

Municipal Bridge Projects MGL Chapter 85 Section 35 Review Process Design Requirements and Submittals for New Bridge and Full Bridge Replacement Projects NOTE: Design Requirements to be used depend on the Category of the Proposed Structure and not on the Category of the Existing Structure						
Note: If the Category of the Proposed Structure is neither BRI nor NBI (i.e., span ≤ 10 feet), a Chapter 85 review is not required						
If the Category of the Proposed Structure is a BRI Bridge (10 feet < span ≤ 20 feet)						
Roadway Functional Class	Hydraulic Design	Geotechnical Design	Structural Design	Construction Details	Design Review Submittals	Other Considerations
Rural Minor Collector Rural Local Road Urban Collector Urban Local Road	Hydraulic report per Bridge Manual (except as noted below)  Less than 2 feet of freeboard  Flood frequency: 10 year Design Scour freq.: 25 year Check Scour freq.: 50 year  Must be scour stable after Design Scour Event but not necessarily available for use.	Geotechnical Report per Bridge Manual (except as noted below)  At least one boring to refusal below bottom of footing or pile tip for every 30 feet of abutment or culvert width. If rock is encountered, a 10 foot core is recommended.	Design in accordance with AASHTO LRFD for HL-93 Design Loading.  Bridge Manual DL and LL load distribution procedure if applicable.  Seismic: AASHTO Guide Specifications for SDC A requirements.  If a pre-fabricated structure that is designed by the fabricator: when the Contractor submits the fabricator design calculations and shop drawings, the municipality's Designer of Record shall review and accept the design.	Need not follow MassDOT Bridge Manual construction details.  If not using standard MassDOT bridge railings or barriers and transitions, those used must be crash tested to either NCHRP 350 or MASH, Test Level 2 minimum if roadway speed ≤ 45 mph, minimum Test Level 3 if roadway speed > 45 mph. Provide 42" railing height if pedestrians are allowed on bridge.	Hydraulic Report (if over water)  Geotechnical Report  Complete final set of Construction Plans and one set of design calculations checked by a second engineer for MassDOT review.  If a pre-fabricated structure, submit the shop drawings and fabricator design calculations after they have been reviewed and accepted by the municipality's Designer of Record.  After MassDOT accepts the design, a complete final set of Construction Plan mylars with the MassDOT Chapter 85 approval stamp printed on each sheet for Bridge Engineer's signature.	Evaluation of structure from a Cultural Resources standpoint.  Consider Stream Crossing Standards requirements.  Consider "no rise" guidelines for NFIP regulatory floodways.  Consider Complete Streets guidelines.  Provide for utilities (water, gas, etc.) if it is expected that they will be installed in the future.  Environmental permitting may put restrictions on time of year when work can be done in the water.
Rural Major Collector Urban Minor Arterial	Hydraulic report per Bridge Manual  Provide 2 feet of freeboard  Flood frequency: 25 year Design Scour freq.: 50 year Check Scour freq.: 100 year  Must be scour stable and available for limited use after the Design Scour Event.	Geotechnical Report per Bridge Manual  Perform a Design Boring program in accordance with Bridge Manual Part I, Section 1.2.	Design in accordance with AASHTO LRFD for HL-93 Design Loading  Bridge Manual DL and LL load distribution procedure if applicable.  Seismic design per Bridge Manual for a 1000 year return period event.  If a pre-fabricated structure that is designed by the fabricator: when the Contractor submits the fabricator design calculations and shop drawings, the municipality's Designer of Record shall review and accept the design.	If using MassDOT standard bridge details, follow MassDOT Bridge Manual construction details.  Use MassDOT bridge railings and barriers and transitions.	Hydraulic Report (if over water)  Geotechnical Report  Complete final set of Construction Plans and one set of design calculations checked by a second engineer.  If a pre-fabricated structure, submit the shop drawings and fabricator design calculations after they have been reviewed and accepted by the municipality's Designer of Record.  After MassDOT accepts the design, a complete final set of Construction Plan mylars with the MassDOT Chapter 85 approval stamp printed on each sheet for Bridge Engineer's signature.	Evaluation of structure from a Cultural Resources standpoint.  Consider Stream Crossing Standards requirements.  Consider "no rise" guidelines for NFIP regulatory floodways.  Consider Complete Streets guidelines.  Provide for utilities (water, gas, etc.) if it is expected that they will be installed in the future.  Environmental permitting may put restrictions on time of year when work can be done in the water.

If the Category of the Proposed Structure is a BRI Bridge (10 feet < span ≤ 20 feet) (Continued)						
Roadway Functional Class	Hydraulic Design	Geotechnical Design	Structural Design	Construction Details	Design Review Submittals	Other Considerations
<b>Rural Principal Arterial</b> <b>Rural Minor Arterial</b> <b>Urban Principal Arterial</b> <b>Or</b> <b>Any structure on the National Highway System (NHS)</b> (See Note 1 Below)	Hydraulic report per Bridge Manual  Provide 2 feet of freeboard  Flood frequency: 50 year Design Scour freq.: 100 year Check Scour freq.: 200 year  Must be scour stable and available for limited use after the Check Scour Event.	Geotechnical Report per Bridge Manual  Perform a Design Boring program in accordance with Bridge Manual Part I, Section 1.2.	Design in accordance with AASHTO LRFD for HL-93 Design Loading.  Bridge Manual DL and LL load distribution procedure if applicable.  Seismic design per Bridge Manual for a 1000 year return period event, or 2500 year return period event for NHS bridges, based on the SDC of the site.  If a pre-fabricated structure that is designed by the fabricator: when the Contractor submits the fabricator design calculations and shop drawings, the municipality's Designer of Record shall review and accept the design.	If using MassDOT standard bridge details, follow MassDOT Bridge Manual construction details.  Use MassDOT bridge railings and barriers and transitions.	Hydraulic Report (if over water)  Geotechnical Report  Complete final set of Construction Plans and one set of design calculations checked by a second engineer.  If a pre-fabricated structure, submit the shop drawings and fabricator design calculations after they have been reviewed and accepted by the municipality's Designer of Record.  After MassDOT accepts the design, a complete final set of Construction Plan mylars with the MassDOT Chapter 85 approval stamp printed on each sheet for Bridge Engineer's signature.	Evaluation of structure from a Cultural Resources standpoint.  Consider Stream Crossing Standards requirements.  Consider "no rise" guidelines for NFIP regulatory floodways.  Consider Complete Streets guidelines.  Provide for utilities (water, gas, etc.) if it is expected that they will be installed in the future.  Environmental permitting may put restrictions on time of year when work can be done in the water.
If the Category of the Proposed Structure is a NBI Bridge (20 feet < clear span)						
Roadway Functional Class	Hydraulic Design	Geotechnical Design	Structural Design	Construction Details	Design Review Submittals	Other Considerations
<b>Rural Minor Collector</b> <b>Rural Local Road</b> <b>Urban Collector</b> <b>Urban Local Road</b>	Hydraulic report per Bridge Manual (except as noted below)  Provide 2 feet of freeboard  Flood frequency: 10 year Design Scour freq.: 25 year Check Scour freq.: 50 year  Must be scour stable after Design Scour Event but not necessarily available for use.	Geotechnical Report per Bridge Manual (except as noted below)  Perform a Design Boring program in accordance with Bridge Manual Part I, Section 1.2.	Design in accordance with AASHTO LRFD for HL-93 Design Loading and following Bridge Manual guidelines.  Seismic design per Bridge Manual for a 1000 year return period event based on the SDC of the site.  If a pre-fabricated structure that is designed by the fabricator: when the Contractor submits the fabricator design calculations and shop drawings, the municipality's Designer of Record shall review and accept the design.	Need not follow MassDOT Bridge Manual construction details.  If not using standard MassDOT bridge railings or barriers and transitions, those used must be crash tested to either NCHRP 350 or MASH, Test Level 2 minimum if roadway speed ≤ 45 mph, minimum Test Level 3 if roadway speed > 45 mph. Provide 42" railing height if pedestrians are allowed on bridge.	Hydraulic Report (if over water)  Geotechnical Report  Complete final set of Construction Plans and one set of design calculations checked by a second engineer.  If a pre-fabricated structure, submit the shop drawings and fabricator design calculations after they have been reviewed and accepted by the municipality's Designer of Record.  After MassDOT accepts the design, a complete final set of Construction Plan mylars with the MassDOT Chapter 85 approval stamp printed on each sheet for Bridge Engineer's signature.	Evaluation of structure from a Cultural Resources standpoint.  Consider Stream Crossing Standards requirements.  Consider "no rise" guidelines for NFIP regulatory floodways.  Consider Complete Streets guidelines.  Provide for utilities (water, gas, etc.) if it is expected that they will be installed in the future.  Environmental permitting may put restrictions on time of year when work can be done in the water.

If the Category of the Proposed Structure is a NBI Bridge (20 feet < clear span) (Continued)						
Roadway Functional Class	Hydraulic Design	Geotechnical Design	Structural Design	Construction Details	Design Review Submittals	Other Considerations
Rural Major Collector Urban Minor Arterial	Hydraulic report per Bridge Manual  Provide 2 feet of freeboard  Flood frequency: 25 year Design Scour freq.: 50 year Check Scour freq.: 100 year  Must be scour stable and available for limited use after the Design Scour Event.	Geotechnical Report per Bridge Manual  Perform a Design Boring program in accordance with Bridge Manual Part I, Section 1.2.	Design in accordance with AASHTO LRFD for HL-93 Design Loading and following Bridge Manual guidelines.  Seismic design per Bridge Manual for a 1000 year return period event based on the SDC of the site.  If a pre-fabricated structure that is designed by the fabricator: when the Contractor submits the fabricator design calculations and shop drawings, the municipality's Designer of Record shall review and accept the design.	If using MassDOT standard bridge details, follow MassDOT Bridge Manual construction details  Use MassDOT bridge railings and barriers and transitions.	Hydraulic Report (if over water)  Geotechnical Report  Complete final set of Construction Plans and one set of design calculations checked by a second engineer.  If a pre-fabricated structure, submit the shop drawings and fabricator design calculations after they have been reviewed and accepted by the municipality's Designer of Record.  After MassDOT accepts the design, a complete final set of Construction Plan mylars with the MassDOT Chapter 85 approval stamp printed on each sheet for Bridge Engineer's signature.	Evaluation of structure from a Cultural Resources standpoint.  Consider Stream Crossing Standards requirements.  Consider "no rise" guidelines for NFIP regulatory floodways.  Consider Complete Streets guidelines.  Provide for utilities (water, gas, etc.) if it is expected that they will be installed in the future.  Environmental permitting may put restrictions on time of year when work can be done in the water.
Rural Principal Arterial Rural Minor Arterial Urban Principal Arterial Or Any structure on the National Highway System (NHS) (See Note 1 Below)	Hydraulic report per Bridge Manual  Provide 2 feet of freeboard  Flood frequency: 50 year Design Scour freq.: 100 year Check Scour freq.: 200 year  Must be scour stable and available for limited use after the Check Scour Event.	Geotechnical Report per Bridge Manual  Perform a Design Boring program in accordance with Bridge Manual Part I, Section 1.2.	Design in accordance with AASHTO LRFD for HL-93 Design Loading and following Bridge Manual guidelines.  Seismic design per Bridge Manual for a 1000 year return period event, or 2500 year return period event for NHS bridges, based on the SDC of the site.  If a pre-fabricated structure that is designed by the fabricator: when the Contractor submits the fabricator design calculations and shop drawings, the municipality's Designer of Record shall review and accept the design.	If using MassDOT standard bridge details, follow MassDOT Bridge Manual construction details.  Use MassDOT bridge railings and barriers and transitions.	Hydraulic Report (if over water)  Geotechnical Report  Complete final set of Construction Plans and one set of design calculations checked by a second engineer.  If a pre-fabricated structure, submit the shop drawings and fabricator design calculations after they have been reviewed and accepted by the municipality's Designer of Record.  After MassDOT accepts the design, a complete final set of Construction Plan mylars with the MassDOT Chapter 85 approval stamp printed on each sheet for Bridge Engineer's signature.	Evaluation of structure from a Cultural Resources standpoint.  Consider Stream Crossing Standards requirements.  Consider "no rise" guidelines for NFIP regulatory floodways.  Consider Complete Streets guidelines.  Provide for utilities (water, gas, etc.) if it is expected that they will be installed in the future.  Environmental permitting may put restrictions on time of year when work can be done in the water.
<b>Note 1:</b> The following NHS routes: Eisenhower Interstate, Other NHS Routes and STRAHNET Routes and Connectors, are considered Critical/Essential in that they are the primary routes for emergency use during and after an emergency or natural event. Structures on these NHS routes must be available for limited use after such an event. See MassDOT Bridge Manual for more information on these requirements. A map of NHS Routes in Massachusetts is available on the following website: <a href="http://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/">http://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/</a>						
<b>Note 2:</b> Bridge Railing and Transition and Bridge Railing Retrofit Resources:  Federal Highway Administration: <a href="http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/ctrmeasures/bridge_railings/">http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/ctrmeasures/bridge_railings/</a>  AASHTO   AGC   ARTBA Task Force 13: <a href="http://www.aashtotf13.org/Bridge-Rail.php">http://www.aashtotf13.org/Bridge-Rail.php</a>						
<b>Note 3:</b> AASHTO LRFD = AASHTO LRFD Bridge Design Specifications, Latest Edition with current interims and errata						