I. Plans					X*	* In accordance with Falcon, Retain copies 5 yrs.
Paper Plan Files					X*	* Paper copies may be destroyed after scanning
Project CADD Files					X	
Project Computations		X*				* Retained until project is Route Filed
<b>ESTIMATES</b>						
Appalachian Cost Estimates					X	
Appalachian Estimate Backup	X					
Interstate Cost Estimates					X	
Interstate Estimates Backup	X					
Project Estimates		X*			X*	* Originals retained in Central File, See IIM 183
<b>CORRESPONDENCE</b>						
Non-Project Correspondence			X			
Project Correspondence		X*			X*	* Originals retained in Central File, See Sec. 2G-12
<b>RECORDS/FORMS</b>						
A.E.S. Help Rec./Purchase Files		X				
Engineering Publications		X				
Budget Reports				X*		* Retained 3 years beyond applicable biennium
Committee minutes	X					
Consultant Files				X*		* Non-short-listed Expressions of Interest-30 days
Consultant Perform. Reports				X		
Consultant Vouchers/Invoices	X*					* Most recent three
Dist. Coordination Year Books					X*	* Retained until scanned at Quality Control Review
Leave Records					X*	* Retained in FMS
LD Form Backup	X					
Personnel Files		X*				* May be destroyed 6 months after separation
Publications/Photo Sales Records				X		
Training Records				X		
<b>MANUALS</b>						
CADD/Survey Man./Support Data	X					
IIM / RDM/Support Data					X	
<b>ST'D/SPEC. DESIGN</b>						
Special Designs / Shop Drawings					X	
St'd. /Insert. Sheets/Backup Data					X	

TABLE 2G-1-1