

PROJECT DELIVERY PROCESS

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PROJECT DELIVERY PROCESS

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PROJECT DELIVERY PROCESS

PROJECT MANAGEMENT

PROJECT MANAGEMENT IS INDOT’S PROCESS TO DELIVER PROJECTS. THE PROJECT MANAGEMENT PLAN CAN BE VIEWED AS A “ROAD MAP” WHICH CAN EFFECTIVELY MANAGE THE SCOPE, BUDGET, SCHEDULE AND QUALITY OF PROJECTS. IT CONSISTS OF THREE PHASES, PLANNING, DESIGN, AND CONSTRUCTION.

TOGETHER, THE PROJECT MANAGER AND THE AREA ENGINEER (HEREAFTER REFERRED TO AS CONSTRUCTION MANAGER) AS TEAM LEADERS, FACILITATE THIS ROAD MAP TO A SUCCESSFUL COMPLETION.

PLANNING AND DESIGN: WITH THE SUPPORT OF THE CONSTRUCTION AND MAINTENANCE MANAGERS, THE PROJECT MANAGER PLANS, COORDINATES, AND DEVELOPS CONSTRUCTION PROJECTS FROM PLANNING TO THE CONTRACT LETTING.

CONSTRUCTION: WITH THE SUPPORT OF THE PROJECT MANGER AND MAINTENANCE MANAGER, THE CONSTRUCTION MANAGER PLANS, COORDINATES, AND SUPERVISES CONSTRUCTION PROJECTS FROM THE CONTRACT LETTING TO ITS COMPLETION.

EVERYONE ON A PROJECT HAS A FUNCTION OR ROLE AND A RESPONSIBILITY ASSIGNED TO THAT FUNCTION. THE TEAM IS THAT GROUP OF INDIVIDUALS THAT PERFORM THE WORK REQUIRED FOR THE PROJECT AND PROJECT DELIVERY. EARLY AND CONSTANT COMMUNICATION IS ESSENTIAL AMONG ALL PARTIES. THE TEAM LEADERS ARE THE PROJECT MANAGER AND THE CONSTRUCTION MANAGER. THEIR SUCCESS DEPENDS ON THEIR MUTUAL COORDINATION AND COMMUNICATION.

PLANNING/SCOPE DEVELOPMENT

SCOPING ENGINEER PROJECT MANAGEMENT CONSTRUCTION MANAGEMENT MAINTENANCE MANAGEMENT

DESIGN/PROJECT DEVELOPMENT

- | | | |
|---------------------------|--------------------------|-------------------|
| ● PROJECT MANAGEMENT | ● ROAD DESIGN | ● HYDRAULICS |
| ● CONSTRUCTION MANAGEMENT | ● BRIDGE DESIGN | ● PAVEMENT DESIGN |
| ● MAINTENANCE MANAGEMENT | ● ENVIRONMENTAL SERVICES | ● GEOTECHNICAL |
| ● UTILITIES/RAILROAD | ● REAL ESTATE | ● SURVEY |

SPECIALTY GROUPS

- CONSULTANTS

CONSTRUCTION

- PROJECT MANAGEMENT
- CONSTRUCTION MANAGEMENT
- MAINTENANCE MANAGEMENT

PROJECT DELIVERY PROCESS

INTRODUCTION

THE PURPOSE OF CONSTRUCTABILITY REVIEWS IS TO ENSURE THAT PROJECTS ARE BIDDABLE, BUILDABLE, COST-EFFECTIVE, AND MAINTAINABLE.

THE INDIANA DEPARTMENT OF TRANSPORTATION HAS ENDORSED CONSTRUCTABILITY REVIEWS TO IMPROVE THE TOTAL QUALITY OF OUR CONSTRUCTION BID PACKAGE. THE NARROW FOCUS ON JUST FIXING PROBLEMS HAS CHANGED TO THE BROADER FOCUS OF PREVENTING PROBLEMS. THE DEPARTMENT HAS DIRECTED BOTH CONSTRUCTION AND MAINTENANCE TO USE THEIR KNOWLEDGE AND EXPERIENCE IN PLANNING AND DESIGN TO ACHIEVE THE PROJECT OBJECTIVES.

WHILE EARLY INVOLVEMENT OF CONSTRUCTION AND MAINTENANCE IS MOST IMPORTANT, MULTI-DISCIPLINARY TEAMWORK IS NEEDED FROM THE BEGINNING. THERE ARE FEW CONSTRUCTABILITY CONCEPTS THAT ARE SINGLE DISCIPLINE ACTIVITIES.

A MULTI-DISCIPLINARY TEAM WILL SUPPORT THE PARTNERING AND TEAM BUILDING CONCEPT AND WILL IMPROVE CONSTRUCTABILITY RESULTS. THE TEAM CREATION ALLOWS THE FUNCTIONAL OFFICES TO KNOW OF EACH OTHER'S INVOLVEMENT AND PROVIDES SOME OF THE CROSS-TRAINING AND FORMAL COMMUNICATION NEEDED THROUGHOUT THE PROCESS.

THOROUGH CONSTRUCTABILITY REVIEWS DURING PROJECT DEVELOPMENT WILL REDUCE ISSUES ENCOUNTERED DURING CONSTRUCTION AND WILL REDUCE CHANGE ORDERS.

A SURVEY OF PROJECT MANAGERS, DISTRICT CONSTRUCTION DIRECTORS AND AREA ENGINEERS IDENTIFIED CERTAIN RECURRING CONSTRUCTABILITY ISSUES. THESE ISSUES IMPACT COSTS, SCHEDULE AND QUALITY OF WORK.

•UTILITIES •RIGHT OF WAY •DRAINAGE •PERMITS •TRAFFIC CONTROL

TO ADDRESS THESE CRITICAL ISSUES, IT HAS BEEN NECESSARY FOR PROJECT-LEVEL PARADIGM SHIFTS.

- THE PROJECT CONSTRUCTABILITY PROCESS SHALL INCLUDE THESE OFFICES; PROJECT MANAGEMENT, CONSTRUCTION MANAGEMENT, MAINTENANCE MANAGEMENT, PLANNING AND DESIGN**
- USE OF CONSTRUCTABILITY REVIEW TOOLS**
- USE OF A TEAM APPROACH**
- DEVELOP PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS FOR CONSTRUCTABILITY**

PROJECT DELIVERY PROCESS

CURRENT PRACTICES

THE PROJECT MANAGER AND THE CONSTRUCTION MANAGER HAVE RESPECTIVE PROJECT MANAGEMENT RESPONSIBILITIES AND ACCOUNTABILITY. THEIR JOINT OVERSIGHT OF THE DESIGNER'S EFFORTS TO DELIVER A SUCCESSFUL PROJECT TO CONTRACT REQUIRES MUTUAL COORDINATION AND COMMUNICATION.

- THE PROJECT MANAGER SCHEDULES THE CONSTRUCTABILITY REVIEWS DURING PROJECT DEVELOPMENT. HE/SHE WILL COORDINATE WITH THE CONSTRUCTION MANAGER AND MAINTENANCE MANAGER IN SUFFICIENT TIME TO ENSURE THEIR PARTICIPATION. THE PROJECT MANAGER SENDS ALL PLANS AND NECESSARY DOCUMENTS TO CONSTRUCTION MANAGER AND MAINTENANCE MANAGER.
- THE PROJECT MANAGER WILL SCHEDULE THE FIELD CHECKS AND THE CONSTRUCTABILITY/UTILITY CONFERENCE.
- AFTER THE LETTING, THE CONSTRUCTION MANAGER WILL SCHEDULE THE PRE-CONSTRUCTION CONFERENCE, AND WILL COORDINATE WITH THE PROJECT MANAGER AND MAINTENANCE MANAGER TO ENSURE THEIR PARTICIPATION.
- WHEN THE CONSTRUCTION MANAGER DETERMINES THE SCHEDULE OF THE PROJECT CONSTRUCTION MEETINGS (WEEKLY, MONTHLY), HE/SHE WILL NOTIFY BOTH THE PROJECT MANAGER AND MAINTENANCE MANAGER.

SCOPE

- THE PROJECT MANAGER DEFINES AND MAINTAINS THE SCOPE WITH THE DESIGNER. AT EACH CONSTRUCTABILITY STAGE, THE PROJECT MANAGER REVIEWS THE PROJECT PURPOSE, NEED AND SCOPE WITH THE CONSTRUCTION MANAGER AND PROJECT TEAM.
- THE CONSTRUCTION MANAGER, DURING PROJECT CONSTRUCTION, MAINTAINS THE SCOPE BY CLARIFYING AND DEFINING ANY CHANGE WITH THE PROJECT MANAGER.

SCHEDULE

- THE PROJECT MANAGER DEFINES THE PROJECT SCHEDULE FROM PROJECT START TO THE CONTRACT LETTING.
- SCHEDULE CONSIDERATIONS, DURING DEVELOPMENT, ARE MADE AND DEFINED BY BOTH THE PROJECT MANAGER AND CONSTRUCTION MANAGER. THEIR EFFORT DEFINES THE "TIME SET" BY THE CONSTRUCTION MANAGER.
- THE CONSTRUCTION SCHEDULE IS THE RESPONSIBILITY OF THE CONSTRUCTION MANAGER.

PROJECT DELIVERY PROCESS

CURRENT PRACTICES CONT'D

BUDGET

- **THE PROJECT MANAGER IS RESPONSIBLE FOR THE PROJECT'S BUDGET AND DEFINES THE PROJECT BUDGET FOR DEVELOPMENT AND CONSTRUCTION. HE/SHE COORDINATES AND OVERSEES FUNDING FOR BOTH PERIODS.**
- **THE CONSTRUCTION MANAGER IS RESPONSIBLE TO MAINTAIN THE CONSTRUCTION BUDGET. COPIES OF ALL CONSTRUCTION CHANGE ORDERS AND TRACKING DOCUMENTS WILL BE TRANSMITTED TO THE PROJECT MANAGER IN A TIMELY MANNER.**
- **THE PROJECT MANAGER WILL DETERMINE IF ANY CHANGE HAS IMPACTED THE BUDGET. WITH CONSULTATION OF THE CONSTRUCTION MANAGER, HE/SHE WILL DETERMINE IF RESTITUTION IS WARRANTED FOR ANY ERRORS AND OMISSIONS, CONSTRUCTABILITY AND THE LIKE.**
- **THE PROJECT MANAGER WILL COORDINATE THE FUNDING REQUIRED BY CHANGES.**

PROJECT DELIVERY PROCESS

PROJECT SELECTION

THE FIRST ORDER OF BUSINESS IS TO SELECT THE PROJECT TO ANALYZE THE PURPOSE AND NEED BEFORE BEGINNING SCOPING AND PLAN DEVELOPMENT.

INDOT HAS THE TYPES OF MAJOR, INTERMEDIATE, AND MINOR PROJECTS FOR REVIEWS. TYPICAL CATEGORIES MAY INCLUDE MAJOR HIGHWAY CONSTRUCTION, MAJOR INTERCHANGE CONSTRUCTION, BRIDGE CONSTRUCTION, BRIDGE REHABILITATION, RESURFACING AND THE LIKE IN A THREE-LEVEL PROCESS.

CONSTRUCTABILITY REVIEW LEVEL 1 INCLUDES PRE-CONSTRUCTION REVIEWS AT STAGE 1, STAGE 2, AND STAGE 3, FINAL PLAN REVIEW, AND POST CONSTRUCTION REVIEW FOR THESE TYPES OF PROJECTS:

- MAJOR, LARGER, COMPLEX ROADWAY IMPROVEMENTS (INCLUDING NEW CONSTRUCTION, WIDENING, OR REALIGNMENT PROJECTS WITH SIGNIFICANT STAGING, AND TRAFFIC HANDLING REQUIREMENTS).
- MAJOR, COMPLEX BRIDGE REPLACEMENT INCLUDING POST-TENSIONED, CABLE-STAYED, EXTENSIVE AND COMPLEX REHABILITATIONS.
- MAJOR, COMPLEX INTERCHANGE CONSTRUCTION OR MODIFICATION.
- MAJOR, LARGE PRESERVATION PROJECTS THAT INCLUDE WIDENING AND MAJOR STRUCTURE REPLACEMENT.

CONSTRUCTABILITY REVIEW LEVEL 2 INCLUDES STAGE 1 AND STAGE 3 FINAL PLAN DEVELOPMENT REVIEW, AND POST CONSTRUCTION REVIEW FOR THESE TYPES OF PROJECTS:

- INTERMEDIATE, LESS COMPLEX ROADWAY PROJECTS (INCLUDING WIDENING PROJECTS WITH MINIMAL STAGING/TRAFFIC HANDLING).
- INTERMEDIATE, LESS COMPLEX BRIDGE OR INTERCHANGE PROJECTS.
- MOST PRESERVATION PROJECTS, INCLUDING MINOR WIDENING, DRAINAGE OR SAFETY IMPROVEMENTS.
- ALL LESS COMPLEX BRIDGE PROJECTS

CONSTRUCTABILITY REVIEW LEVEL 3 INCLUDES A STAGE 3 PLAN DEVELOPMENT REVIEW FOR MINOR PROJECTS:

- PREVENTIVE MAINTENANCE OVERLAY PROJECTS
- ALL OTHERS

PROJECT DELIVERY PROCESS

SCOPE DEVELOPMENT

THE PROJECT MANAGER JUMP-STARTS THE PROJECT DEVELOPMENT WITH THE TEAM. FUNCTIONAL GROUPS INVESTIGATE POTENTIAL ITEMS THAT COULD BE INCLUDED IN THE SCOPE. PROJECT MANAGER SHOULD UTILIZE THE PRINCIPLES OF PRACTICAL DESIGN (OPEN ROADS) BY INCLUDING A FULL RANGE OF STAKEHOLDERS. THEY MUST CLEARLY DEFINE THE PROJECT PURPOSE AND NEED AS EVIDENCED BY TEAM ROLES AND RESPONSIBILITIES FOR DEVELOPING THE PROJECT'S SCOPE.

PROJECT MANAGER

- **COORDINATES WITH CONSTRUCTION AND MAINTENANCE FOR THE DEVELOPMENT OF PROJECTS FROM THE TIME OF PROGRAMMING THROUGH THE COMPLETION OF CONSTRUCTION**
- **TAKES OWNERSHIP OF THE PROJECT SCOPE, BUDGET, AND SCHEDULE**
- **SUPERVISES THE PROJECT SCOPE, BUDGET, AND SCHEDULE THROUGHOUT THE LIFE OF THE PROJECT, FROM PLANNING TO CONSTRUCTION**

CONSTRUCTION MANAGER

- **PARTICIPATES IN THE DEVELOPMENT OF PROJECT SCOPE, AND SCHEDULE WITH PROJECT MANAGER AND MAINTENANCE**
- **COORDINATES WITH PROJECT MANAGER AND MAINTENANCE FOR THE DEVELOPMENT OF PROJECTS FROM THE TIME OF PROGRAMMING THROUGH THE COMPLETION OF CONSTRUCTION**

HIGHWAY MAINTENANCE DIRECTOR

- **PARTICIPATES IN THE DEVELOPMENT OF PROJECT SCOPE, AND SCHEDULE WITH PROJECT MANAGER AND CONSTRUCTION MANAGER**
- **IDENTIFIES MAINTENANCE STAFF WHO WILL ATTEND MEETINGS**
- **IDENTIFIES CONDITION FOR SUBDISTRICT ROAD PROJECTS BASED ON MAINTENANCE RECORDS**

DISTRICT TECHNICAL SERVICES DIRECTOR

- **COORDINATES WORK OF SYSTEM ASSESSMENT MANAGER, WHO WORKS WITH PAVEMENT ENGINEER AND BRIDGE ASSET ENGINEER. THESE THREE INDIVIDUALS HAVE ACCESS TO ALL SYSTEM DATA BRIDGE CONDITIONS VIA INSPECTION REPORTS, ROADWAY CONDITIONS VIA MAINTENANCE OR PERSONAL INSPECTION AND ROADWAY REVIEWS, CRASH DATA AND CONGESTION DATA. THESE ARE EVALUATED TO PROVIDE COST EFFECTIVE RECOMMENDATIONS FOR FUTURE PROJECT NEEDS.**
- **SCOPING ENGINEER, ALSO IN THIS SECTION ALSO SUPPORTS THE CALL FOR PROJECT AND DEVELOP SCOPES (WITH SUPPORTING COSTS) FOR PROJECTS SELECTED DURING THE CALL PROCESS.**
- **TRAFFIC ENGINEERING PROVIDES RECOMMENDATION FOR SAFETY AND MOBILITY PROJECTS, PERFORMS LANE CLOSURE EXCEPTIONS AND REVIEW TRAFFIC ENGINEERING DESIGN ELEMENTS.**

PROJECT DELIVERY PROCESS

ENVIRONMENTAL SERVICES DIVISION (ESD)

- **AT THE REQUEST OF THE PROJECT MANAGER, ESD STAFF ADVISE THE PROJECT MANAGER ON PROCEDURES AND COMPLETION TARGET DATES FOR ENVIRONMENTAL DOCUMENTATION. THIS IS FOR THE PROJECT MANAGER'S USE IN SETTING PROJECT SCHEDULES IN SPMS AND CONSULTANT DELIVERABLE SCHEDULES.**
- **FOR MAJOR PROJECTS ONLY AND AT THE REQUEST OF THE PROJECT MANAGER, ESD STAFF PARTICIPATE IN SCOPING, INCLUDING SETTING TARGET DATES FOR COMPLETING DOCUMENTATION AND ADVISING ON THE SUITE OF INVESTIGATIONS AND DOCUMENTS THAT MAY BE REQUIRED TO DELIVER THE PROJECT. BY AGREEMENT BETWEEN THE PROJECT MANAGER AND ESD MANAGERS, ESD MAY OR MAY NOT REMAIN CLOSELY INVOLVED IN ADVISING AS THE PROJECT PROGRESSES.**
- **THROUGHOUT PROJECT DEVELOPMENT, ESD STAFF ARE AVAILABLE TO PROVIDE ADVICE ON STRATEGIES FOR COMPLETING ENVIRONMENTAL DOCUMENTATION AND ON ADJUSTMENTS TO THE CONSULTANT'S DELIVERABLE SCHEDULE.**

REAL ESTATE PROJECT MANAGER (REPM)

- **COORDINATES WITH THE PROJECT MANAGER FROM THE DEVELOPMENT AND PLANNING OF PROJECTS THROUGH THE COMPLETION AND CERTIFICATION OR RIGHT-OF-WAY ACQUISITION**
- **ATTEND MEETINGS AT THE SCOPING AND PLANNING STAGES OF NEW PROJECTS WHERE ROW ACQUISITION OF 10 OR MORE PARCELS ARE INVOLVED**
- **PROVIDE A "PRELIMINARY PROJECT SCOPE ANALYSIS" BASED OFF OF THE EARLY DESIGN OF THE PROJECT WITH THE GOAL OF PROVIDING THE PROJECT MANAGER ESTIMATED ACQUISITION COSTS, ANTICIPATED RELOCATION AND CONDEMNATION ISSUES, PROVIDE AN ESTIMATED ACQUISITION TIMELINES AND POTENTIAL COST SAVING DESIGN ALTERNATIVES**
- **ONCE THE PROJECT IS FINALIZED, THE REPM WILL WORK WITH PROJECT AND UTILITIES MANAGER TO DETERMINE ACQUISITION PRIORITIES**
- **COORDINATES AND CONVEYS OBJECTIVES/GOALS WITH THE CENTRAL OFFICE REAL ESTATE SECTION, DISTRICT RIGHT-OF-WAY MANAGERS, THE ATTORNEY GENERAL AND UTILITIES**
- **SUPERVISES BUDGET AND SCHEDULE THROUGHOUT THE ACQUISITION PHASE**
- **ORGANIZES MONTHLY SCHEDULING MEETINGS WITH PROJECT MANAGERS**
- **PROVIDES A RED, YELLOW OR GREEN STATUS REPORT BASED OFF OF ANTICIPATED TIMELINES**

DISTRICTS INDOT ROW SCHEDULING MEETINGS

- **INDOT REAL ESTATE (APPRAISING, BUYING, CONDEMNATION & PROPERTY MANAGEMENT) SCHEDULES MONTHLY CONFERENCE CALLS WITH EACH DISTRICT'S PROJECT MANAGERS, REAL ESTATE MANAGERS AND CAPITAL PROGRAM MANAGERS TO DISCUSS ON-GOING AND UPCOMING DISTRICT PROJECTS**
- **PROJECTS INVOLVING ROW ACQUISITION ARE REVIEWED USING THE PROJECT PARCEL STATUS REPORT WHICH IS GENERATED FROM THE LAND RECORDS SYSTEMS (LRS)**

UTILITY COORDINATOR

- **PARTNER WITH THE PROJECT MANAGER AND OTHER ESSENTIAL PERSONNEL TO REVIEW THE PROJECT SCOPE EARLY IN THE PROCESS**

PROJECT DELIVERY PROCESS

- **CONDUCT EARLY RESEARCH TO IDENTIFY POSSIBLE UTILITIES AND TYPES OF FACILITIES WITHIN THE INITIAL SCOPE TO DETERMINE THE FOLLOWING:**
 - **POSSIBLE CONFLICTS**
 - **COSTS**
 - **TIME FOR RELOCATION**
 - **RIGHT-OF-WAY NEEDS**
- **PROACTIVELY ENGAGE ALL PARTNERS INVOLVED IN UTILITY COORDINATION TO FACILITATE THE EXECUTION OF ALL UTILITY RELOCATION WORK**
- **ONCE THE PROJECT SCOPE IS FINALIZED, MEET WITH THE PROJECT MANAGER, RIGHT-OF-WAY MANAGER, AND OTHER PERTINENT PERSONNEL TO DETERMINE THE FOLLOWING:**
 - **TARGET DATES FOR UTILITY RELOCATION FOR PROJECT**
 - **IDENTIFY CRITICAL PARCELS NEEDED FOR RELOCATION**
 - **IDENTIFY INITIAL REIMBURSABLE POSITION FOR UTILITIES**
 - **BUDGET NEEDS FOR PROJECT**
 - **R/W CLEAR PLAN, IF NEEDED (WHO IS GOING TO DO IT)**
 - **SURVEYING NEEDS AND OPTIONS**
 - **RELOCATION OPTIONS**
 - **INITIAL RISK ASSESSMENT**
- **ATTEND PRELIMINARY FIELD CHECK MEETING(S)**
- **SCHEDULE ALL ESSENTIAL MEETINGS FOR SUCCESSFUL RELOCATION**
- **CONTACT THE PROJECT MANAGER IF THERE IS A POSSIBLE COST OVERRUN OR IF AN UNEXPECTED UTILITY HAS BEEN FOUND**
- **ASSIST AND INFORM RIGHT-OF-WAY NEEDS REQUIRED FOR UTILITY RELOCATION. PROVIDE ROW BUYERS AND PROJECT MANAGER WITH A ROW ACQUISITION PLAN THAT IDENTIFIES THE CRITICAL PATH NECESSARY TO FACILITATE THE TIMELY ACQUISITION OF PARCELS IN SUPPORT OF UTILITY RELOCATION**

RAILROAD COORDINATOR

- ***PARTNER WITH THE PROJECT MANAGER AND OTHER ESSENTIAL PERSONNEL TO REVIEW THE PROJECT SCOPE EARLY IN THE PROCESS***
- ***CONDUCT EARLY RESEARCH TO IDENTIFY RAILROAD(S) INVOLVED AND TYPE OF RAILROAD PROJECT WITHIN THE INITIAL SCOPE TO DETERMINE POSSIBLE ISSUES, COSTS, TIME FOR CONSTRUCTION, AND RIGHT-OF-ENTRY NEEDS***
- ***PROVIDE INITIAL RESEARCH AND ESTIMATES TO PROJECT TEAM TO FINALIZE THE PROJECT SCOPE***

PAVEMENT ENGINEER MANAGER

- ***COORDINATES STAFFS (INCLUDES CO, DISTRICT PAVEMENT ENGINEER, AREA ENGINEER) TO ATTEND PARTNERING MEETING AND "PRELIMINARY PAVEMENT & GEOTECHNICAL MEETING" BOTH INITIATED BY THE PROJECT MANAGER NOT LATER THAN 10% PROJECT PLAN DEVELOP. THIS MEETING IS TO DISCUSS AND CLARIFY THE UNDERSTANDING OF THE PROJECT SCOPE OF WORK. THE PAVEMENT ENGINEER WILL PROVIDE A PRELIMINARY PAVEMENT DESIGN THAT VALIDATE AND REFINE THE APPROPRIATE TREATMENT OPTIONS FOR THE PROJECT SCOPE DISCUSSED; WHICH WILL AID THE PROJECT MANAGER IN DETERMINING APPROPRIATE COST***

PROJECT DELIVERY PROCESS

- **THE PROJECT MANAGER REQUESTS THE APPROPRIATE PAVEMENT AND GEOTECHNICAL 20-30% PLAN DEVELOPMENT STAGE;**
 - **REQUEST GEOTECHNICAL REPORT OR WAIVER.**
 - **REQUESTING TRAFFIC DATA, CORING, GPR, FWD, AND ETCETERA AND DOCUMENTING THE GPA PROGRAM WITH REQUEST DATES.**
 - **MOT DESCRIPTION AND PLANS SHOULD BE DETERMINED AND PROVIDED TO THE PAVEMENT DESIGNER, PRIOR TO OR CONCURRENT WITH THE REQUEST FORM BEING SUBMITTED.**
- **THE PAVEMENT DESIGN ENGINEER WILL BE ASSIGNED A PAVEMENT DESIGN TASK AND HAVE APPROXIMATELY 120 DAYS TO COMPLETE THE DESIGN. THE PAVEMENT DESIGN ENGINEER WILL DELIVER THE PAVEMENT DESIGN TO THE PROJECT MANAGER NOT LATER THAN 60% PROJECT DEVELOPMENT STAGE. THIS DATE MAY BE EARLIER IF MUTUALLY AGREED UPON**

GEOTECHNICAL INVESTIGATION MANAGER

- ***COORDINATES STAFF (INCLUDES INTERNAL OR CONSULTANT CONTRACTS) TO ATTEND PARTNERING MEETING AND "PRELIMINARY PAVEMENT & GEOTECHNICAL MEETING" BOTH INITIATED BY THE PROJECT MANAGER NOT LATER THAN 10% PROJECT PLAN DEVELOP. THIS MEETING IS TO DISCUSS AND CLARIFY THE UNDERSTANDING OF THE PROJECT SCOPE OF WORK. A PRELIMINARY RECOMMENDATION WILL BE PROVIDED THREE WEEKS FROM A REQUESTED PRELIMINARY RECOMMENDATION BASED ON DATABASE INFORMATION, ENGINEERING JUDGMENT, AND THE KNOWLEDGE OF THE AREA***
- **IMPORTANT NOTE: THE PROCESS CAN TAKE APPROXIMATELY 120 DAYS FROM RECEIPT OF REQUEST. THE REASON FOR THIS IS THAT THE GEOTECHNICAL REPORT MAY BE PROVIDED BY A CONSULTANT AND THE TIME TO PROCURE A PURCHASE ORDER AND SCHEDULE RESOURCES MAY VARY.**
- **THE PROJECT MANAGER REQUESTS GEOTECHNICAL TESTING AND REPORTING NEEDS NO LATER THAN 30% PLAN DEVELOPMENT STAGE. RECORDING REQUEST AND DATES WITHIN THE GPA SYSTEM**

HYDRAULICS ENGINEERS

- ***PERFORMS PRELIMINARY HYDROLOGIC AND HYDRAULIC MODELING FOR PRELIMINARY SMALL STRUCTURE, PIPE LINER, AND BRIDGE SIZES FOR ENGINEERS REPORTS AND PLANNING DOCUMENTS UTILIZING LIMITED FIELD SURVEY. PRELIMINARY STRUCTURE SIZES ARE FOR COST ESTIMATING AND PLANNING PURPOSES ONLY. PIPE LINER STUDIES ARE DONE PRIOR TO THE ASSET TEAM CALL FOR PROJECTS, TO ENSURE THE RIGHT REPAIR IS BEING PROPOSED***
- **PERFORMS HYDROLOGIC AND HYDRAULIC MODELING FOR FINAL SMALL STRUCTURE, PIPE LINER, AND BRIDGE SIZES FOR DISTRICT AND CENTRAL OFFICE IN-HOUSE DESIGNED PROJECTS, UTILIZING FINAL SURVEY, APPROXIMATELY 60 DAYS PRIOR TO STAGE 1**
- **PROVIDES FINAL HYDRAULICS REVIEWS FOR CONSULTANT DESIGNED PROJECTS AT 60 DAYS PRIOR TO STAGE 1, TO CONFIRM THAT CALCULATIONS ARE BEING DONE IN ACCORDANCE WITH HYDRAULICS POLICY. THIS INCLUDES SMALL STRUCTURES, BRIDGES, AND REHABILITATION PROJECTS INVOLVING SCOUR CALCULATIONS FOR PROJECTS ON BOTH THE INDOT AND LPA SYSTEMS**

THE SCOPING ENGINEER RECEIVES A CALL FOR A PROJECT THAT ADDRESSES A MAINTENANCE, SAFETY OR CAPACITY ISSUE. AT THIS POINT, THE SCOPE IS SOMEWHAT VAGUE AND A GENERAL STATEMENT OF PURPOSE AND NEED IS ESTABLISHED.

PROJECT DELIVERY PROCESS

EACH PROJECT WILL HAVE A PURPOSE AND NEED STATEMENT WHICH WILL BE UTILIZED TO ESTABLISH THE SCOPE OF THE REQUIRED WORK.

THE DEVELOPMENT OF THE PURPOSE AND NEED STATEMENT IS THE RESPONSIBILITY OF THE PROJECT TEAM.

THE INTENT OF THE PURPOSE AND NEED STATEMENT IS TO PROVIDE A CLEAR AND PRECISE APPROACH FOR INDOT AND ITS PARTNERS TO USE IN THE DEVELOPMENT OF A PROJECT.

THE PROJECT'S PURPOSE AND NEED MUST BE DEVELOPED AND UTILIZED TO DEFINE THE SCOPE OF THE REQUIRED WORK.

- **THE PROJECT HAS BEEN AUTHORIZED**
- **THE NOTICE TO PROCEED HAS BEEN ISSUED**
- **THE PROJECT MANAGER HAS BEEN SELECTED**
- **THE PROJECT DESIGNER HAS BEEN SELECTED**

THE PROJECT MANAGER ASSEMBLES THE PROJECT TEAM TO PREPARE THE PROJECT MANAGEMENT PLAN TO DEFINE:

- **THE PROJECT DESCRIPTION**
- **TEAM MEMBERS' ROLES AND RESPONSIBILITIES**
- **MEASURE OF SUCCESS/PROJECT GOAL AND OBJECTIVES**
- **MAJOR MILESTONES**
- **BOUNDARIES**
- **OPERATING GUIDELINES**

THE PROJECT MANAGER'S MANDATE IS TO DELIVER A QUALITY PROJECT ON TIME, IN BUDGET AND ON SCOPE – BUT THIS CANNOT BE DONE ALONE! HE/SHE IS THE LEADER OF THE PROJECT TEAM, COMPOSED OF MANY FUNCTIONAL MANAGERS AND SUPPORT GROUPS. EACH OF THESE PEOPLE HAS AN INTEGRAL PART IN COORDINATING EFFORTS FOR DELIVERING THE PROJECT. THEIR PARTICIPATION IS CRITICAL FOR SUCCESS.

THE PROJECT TEAM IS HELD ACCOUNTABLE FOR SUCCESS AGAINST BUDGET AND SCHEDULE.

DURING THIS PERIOD, THE SCOPING ENGINEER IS JOINED BY THE MAINTENANCE, CONSTRUCTION, AND PROJECT MANAGERS TO REFINE AND ADD VALUE TO THE STATEMENT OF PURPOSE AND NEED, SO THAT ANY OBSTACLES AND OPPORTUNITIES CAN BE CONSIDERED.

UTILITY, REAL ESTATE, ENVIRONMENTAL REPRESENTATIVES, AND THE OTHER TEAM MEMBERS JOIN TO FINALIZE THE SCOPE AND THE STATEMENT OF PURPOSE AND NEED.

PROJECT DELIVERY PROCESS

THE SCOPE IS THE FOUNDATION ON WHICH THE PROJECT DEVELOPMENT IS BUILT. IT IS THE SCOPE THAT DETERMINES THE BUDGET AND SCHEDULE.

THE PURPOSE OF THE PROJECT SCOPING PROCESS IS TO EXTENSIVELY INVESTIGATE ALL POTENTIAL ISSUES THAT COULD AFFECT THE COST AND SCHEDULE OF A PROJECT.

PRACTICAL DESIGN WILL BE INITIATED DURING DEVELOPMENT OF SCOPE.

THE PROJECT MANAGER THEN LEADS THE PROJECT TEAM THROUGH THE DEVELOPMENT OF ALTERNATIVES AND THE SELECTION OF THE PREFERRED ALTERNATIVE, AFTER WHICH DETAILED SCOPING BEGINS.

A TEAM MEETING IS HELD AND DECISIONS ARE MADE AS TO WHAT WILL AND WHAT WILL NOT BE PART OF THE SCOPE. THE TEAM COMPLETES THE SCOPING REPORT AND A BASELINE COST ESTIMATE.

THE PROJECT SCHEDULE IS UPDATED WHEN THE SCOPING IS COMPLETE AND APPROVED.

THE PROJECT MANAGER ASSEMBLES THE PROJECT SCOPE, MASTER SCHEDULE AND MASTER ESTIMATE (BUDGET) FOR APPROVAL.

AS THE TEAM MOVES TO DESIGN STAGE 1, THE PROJECT MANAGER DIRECTS GEOTECH TO CONDUCT INVESTIGATIONS FOR PAVEMENT DESIGN.

THE TEAM TAKES STEPS TO INITIATE PRACTICAL DESIGN.

THE TEAM PLANS THE WORK AND WORKS THE PLAN.

SO LET US BEGIN...

CONSTRUCTABILITY REVIEW PROCESS

PRE-CONSTRUCTION

STAGE 1 CONSTRUCTABILITY REVIEW

THE PROJECT PURPOSE AND NEED AND SCOPE HAVE BEEN DEVELOPED BY THE TEAM WITH PROJECT, CONSTRUCTION, AND MAINTENANCE MANAGERS. THE PROJECT MANAGER BROUGHT THE TEAM FUNCTIONAL MANAGERS TO ASSIST.

IN ADDITION, PRACTICAL DESIGN HAS BEEN INITIATED.

NOW AT STAGE 1, THE MAINTENANCE MANAGER WILL SUPPLY MAINTENANCE RECORDS FOR REVIEW. HE/SHE WILL PROVIDE INPUT BASED ON KNOWLEDGE OF THE ROADWAY SECTION.

MAINTENANCE WILL IDENTIFY THE CONDITION FOR SUB-DISTRICT ROAD PROJECTS BASED ON MAINTENANCE RECORDS.

THE PAVEMENT ENGINEERS (BOTH CO AND DISTRICT) HAVE MET WITH THE PROJECT MANAGER TO PROVIDE PRELIMINARY PAVEMENT DESIGNS.

THE PROJECT MANAGER HAS REQUESTED THE GEOTECHNICAL REPORT OR WAIVER.

STAGE 1 REVIEW ON ELEVEN CRITERIA:

- SAFETY/SPECIFIC CONSIDERATION
- PLANS
- PAY ITEMS AND COST ESTIMATE
- UTILITIES AND RAILROAD
- ENVIRONMENTAL
- SCHEDULE AND SPECIAL CONSIDERATIONS
- UTILITIES
- PAVEMENT
- STRUCTURE/HYDRAULICS
- ROADSIDE SAFETY
- GENERAL CONSIDERATIONS

STAGE 1. PLANS FOR THE STAGE 1 SUBMISSION ARE 25% COMPLETE. IN THIS PHASE, THE ENVIRONMENTAL DOCUMENT IS DEVELOPED AND CRITICAL ISSUES OF FIELD SURVEY, EXISTING UTILITIES, EXISTING RIGHT-OF-WAY, PROJECT LIMITS, STRUCTURE HYDRAULICS, STRUCTURE SIZING AND TYPE SELECTION, TYPICAL SECTIONS, HORIZONTAL ALIGNMENTS, AND VERTICAL ALIGNMENTS ARE IDENTIFIED AND DISCUSSED IN DETAIL.

CONSTRUCTABILITY REVIEW PROCESS

STAGE 1 DOCUMENTS

- **STAGE 1 PLANS**
- **ENVIRONMENTAL SUMMARY (DRAFT DOCUMENT)**
- **DESCRIPTION OF ALL PERMITS NEEDED**
- **FIRM LINE/GRADE/GEOMETRIC LAYOUT**
- **DESIGN EXCEPTION**
- **MAINLINE CULVERT HYDRAULICS REPORT**
- **BRIDGE HYDRAULICS REPORT**
- **BRIDGE STRUCTURE ECONOMIC ANALYSIS**
- **COST ESTIMATE**
- **COMMITMENT REPORT**
- **GEOTECHNICAL REPORT**
- **PRELIMINARY PAVEMENT DESIGN**

- **THE DESIGNER HAS SOME INDICATION OF WHAT PERMITS WILL BE NEEDED FOR THE CONTRACT AT 25% PLANS. IF THIS INCLUDES THE GEOMETRIC LAYOUT THEN IMPACTS SHOULD BE DETERMINED. THE DESIGNER SHOULD COMPILE A LIST OF PERMITS WHICH MAY BE PERTINENT AT THIS TIME. (USACE, RGP, NWP, ETC) ALTHOUGH THE DESIGNER CANNOT APPLY AT THIS POINT DUE TO THE LIMITED AMOUNT OF DETAILS, ALL PERMITS SHOULD BE DISCUSSED.**
- **THE EXISTING RIGHT OF WAY (IF APPLICABLE) SHOULD BE SHOWN AT THIS POINT. INDOT SHOULD VERIFY THAT THE RIGHT OF WAY SHOWN ON THE 25% PLANS IS ACTUALLY OWNED BY INDOT.**
- **VERIFY THE STRUCTURE OF THE EXISTING ROAD WAY, DO CORES OF THE EXISTING PAVEMENT AND SHOULDER NEED TO BE TAKEN? IF SO, AT WHAT LOCATIONS SHOULD CORES BE TAKEN? THE EXISTING PAVEMENT MAY AFFECT MOT, PAVEMENT REMOVAL, ETC.**

CONSTRUCTABILITY REVIEW PROCESS

ITEMS TO CONSIDER

- **WHAT IS THE LIFE EXPECTANCY OF THIS PROJECT?**
- **IS ALL OF THE WORK NECESSARY TO COMPLETE THE INTENDED PURPOSE?**

ITEMS TO REVIEW

- **HOW MANY UTILITIES ARE INVOLVED WITH THE PROJECT?**
- **CHECK FOR UTILITIES NOT ON THE PLANS.**
- **PRELIMINARY R/W LAYOUT, IS IT SUFFICIENT R/W FOR UTILITIES?**
- **WILL SUE BE UTILIZED?**
- **WHAT ARE THE EXPECTED PERMITS REQUIRED AND THEIR IMPACT TO THE SCHEDULE?**
- **CHECK ON THE BUDGET.**
- **WHAT ARE THE EXPECTED ENVIRONMENTAL RESTRICTS AND THEIR IMPACT ON THE SCHEDULE?**
- **PROPERTY RELOCATIONS?**
- **MAINTENANCE CONCERNS ADDRESSED?**
- **SAFETY CONCERNS ADDRESSED?**

UTILITY COORDINATION FLOW CHART – INDOT PROJECT

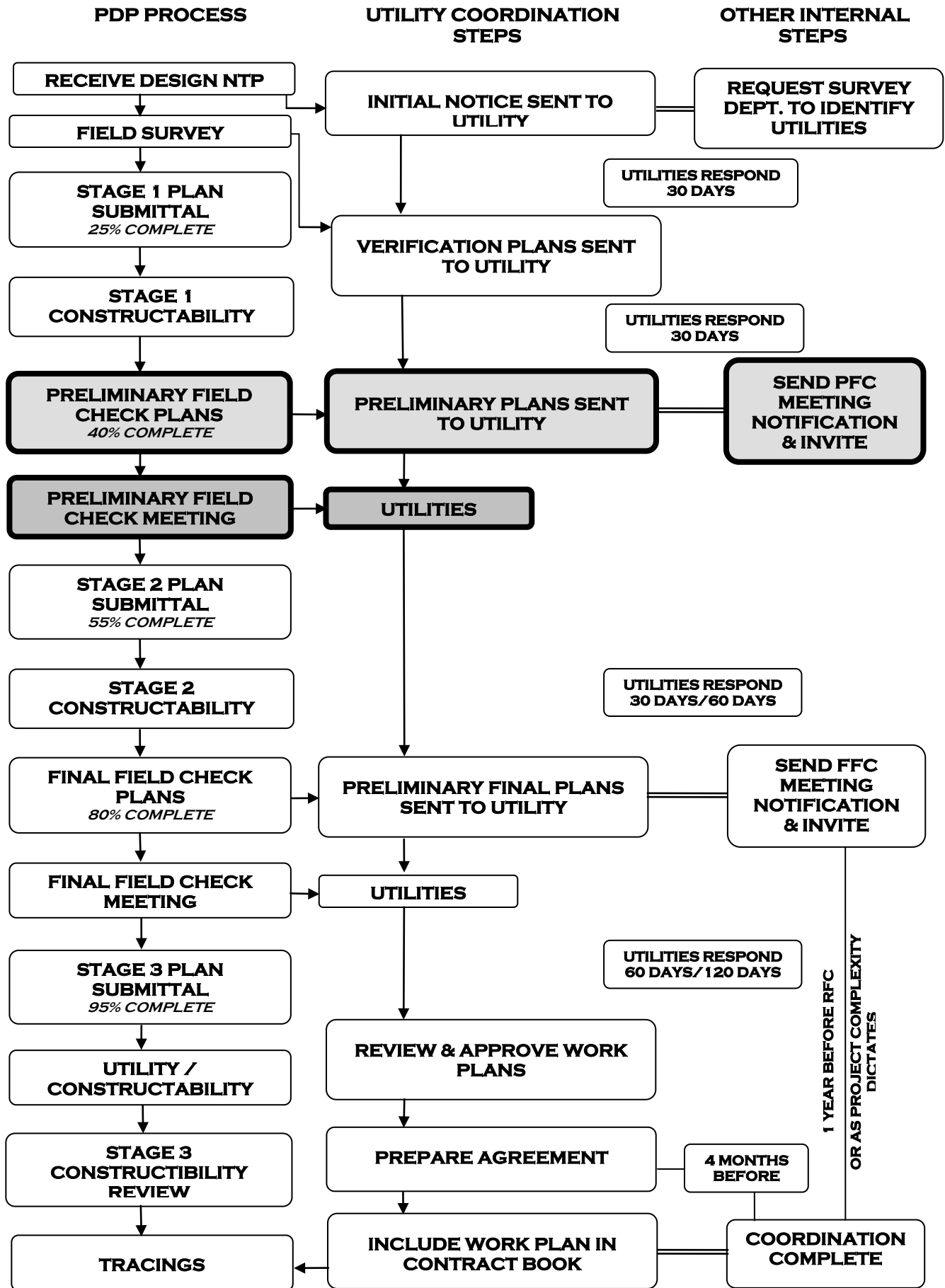


FIGURE U-1

CONSTRUCTABILITY REVIEW PROCESS

PRELIMINARY FIELD CHECK

PRELIMINARY FIELD CHECK IS THAT STEP WHERE THE PROJECT TEAM HAS THE FIRST OPPORTUNITY TO COORDINATE THEIR EFFORTS AND EXAMINE PLANS AND DOCUMENTS.

THIS IS THE SECOND FIELD CHECK SINCE THE TEAM MADE THE SCOPING FIELD CHECK. IT IS APPROPRIATE FOR THE FIELD CHECK TO BE CONDUCTED IN TWO STEPS. STEP 1 (SEE FIGURE U-1, OPPOSITE PAGE) WOULD ALLOW EFFORTS TO BE FOCUSED ON UTILITY CONCERNS. STARTING HERE AND CONTINUING THROUGHOUT THE PROJECT DEVELOPMENT, THE PROJECT MANAGER AND CONSTRUCTION MANAGER WITH THE DESIGNER, UTILITY COORDINATOR AND THE UTILITIES MUST ENTER DISCUSSIONS THAT UTILITY IMPACTS CAN BE MINIMIZED AND RELOCATIONS CAN BE COMPLETED SOONER.

THE PROJECT MANAGER WILL HAVE CONTACTED EACH UTILITY AND SENT PRELIMINARY FIELD CHECK PLANS WITH THE UTILITY CHECKLIST. EACH UTILITY IS ASKED TO COMPLETE IT DURING THEIR REVIEW. (SEE APPENDIX 2)

IT IS IN EVERYONE'S BEST INTEREST TO HAVE DESIGNED AROUND UTILITIES TO THE MAXIMUM EXTENT POSSIBLE. IT WILL REDUCE COSTS AND PROJECT DELAYS DUE TO UTILITY RELOCATIONS.

THE PLANS FOR THE PRELIMINARY FIELD CHECK ARE 40% COMPLETE. THE OBJECT OF THESE PLANS IS TO HAVE ENOUGH DESIGN INFORMATION ON THE PLANS FOR THE UTILITY COMPANIES TO BE ABLE TO DETERMINE WHAT MAJOR IMPACTS THE PROJECT WILL CAUSE TO THEIR EXISTING UTILITY FACILITIES.

STEP 1, PRELIMINARY FIELD CHECK

OFFICES INVOLVED:

- PROJECT MANAGEMENT
- MAINTENANCE MANAGEMENT
- REAL ESTATE
- CONSTRUCTION MANAGEMENT
- DESIGN
- UTILITIES

ITEMS TO REVIEW:

- ARE UTILITIES KNOWLEDGEABLE ABOUT THE ROAD DESIGN? IS R/W CONDUCTIVE TO UTILITY RELOCATION?
- PRELIMINARY R/W LAYOUT. SUFFICIENT R/W FOR UTILITIES?
- IF PROJECT IS "LIMITED ACCESS R/W", WILL UTILITIES STAY IN R/W?
- WILL SUE BE UTILIZED?
- WHAT WILL BE THE CLEARING REQUIREMENTS FOR THE PROJECT AND/OR UTILITY RELOCATION?

CONSTRUCTABILITY REVIEW PROCESS

PRELIMINARY FIELD CHECK CONT'D

STEP 2, PRELIMINARY FIELD CHECK

IN STEP 2 OF THE FIELD CHECK, THE TEAM WILL REVIEW ENVIRONMENTAL REQUIREMENTS, ANY RIGHT OF WAY ISSUES, DRAINAGE, AND ANY MOT CONCERNS

OFFICES INVOLVED:

- **PROJECT MANAGEMENT**
- **CONSTRUCTION**
- **DESIGN**
- **TRAFFIC - DISTRICT**
- **ENVIRONMENTAL**
- **GEOTECHNICAL**
- **REAL ESTATE**
- **MAINTENANCE**

ITEMS TO REVIEW:

- **CHECK ON THE BUDGET.**
- **WHAT IS THE CONSTRUCTION SCHEDULE? IS IT AN EARLY-SEASON PROJECT OR MID-SEASON PROJECT?**
- **IS R/W OUTSIDE THE CLEAR ZONE?**
- **CONCEPTUAL TRAFFIC MAINTENANCE PLAN AND PHASING? ANY DETOUR SHOULD BE DRIVEN.**
- **COMPARE COSTS/FEASIBILITY OF STAGED CONSTRUCTION AND DETOUR.**
- **CHECK FOR DRIVES NOT IDENTIFIED ON PLANS.**
- **INTERSECTION LAYOUT?**
- **CONCEPTUAL STORM SEWER LAYOUT.**
- **DRAINAGE OUTLETS MEET PHASING SHOWN?**
- **CHECK FOR NEW DEVELOPMENTS AND CONDITIONS NOT NOTED ON THE PLANS.**
- **VERIFY THAT THE CONSTRUCTION LIMITS ARE REASONABLE. (ALLOWS ENOUGH WORK SPACE)**
- **LANDSCAPING AND EROSION CONTROL ITEMS REASONABLE?**
- **ANY OTHER SPECIAL CONCERNS, MATERIAL, LOCAL FESTIVALS, ETC.?**
- **REVIEW COMMITMENT REPORT**

CONSTRUCTABILITY REVIEW PROCESS

PRELIMINARY FIELD CHECK CONT'D

COMMONLY MISSED ITEMS TO CHECK

- **KEEP ANY EXISTING HIGHWAY LIGHTING OPERATING AS LONG AS PRACTICAL DURING UTILITY RELOCATION AND CONSTRUCTION. MAY BE PRACTICAL TO USE TEMPORARY ELECTRICAL SERVICE.**
- **ACCESS/MAINTENANCE OF EXISTING DRIVES FOR RESIDENTS AND BUSINESSES SHOULD BE DISCUSSED.**
- **THE FINAL GRADES AND WIDTHS OF THE PROPOSED DRIVES FOR RESIDENTS AND BUSINESSES SHOULD BE DISCUSSED. THE DESIGNER SHOULD TRY TO MAKE THE EXISTING DRIVES EITHER AT THE EXISTING GRADES OR LESS. THIS MAY SHOW A CAUSE FOR ADDITIONAL TEMPORARY RIGHT OF WAY.**
- **ARE THERE ANY EXISTING SURVEY MONUMENTS – SUCH AS SECTION CORNERS – THAT NEED TO BE MAINTAINED?**
- **ARE THERE ANY EXISTING CASTINGS SUCH AS SURVEY MONUMENTS, MANHOLES, INLETS, VALVES, ETC – THAT NEED TO BE ADJUSTED TO GRADE?**

OTHER CONSIDERATIONS

- **CONSTRUCTION PHASING SHOULD BE CHECKED TO MAKE SURE THAT PHASE LINES ARE CONSISTENT. DO PROPOSED MOT SCHEMES FIT ON THE BRIDGE DECKS AND DO THE BRIDGE CONSTRUCTION JOINTS WORK WITH THE ADJACENT ROADWAY AND EXISTING STRUCTURES.**

CONSTRUCTABILITY REVIEW PROCESS

STAGE 2 CONSTRUCTABILITY REVIEW

STAGE 2 IS THE PHASE BETWEEN THE PRELIMINARY AND FINAL FIELD CHECKS. PLANS ARE 55% COMPLETE.

IT IS AT THIS STAGE THAT THE CONSTRUCTABILITY REVIEW WILL BE MOST EFFECTIVE AND HAVE THE MOST SIGNIFICANT IMPACT.

STAGE 2 HAS SPECIAL SIGNIFICANCE. THE PROJECT MANAGER AND TEAM HAVE BROUGHT THE PROJECT FORWARD WHERE ALL ELEMENTS HAVE GENERALLY "SETTLED IN". IT IS A COMFORT LEVEL WHERE WE HAVE DIRECTION OF WHAT IS COMPLETE OR WHAT IS TO BE COMPLETED.

STAGE 2 PLANS HAVE PROGRESSED THE DESIGN FURTHER TO A POINT WHERE UTILITY IMPACTS HAVE MINIMIZED AND THE FINAL RIGHT OF WAY OF THE PROJECT IS SET. PRACTICAL DESIGN HAS BEEN THOROUGHLY REVIEWED.

ONCE THE STAGE 2 PLANS ARE APPROVED, THERE IS LITTLE OPPORTUNITY TO GO BACK AND RE-DESIGN FOR UTILITY IMPACTS.

THIS REVIEW SHOULD ENSURE THAT THE DESIGN TEAM, INCLUDING ALL OF THE INVOLVED OFFICES, HAVE THE NECESSARY DIRECTION TO PROCEED TO THE FINAL DESIGN STAGE AND THAT ANY MAJOR CHANGES, REVISIONS OR SPECIAL CONSIDERATIONS ARE IDENTIFIED WITH RESOLUTION TO BE MADE AND SCHEDULED.

STAGE 2 COVERS ELEVEN CRITERIA:

- PLANS - ROAD
- ENVIRONMENTAL
- PLANS - BRIDGE
- TRAFFIC MAINTENANCE AND TRAFFIC MANAGEMENT PLAN
- COST ESTIMATE
- CONSTRUCTION PHASING
- SITE INVESTIGATION
- SCHEDULING
- RIGHT OF WAY
- GENERAL CONSIDERATION
- UTILITIES AND RAILROAD

CONSTRUCTABILITY REVIEW PROCESS

STAGE 2 PROJECT DEVELOPMENT PROCESS CONT'D

IN STAGE 2, BRIDGE PLANS, COSTS AND STRUCTURAL REQUIREMENTS, ANY SPECIAL FOUNDATION CONSIDERATIONS OR MATERIALS INVOLVED, A REVIEW OF ALL TRAFFIC REQUIREMENTS FOR THE PROJECT. PRELIMINARY QUANTITIES AND RIGHT-OF-WAY REQUIREMENTS ARE MADE. SIGNALIZATION, PHASING UTILITIES PLANS AND RAILROAD NEEDS ARE IDENTIFIED AND DEVELOPED. SIGNAL PLANS, SIGNING PLANS AND PAVEMENT MARKING PLANS REVIEWED BY TRAFFIC ENGINEER? RIGHT OF WAY, DRAINAGE, STRUCTURE AND GEOTECH PLANS ARE FINALIZED. DETAILS OF HYDRAULIC REQUIREMENTS ALONG WITH ANY SPECIAL DRAINAGE STRUCTURES. REVIEW PLANS WITH RESPECT TO GEOTECHNICAL RECOMMENDATIONS.

STAGE 2 DOCUMENTS

- PRELIMINARY FIELD CHECK MEETING REPORT
- VALUE ENGINEERING REPORT
- GEOTECH AND SOILS REPORT
- STAGE 2 PLANS
- COST ESTIMATE
- DRAFT TRAFFIC CONTROL RECOMMENDATION
- HYDRAULICS REPORT/PLAN INCLUDING DRAINAGE LAYOUT
- BRIDGE GENERAL PLANS WITH SCHEDULES, CONCEPTS, COSTS AND PRELIMINARY QUANTITIES FOR ALL BRIDGES
- COMPLETED EARTHWORK AND GRADING PLAN
- ENVIRONMENTAL DOCUMENT COMPLETE
- APPROVED R/W PLAN WITH ANY RECOMMENDED MITIGATION OR DESIGN AND CONSTRUCTION COMMITMENTS
- A LIST OF RECOMMENDATIONS AND COMMITMENTS FOR PERMIT REQUIREMENTS INCLUDING SCHEDULES/COMMITMENTS BY THE PERMITTING AGENCIES
- BRIDGE FOUNDATION REVIEW FORM
- VERIFY IF MOT CAN BE SUPPORTED ON EXISTING PAVEMENT OR SHOULDERS
- COMMITMENT REPORT

CONSTRUCTABILITY REVIEW PROCESS

STAGE 2 PROJECT DEVELOPMENT PROCESS CONT'D

STAGE 2

COMMONLY MISSED ITEMS TO CHECK

- **ON PROJECTS WITH MULTIPLE BRIDGES IS THE CONSTRUCTION PHASING CONSISTENT?**
- **ARE THE PHASE LINES (HORIZONTALLY) LOCATED TO ALLOW THE CONTRACTOR GREATER FLEXIBILITY DURING CONSTRUCTION?**
- **ARE CONSTRUCTION PHASE LINES CONSISTENT? DO PROPOSED MOT SCHEMES FIT ON THE BRIDGE DECKS AND DO THE BRIDGE CONSTRUCTION JOINTS WORK WITH THE ADJACENT ROADWAY AND EXISTING STRUCTURES?**
- **IS THERE ENOUGH HORIZONTAL CLEARANCE FOR BARRIERS, SHORING AND CONSTRUCTION ACCESS?**
- **ARE THERE DRAINAGE STRUCTURES THAT CAN CONFLICT WITH THE BRIDGE FOUNDATIONS OR RETAINING WALLS?**
- **DO THE RETAINING WALLS EXCAVATION ENVELOP CONFLICT WITH CONSTRUCTION PHASE LINES?**
- **DOES THE MEDIAN BRIDGE RAIL, OR DIVIDED HIGHWAYS, CREATE HORIZONTAL SIGHT DISTANCE RESTRICTIONS?**
- **ARE STRUCTURES DESIGNED FOR CLEAR ZONE (SUCH AS GRADED-BOX-END-SECTION) BEING PLACED BEHIND GUARDRAIL?**
- **ARE THERE ANY EXISTING SURVEY MONUMENTS – SUCH AS SECTION CORNERS – THAT NEED TO BE MAINTAINED?**
- **ARE THERE ANY EXISTING CASTINGS – SUCH AS SURVEY MONUMENTS, MANHOLES, INLETS, VALVES, ETC – THAT NEED TO BE ADJUSTED TO GRADE?**
- **WILL TEMPORARY WIDENING BE REQUIRED BETWEEN MOT PHASING?**
- **ARE THERE ANY LOCAL FESTIVALS THAT MOT PHASING NEEDS TO TAKE ACCOUNT?**
- **DO MAINTENANCE OF TRAFFIC PLANS REFLECT ELEVATION DIFFERENCES?**
- **ARE THERE ANY LOCAL RESTRICTIONS THAT PROHIBIT NIGHT WORK THAT MAY REQUIRE A SPECIAL PROVISION?**

CONSTRUCTABILITY REVIEW PROCESS

STAGE 2 CONT'D

OTHER CONSIDERATIONS

- **WILL THERE BE GRADE DIFFERENCES BETWEEN MOT PHASING? IF SO, APPLICABLE CROSS SECTIONS WILL BE NEEDED.**
- **THE DESIGN SHOULD CONSIDER STABILITY DURING CONSTRUCTION OF A BRIDGE, STRUCTURE OF LARGE ROADWAY CUTS, OF LARGE ROADWAY EMBANKMENTS, AND OF SIGNIFICANTLY LARGE EXCAVATIONS NEEDED FOR STORM WATER STRUCTURES.**
- **BRIDGE DRAWINGS AND ROAD DRAWINGS ARE NOT MATCHING UP. PHASE LINE RETENTIONS, MOT CONFIGURATIONS, CONSTRUCTION LIMITS PER PHASE. (CONTRACTOR COMMENTS)**
- **REVIEW POTENTIAL CONFLICTS; DRAINAGE ISSUES, EXISTING UTILITIES, TIE IN TO EXISTING CONSTRUCTION. (CONTRACTOR COMMENTS)**
- **PROPOSED FOUNDATIONS SHOULD BE LOCATED SUCH THAT CONFLICTS WITH EXISTING FOUNDATIONS ARE NOT LIKELY. DO NOT ASSUME THAT BE EXISTING FOUNDATIONS (BELOW GRADE) WERE CONSTRUCTED TO PLAN. ALLOW EXTRA ROOM BETWEEN THE EXISTING AND PROPOSED FOUNDATIONS.**
- **IF THE PROPOSED STRUCTURE WILL HAVE SIGNIFICANT DEFLECTIONS WITH DECK POUR (AND YOU ARE CONSTRUCTING IN PHASES) CONSIDER PROVIDING A CLOSURE POUR TO AVOID PROBLEMS WITH LONGITUDINAL JOINTS.**
- **KEEP CLOSE WATCH ON LENGTHY SPECIAL PROVISIONS. SOMETIMES DESIGNERS LIKE TO LUMP MULTIPLE ISSUES INTO ONE SPECIAL. SPECIAL PROVISIONS SHOULD BE SPECIFIC WITH ALL INFORMATION RELATIVE TO THE ITEM AND SET UP AS A SECTION OF THE STANDARD SPECIFICATIONS.**
- **MAKE SURE THAT PROPRIETARY MATERIALS ARE NOT USED OR HAVE BEEN APPROVED BY FHWA PRIOR TO PLACING THEM IN CONTRACT.**
- **USE THE APPROPRIATE RETAINING WALL TYPE FOR THE SITE. SOME WALL TYPES ARE MORE CONDUCTIVE FOR USE IN FILL CONSTRUCTION, WHILE OTHERS ARE LEFT IN CUT SITUATIONS. THE GEOTECHNICAL ENGINEER SHOULD PROVIDE THE MOST APPROPRIATE SYSTEM.**
- **MAKE SURE ALL PERMANENT RETAINING WALL ELEMENTS FIT IN THE R/W. CUT WALLS PLACED CLOSE TO THE R/W MAY REQUIRE EASEMENTS FOR CONSTRUCTION.**
- **IF THE PROPOSED STRUCTURE WILL HAVE SIGNIFICANT DEFLECTIONS AT THE DECK POUR AND YOU ARE CONSTRUCTING IN PHASES, CONSIDER PROVIDING A CLOSURE POUR TO AVOID PROBLEMS WITH THE LONGITUDINAL JOINTS.**

UTILITY COORDINATION FLOW CHART – INDOT PROJECT

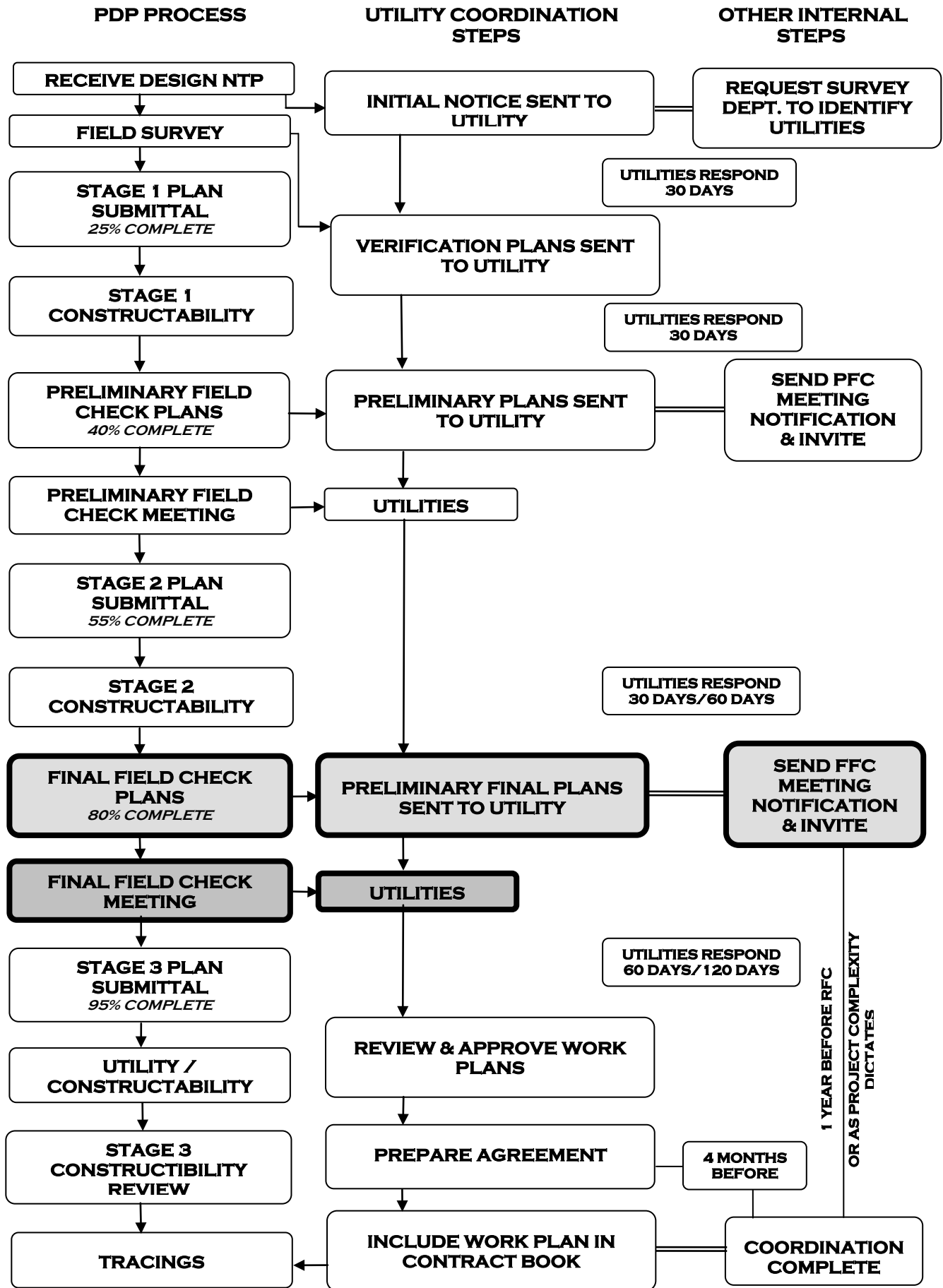


FIGURE U-2

CONSTRUCTABILITY REVIEW PROCESS

FINAL FIELD CHECK

FINAL FIELD CHECK PLANS ARE 80% COMPLETE. PREVIOUS STAGE 2 REVIEW COMMENTS HAVE BEEN ACCOUNTED FOR.

THE PROJECT MANAGER HAS CONTINUED COORDINATION WITH UTILITY COMPANIES THROUGH STAGE 2 TO MINIMIZE THEIR IMPACTS.

FOR THE FINAL FIELD CHECK, THE UTILITIES HAVE EACH RECEIVED THE FINAL FIELD CHECK PLANS (PRELIMINARY FINAL PLANS) WITH THE UTILITY CHECKLIST (SEE APPENDIX 4). IT IS IMPORTANT FOR THE PROJECT MANAGER TO WORK WITH EACH UTILITY TO DETERMINE THE BEST TIME FRAMES, PER CHECKLIST QUESTIONS 6-9. FROM THESE, THE PROJECT MANAGER CAN DETERMINE SOME OF THE RISKS INVOLVED.

IN THIS PHASE, REVIEW THE BRIDGE DESIGN AND REQUIREMENTS, FINAL MAINTENANCE OF TRAFFIC PLANS, SIGNALIZATION, SIGNS AND STRIPING PLANS. FINALIZE CONSTRUCTION RESTRICTIONS AND REVIEW TRAFFIC AND COMMUNITY IMPACT. REQUEST UTILITY RELOCATION PLANS, UPDATE UTILITY RELOCATION IMPACT, AND REVIEW AND UPDATE NECESSARY PERMITS. OBTAIN RIGHT OF ENTRY ON ALL R/W PARCELS.

OFFICES INVOLVED:

- | | |
|----------------------|---------------------|
| • PROJECT MANAGEMENT | • ENVIRONMENTAL |
| • CONSTRUCTION | • HYDRAULICS |
| • DESIGN | • GEOTECH |
| • MAINTENANCE | • RIGHT OF WAY |
| • TRAFFIC | • BRIDGE/STRUCTURES |

THE INTENT OF THE FINAL FIELD CHECK PLANS (SEE FIGURE U-2, OPPOSITE PAGE) IS TO HAVE THE FINAL DESIGN COMPLETE TO THE POINT THAT THE UTILITY COMPANIES CAN PREPARE THEIR WORK PLANS FOR RELOCATION. THE PROJECT MANAGER NEEDS FEEDBACK FROM THE UTILITY COMPANIES AS SOON AS POSSIBLE FOR THE DESIGNER AFTER THE FINAL FIELD CHECK.

ITEMS TO REVIEW AT FINAL FIELD CHECK

- **WHAT RECENT CHANGES, EXISTING/PLANNED, ON THE JOB SITE?**
- **WHAT ARE CHANGES TO DRAINAGE STRUCTURES AND GRADING IN THE TRAFFIC MAINTENANCE PLAN?**
- **ANY CHANGES TO SIGNAGE AND TRAFFIC SIGNALS IN THE TRAFFIC MAINTENANCE PLAN?**
- **HAVE TEMPORARY PAVEMENT MARKINGS (TEMPORARY/REMOVABLE) AND LINE REMOVAL BEEN ADDRESSED IN THE PHASING?**
- **HAVE THE TRAFFIC SIGNALS, TRAFFIC SIGNAL DETECTION, AND SIGNAGE BEEN ADDRESSED IN EACH PHASE?**
- **ARE EROSION CONTROL MEASURES (TEMPORARY SEEDING, MOBILIZATION/DEMobilIZATION, ETC.) ADDRESSED IN EACH PHASE?**
- **HAS THE UTILITY'S RELOCATION PLAN ADDRESSED EROSION CONTROL REQUIREMENTS?**

CONSTRUCTABILITY REVIEW PROCESS

FINAL FIELD CHECK CONT'D

OTHER CONSIDERATIONS

- **ENSURE THAT NOTHING HAS CHANGED SINCE THE TIME THAT THE TOPOGRAPHIC AND ALIGNMENT & GRADE SURVEY WAS COMPLETED (I.E., PAVEMENT HAS BEEN OVERLAID, DRIVES HAVE BEEN ADDED, DRAINAGE HAS BEEN CHANGED, ETC.).**
- **TEMPORARY SIGNALS AND OFFICIAL ACTIONS SHOULD BE DISCUSSED AT THIS POINT. THE AFFECT OF THE TEMPORARY SIGNALS AND OA'S ON MOT, UTILITIES, RAILROAD, ETC SHOULD BE REVIEWED.**
- **UTILITIES SHOULD DISCUSS THEIR OPERATIONS AND COOPERATION WITH OTHER UTILITIES. WHO MOVES FIRST, WHO NEEDS TO MOVE FIRST, TIMELINES, CONSTRUCTION ISSUES, RESPONSIBILITY OF REMOVING POLES, AND SEEDING AND SODDING. THIS MAY MODIFY PHASING, LETTING DATES, INTERMEDIATE COMPLETION DATES, ETC.**
- **CHECK COMMITMENT REPORT.**

UTILITY COORDINATION FLOW CHART – INDOT PROJECT

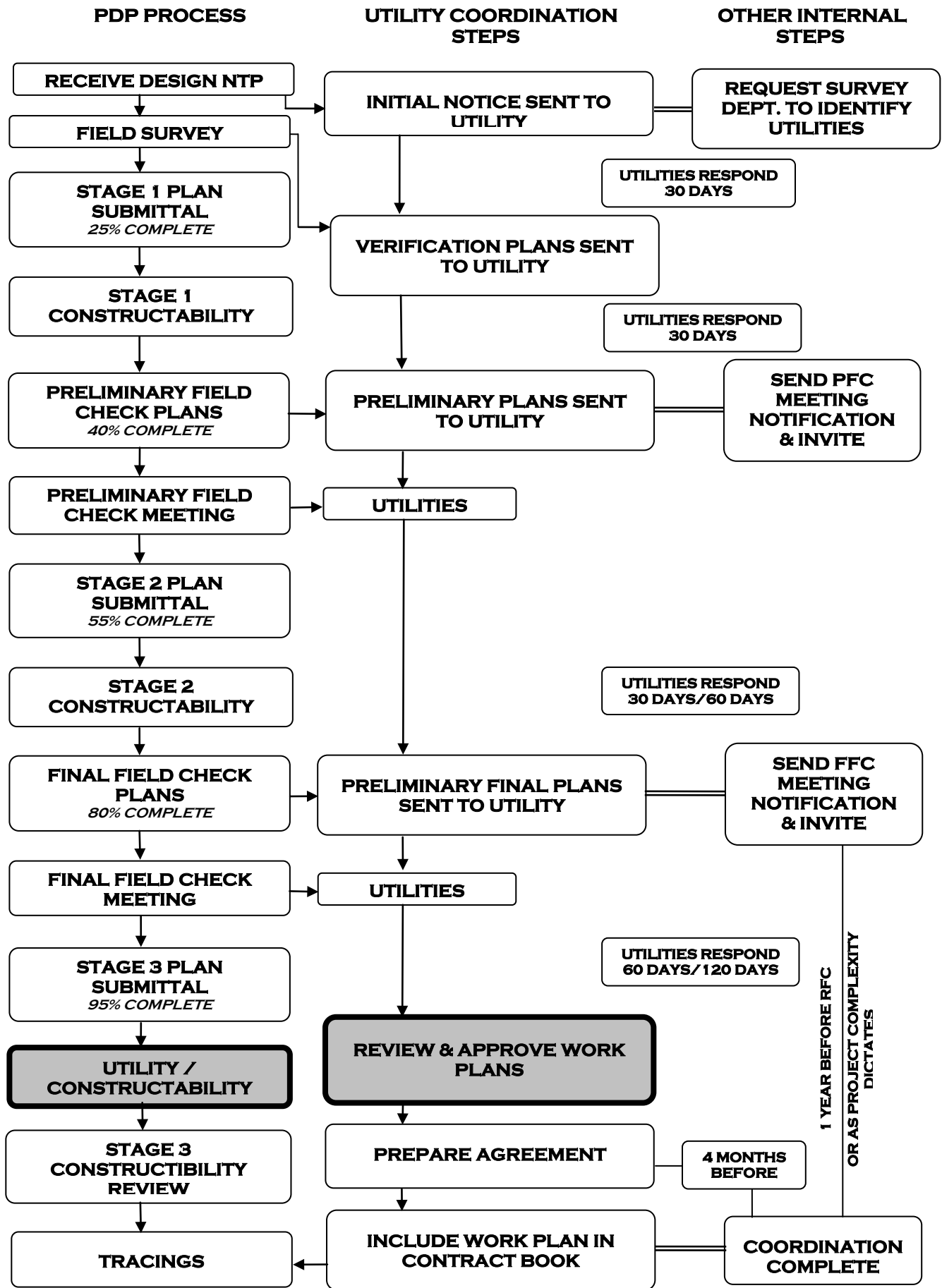


FIGURE U-3

CONSTRUCTABILITY REVIEW PROCESS

CONSTRUCTABILITY/UTILITY CONFERENCE

THE RESOLUTION OF THE UTILITIES' RELOCATION IS A MAJOR CONSTRUCTABILITY ISSUE. IT IS THE NUMBER 1 CONSTRUCTABILITY IMPEDIMENT. CONSTRUCTION PHASING AND SCHEDULING CAN BE SIGNIFICANTLY IMPACTED BY UTILITIES. CONTRACT "TIME SET" CANNOT BE DECIDED UNTIL AFTER THEIR RESOLUTION.

IN ORDER TO FACILITATE THEIR RESOLUTION, THE STAGE 3 CONSTRUCTABILITY REVIEW IS MOVED TO THE FINAL PLAN REVIEW. THIS LEAVES NO OPPORTUNITY TO REVIEW, MAKE COMMENTS AND CHANGES.

THE PROJECT MANAGER AND THE CONSTRUCTION MANAGER WILL CONFER WITH THE DESIGNER/UTILITY COORDINATOR TO DETERMINE THE STATUSES OF THE UTILITIES IN THE PROJECT. THE "PRELIMINARY FINAL PLANS" WILL HAVE BEEN SENT TO THE UTILITIES TO PREPARE A WORK PLAN (SEE FIGURE U-3, OPPOSITE PAGE). AS WORK PLANS AND AGREEMENT ARE APPROVED, UTILITY PERMITS AND NTP ARE ISSUED.

THE UTILITY COORDINATOR HAS COMPLETED THE UTILITY RELOCATION PLAN CHECKLIST. (SEE APPENDIX 5)

THIS CONSTRUCTABILITY/UTILITY CONFERENCE IS THE STAGE WHERE THE PROJECT MANAGER AND THE CONSTRUCTION MANAGER MUST DECIDE IF INDOT CAN MOVE FORWARD WITH THE PROJECT ON THE CURRENT SCHEDULE. IF THE UTILITY RELOCATION CANNOT BE COMPLETED BEFORE CONSTRUCTION, CAN THE PROJECT BE LET WITH EXCEPTIONS? WHAT EFFECT WOULD THIS HAVE ON THE SCHEDULE AND COSTS?

ITEMS TO DETERMINE AT THIS REVIEW:

- **HOW MANY UTILITIES ARE INVOLVED WITH THE PROJECT?**
- **ARE ALL KNOWN UTILITIES SHOWN ON THE PLANS?**
- **HAVE ALL UTILITIES SUBMITTED RELOCATION PLANS?**
- **DOES PROJECT PHASING ADDRESS UTILITY RELOCATION?**
- **DO UTILITIES CONFLICT WITH DRAINAGE?**
- **ARE THE RELOCATIONS DEPENDANT ON ANOTHER UTILITY?**
- **CAN THE UTILITIES BE RELOCATED CONCURRENTLY?**
- **ANY METHODS OF CONSTRUCTION CONFLICT WITH UNDERGROUND/OVERHEAD UTILITIES?**
- **IS THERE A DRAWING OF ALL PROPOSED UTILITY LOCATIONS USING ROAD AND/OR BRIDGE PLANS?**
- **WITH R/W ACQUIRED, IS A CLEARING CONTRACT CONSIDERED?**

CONSTRUCTABILITY REVIEW PROCESS

CONSTRUCTABILITY/UTILITY REVIEW CONT'D

- **ARE REIMBURSABLE AGREEMENTS WITH UTILITIES COMPLETE?**
- **HAVE PERMITS AND NTP BEEN ISSUED?**
- **HAVE ANY UTILITIES BEEN RELOCATED?**
- **WHAT UTILITIES WILL REMAIN IN PLACE THAT THE CONTRACTOR MUST WORK AROUND?**

THE PROJECT MANAGER MUST DETERMINE THE R/W AND PERMIT STATUS.

- **IS ALL R/W CLEARED?**
- **WHEN WILL R/W BE CLEARED?**
- **ARE ALL PERMITS IN PLACE?**
- **WHEN WILL PERMITS BE COMPLETE?**

THE CONSTRUCTION MANAGER AFTER CONFERRING ABOUT UTILITIES, RIGHT OF WAY, AND PERMIT STATUS, SHOULD CONSIDER IF THERE ARE ANY ITEMS THAT COULD AFFECT "TIME SET".

THE DESIGNER NEEDS TO HAVE THE UTILITIES' FINAL PLAN IN ORDER TO COMPLETE THE SPECIAL PROVISIONS REGARDING THE UTILITY RELOCATION WORK AND THEIR EXPECTED COMPLETION DATE.

CONSTRUCTABILITY REVIEW PROCESS

STAGE 3 PROJECT CONSTRUCTABILITY REVIEW

CONSTRUCTABILITY REVIEWS ARE INTENDED TO IMPROVE THE EFFECTIVENESS OF A SET OF PLANS, SPECIFICATIONS AND BID DOCUMENTS. THE PLANS SHOULD BE CLEAR FOR THE CONTRACTOR TO BE ABLE TO PROVIDE ACCURATE BIDS AND UNDERSTAND INDOT'S REQUIREMENTS DURING CONSTRUCTION.

THE BASIC OBJECTIVE OF THE CONSTRUCTABILITY REVIEW IS TO SEEK OUT OVERLOOKED PROBLEMS THAT INCREASE COSTS, IMPAIR THE SCHEDULE, AND DECREASE QUALITY AND SAFETY MARGINS.

THE STAGE 3 REVIEW IS CONDUCTED JOINTLY BY THE PROJECT MANAGER, CONSTRUCTION MANAGER AND THE MAINTENANCE MANAGER TO ACHIEVE THE BEST BID PACKAGE.

STAGE 3 CONSTRUCTABILITY REVIEW IS FINAL PLAN PACKAGE PHASE WITH PLANS 95% COMPLETE AND UTILITY AND RAILROAD PERMITS HAVE BEEN ISSUED.

STAGE 3 ENCOMPASSES TWO CATEGORIES, BIDDABILITY AND CONSTRUCTABILITY, THAT DETAILS ITEMS THAT CONSTRUCTION AND CONTRACTORS HAVE IDENTIFIED AS FREQUENT ERRORS AND OMISSIONS. THE ACCURACY AND COMPLETENESS OF THE BID PACKAGE IS CRITICAL FOR THE DESIGNER.

IN THE STAGE 3 REVIEW, THERE ARE FOURTEEN REVIEW CRITERIA:

- | | |
|----------------------|-------------------------------------|
| ◆ PLANS - ROAD | ◆ SITE INVESTIGATION |
| ◆ PLANS - BRIDGE | ◆ RIGHT OF WAY |
| ◆ PAY ITEMS | ◆ CONSTRUCTION PHASING |
| ◆ QUANTITIES | ◆ TRAFFIC MAINTENANCE & TMP |
| ◆ SPECIAL PROVISIONS | ◆ SCHEDULE & SPECIAL CONSIDERATIONS |
| ◆ UTILITIES | ◆ SPECIAL MATERIALS/CONDITIONS |
| ◆ ENVIRONMENTAL | ◆ FINAL ESTIMATES |

STAGE 3 REVIEW OCCURS AT THE FINAL PLAN PACKAGE. THE INTENT OF THE STAGE 3 PLANS IS TO HAVE THE PLANS, SPECIAL PROVISIONS AND COST ESTIMATES IN FINAL FORM.

- **FINAL FIELD CHECK AND CONSTRUCTABILITY/UTILITY CONFERENCE COMMENTS HAVE BEEN ACCOUNTED FOR.**
- **RIGHT OF WAY IS COMPLETE OR ACCOUNTED FOR.**
- **UTILITIES PERMITS AND NTP HAVE BEEN ISSUED OR ACCOUNTED FOR.**

CONSTRUCTABILITY REVIEW PROCESS

STAGE 3 PROJECT DEVELOPMENT PROCESS CONT'D

- **IF REQUIRED, RAILROAD PERMITS AND NTP HAVE BEEN ISSUED.**
- **FINAL CONSTRUCTION COST ESTIMATE AND FINAL SPECIAL PROVISIONS (INCLUDING ALL WATER WAY PERMITS) ARE COMPLETE.**
- **COMPARE THE COST ESTIMATE WITH THE QUANTITY CALCULATIONS, QUANTITY TABLES IN THE PLAN SET, AND LOOK FOR ANY MISSING PAY ITEMS.**

ITEMS TO REVIEW AT STAGE 3

- **CHECK FOR CONFLICTS BETWEEN ITEMS AND PLANS AND SPECIAL PROVISIONS AND SPECIFICATIONS. THEY SHOULD BE CONSISTENT THROUGHOUT.**
- **CHECK FOR ANY SPECIFICATION UPDATES THAT MIGHT IMPACT THE ITEM NEEDED.**
- **THE ITEMS USED NEED TO MATCH THE SPECIFICATION ITEMS.**
- **WATCH FOR SPECIALTY ITEMS THAT HAVE SUPPLEMENTAL DESCRIPTIONS.**

STAGE 3 DOCUMENTS

- **STAGE 3 PLANS**
- **FINAL FIELD CHECK MEETING MINUTES**
- **CONSTRUCTABILITY/UTILITY REVIEW MINUTES**
- **SPECIAL PROVISIONS**
- **PERMITS (ENVIRONMENTAL, RAILROAD, & UTILITY)**
- **FINAL ENVIRONMENTAL DOCUMENT**
- **RULE 5 EROSION CONTROL SUBMISSION**
- **GEOTECHNICAL INVESTIGATION REPORT**
- **PAVEMENT DESIGN APPROVAL**
- **HAZARDOUS MATERIALS INVESTIGATION REPORT**
- **QUANTITY CALCULATIONS**
- **COST ESTIMATE**
- **TRANSPORTATION MANAGEMENT PLAN**
- **COMMITMENT REPORT**

CONSTRUCTABILITY REVIEW PROCESS

STAGE 3 PROJECT DEVELOPMENT PROCESS CONT'D

COMMONLY MISSED ITEMS TO CHECK

- PAVEMENT REMOVAL
- RPM REMOVAL
- REMOVE TRAFFIC SIGNAL
- LINE REMOVAL FOR PHASING
- PAVEMENT MESSAGE MARKING REMOVAL
- PIPE REMOVAL. EITHER INCLUDE AN ITEM FOR THIS AND QUANTIFY IT WITH A TABLE OR INCLUDE IT IN CLEARING OR RIGHT OF WAY.
- CZ UNITS FOR BARRIER WALL
- MOB/DEMOB FOR SEEDING
- MISSED PAVEMENT MARKING ITEMS
- ROAD CLOSURE SIGN ASSEMBLIES

OTHER CONSIDERATIONS

- A "CLEARING OF R/W" DESCRIPTION HELPS.
- "HMA FOR APPROACHES" CONFLICTS BETWEEN SPECS, PLANS AND SPECIAL PROVISIONS.
- SOMETIME IT IS BETTER TO NOT HAVE AN ITEM RATHER THAN TO DO A "JUST IN CASE" ITEM THAT IS UNDISTRIBUTED.
- LOW QUANTITY ITEMS CAN HURT US, ESPECIALLY IF THERE IS A "QUANTITY BASIS".
- USAGE OF MESSAGE BOARDS IS NOT "PER DAY". IT SHOULD BE "EACH".
- THE DIRECTION SIGN ON THE DETOUR ROUTE MARKER ASSEMBLIES ARE LEFT OUT OF THE PLANS.
- BARRICADE QUANTITIES ARE TOO LOW.
- AT SITE CLOSURE ITEMS ARE MISSED. THE DESIGNERS ARE GOOD ABOUT THE DETOURS, BUT NOT RIGHT AT THE POINT OF CLOSURE.
- PREFORMED LOOPS RARELY WORK INTO THE PHASING.
- ASPHALT PAVEMENT VS. CONCRETE: IS THERE ENOUGH ROOM FOR CONSTRUCTION STAGING FOR CONCRETE PAVEMENT.

CONSTRUCTABILITY REVIEW PROCESS

PRE-LETTING

FROM THE FINAL TRACING SUBMITTAL TO THE BID LETTING, THE PROJECT MANAGER AND THE CONSTRUCTION MANAGER SHALL WORK TOGETHER WITH THE DESIGNER TO CHECK THE FINAL ESTIMATE, SPECIAL PROVISIONS, AND ANSWER ANY INQUIRIES BY PROSPECTIVE BIDDERS.

IF A PRE-BID MEETING IS TO BE HELD, THE PROJECT MANAGER WILL ORGANIZE AND, WITH THE CONSTRUCTION MANAGER, HOLD THE MEETING WITH THE DESIGNER.

CONSTRUCTABILITY REVIEW PROCESS CONSTRUCTION

PRE-CONSTRUCTION CONFERENCE

THE CONSTRUCTION MANAGER SHALL ORGANIZE AND RUN THE PRE-CONSTRUCTION CONFERENCE. BEFORE ARRANGING TIME AND DATE, HE/SHE WILL COORDINATE WITH THE PROJECT MANAGER'S SCHEDULE TO INSURE HIS/HER PARTICIPATION, INCLUDING THE DESIGNER.

THE PROJECT MANAGER SHALL ESTABLISH HIS/HER SUPPORT ROLE WITH THE PROJECT ENGINEER/SUPERVISOR. SHOULD THE PROJECT ENGINEER/SUPERVISOR HAVE ANY QUESTIONS, WHETHER IT IS DESIGN, GEOTECHNICAL, R/W, UTILITIES, OR THE LIKE, THE PROJECT MANAGER WILL GET SOLUTIONS IN A TIMELY RESPONSE. ALL SUCH COMMUNICATIONS SHOULD GO THROUGH THE PROJECT MANAGER.

MID-CONTRACT CONSTRUCTABILITY REVIEW

THE RESULTS OF THIS REVIEW ARE DETERMINED BY IDENTIFYING THE CHANGE ORDERS, CAUSES, AND ACCOUNTABILITY IN THESE CATEGORIES:

- ERRORS AND OMISSIONS**
- SCOPE CHANGES**
- CHANGED FIELD CONDITIONS**
- FAILED MATERIALS**
- INCENTIVE/DISINCENTIVE CONTRACT COMPLETION TIME**
- STANDARD/SPECS UPDATE OR CHANGES**

MOST OF A PROJECT'S CHANGE ORDERS WILL LIKELY OCCUR DURING THE FIRST HALF OF CONSTRUCTION. THE PROJECT ENGINEER/SUPERVISOR WILL HAVE COPIED THE PROJECT MANAGER ON ALL CHANGE ORDERS. THEY WILL BE MOST ATTENTIVE TO ANY POSSIBLE CHANGE OF SCOPE.

THEY WILL ALSO CONFER AND DISCUSS ANY CHANGES DESIGNATED "ERROR AND OMISSIONS" TO DETERMINE THE IMPACT AND RESPONSIBILITY (SEE APPENDIX 12). IT IS IMPORTANT THAT SUCH EVALUATION HAS MERIT AND IS CONSISTENT WITH THESE DIRECTIONS.

DATA ASSIMILATION INTO SITE MANAGER IS BEING REVIEWED FOR BETTER PROSECUTION.

CONSTRUCTABILITY REVIEW PROCESS

POST-CONSTRUCTION REVIEW

THE POST CONSTRUCTION REVIEW IS CONDUCTED WHEN A PROJECT'S CONSTRUCTION IS 90% COMPLETE, "LESSONS LEARNED" HAVE OCCURRED AND THEY ARE STILL "HOT" IN THE MINDS OF ALL.

SOME ADVANTAGES OF THIS REVIEW ARE:

- **HELPS ELIMINATE REPEATED MISTAKES ON FUTURE PROJECTS**
- **INCREASES COMMUNICATION BETWEEN PARTIES**
- **ADDRESSES MAINTENANCE CONCERNS ON THE RECENTLY FINISHED PROJECT**

DEPENDING ON THE LEVEL OF REVIEW, INDOT SHOULD CONSIDER PARTICIPATION BY MEMBERS OF THESE ORGANIZATIONS IN THEIR POST-CONSTRUCTION REVIEWS.

INDOT STAFF

**ROAD DESIGN
BRIDGE DESIGN
GEOTECHNICAL
HYDRAULICS
CONSTRUCTION
ENVIRONMENTAL
TRAFFIC
MAINTENANCE PERSONNEL
UTILITY COORDINATOR**

EXTERNAL STAFF

**DESIGNER
CONTRACTOR SUPERVISOR
CONTRACTOR ESTIMATOR
KEY SUBCONTRACTORS
UTILITY COMPANIES
IDEM/DNR
RAILROADS
LOCAL MUNICIPALITY**

THIS REVIEW PROVIDES THE OPPORTUNITY FOR THOSE PARTNERS WHO HAVE CONSTRUCTED THE PROJECT TO CRITIQUE THE EFFORTS OF THOSE WHO DEVELOPED THE PROJECT AND VICE VERSA. HOW WELL DID THE CONSTRUCTION DELIVER THE PROJECT? FRANK, CANDID DISCUSSIONS WILL PRODUCE BETTER UNDERSTANDING FOR PROJECT DELIVERY.

CONSTRUCTABILITY REVIEW PROCESS

“LESSONS LEARNED” DISSEMINATION

FROM THE CONSTRUCTION INSPECTOR TO THE PROJECT MANAGER, CONSTRUCTION IS AN EXPERIENCE-BASED INDUSTRY. KNOWLEDGE OF PAST PROBLEMS CAN IDENTIFY POTENTIAL PROBLEMS EARLIER IN FUTURE PROJECTS AND REDUCE THEIR IMPACT.

TO ADDRESS THIS ISSUE, INDOT IS DEVELOPING A DATA COLLECTION PROCESS TO STORE THE “LESSONS LEARNED” FOR FUTURE REFERENCE FOR DESIGNERS, INDOT STAFF AND LOCAL AGENCIES.

THE KEY COMPONENT OF IMPROVING A PROJECT’S DESIGN IS SHARING OF “LESSONS LEARNED” FROM VARIOUS PARTICIPANTS’ EXPERIENCE AND EXPERTISE.