Constructability Review Checklist

Project: Design Phase:

Reviewer: Date:

The Constructability Checklist outlined below provides a guide for performing design reviews at the 50%, 70%, 95% and final design milestones. The intent of this review is to ensure the design is buildable while also being cost-effective, biddable and maintainable. All comments generated from this checklist need to be submitted to the designer using the "Design Review Comment Spreadsheet" provided to the CFT.

For the reviewer it is important to think about what the work is and how it will be accomplished. It is also imperative the reviewer considers how all items are tested, measured and paid for.

No.	Item to be Checked	Yes	No	N/A	Comments
	Plans, Pay Items, Schedules and Survey				
A-1	Are the bid schedule, plan summary, plan quantity tables, materials references, etc. consistent throughout?				
A-2	Do the plan and profile sheets and X-sections match and do they scale the same?				
A-3	Is the contract number, project number, and project name the same on the plans and the contract?				
A-4	Do the plan and profile sheets have scale bars and do they match?				
A-5	Does each plan sheet have a north arrow?				
A-6	Do the tabulation of quantities tables reference the location and description of work in the plan sheets?				
A-7	Are the appropriate QC plan items included in the QC specifications?				
A-8	Does the coloring of construction items specified in the plans coincide with surrounding items and do they meet the intent of the partners (i.e. concrete, signs, etc.)?				
A-9	If items are combined for payment is it clear in the specifications? Do pay items cover all of the work?				
A-10	Is the method of measurement for all items of work appropriate and easily verified (i.e. LPSM, CUYD, Hour, Contract Quantity, Ton, etc.)?				
A-11	Is the method of payment easily identified and verified (direct or indirect payment)?				
A-12	Do bid items that necessitate allowances have them and do they make sense?				
A-13	Are any items being paid for in two ways?				
A-14	If subsidiary quantities, work items or other tables have been listed in the plans are they accurate and have they been labeled as "for information only"?				
A-15	Are all included contract quantities reasonable and are there any items that have been overlooked?				
A-16	Are there any major incidental items that are required for the project and have they been clearly identified and addressed?				
A-17	Are construction staff facilities available in the project area? Do any facilities need to be provided by the Contractor for the project? Is the provision of these facilities realistic?				

A-18	Is a Government lab trailer being offered in the solicitation and is the specification for this added to the contract?				
A-19	Is night work necessary to complete any part of the work? If so, are there noise restrictions associated with the night work around residences, businesses, campgrounds, etc.?				
A-20	Is the project duration and completion date reasonable and achievable (i.e. shut down periods, environmental constraints, etc.)?				
A-21	Has the project conditions changed since the last visit (deteriorated surface condition, flood damages, etc.)?				
A-22	Does the schedule provide for the appropriate windows to perform seasonal-dependent work (i.e. paving, micro surfacing, revegetation)?				
A-23	Has adequate time been placed in the schedule to allow for review and approval of specialty items requested by the owner?				
A-24	Are there any special conditions or work windows that may cause unreasonable scheduling conflicts?				
A-25	Are there any other known projects scheduled in the area that could conflict with construction? If so has any alternate routes, timelines, etc. been considered?				
A-26	Has the project schedule allowed enough time for the review of submittals, production rates, work windows, cure times, weather delays, etc.?				
A-27	Are the survey control points included in the project plans?				
A-28	Is station and offset provided on the plan sheets for needed items?				
A-29	Is the survey horizontal and vertical datums readily available for staking needs?				
A-30	Is the survey unit of measurement indicated (US Survey feet or International feet)?				

	Permitting, Environmental and Right of Way				
B-1	Has access to the project been verified (i.e. Alaska Tribal Lands, etc.)?				
B-2	Are permitted areas clearly defined in the contract?				
B-3	Do the permits and Right of Way allow sufficient work area for construction (i.e. widenings, drainage, structures, traffic diversions and detours, etc.)?				
B-4	Are the environmental measures adequately set forth in the contract and do they make sense?				
B-5	Is the use of environmentally friendly oils in hydraulic machinery required for the project and is this obvious?				
B-6	Are the environmental requirements reasonable (i.e. in-water work windows, type and quantity of BMP's, etc.) and does the requirements in the SCR correspond to the permits?				
B-7	Do the included permits coincide with necessary work windows (i.e. in-water work, tree removal, etc.)?				
B-8	Have all necessary permits for construction been acquired (i.e. FLAP projects can have many partners requiring many different permits (City, County, State, Federal, Tribal, etc.))?				

	Erosion Control, Topsoil and Revegetation				

C-1	Do the locations identified for erosion control devices make sense on the ground in comparison to the plans and X-sections?				
C-2	Is it defined who is responsible for the SWPPP monitoring after the contract is closed?				
C-3	Is it defined who is responsible for revegetation and is there an adequate plan included in the contract (both temporary and permanent)?				
C-4	Does the specified revegetation timelines correspond with the project completion date?				
C-5	Are all revegetation areas accounted for and obvious in the plans and calculations (staging areas, work areas, etc.)?				
C-6	Does the revegetation plan meet the permit requirements (i.e. seed mix, plantings, etc.)?				
C-7	Has the topsoil quantity been subtracted from the excavated material quantity shown that is available for embankment material?				
C-8	Is there sufficient topsoil available onsite? Is it included in the roadway excavation quantity?				
C-9	Has there been an allowance on the project for adequate topsoil storage and if needed in the permits or Right of Way agreements?				
C-10	How was the quantity of available topsoil calculated and is it reasonable for the project?				
C-11	Will special handling/storage of topsoil be required? If so is it clearly spelled out?				

	Earthwork and Grading				
D-1	Does the designed roadway require widening on both sides of the roadway? Would it be possible to only widen one side?				
D-2	Are rock cuts wide enough to accommodate drill rigs?				
D-3	Does the design include unnecessary sliver cuts or fill? Can changes to the alignment be made to eliminate these?				
D-4	Do narrow embankments allow for standard compaction equipment and specifications?				
D-5	Is there adequate staging areas and turnaround areas available for equipment?				
D-6	If maintaining an existing alignment, are there provisions in the contract for controlling grade and/or correcting deficient cross slopes?				
D-7	Are there any known load restrictions on the haul route?				
D-8	If known waste sites are located off the project are there provisions clearly indicating who is responsible for haul route damage?				
D-9	Where the existing road and proposed design meet, do the designed horizontal and vertical alignments and cross slopes match?				
D-10	Are shrink and swell factors provided? Do they appear reasonable?				
D-11	If obliteration areas are included in the project, do they fall within the construction limits?				
D-12	If ditch reconditioning is occurring, are the quantities accounted for?				

D-13	When there are multiple options associated with a project does the earthwork quantities balance or is borrow or waste sites required? If borrow or waste sites are needed is there need for payment?				
D-14	Are the subexcavation limits wide enough to accommodate construction equipment?				
D-15	Does the roadway excavation quantity agree with the design? If there is excess waste associated, are the quantities clearly identified?				
D-16	On trail projects, are the widths and equipment limitations clearly indicated in the plans? Can the work be performed with industry standard equipment? Is the trail access clearly shown on the plans?				
D-17	Are earthwork tables and X-sections provided and do they agree?				
D-18	Do the horizontal and vertical alignments and cross slopes of all approaches tie into the mainline properly?				
D-19	For all approaches and parking lots, have quantities been calculated (i.e. roadway excavation, aggregates, etc.)?				
D-20	Are items such as widening for guardrail terminals or inlet treatments in cuts clearly defined as subsidiary to a corresponding item, or is it included in the excavation quantity? Is it identified in the cross sections?				
D-21	Have fences, gates, driveways, mailboxes etc. been adequately addressed in the design and in accordance with right-of-way agreements?				
D-22	Are the clearing limits and construction limits clearly defined in the plans?				
D-23	Is there any need for special construction entrances or exits and have they been addressed in the project plans?				
D-24	Can the finished product be easily maintained by the owner?				
D-25	For projects requiring continual maintenance following completion (i.e. snow plowing, ditch and culvert cleaning, etc.) are there roadside design elements or obstacles that need attention to promote simplified maintenance procedures ?				
D-26	During winter shutdowns, is it clear who is responsible for road maintenance, including snow plowing?				
D-27	Is double handling of material required or can it be incorporated into a fill immediately? Is there sufficient space on the project for temporary stockpiling?				
D-28	If select borrow has been specified, is it possible to change to unclassified borrow?				
D-29	Government designated sources requires rehabilitation under an approved reclamation plan, is this included in the plans and is it easily identifiable?				
D-30	When excess waste is produced on a project is there an opportunity to utilize it on-site by reducing the embankment slope, creating turnouts, etc.?				
D-31	If fill material is required on a project is there an opportunity to generate suitable material by laying back slopes, changing the horizontal alignment, etc.?				
D-32	When excess waste is produced on a project has the owner been included to determine if they could utilize the waste?				
D-33	Do the designed ditch line elevations tie into the existing elevations at the beginning and end of the project?				
D-34	Has the ditch profile been checked to ensure adequate drainage?				

D-35	If the ditch profile cannot be designed for adequate drainage, have special ditch profiles been established and documented?				
D-36	Is the quantity for watering for dust control adequate?				
D-37	Is there a water source available within a reasonable distance?				
D-38	Would the project benefit from a dust palliative such as mag chloride, maintenance rock or a temporary AC item and would the owner be agreeable to such products?				

	Drainage - Culverts and Other Devices				
E-1	Are culvert designs included and verified?				
E-2	Do the designs provide adequate cover for the type of culvert?				
E-3	Do culvert designs provide positive drainage?				
E-4	Is there a cut slope typical included for culvert installation?				
E-5	Can culvert installation occur while maintaining traffic or will road closures, excavation shoring or other means be necessary? If closures are necessary have they been accounted for?				
E-6	Have culverts been designed with proper size, length, extension lengths, cover and material allowance on summary if the road width has changed?				
E-7	Do old culverts scheduled for removal need to be tested for asbestos?				
E-8	Are culverts that are intended to remain or lengthened in good condition?				
E-9	Are culvert bevels listed consistently on the profile details and summary sheets?				
E-10	Is designated Geotextile for slope protection the same throughout?				
E-11	Do the inlets and outlets have stations, offsets and elevations? Are they consistent between plan sheets?				

	Asphalt and Surface Treatments				
F-1	Is a wedge milling detail necessary or required?				
F-2	Is the pavement roughness type obvious?				
F-3	Is the paving schedule reasonable with regards to the construction schedule and weather limitations?				
F-4	Does the max aggregate size of the mix make sense with the lift thickness being specified?				
F-5	If substantial asphalt concrete milling or removal is required can it be incorporated into the project?				
F-6	Will shoulder areas be disturbed for overlay projects? If so, is there sufficient room for the safety edge construction, shoulder rock etc.? Is this additional disturbance area permitted?				
F-7	Does the line and grade of approaches need to be adjusted due to the effects of an overlay of the mainline?				
F-8	Does the curb design match the adjacent road work? Is the curb design consistent with designs typically used in the area? Will a slip form be available for the design?				
F-9	Do curbs, sidewalks and other flatwork include reinforcing steel requirements? If so, is black or epoxy coated bar necessary and clearly specified?				

F-10	On surfacing projects is the surface preparation methods clear (i.e. deleterious materials, old lubricants from parking areas, etc.)?				
F-11	On pavement preservation projects, have old thermoplastic markings been identified and specified for removal prior to the establishment of the new surface treatment?				
F-12	Is there supportive language on surfacing projects where greater than typical surface preparation has been identified?				

	Structures				
G-1	Have existing and new design alignments and elevations been verified with structure designs?				
G-2	Are catch basins or other precast/fabricated elements readily available "off-the-shelf"?				
G-3	Does the designed structure, catch basins, end treatments, energy dissipaters, etc. fit in the permitted area?				
G-4	Are permit windows reasonable for construction and installation of pipe culverts that require in-water work or water diversions?				
G-5	Is there adequate space for structure installation, slope protection and diversion between the construction limits and the R/W or is a temporary construction easement needed?				
G-6	Are the structure materials consistent between the summary sheets and profile detail?				
G-7	Does the standard temporary diversion plan make sense for the site or should the diversion be left for contractor design? Does LPSM or LNFT make more sense for payment?				
G-8	Are catch basins, utility manholes or other structures situated in a reasonable location (i.e. outside of wheel paths, driveways and road approaches?				
G-9	Do the structure alignments and elevations match the road design? Do the cross slopes match? Are all of the plan sheets consistent?				
G-10	If demolition is required, what methods are acceptable based on the location and permits? Are they addressed in the permits and specifications?				
G-11	Is a temporary bridge needed for bridge construction? If so, has it been addressed in the plans and permits?				
G-12	Has adequate time been accounted for in the project schedule for shop drawings, submittals, review, fabrication and proper curing?				
G-13	Will the project schedule allow for construction to avoid cold weather situations? If not, are the cold weather requirements clearly indicated in the contract?				
G-14	If removing or retrofitting an older structure, is there potential for lead or asbestos? Has this been identified in the plans and permits?				
G-15	If access is difficult for stripping forms, can stay-in-place forms be used?				
G-16	Will false work be required? If the false work falls below OHW has it been identified in the permits and plans?				
G-17	Are concrete suppliers within a reasonable distance or will an on-site batch plant be necessary? Does the Engineer's Estimate reflect the source for concrete?				

G-18	Does the structure require staged construction methods? If so, have impacts to traffic been addressed for each stage of construction?				
G-19	Is dewatering required for the foundation work? If so, has it been addressed in the design and permits?				
G-20	If stream diversion or dewatering is necessary, is the temporary alignment or discharge location indicated in the permits and plans?				
G-21	If a crane is required, is the permitted area sufficient to accommodate it with outriggers fully extended? Is mobilization for the size of crane feasible and are there any known load restrictions on the route? Will the crane require traffic control while operating?				
G-22	If steel or precast girders are specified, can they be transported to the site?				
G-23	Can the existing/new bridge approaches be used for material storage and staging? Is there adequate room for girder delivery and placement in one operation?				
G-24	If shoring is needed, is there sufficient room to lay back the structural excavation slopes? Is this clearly indicated on the plans?				
G-25	What material is expected to be used for structure backfill and is it available on site? If it needs to be imported, is it clearly defined?				
G-26	Are adequate BMPs accounted for in the structure excavation area?				
G-27	Are there culverts, guardrail etc. that will be installed in wall locations and how will they interact with the designs?				

	Utilities and Guardrail				
H-1	Do catch basins, culverts or other items conflict with new or existing utilities?				
H-2	If utility access is situated in the roadway, are they located outside of the wheel path?				
H-3	If a crane or other specialty equipment is required, will there be utility conflicts? Could they be temporarily relocated?				
H-4	If blasting is necessary for utility placement or relocation, has it been clearly identified?				
H-5	If utility relocations or conflicts are known, have they been clearly identified? Is there a need for buffer zones?				
H-6	Are guardrail terminal end sections or structural transition railing installed on a radius? If so, does the design adequately address this?				
H-7	Is there consistency between bridge railing and guardrail for weatherized or galvanized?				
H-8	Are the guardrail lengths divisible by 12.5'?				
H-9	Based on the X-sections, if there are steep slopes adjacent to the project, is guardrail provided for safety or has it been mitigated for?				

	Traffic Control and Devices				
I-1	Is there a requirement for a detour? If so, is it identified in the plans, does it meet the project needs, is there enough maintenance money if needed, and are there enough traffic control devices to clearly mark it?				

I-2	Are there enough traffic control hours (flaggers, pilot cars, etc.)?				
I-3	How is the TCS being paid for, is it obvious and does it make sense?				
I-4	Are appropriate requirements for coordination, facilitation and mitigation of necessary road or parking area closures included in the contract?				
I-5	For work areas or detours, is the minimum lane width of 10' available?				
I-6	If a detour is necessary are there load permits needed and are turning radius' taken into account?				
I-7	Are all specified road closures, parking areas closures and staging areas agreed upon by the partners?				
I-8	Have traffic barriers been included to protect structural excavation sites adjacent to the traveled way or other potential hazards for the public?				
I-9	Will the work require maintaining one-lane of traffic after hours? If so, are there plenty of flagger hours or temporary signals included in the contract?				
I-10	Do portions of the project require quickly progressing traffic control that creates extended work areas or multiple working areas? If so, have enough additional hours and/or devices been provided?				
I-11	Are traffic control quantities reasonable (flagger hours, TSS days, pilot car hours, temporary striping, devices, etc.)?				
I-12	Are approach roads (both high and low volume) adequately addressed in the temporary traffic control plans? Is special signing required? Is public access maintained throughout construction?				
I-13	Are there businesses that will be impacted by the construction? Are appropriate mitigation measures included in the contract - Special signs, construction schedule notifications to business owners, etc.?				
I-14	Has the permanent striping plan been verified to match field conditions?				
I-15	Have all impracticable striping plans been removed from the plan set?				
I-16	Has the pavement marking type been confirmed with the partners if it is different from paint?				
I-17	Are stop bars warranted and/or accounted for on approach roads?				
I-18	If extended traffic closures are part of the contract, have the impacts been addressed (transportation of children to school, emergency vehicles, impacts to business, etc.)?				
I-19	Are the allowable traffic closures sufficient to complete the work?				

	Materials				
J-1	How is aggregate being paid for and does this make sense? (Ton vs. SQYD/CUYD)				
J-2	Has the feasibility of government provided sources vs commercial/contractor located sources been considered and addressed based on the project type, size and location?				
J-3	Are the material testing frequencies appropriate for the quantity of the item in the contract?				
J-4	For each item of work, are all materials specification clear?				

J-5	Do the pay factor calculations and unit of payment match?				
J-6	When statistical evaluation is utilized, are the categories reflected in the table? Does the quantity in the contract support statistical analysis? If materials meeting State specifications are being substituted, is the category band specified or otherwise addressed?				