

PROJECT DESCRIPTION: _____

75% HIGHWAY DESIGN REVIEW CHECKLIST

Submission Date _____

PURPOSE

The 75% highway design review allows MassHighway to ensure that all comments from the 25% review have been addressed. It is also an opportunity to make certain that the plans and special provisions provide sufficient information to bid and construct the project.

GENERAL

This checklist represents the minimum amount of issues that should be considered when reviewing a 75% highway submittal. This checklist does not generally repeat items covered in the 25% Design Review Checklist. The submittal should include: responses to all comments from the 25% review, plans which are 90% complete, cross-sections, special provisions and estimate (including non-participating items).

Any question listed below with a No (N) or Not Applicable (NA) answer will require a written comment.

RESPONSE TO COMMENTS

Y N NA

1.01 Have all comments from the 25% review been addressed?

Comment: _____

PLANS

Y N NA 2.00 Title Sheet

2.01 Is the Title Sheet prepared consistent with Exhibit 18-14?

Comment: _____

2.02 Does the index indicate that the plans have been organized in the same order as indicated in Section 18.2.2.6?

Comment: _____

2.03 Are all sheets sized in accordance with E-99-004?

Comment: _____

2.04 Are the stations and coordinates for the beginning and end of the Project Limits labeled on the project locus?

Comment: _____

2.05 Is the latest version of all appropriate documents listed on the right side of the Title Sheet (e.g. (Date) Standard Specifications, Supplemental Specifications (Date), etc.)?

Comment: _____

Y N NA 3.00 Typical Sections

3.01 Do the typical sections provide sufficient representative sections so that adequate dimensioning and materials information is communicated to the contractor?

Comment: _____

Y N NA 3.00 Typical Sections (Cont.)

3.02 All proposed materials should be labeled on the Typical Sections. Are the material descriptions identical to the STANDARD NOMENCLATURE AND LIST OF STANDARD ITEMS or the material description in the STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES (Std. Specs.)?

Comment: _____

3.03 Is the gravel borrow type specified?

Comment: _____

3.04 Was the proposed pavement design developed consistent With Chapter 9 of the Project Development and Design Guidebook?

Comment: _____

3.05 Are the pavement thicknesses and materials consistent with the approved pavement design?

Comment: _____

Y N NA 4.00 Construction Drawings

4.01 Are the symbols and abbreviations used consistent with Exhibits 18-1 & 18-2?

Comment: _____

4.02 Are the proposed horizontal geometry (PC, PT, R, T, DELTA, L) and lane and shoulder widths shown on every sheet?

Comment: _____

4.03 Are limits of slope work clearly shown throughout the entire project?

Comment: _____

4.04 Do the limits of work shown at the back of sidewalks, walls and bridges provide sufficient area for the proposed work to be constructed and to adequately transition to the existing topography?

Comment: _____

4.05 Are the limits of proposed takings and easements shown?

Comment: _____

4.06 Is sufficient right of way available to perform the work?

Comment: _____

4.07 Is the disposition of every existing item located between the slope limits labeled on the construction drawings (e.g. Rem., R&R, R&S, Ret., etc.)?

Comment: _____

4.08 Is all work not to be performed by MassHighway's Contractor labeled BY

Comment: _____

4.09 Is all necessary information to construct the proposed drainage system shown on the drawings? (The words DRAINAGE DETAILS with location reference SEE BELOW or SEE PAGE NO:___ should appear at the top of each sheet. Depending on the amount of information depicted on the construction drawings a separate set of drawings may be required. Refer to DRAINAGE AND WATER SUPPLY DETAILS below for additional information)

Comment: _____

Y N NA 4.00 Construction Drawings (Cont.)

4.10 Do the plans adequately address water supply details? (The words WATER SUPPLY ALTERATIONS with location reference SEE BELOW or SEE PAGE NO:___ should appear at the top of each sheet. Refer to DRAINAGE AND WATER SUPPLY DETAILS below for additional information.)

Comment: _____

4.11 Are the proposed guardrail locations consistent with Section 5.6 of THE HIGHWAY DESIGN MANUAL, ENGINEERING DIRECTIVE E-95-008 and E-00-002, THE ROADSIDE DESIGN GUIDE, and THE CONSTRUCTION AND TRAFFIC STANDARD DETAILS? (The words HIGHWAY GUARD should appear at the top of each sheet. The type of guardrail, end treatments and stations should be noted for all proposed guardrail.)

Comment: _____

4.12 If plan and profile are separate sheets is the sheet number for the profile noted in the lower right corner of the drawing?

Comment: _____

4.13 Are all proposed materials adequately labeled? (e.g. type of curb, sidewalk treatment, driveway material, etc.)

Comment: _____

4.14 Is the proposed design consistent with ADA and AAB requirements? (A significant amount of information is necessary to present a design that adequately represents the proposed dimensions and elevations. In most instances, a separate large scale detail will be required)

Comment: _____

Y N NA 5.00 Profiles

5.01 Are the proposed profiles prepared consistent with Exhibit 18-10?

Comment: _____

5.02 Are all aspects of the vertical geometry noted (Stopping Sight Distance, Passing Sight Distance, if applicable, G1, G2, L, K, station and elevation of the PVC, PVT and PVI)?

Comment: _____

Y N NA 6.00 Curb Tie and Grading Plans

6.01 Does the curb tie information adequately provide station and offset information to PC's, PT's tapers, etc.?

Comment: _____

6.02 Are grades shown every 25 feet, or closer, to note intermediate high or low points?

Comment: _____

6.03 Does the curb tie and grading plan provide sufficient information to the contractor to adequately layout the proposed curb and construct a roadway that will not have ponding?

Comment: _____

PROJECT DESCRIPTION: _____

75% HIGHWAY DESIGN REVIEW CHECKLIST

Submission Date _____

Y N NA 7.00 Drainage and Water Supply Details

7.01 Are drainage structures located approximately 300 feet apart on tangents, or closer for intersections?

Comment: _____

7.02 Are drainage structures located approximately 200 to 250 feet apart on the inside of superelevated curves?

Comment: _____

7.03 Are drainage structures located approximately 250 feet apart on highway grades

Comment: _____

7.04 Are drainage structures located at the uphill side of bridges?

Comment: _____

7.05 For major highways are six drainage structures used at low points (three each side)?

Comment: _____

7.06 For all other roadways are four drainage structures used at low points?

Comment: _____

7.07 Are drainage structures proposed prior to superelevation transitions?

Comment: _____

7.08 Have catch basin to catch basin connections been avoided?

Comment: _____

7.09 Is the drainage trunkline located in the most appropriate location for future maintenance?

Comment: _____

7.10 Has every effort been made to limit the amount of structures located in the travel lane?

Comment: _____

7.11 Does the location and number of pipes entering manholes allow the walls of the manhole to maintain their structural integrity?

Comment: _____

7.12 Is the length, size, direction of flow and type of material noted on each length of pipe? (Invert elevations should only be noted on cross culverts, not on the drainage trunkline)

Comment: _____

7.13 Is the disposition of the existing drainage system adequately labeled? (RET, ADJ, R&R, ABON, REM, etc.)

Comment: _____

7.14 Do the plans fully address all the impacts that the proposed roadway design may have on the existing water supply system? (Full depth reconstruction, profile changes, roadway widenings, etc. may all influence the water supply alterations required.)

Comment: _____

7.15 Are the disposition of all curb stops and service boxes located within the proposed slope limits labeled?

Comment: _____

PROJECT DESCRIPTION: _____

75% HIGHWAY DESIGN REVIEW CHECKLIST

Submission Date _____

Y N NA 8.00 Traffic Signal Plans

8.01 Do plans for signalized intersections include signal equipment locations, sequence and timing chart, phasing diagram, list of major items, pavement markings and signs?

Comment: _____

8.02 Are signal heads located in the vision cone specified by the MUTCD?

Comment: _____

Y N NA 9.00 Traffic Management Plans (may be 8-1/2 x 11 for simple projects)

9.01 Does the TMP provide sufficient information to determine that the proposed project can be constructed without undue inconvenience to the public?

Comment: _____

9.02 For projects with a detour, is the proposed detour reasonable considering available traffic data?

Comment: _____

9.03 Does the proposed TMP adequately address bicycle and pedestrian accommodation?

Comment: _____

9.04 Does the TMP anticipate the proposed changes in grade? Temporary barrier or sheeting may be required, or sufficient area must be available for slopes.

Comment: _____

9.05 For bridge projects, does the TMP provide sufficient space to allow for demolition, forming, dowel bar splicing, etc.?

Comment: _____

Y N NA 10.00 Cross Sections

10.01 Are the cross-sections plotted consistent with Section 18.2.14?

Comment: _____

10.02 Is the proposed profile elevation shown on each cross section?

Comment: _____

10.03 Are the edge elevations noted on all sections that are superelevated or located on the transition to a superelevated section?

Comment: _____

10.04 Is the PC, R, PT and Rate of Bank noted on each sheet that contains a superelevated or transition cross section?

Comment: _____

10.05 Are the pay limits for the appropriate excavation types shown properly? (e.g. ITEM 140., ITEM 141., ITEM 123., ITEM 125. ITEM 121.)

Comment: _____

10.06 Does the proposed cross-section provide sufficient area to install guardrail where necessary?

Comment: _____

Y N NA 10.00 Cross Sections (Cont.)

10.07 Do the proposed cross sections relate well to the adjacent properties? (e.g. slope, material treatment, existing trees, walls, etc.)

Comment: _____

10.08 Are cross sections provided at all intersecting driveways?

Comment: _____

10.09 Does the gravel box adjust to cut and fill ("daylight") cross sections consistent with Chapter 5 and the Typical Sections?

Comment: _____

11.00 SPECIAL PROVISIONS

Special provisions should only be written when absolutely necessary to address a project specific issue that is not satisfactorily addressed in the STD. SPECS. and SUPPLEMENTAL SPECS., or if the item has an asterisk in the STANDARD NOMENCLATURE. If a special provision is absolutely necessary, particular attention should be paid to the basis of payment and method of measurement.

Y N NA

11.01 Is an adequate Scope of Work provided?

Comment: _____

11.02 Are all the latest manuals, supplemental manuals and documents listed in the contract?

Comment: _____

11.03 If the project requires specific information relative to lane closures and traffic management is the information concisely conveyed as a supplement to Subsection 7.09 Public Safety and Convenience?

Comment: _____

11.04 If workhours, other than the standard eight hour shift, are proposed, is (are) the available workshift(s) described as a supplement to Subsection 7.09 Schedule of Operations?

Comment: _____

11.05 Is a complete list of affected utility companies included as a supplement to Subsection 7.13 Protection and Restoration of Property?

Comment: _____

11.06 Do all items contained in the estimate with an asterisk in the STANDARD NOMENCLATURE have a special provision?

Comment: _____

11.07 Are all item descriptions and units contained in the special provisions consistent with the estimate (and STANDARD NOMENCLATURE, if applicable)?

Comment: _____

11.08 If the plans contain work that requires specific construction techniques not defined in the STD. SPECS., has a special provision been included?

Comment: _____

PROJECT DESCRIPTION: _____

75% HIGHWAY DESIGN REVIEW CHECKLIST

Submission Date _____

Y N NA 11.00 SPECIAL PROVISIONS (Cont.)

11.09 Do all special provisions include a very specific, unambiguous, method of measurement and basis of payment that will eliminate the potential for disputes during construction?

Comment: _____

11.10 For Items labeled R&S, is the location where they are to be stacked clearly identified?

Comment: _____

11.11 Have the special provisions been reviewed to ensure that there are no proprietary items specified? If proprietary items are specified, please justify.

Comment: _____

Y N NA 12.00 ESTIMATE

12.01 Is the methodology used to estimate the project consistent with the STD. SPECS. and the latest SUPPLEMENTAL SPECIFICATIONS?

Comment: _____

12.02 Does every item of work shown on the plans have an associated pay item?

Comment: _____

12.03 Is there a clear delineation between highway items and bridge items such that all work is included in the estimate and no work is included twice?

Comment: _____

12.04 Does the estimate include a payment method for all work associated with the environmental permits?

Comment: _____

The following issues should be considered when reviewing contract estimates. The issues listed below are based on analysis of common extra work orders:

Y N NA 13.00 Section 100

13.01 Is the estimated quantity for ITEM 101. of significant size to prevent unusually high bid prices? (If not consider eliminating item. Section 101.81 indicates that if item is not in contract work is included in Earth Excavation or Borrow).

Comment: _____

13.02 If ITEM 101. is included in the estimate then ITEM 103. and 104. should not be used. The only exception would be in instances where the tree removal is outside the limits of the clearing and grubbing. In this case, the Detail Sheets should describe the station and offset for the trees to be paid for under ITEMS 103. or 104.

Comment: _____

13.03 All earthwork volumes shall be calculated using the shrinkage and swell criteria from Exhibit 18-30. The contract quantity will then be calculated using the SUMMARY EARTHWORKS QUANTITY SHEET on page 18-73.

Comment: _____

Y N NA 13.00 Section 100 (Cont.)

13.04 If ITEM 112. is included in the contract, consider the use of ITEM 119.

Comment: _____

13.05 ITEM 120. includes the excavation of a huge variety of materials and should be used whenever possible.

Comment: _____

13.06 If ITEM 120.1 is included in the contract do not include ITEM 121 and ITEM 120.

Comment: _____

13.07 Considering the boring information, ITEM 121. (unless ITEM 120.1 is used) and 144. may be required.

Comment: _____

13.08 ITEM 141.1 should be included in nearly every project that will require excavation.

Comment: _____

13.08 ITEM 142. will most likely be required if ITEM 202.2 or ITEM 202.3 is proposed.

Comment: _____

13.09 Is ITEM 150.1 appropriate based on the type of construction involved and the boring information?

Comment: _____

13.10 Consider ITEM 156. for contracts that include drainage or water supply work.

14.00 Section 200

14.01 In areas with a significant amount of existing utilities, consideration should be given to include ITEMS 204. and 238.XX.

Comment: _____

14.02 Trunklines 36" (900 mm) or greater require ITEM 203.

Comment: _____

14.03 Grade changes of more than 6" (150 mm) require ITEM 220.5.

Comment: _____

14.04 The condition of the existing drainage system should be evaluated to determine if ITEMS 221. and 222. should be specified rather than 220. Also 220.2 should be considered.

Comment: _____

Y N NA 15.00 Section 300

15.01 Contracts that include alterations to a water system will generally require ITEMS 156., 309. and 903.

Comment: _____

15.02 Consider ITEMS 357. and 381. to allow for existing boxes that are not adjustable.

Comment: _____

15.03 Consider contingency items for service lines.

Comment: _____

PROJECT DESCRIPTION: _____

75% HIGHWAY DESIGN REVIEW CHECKLIST

Submission Date _____

Y N NA 15.00 Section 300 (Cont.)

15.04 Projects involving roadway widening may require ITEM 376.2.

Comment: _____

15.05 Will temporary or transitional water service use be required? Will weekend or evening work be required to implement?

Comment: _____

16.00 Section 400

16.01 ITEM 440. and ITEM 443. should be included in all projects with full depth

Comment: _____

16.02 Consider ITEM 463. for projects that include full depth reconstruction.

Comment: _____

16.03 ITEM 464. should be estimated at a rate of 1/20 gal/sy (0.20 l/sm).

Comment: _____

16.04 ITEM 464.5 should be included in all projects that include paving.

Comment: _____

16.05 ITEM 472. should be included in nearly every project requiring paving.

Comment: _____

17.00 Section 500

17.01 Curbing to be set on radius of 100 ft (30 m) or less shall paid for using the appropriate "curved" curb item.

Comment: _____

17.02 Edging to be set on radius of 10 ft (3 m) or less shall paid for using the appropriate "curved" edging item.

Comment: _____

18.00 Section 600

18.01 Wood blocks must be used on all guardrail installations, see E-00-002.

Comment: _____

18.02 Refer to E-95-008 and E-02-001 for the design of impact attenuators.

Comment: _____

18.03 Buried ends are measured as units of 37.5 ft (11.46 m)

Comment: _____

18.04 Leading and trailing ends at bridges are measured as units of 25 ft (7.64 m).

Comment: _____

18.05 Leading and trailing ends at bridges are thrie beam, therefore if Type SS highway guard is proposed, ITEM 627.6 will be required.

Comment: _____

18.06 Guardrail constructed to a radius of less than 150 ft (45 m) will paid for under the appropriate curved guardrail item.

Comment: _____

PROJECT DESCRIPTION: _____

75% HIGHWAY DESIGN REVIEW CHECKLIST

Submission Date _____

Y N NA 18.00 Section 600 (Cont.)

18.07 The Method of Measurement and Basis of Payment for stone masonry walls has been revised in the Supplemental Specifications. ITEM 685. now includes the cement concrete footing and the coping material. Excavation is still paid for under ITEM 141.

Comment: _____

19.00 Section 700

19.01 All projects shall include ITEM 748. This item should be estimated at 3% of construction costs.

Comment: _____

20.00 Section 800

20.01 Refer to E-02-003 for estimating procedures for ITEM 851.

Comment: _____

20.02 All guardrail installations require delineators. Refer to Subsection 828.60 for estimating.

Comment: _____

20.03 ITEM 854.034 and/or 854.036 should be included for temporary pavement markings on proposed top course.

Comment: _____

20.04 If the TMP requires the removal of pavement markings, include ITEM 854.1 and/or 854.2.

Comment: _____

20.05 If ITEM 853.2 is specified, will ITEM 853.21 be required?

Comment: _____

20.06 Will ITEM 856.12 be required?

Comment: _____

21.00 Section 900

21.01 If ITEM 987., 987.1, 987.12 or 987.2 is proposed, refer to E-99-001 for applicability.

Comment: _____

CONCLUSIONS

Y N NA

22.01 Have all the comments from the 25% review been satisfactorily addressed?

Comment: _____

22.02 Is the estimated total construction cost consistent with the TIP?

Comment: _____

22.03 Has an independent constructability review been performed?

Comment: _____

PROJECT DESCRIPTION: _____

75% HIGHWAY DESIGN REVIEW CHECKLIST

Submission Date _____

CONCLUSIONS (Cont.)

22.04 Do the plans represent a project that is reasonable from a constructability standpoint with respect to construction techniques and available right of way?

Comment: _____

22.05 Does the estimate include all the items of work necessary to complete the project?

Comment: _____

22.06 Does the estimate appropriately distinguish participating from non-participating items?

Comment: _____

All remaining information to be provided by the MassHighway District Office.

Y

The Designer certifies that the 75% Design Plans have been reviewed in accordance with this checklist and that all responses are correct and accurately reflect the information presented on the submitted Design Plans.

Consultant Firm Principal or Project Manager (circle one) Date

Y

A constructability review has been performed by a member of the District Construction Office and the comments are attached.

District Construction Engineer Date

Y

A traffic review has been performed by the District Traffic Section and the comments are attached.

District Traffic Engineer Date

Y

A design review has been performed by the District Projects Section and the comments are attached.

District Project Development Engineer Date

Y

A design review has been performed by the District Office and the comments are attached.

District Highway Director Date

HIGHWAY SUBMITTALS

	25%							75%						100%					
	PLANS	X-SECTIONS	ESTIMATE	DER	FDR	PREL. ROW		PLANS	X-SECTIONS	SPECIAL PROVISIONS	ESTIMATE	LAYOUT PLANS & INST		PLANS	X-SECTIONS	SPECIAL PROVISIONS	ESTIMATE	DETAIL SHEETS	FINAL ROW PLANS
DISTRICT	2	2	2	1	1			2	2	2	2			2	2	2	2	2	
TRAFFIC ENGINEERING	1				1			1		1	1			1		1	1	1	
REGULATIONS UNIT (NOTE 1)								1		1	1			1		1	1	1	
ENVIRONMENTAL (note 2)	1							2		2	2			2		2	2		
RIGHT OF WAY	1					2		1				2		1					2
AAB COORDINATOR	1							1		1	1			1		1	1		
BICYCLE AND PED COORD (Note 3)	1							1		1	1			1		1	1		
LANDSCAPE SECTION	1							1		1	1			1		1	1		
FHWA (Note 4) (half size)	1	1	1	1	1			1	1	1	1			1	1	1	1	1	
CITY/TOWN	1							1						1					
UTILITIES (Note 5)																			
PROJECT MANAGER	1	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1
CONSTRUCTABILITY REVIEW (Note 6)	1	1	1					1	1	1	1			By REQUEST ONLY					

1 FEDERAL AID PROJECTS ONLY

2 REFER TO ENGINEERING DIRECTIVE E-02-005 REGARDING REQUIREMENTS FOR EARLY ENVIRONMENTAL COORDINATION

3 75% AND 100% SUBMITTALS TO BICYCLE AND PED. COORD. NOT NECESSARY IF APPROVED AT 25% (UNLESS DESIGN HAS CHANGED)

4 REFER TO FEDERAL OVERSIGHT AGREEMENT DATED 3-8-99

5 See UTILITY TAB Below

6 Consult with Project Manager before including plans for Constructability Review.

UTILITY SUBMITTALS

UTILITY TYPE	25%						75%					100%					
	PLANS	X-SECTIONS	ESTIMATE	DER	FDR	PREL. ROW	PLANS	X-SECTIONS	SPECIAL PROVISIONS	ESTIMATE	LAYOUT PLANS & INST	PLANS	X-SECTIONS	SPECIAL PROVISIONS	ESTIMATE	DETAIL SHEETS	FINAL ROW PLANS
Electric	2						2					2					
Telephone	2						2					2					
Gas	2						2					2					
Cable TV	1						1					1					
Fire Alarm	1						1					1					
Sewer*	1						1					1					
Water*	1						1					1					
DPW/City Highway Dept. *	1						1					1					
RCN, AT&T, MCI, Sprint, Qwest or other long distance utility	1						1					1					

* Some Municipalities may have the same office review these plans. Therefore, each department may not have to receive an individual set. The consultant should determine if each department's review and subsequent plans submittal is applicable.

All utility plan submissions should have a list of the names of the actual utility companies to which these plans are to be forwarded. Utility contact information for many municipalities may be found on MassHighway's webpage - "Doing Business with MassHighway

UTILITY SUBMITTALS

UTILITY TYPE	25%						75%					100%					
	PLANS	X-SECTIONS	ESTIMATE	DER	FDR	PREL. ROW	PLANS	X-SECTIONS	SPECIAL PROVISIONS	ESTIMATE	LAYOUT PLANS & INST	PLANS	X-SECTIONS	SPECIAL PROVISIONS	ESTIMATE	DETAIL SHEETS	FINAL ROW PLANS
Electric	2						2					2					
Telephone	2						2					2					
Gas	2						2					2					
Cable TV	1						1					1					
Fire Alarm	1						1					1					
Sewer*	1						1					1					
Water*	1						1					1					
DPW/City Highway Dept. *	1						1					1					
RCN, AT&T, MCI, Sprint, Qwest or other long distance utility	1						1					1					

* Some Municipalities may have the same office review these plans. Therefore, each department may not have to receive an individual set. The consultant should determine if each department's review and subsequent plans submittal is applicable.

All utility plan submissions should have a list of the names of the actual utility companies to which these plans are to be forwarded. Utility contact information for many municipalities may be found on MassHighway's webpage - "Doing Business with MassHighway