

Work Breakdown Structure Element Dictionary

Preliminary Engineering

Element Name	Phase	Index Number	Work Breakdown Structure Element Description
Preliminary Engineering Initiation	PE	3.1	Preliminary Engineering Initiation includes the implementation of the project's funding and notification of the consultant or in-house design staff to commence work, the Preliminary Engineering Kickoff Meeting with the Designer.
Kickoff Meeting Minutes	PE	3.1.1	Preliminary Engineering Kickoff Meetings are held with the Project Manager, Designer and local officials. The Designer documents the meeting minutes to include important comments and input received at the meeting.
Roadway Engineering	PE	3.2	Roadway Engineering includes the deliverables associated with the project's roadway design features, such as pavement design, horizontal and vertical geometry, soil erosion and sediment control, highway lighting, drainage, survey efforts and the completion of jurisdictional limit maps and agreements.
Control Survey Report	PE	3.2.1	The Geodetic Survey approves a Control Survey Report. The report consists of the control survey and data required to establish primary and photogrammetric control.
Topographic Survey	PE	3.2.2	The Designer conducts a topographic survey that provides documentation within specific project limits and offsets of the site's existing field conditions including existing baselines, centerlines, existing and proposed right of way lines, structure clearances, drainage systems, utility lines, soil borings, control points, and elevations. The topographic survey may supplement necessary photogrammetric survey or GIS work.
Base Maps	PE	3.2.3	Base maps depict in detail the required existing topography including the mainline and secondary road baselines and existing right of way deed search results.
Preliminary Drainage Design Report	PE	3.2.4	The Preliminary Drainage Design Report addresses the proposed preliminary layout plans of drainage pipes (excluding pipe sizes or inverts) for the design of a stormwater runoff system and discharge to an adequate receiving area. The report identifies the footprint of the proposed storm water runoff system and conflicts with underground utilities, and addresses potential conflicts with environmental impacts.
Traffic Engineering Facility Locations	PE	3.2.5	Traffic Engineering Facility Locations include the preparation of concept level plans for the layout of major guide signs, pavement markings, regulatory traffic control devices, ITS facilities, bicycle and pedestrian design accommodations, signal design and the associated ROW needs. Conceptual plans are prepared using Traffic Signal and Safety Engineering (TSSE) standards.

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PE Constructability-Risk Analysis Workshop Summary Memo	PE	3.2.6	The PECRA workshop summary memo will include identified risks and opportunities that may impact the project’s delivery and constructability such as: construction staging, traffic control, work zone safety, ROW, Access, Utilities, and environmental risks, all with a goal to eliminate alternatives that have either fatal flaws or unacceptable risks.
Preliminary ITS Facility Design Plans	PE	3.2.7	Preliminary Intelligent Transportation Systems (ITS) facility design plans are prepared and include resolving any conflicts associated with the conduit and ITS facility layout and potential utility and network conflicts.
Updated Preliminary Detour and Construction Staging Plans	PE	3.2.8	The Designer updates the preliminary construction staging plans of the Preliminary Preferred Alternative (PPA) that was developed during the Concept Development phase and coordinates with outside agencies, local officials and engineers. Construction sequence narrative and schedule is updated, as necessary.
Preliminary Roadway Plans	PE	3.2.9	Preliminary Roadway Plans are developed to include horizontal and vertical geometry, drainage, traffic engineering, geotechnical design and structural design to the level of detail necessary to support obtaining an approved environmental document and the approved design exception report.
Pavement Design Data	PE	3.2.10	<p>Pavement Design Data is traffic data that is used to calculate the recommended depth of pavement on a proposed project. The traffic data includes:</p> <ul style="list-style-type: none"> • Base Year Average Daily Traffic (ADT) per direction • Design Year ADT per direction • Heavy Truck percentage within a 24 hour period • Total Truck percentage within a 24 hour period
Pavement Recommendation	PE	3.2.11	A Pavement Recommendation is the recommended pavement depth and material composition on a proposed project. This depth is based on structural design calculations utilizing pavement design data, environmental constraints and material considerations. The Pavement Recommendation is included within the Pavement Recommendation Report and is submitted to the Pavement Design Unit for approval.

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Lighting Warrant Analysis Report	PE	3.2.12	A Lighting Warrant Analysis Report evaluates the need to install street lighting at a specific location based on a set of standard warrants.
Initial Deforestation/Reforestation Plan	PE	3.2.13	An Initial Deforestation/Reforestation Plan identifies areas that may be considered for possible deforestation and reforestation. An Initial Deforestation/Reforestation Plan is prepared if the total area of deforestation is greater than ½ acre.
Preliminary Construction Schedule	PE	3.2.14	A Preliminary Construction Schedule identifies the anticipated dates and estimated durations of the proposed construction stages.
Structural Engineering	PE	3.3	Structural Engineering includes the deliverables associated with the project’s structural design features, such as bridges, culverts and retaining walls.
Structural Design Recommendation Summary	PE	3.3.1	A structural design recommendation summary is prepared that documents the structural selection process, the recommended structure, and utility, right of way and environmental impacts, the structural type (if not determined in CD), length, width and footprint.
Preliminary Geotechnical Engineering Report	PE	3.3.2	Existing soil information is obtained using NJDOT GDMS (on-line soil boring data), the Engineering Soil Survey Report by Rutgers University, available geologic publications, and as-built plans to conduct a geotechnical study and to prepare a Preliminary Geotechnical Engineering Report. The Geotechnical Engineering Report includes recommendations on the projects structural foundations and documents the coordination with the Department’s Geotechnical Subject Matter Experts.
Right of Way and Access	PE	3.4	Right of Way, Access and Jurisdiction encompasses the deliverables needed to acquire the required right of way for the project, complete driveway access changes and obtain jurisdictional agreements.
Project Access Plan	PE	3.4.1	The Designer prepares the Project Access Plan (PAP) in accordance with the “NJDOT Access Management Guidelines”. The PAP identifies each driveway within the project area and the proposed alterations to each property’s access.
Access Impact Summary	PE	3.4.2	Access Impacts Summary (AIS) includes the identification of NJ State Highway Access Management Code implications and the identification and elimination of any potential “fatal flaw” access issues. The AIS Identifies any warranted "waivers" to the Access Code requirements with justifications.

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Right of Way Report	PE	3.4.3	A Right of Way (ROW) Report is required for all roadway improvement projects that have right of way acquisition. The ROW Report identifies the potential acquisition and easements that are required for the project. The ROW Report is updated and submitted for all ROW submissions and used for the presentation at the ROW Kickoff Meeting.
Right of Way Impact Plan	PE	3.4.4	The Right of Way Impact Plan depicts all ROW impacts (acquisitions). It includes the block and lot numbers, the properties owner's names, the acquisition area of each parcel and preliminary site plans and final site plan approvals. It is utilized for the ROW Kickoff Meeting and updated to incorporate comments from the meeting. It is also utilized for preparing the Initial ROW Estimate.
Initial Right of Way Estimate	PE	3.4.5	The Division of Right of Way and Access Management prepares the Initial ROW Estimate from the ROW Impact Plan at the request of the Project Manager.
Utility Engineering	PE	3.5	Utility Engineering includes the deliverables associated with the advancement of utility base plans and Utility Agreements.
Utility Base Plans	PE	3.5.1	Utility Base Plans show existing utility facilities. The plans are utilized for the development of the alternatives of accommodation and the Utility Agreements.
Utility Verification Request Letter	PE	3.5.2	The Utility Verification Request Letter and the Utility Base Plans are sent to each utility owner with a request they locate their utility facilities within the project limits on the utility base plans provided.
Utility Engineering Funding Authorization	PE	3.5.3	Utility Engineering Funding Authorization is provided from Program Coordination at the request of the Project Manager. Funding is authorized on the order and magnitude utility engineering estimate obtained in the Concept Development phase.
Utility Agreement	PE	3.5.4	Utility Agreements set forth the terms, conditions and responsibilities between the Department and the Utility Company.
Subsurface Utility Engineering Test Pit Report	PE	3.5.5	The Subsurface Utility Engineering (SUE) Test Pits Report identifies the locations of potential utility conflicts with the proposed design through subsurface test pits and includes the notes from the SUE Contractor and or Utility Company.

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Updated Base Plans (With Identified Conflicts)	PE	3.5.6	Utility Base Plans are updated to Identify potential subsurface utility engineering (SUE) test pit locations to verify the exact location of existing utilities. The update also includes the collective utility owner comments to identify potential utility conflicts between existing utility facilities and the proposed design.
Railroad Diagnostic Team Meeting Memo of Record	PE	3.5.7	A Memo of Record is prepared to document that discussions, decisions and results of a Railroad Diagnostic Team Meeting. A Railroad Diagnostic Team Meeting is an on-site meeting with the railroad operator, local officials, engineer, school and emergency services, Designer and any NJDOT unit or entity deemed relevant to discuss the grade crossing, gather expert testimony, and develop recommendations for modifications to the grade crossing.
Updated Utility Risk Assessment Plan	PE	3.5.8	The updated Utility Risk Assessment Plan further refines the potential high risk utility impacts based on information received from utility companies and any subsurface utility engineering conducted. This updated plan is utilized as a reference to address utility risks and to prepare the updated construction staging plans and preliminary roadway plans.
Quality Management	PE	3.6	Quality Management includes the quality controls that are to be applied by the Designer during the Concept Development, Preliminary Engineering, Final Design and Construction phases of the Project Delivery Process, including adherence to the requirements of a Quality Management Plan and NJDOT Quality Management procedures.
PE Quality Management Certification	PE	3.6.1	The Designer submits the signed Quality Management Quality Certification for the Preliminary Engineering phase of work to the Project Manager to certify that the work on the project was performed in accordance with the Department's Quality Management Procedures, the project has been designed in accordance with all applicable State and Federal design standards and requirements and in accordance with the Preliminary Engineering Scope Statement.
Communications	PE	3.7	The flow or exchange of information during the design, the development and the construction of the project between internal and external stakeholders.

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Design Communications Report	PE	3.7.1	The Design Communications Report (DCR) is a Quality Management process required of all designers. The DCR documents the significant issues/critical design decisions and agreements made during design development and the construction of a project. The Designer creates DCR Entries in the project's Design Communications Report as design decisions are made in accordance with the Interactive Communications Procedure. The Designer submits DCR Entries to the Project Manager for approval for the CD and PE phases and to the DPM PM for the FD and Construction phases.
Environmental Documents	PE	3.8	Environmental Documents include the Technical Environmental Studies, Executive Order 215 document, Environmental Impact Statement, Categorical Exclusion document, Self-Certified Categorical Exclusion document, Environmental Assessment and the Environmental Commitments Plan Sheet(s).
Technical Environmental Studies	PE	3.8.1	Environmental Documents require Technical Environmental Studies (TES) to be performed that include analysis of potential environmental impacts in seven general activity categories including Air Quality, Noise, Ecology, Cultural Resources, Hazardous Waste, Section 4(f) and Socio-Economics. The scope of these studies will align with the NEPA classification, regulatory requirements, public involvement, environmental scope statements and the project scope.
Air Study	PE	3.8.1.1	When required, the Designer or the Division of Environmental Resources (DER) evaluates potential impacts to air quality including hot spot carbon monoxide analysis and Particulate Matter (PM) 2.5 and PM 10 analysis. If an Air Study is not required, then the Designer or DER completes the air quality section of the Categorical Exclusion Document (CED). Some projects may require an air quality analysis. The results of the air quality analysis will be completed and incorporated into a CED or TES as appropriate. The Division of Environmental Resources approves the Air Quality Technical Environmental Study (TES).

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Noise Study	PE	3.8.1.2	If a noise study is required, the Designer or DER evaluates potential noise impacts on noise sensitive areas such as residences, businesses, schools, parks, etc. The scope of this activity can vary significantly in response to project scope. If required, the Designer or DER conducts a noise monitoring study. If no noise study is required, then the Designer or DER completes the noise section of the Categorical Exclusion Document (CED). Some projects may require a noise analysis. The results of the noise analysis will be completed and incorporated into a CED or TES as appropriate. The Division of Environmental Resources approves the Air Quality Technical Environmental Study.
Ecology Study	PE	3.8.1.3	An Ecology Study includes the evaluation and documentation of potential impacts of the Preferred Project Alternative to natural resources that include surface and ground water quality, wetlands, water-bodies, aquatic species and habitats, floodplains and flooding, terrestrial species and habitats, and threatened and endangered species. The Ecology Study makes recommendations as to measures to avoid, minimize or mitigate the impacts. The Division of Environmental Resources approves the Ecology Technical Environmental Study (TES).
Hazardous Waste Study	PE	3.8.1.4	A Hazardous Waste Study evaluates and documents the project's potential involvement with known or suspected contaminated sites, underground storage tanks, or other hazardous waste.
Socio-Economic Study	PE	3.8.1.5	Socio-Economic Study and Environmental Study includes the evaluation and documentation of potential project-related impacts to communities, land use patterns, businesses, and community facilities, accounting for public mobility, access and use, as well as displacements of residents and businesses. The study includes identification of minority and other populations covered by EO 21898 on Environmental Justice and an analysis of the potential for disproportionate impacts to these communities.

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Cultural Resources Study	PE	3.8.1.6	A Cultural Resources Study includes the identification and analysis, background research, interviews and fieldwork for both archaeology and architectural resources (which may be included on or be eligible for the National Register of Historic Places leading to a determination of effect pursuant to Section 106 of the Historic Preservation Act). Consultation with the State Historic Preservation Office (SHPO), Interested/Consulting parties, the Advisory Council on Historic Preservation (as needed) and the FHWA are included in this effort. Appropriate measures are established to mitigate adverse impacts including mitigation needs and identifying mitigation lands.
Section 4(f)	PE	3.8.1.7	Section 4(f) includes the identification of any publicly owned land in the project study area, which may include recreational properties purchased with municipal, county, state, or federal funds including Green Acres funded land. Impacts are evaluated to these properties and alternatives are assessed to avoid and minimize impacts to the Section 4(f) resource. Historic properties are identified in the Cultural Resources process that would have an adverse effect to the property and/or a loss of property due to ROW acquisition. The appropriate Section 4(f) document is prepared pursuant to federal regulations based on the extent of impact or loss of land due to the acquisition.
Individual Section 4(f) Evaluation	PE	3.8.1.7.1	Projects having more than a minor impact to 4(f) properties require an Individual Section 4(f) document. Processing this form of document involves circulation of a Draft and Final Document for formal comments on the project's impacts and alternatives. The process ends with formal determination that the project has no prudent or feasible alternatives that avoid the resource.
Programmatic Section 4(f) Evaluation	PE	3.8.1.7.2	A Programmatic Section 4(f) Evaluation documents the proposed project impacts to historic sites, recreation land, parkland, or wildlife and waterfowl refuges utilizing the alternatives analysis performed in Concept Development to justify selection of the most prudent and feasible alternative.
De Minimis Section 4(f) Evaluation	PE	3.8.1.7.3	A De Minimis Section 4(f) Evaluation documents the proposed project's De Minimis impacts to historic sites, recreation land, parkland, or wildlife and waterfowl refuges. The agency having jurisdiction over the resources must concur with the "De Minimis finding."

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Net Benefit Section 4(f) Evaluation	PE	3.8.1.7.4	Projects that will use property of a Section 4(f) park, recreation area, wildlife or waterfowl refuge, or historic property, which in the view of the Administration and official(s) with jurisdiction over the Section 4(f) property, the use of the Section 4(f) property will result in a net benefit to the Section 4(f) property.
Executive Order 215 (E.O. 215) Document	PE	3.8.2	An E.O. 215 is a comprehensive environmental document approved by NJDEP exclusively for 100% State-funded projects. The E.O. 215 assesses the environmental impacts. An E.O. 215 EA is prepared for projects with anticipated construction costs in excess of \$1 million (Level 1), or an Environmental Impact Statement (EIS) for projects with construction costs in excess of \$5 million and land disturbance of five acres (Level 2).
Environmental Impact Statement	PE	3.8.3	Projects requiring an Environmental Impact Statement (EIS) have large scopes, require an evaluation of design alternatives, and can potentially have significant environmental impacts. 23CFR771 describes the types of projects that normally require an EIS. Examples of projects requiring an EIS are a new controlled access freeway and a highway project of four or more lanes on new alignment. The EIS process includes circulation of a Draft and Final EIS with a mandatory comment period.
Record of Decision (ROD)	PE	3.8.3.1	A signed Federal document representing the culmination of the Federal environmental document review and approval process, and documenting Federal project environmental approval.
Categorical Exclusion Document	PE	3.8.4	A Categorical Exclusion Document is an environmental document for projects that do not involve significant environmental impacts.
Certified Categorical Exclusion Document	PE	3.8.5	A Certified Categorical Exclusion Document is a certification by NJDOT that the project meets certain conditions and criteria that will not result in significant environmental impacts. A Certified CED document does not require a formal submission to the FHWA to request FHWA concurrence in accordance with a Memorandum of Agreement and Memorandum of Understanding with the FHWA, NJDOT and NJDEP.

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Environmental Assessment	PE	3.8.6	On projects where the significance of environmental impacts are not clearly established, the preparation of an Environmental Assessment (EA) is required. An EA is prepared, circulated, and commented on to make a determination. If no significant impacts are determined, then a Finding of No Significant Impact (FONSI) is made by FHWA. If significant impacts are identified, an Environmental Impact Statement (EIS) is required.
Finding of No Significant Impact (FONSI)	PE	3.8.6.1	The Division of Environmental Resources prepares the Finding of No Significant Impact (FONSI) request package and submits it to FHWA along with the public hearing transcript and copies of all public and agency comments to FHWA for approval. If approved by FHWA, the project will obtain a Categorical Exclusion (CE) classification. If FHWA does not approve the FONSI, an EIS is required.
Environmental Commitments/Plan Sheets	PE	3.8.7	Environmental Commitments/Plan Sheets are construction plans and specifications that identify all the sensitive environmental areas in the project corridor that must be avoided and any commitments that must be adhered to as a result of the environmental process. Soil erosion and control measures are included.
Historic Sites Council Concurrence	PE	3.8.8	The Historic Sites Council Concurrence is a formal recommendation made by the Council after receiving public comments to the NJ Department of Environmental Protection Commissioner. Considered in the Council's recommendation is an evaluation of the public benefit of the proposed project, potential and prudent and feasible alternatives and measures taken to avoid, minimize or mitigate the encroachment of the historic site.
Preliminary Engineering Report	PE	3.9	The Preliminary Engineering Report documents the work performed in Preliminary Engineering and also includes the Environmental Document, Design Exception Report, Final Design Scope Statement, and the appropriate plans in support of the Environmental Document and Design Exception Report.
Approved Project Plan	PE	3.9.1	The Approved Project Plan (APP) is the advancement and approval of the Preliminary Preferred Alternative (PPA) developed during the Concept Development phase (CD). The APP selection is based on alternative analysis comparisons and provisions of a reasonable cost for derived benefits that satisfy the problem statement. This plan will incorporate detailed environmental analysis and input as obtained in the Preliminary Engineering phase. The PPA as established in the Concept Development phase may address and provide adequate detail for consideration as the APP.

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Construction Cost Estimate	PE	3.9.2	A construction cost estimate is a detailed estimate based on knowledge and information obtained in the PE Phase with input and concurrence of Subject Matter Expert units.
Design Exception Report	PE	3.9.3	The Design Exception Report itemizes the existing controlling substandard design elements that will remain or be proposed in the project. The Design Exception Report is prepared for controlling substandard design elements within the proposed construction areas of a project. The Design Exception Report requires the approval of the FHWA on full oversight and interstate projects.
Final Design Scope Statement	PE	3.9.4	The Designer prepares the Final Design Scope Statement using a standard template. The Designer updates the tasks to include and customize standard activities and to add new activities to include all tasks needed to conduct the Final Design phase of work. It is also used to solicit a designer man-hour estimate and fee proposal for the Final Design phase of work.
Project Management Plan (Major Projects)	PE	3.9.6	The Designer shall prepare a Draft Project Management Plan (Major Projects) for Major Projects as required by FHWA regulations. A Draft Project Management Plan should be submitted at least 60 days prior to the submission of the Final NEPA document. As required by FHWA regulations, a Project Management Plan shall be completed for projects with a total estimated cost of \$500,000,000 or more.
Alternatives Analysis Report	PE	3.9.7	An Alternatives Analysis Report clearly indicates the reasons for developing the range of the alternatives, why the alternative(s) were eliminated from consideration, and why they do not meet the purpose and need of the project. The “No Action Alternative” (which may include short-term minor activities) should be included to serve as a baseline for comparing all other alternatives developed.
Core Group Meeting Minutes	PE	3.9.8	The Designer prepares Core Group Meeting Minutes for all coordination meetings with internal and external stakeholders including Department Subject Matter Experts and local officials and agencies. Important design decisions and agreements made should be further documented in the project’s Design Communications Report (DCR).
Final Design Public Involvement Action Plan	PE	3.9.9	The Final Design Public Involvement Action Plan is prepared to identify critical points for public involvement during the Final Design phase. It includes as a minimum, the updating of the database of known stakeholders, the number of anticipated meetings with local officials, citizen groups and other outside agencies impacted by the project.

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Complete Streets Checklist	PE	3.9.10	The Complete Streets Checklist is used by Project Managers and designers throughout Concept Development and Preliminary Engineering to ensure that all developed alternatives reflect compliance with the Complete Streets Policy. Being in compliance with the policy means that Project Managers and designers plan for, design, and construct all transportation projects to provide appropriate accommodation for bicyclists, pedestrians, and transit users on New Jersey's roadways, in addition to those provided for motorists. The Project Manager is responsible for completing the checklist and must work with the Designer to ensure that the checklist has been completed prior to advancement of a project to Final Design.
Updated Risk Register	PE	3.9.11	A Risk Register is a tool that the Project Risk Manager and Project Risk Team Members can use to address and document project risks throughout the project life cycle. It is a living document that includes a comprehensive listing of risks and the manner in which they are being addressed. It is updated throughout the life of the project whenever new risks are identified or response action plans are modified.
Contracts	PE	3.10	Contracts include the deliverables associated with the development and execution of consultant design agreements. This includes tasks associated with modification of and closeout of the agreement.
Final Design Addendum	PE	3.10.1	A Final Design Addendum is executed to allow the PE Designer to continue to provide design services for NJDOT within the FD Phase. The Final Design Addendum provides additional funding to the original agreement executed for the PE Phase.
Final Design Designer Fee Proposal	PE	3.10.1.1	The Designer prepares a Fee Proposal utilizing the FD Scope Statement and forwards it to the Division of Project Management Project Manager.
Final Invoice	PE	3.10.2	The Project Manager requests the consultant designer submit a Final Invoice to close out the PE phase of work.
Final Design Independent Cost Estimate	PE	3.10.3	An Independent Cost Estimate is an engineering man-hour cost estimate that is developed by the Department for consultant design services for projects advancing into Final Design. The Division of Project Management Project Manager requests that the Office of Schedule and Budget Management develop an Independent Cost Estimate (ICE) to compare to the Designer's fee proposal. The ICE will be used in contract negotiations.

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Summary Independent Cost Estimate Report	PE	3.10.3.1	The Office of Schedule and Budget Management prepares a Summary Independent Cost Estimate (ICE) Report at the request of the Division of Project Management Project Manager. The Summary ICE Report compares the design man-hour estimates between ICE values and the Designers' man-hour proposal.
Final Design Schedule	PE	3.10.4	The Final Design Schedule includes the approval of the project's baseline schedule covering final design and approval of any proposed revisions.
Final Design Budget	PE	3.10.5	The Final Design Budget includes approval of a baseline budget covering final design and approval of proposed revisions to the baseline budget.
Notice of Authorization	PE	3.10.6	A Notice of Authorization is prepared by Capital Program Coordination and provided to the Division of Project Management Project Manager indicating that Final Design funds have been authorized and the authorization date.
Preliminary Engineering Approvals	PE	3.11	Preliminary Engineering Approvals encompasses deliverables associated with securing project-related approvals to advance the project to Final Design.
Capital Program Screening Committee Recommendation	PE	3.11.1	The Project Manager prepares a memo for the Capital Investment Planning and Development (CIPD) Executive Director once BLAES, FHWA, the Designer and other SME units select a final alternative for inclusion in the Final Environmental Impact Statement. The CPSC provides their recommendation for advancement to the Project Manager and forwards their recommendation to the CPC for approval.
Capital Program Committee Approval	PE	3.11.2	Based on the recommendation from the Capital Program Screening Committee, the Capital Program Committee evaluates and grants approval to prepare the Final Environmental Impact Statement.
FHWA Approval	PE	3.11.3	FHWA completes an independent review of the PE Report and Environmental Document and grants approval, indicating it meets all requirements of 23CFR771, as applicable.

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