



Quality Control Plan Reviews: What QC Sees

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ASSISTANT QUALITY CONTROL ENGINEER

Purpose of this presentation : To present common plan errors, transmittal examples (both good and bad), and to offer Quality Control's perspective on plan reviews.

Quality Control Responsibilities

Plan-in-Hand Reviews (GDCP 65)

PS&E Reviews (GDCP 85)

Final Back Check Reviews (GDCP 90)

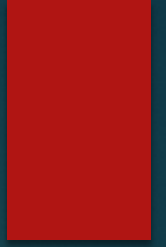
*Quality Control also conducts 30% reviews whenever possible.

The review before the review

1. Plans get logged.
2. Plans are evaluated to determine if submittal requirements are satisfied.
3. Plans are evaluated to determine all parties who need to review plans.
4. Plan reviewers are assigned.



Transmittal letters (both good and bad)



Characteristics of a good transmittal letter

1. Contains the GDCP number.
2. Contains the letting date.
3. Shows everyone copied.
4. Lists all the required attachments.

Example of a good transmittal letter

- Letter tells what is being sent and to whom it is being sent, including all attachments.
- Shows the letting date.
- Contains a link to the electronic files.



INTERDEPARTMENTAL MEMORANDUM

ALABAMA DEPARTMENT OF TRANSPORTATION
1409 Coliseum Boulevard, Montgomery, Alabama 36110

January 24, 2020

TO: Terry McDuffie, P.E.
Quality Control Engineer

FROM: Steven E. Walker, P.E.
State Design Engineer

BY: David J. Welch, P.E. *David Welch (mc)*
Design Services Engineer

RE: IMF-I065(496); PE# 100063652
Welcome Center Replacement on I-65
Limestone County

Please find three (3) half size sets of plans, disposition of 30% comments, one (1) preliminary cost estimates, and one (1) PIH checklist for the above reference project. These plans are being submitted in accordance with GDCP #64.0 for your use in conducting a PIH review. See link below for the file path to the PIH files:

<\\dsvmsdata\transfer\dc\Limestone WC\PIH Submittal>

The letting date for this project is November 6, 2020.

If you have any questions, or need additional information, please contact Martin Clark at 334-242-6107.

SEW:DJW:mc

Attachments

c: Mr. Curtis W. Vincent, P.E., Region Engineer, w/ attachments (8 plan set)
Mr. Steven E. Walker, P.E. / DB File, w/o attachments
Mr. Phillip Shamburger, ROW Engineer, w/o attachments
Mr. Robert Lee, P.E., State Utility Engineer, w/attachments (1 plan set)
Mr. Scott George, P.E., Materials and Test Engineer, w/attachments (1 plan set)
Mr. Mark Bartlett, FHWA, w/attachments (1 plan set)
Mr. Stacey Glass, P.E., State Maintenance Engineer, w/attachments (1 plan set)
Mr. Skip Powe, P.E., State Construction Engineer, w/ attachments (1 plan set)
Ms. Natasha Clay, Environmental Coordinator, w/ attachments (1 plan set)
Mr. Nickolas D. Franklin, P.E., Stormwater Engineer, w/o attachments
Mr. Gary Moore, P.E., State Traffic Engineer, w/attachments (1 plan set)

Characteristics of a bad transmittal letter

1. No GDCP number.
2. No letting date.
3. No indication if others were copied.
4. Incomplete attachments or none at all.

Example of a bad transmittal letter

- No indication that other parties received submittal.
- No letting date.
- Required attachments not included (not in accordance with GDCP 84).



Kay Ivey
Governor

ALABAMA DEPARTMENT OF TRANSPORTATION
1409 Coliseum Boulevard, Montgomery, Alabama 36110



John R. Cooper
Transportation Director

March 3, 2020

Mr. Terry McDuffie, PE
Quality Control Bureau Chief
1409 Coliseum Blvd.
Montgomery, AL 36110

Attn: Paul Beaird, PE

RE: Project No. XXXXXXXXX
XXXXXXXXXXXXXXXXXXXX
Grade, Drain, Base, Pave, Signals,
Lighting, ITS
XXXXXX County

In accordance with GDCP 84, please find (3) attached plan sets for the above referenced project. If you have any questions, please contact XXXXXXXXX at (XXX)-XXX-XXXX.

Sincerely,

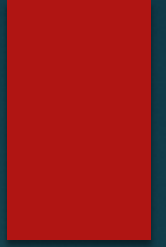
XXXXXX XXXXXXXX

XX/xx

Attachments

CC: File

Disposition of comments letters (both good and bad)



Characteristics of a good disposition of comments letter

1. Fully, but concisely, explains how a comment was addressed (or explains why the comment was not addressed).
2. Includes the comment letter.
3. All comments have been addressed and addressed truthfully, including General Comments.

Example of a good disposition of comments letter

- Both the comment and how it was addressed clearly shown.
- Dispositions are both full and concise.
- Dispositions were able to be verified.

Project No. BR-0021(554) PE 100060129
SR-21 BIN 2634 Bridge Replacement over Cheaha Creek
Talladega County

Sheet 2:

- 1) Provide typical sections for any special ditches. **SPECIAL DITCH TYPICAL ADDED.**
- 2) The shoulder width on this typical section need to include the shoulder width transitions as shown on the paving layouts sheet. **TRANSITION SHOULDER DIMENSIONS UPDATED.**
- 3) Delete the centerline of existing SR-21 throughout the plans given that it is not used to construct anything and is only referenced in the typical sections. **EXISTING SR-21 CL REMOVED.**
- 4) The typical sections call out topsoil (legend 12) and unclassified/borrow excavation (legend 10) in the same place. Remove the callout for legend 10 in these places. **LEGEND 10 CALLOUT REMOVED WHERE APPLICABLE.**
- 5) Delete note 204 from this typical section since it pertains to roadbed stabilization which is not part of this typical section. **NOTE 204 DELETED.**
- 6) Remove the station limits with heading "Phase 2 of TCP" from this sheet and add it to the next sheet because the stationing indicates it should be on the next sheet. **NOTE MOVED TO SHEET 2B.**
- 7) The materials section is asked to evaluate the existing 2ft shoulder on the right side being retained. The plans show the 2ft shoulder on the left side being removed. If it is removed, an update to the materials report will be needed. **SHOULDER IS BEING REMOVED AND A MATERIALS ADDENDUM HAS BEEN PREPARED.**
- 8) Add leveling to the typical section. **LEVELING ADDED.**
- 9) Give legend 1B, pay item 408A-052, its own legend number. **LEGEND 1B CHANGED TO 15.**

Sheet2B:

- 1) Carry through applicable comments. **DONE**
- 2) Show the in-place pavement removal as per plan sheets. **PAVEMENT REMOVAL SHOWN.**
- 3) The front slope on the left-hand side should be 4:1. **SLOPE CHANGED TO 4:1.**
- 4) The subgrade line on the right-hand side should be dashed, not a solid line. **LINE STYLE CHANGED TO DASHED.**
- 5) Show legend identifiers on the right-hand side of the typical sections. **LEGEND IDENTIFIERS SHOWN.**
- 6) The end station limits on the second row of stationing should be 136+57.37 to avoid an overlap in stationing with the previous typical section. **STATIONING UPDATED TO 136+97.37.**
- 7) Give legend 3A, pay item 424B-678, its own legend number. **LEGEND 3A CHANGED TO 16.**
- 8) Update the upper limit of the application rate for 424B-678. **UPPER LIMIT UPDATED.**

Characteristics of a bad disposition of comments letter

1. Concise dispositions without full explanations of how the comment was addressed.
2. No original comment letter.
3. Comments without dispositions or dispositions that are not true.

Example of a bad disposition of comments letter

- Dispositions do not include the original letter.
- Something was done, but what was done is unknown.

Sheet 2E:

1. Done.

Sheet 2F:

1. Done.
2. Done.

Sheets 3 – 3A:

1. Done.
2. Done.
3. Done.
4. Done.

Sheet 3-B:

1. Done.
2. Done.

Sheet 3C:

1. Done.
2. Done.
3. Done.

Sheet 3E:

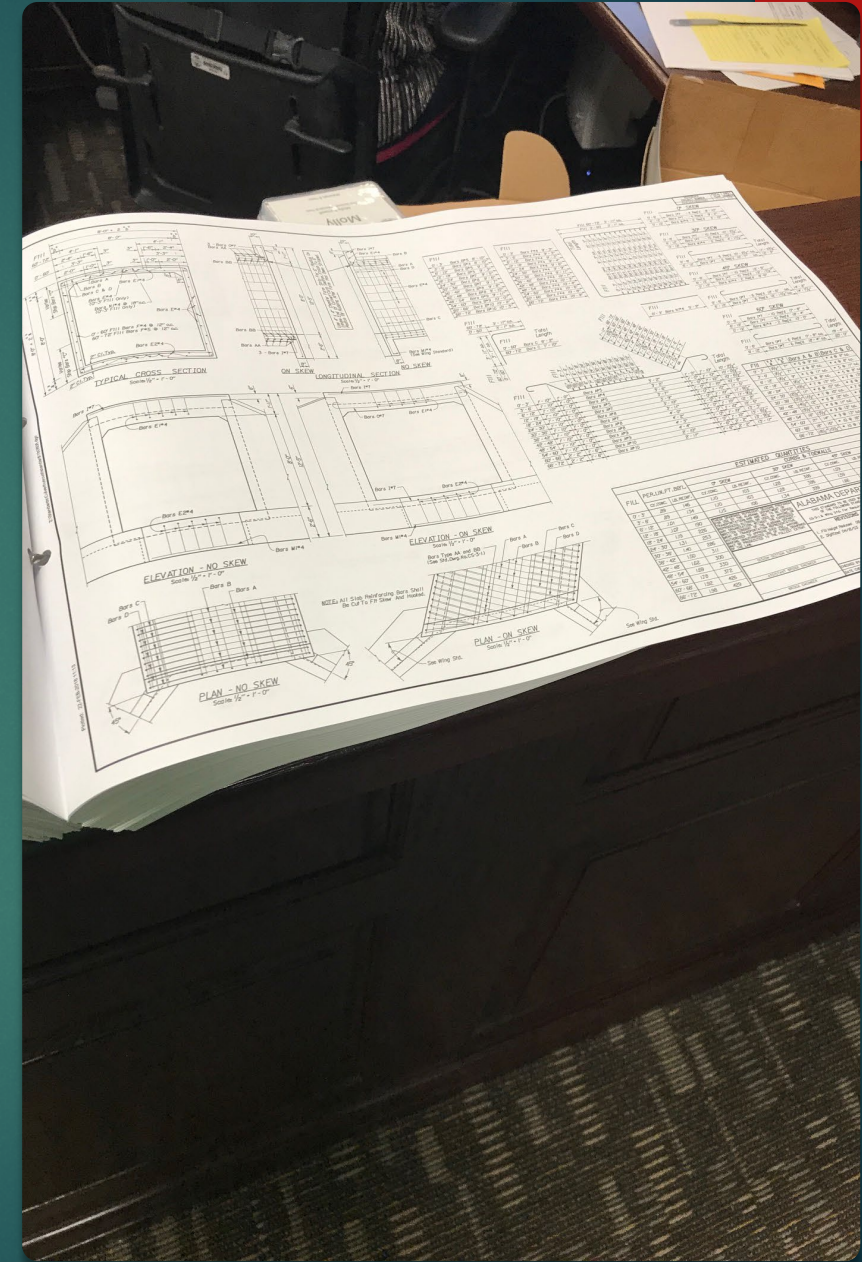
1. Done.
2. Done.
3. Done.
4. Done.
5. Done.

Quality Control Perspective: Why are these items important?

- QUALITY CONTROL IS RESPONSIBLE FOR MAKING SURE THE PLANS ARE REVIEWED TO ENSURE CONFORMITY TO ALL APPLICABLE ALDOT STANDARDS AS WELL AS ALL APPLICABLE DESIGN STANDARDS.
- PLAN REVIEWERS CANNOT REVIEW PLANS IF THEY DON'T HAVE THE PLANS TO REVIEW.
- DISPOSITION OF COMMENTS ARE DESIGN DECISIONS. PLAN REVIEWERS NEED THIS INFORMATION AS IT WILL INFLUENCE THEIR REVIEW.
- WHEN EVERYONE WHO NEEDS PLANS HAS THEM, PLAN REVIEW PARTICIPATION IS BETTER. WHEN PLAN REVIEW PARTICIPATION IS BETTER, PLANS ARE BETTER. WHEN PLANS ARE BETTER, PROJECT CONSTRUCTION IS BETTER.

The Review

1. Material Report Checks
2. Disposition of Review Comment Checks
3. Other Design Decision Checks
4. Reviewer's Toolbox: Spec book, Green book, Plan Preparations Manual, Roadside Design Guide, Standard Drawings, ALDOT GFO list, MUTCD, ALDOT Memorandums, etc.



General items often seen with plan submittals

- PLAN-IN-HAND SUBMITTALS MADE WITHOUT A MATERIALS REPORT AND OR SLOPE STUDY
- MATERIALS REPORT ADDENDUMS ISSUED EITHER DURING THE FBC REVIEW OR EVEN AFTER THE FBC REVIEW IS COMPLETE
- NEED FOR UPDATED SURVEY. USUALLY HAPPENS WHEN THERE HAS BEEN A RESURFACING PROJECT OR AN ACCESS MANAGEMENT PROJECT LET WITHIN THE LIMITS OF THE PROJECT BEING REVIEWED.
- HYDRAULIC DESIGN PERTAINING TO THE ROADWAY IS IN PLANS BUT HAS SELDOM UNDERGONE THE HYDRAULIC REVIEW.

GDCP 44.0

Per ALDOT Policy, an approved slope study and materials report is required on all Grade, Drain, Base, and Pave projects prior to PIH.

4.0 MILESTONE: APPROVED GEOTECHNICAL AND MATERIALS INFORMATION RECEIVED FROM THE MATERIALS AND TESTS BUREAU

The Bureau of Materials and Tests to distribute copies of the Approved Materials Report and Approved Slope Study Report to the following parties as specified below:

- Project lead – (1) electronic copy
- Region / Area Materials Engineer – (1) electronic copy
- Construction Bureau – (1) electronic copy
- FHWA – (1) electronic copy
- Quality Control Bureau - (1) electronic copy
- Materials and Tests project file – (1) hardcopy
- Materials and Tests Geotechnical file – (1) hardcopy
- State Materials Engineer's file – (1) hardcopy
- Maintenance Bureau (submittal only required when the project is an interstate maintenance (IM) project) – (1) hardcopy

If any parties need an additional hard and/or electronic copy of the Approved Materials Report and/or Approved Slope Study Report, contact the project lead.

If the project lead has not received the geotechnical information and the Approved Materials Report within 6 months from the time the submittal at GDCP # 36.0 was made, the project lead shall coordinate with the Region / Area Materials Engineer and State Materials Engineer to determine the status of the materials

2/28/2018

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report. The project lead shall explain that the advancement of plan development will be limited until this information is received.

NOTE: An approved Slope Study is required prior to the Design Hearing for Grade, Drain, Base, and Pave Projects. An approved Slope Study and Materials Report is required prior to the Plan-In-Hand Inspection.

Quality Control Perspective : Why should Plan-in- Hand Submittals **not** be reviewed without an approved materials report?

- ALDOT GDCP 44.0 SPECIFICALLY SAYS NOT TO REVIEW THEM BECAUSE BY DEFINITION, THE SUBMITTAL DOES NOT MEET SUBMITTAL REQUIREMENTS (FOR GRADE, DRAIN, BASE, PAVE PROJECTS).
- WITHOUT THE CONTENTS OF AN APPROVED MATERIALS REPORT , THE PLANS LACK THE CONTENT NEEDED FOR A PIH REVIEW. IN OTHER WORDS, IF THE INFORMATION IS NOT IN THE PLANS, THE PLANS SHOULD NOT BE REVIEWED.
- TIME AND RESOURCES. QUALITY CONTROL UTILIZES BOTH ALDOT EMPLOYEES AND CONSULTANTS BY WAY OF CPO TO REVIEW PLANS. WE SHOULD NOT ALLOW FOR ALDOT EMPLOYEES TO CHARGE TO THE PE BUDGET OR ALLOW CONSULTANTS TO CHARGE TO THEIR CPO WHEN WE KNOW A PROJECT DOES NOT MEET OUR SUBMITTAL REQUIREMENTS. THIS HAS APPLICATION TO PROJECT MANAGERS WHO MANAGE CONSULTANTS. AFTER THE PIH MEETING IS HELD, CONSULTANT CAN INVOICE BETWEEN 65%-84.99% OF THEIR CPO.
- AT 17 HOURS (8 HOURS TO REVIEW PLANS) + (8 HOURS TO CONDUCT PLAN REVIEW) + (1 HOUR TO WRITE COMMENT LETTER), ONE CONSULTANT'S AVERAGE COST TO REVIEW THE PLANS WOULD BE APPROXIMATELY \$3,400, OR \$200 PER HOUR.

GDCP 90.0 FBC Submittal

Per GDCP 90, all design information (except bridge related items) must be complete and included in the plans by this stage.

90.0 MILESTONE - FINAL BACK CHECK

The designer shall transmit plan sets and other items as noted below. This plan submittal shall be made no later than 16 weeks prior to the letting date or earlier if special circumstances exist (refer to the GDCP Miscellaneous Notes page). If bridge work is a part of the project, only the Bridge General Plan and Elevation drawings are required to be in the plan assembly for the Final Back Check submittal. Bridge drawings/bridge information does not have to be signed or stamped at this time. Therefore, complete bridge plans are not required for the Final Back Check submittal. All other plan assembly sheets are required to be in the plan assembly to constitute a complete Final Back Check plan submittal, i.e., signing design, lighting design, ITS design, utility sheets, drainage sheets, all soil borings, cross sections, etc. Incomplete Final Back Check plan submittals may be returned unless accompanied by written approval from the Quality Control Bureau Chief, Assistant Chief Engineer-Preconstruction, or Chief Engineer for the incomplete submittal.

- Quality Control Bureau – (3) plan sets, (1) PDF copy, (1) disposition of PS&E comments and (1) construction estimate. If the materials report or any addendums were approved prior to April 1, 2012, that information should also be submitted.

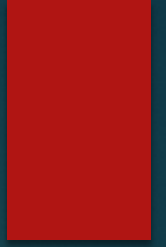
Quality Control Perspective : What happens when plans are submitted for FBC but the design is not complete?

- AT FBC, QUALITY CONTROL TYPICALLY REVIEWS THE DISPOSITION OF PS&E COMMENTS TO ENSURE COMMENTS HAVE BEEN ADDRESSED AND CHECKS QUANTITIES ONE LAST TIME.
- IF DESIGN IS NOT COMPLETE, THE SUBMITTAL IS NOT FINAL.
- IF THERE ARE MATERIALS ADDENDA (PARTICULARLY DEALING WITH PAVEMENT DESIGN) ISSUED AFTER FBC, ANY QUANTITY CALCULATIONS AND OR COMMENTS MADE IN THE FBC REPORT COULD BECOME OBSOLETE. IN OTHER WORDS, THEY ARE ONLY VALID FOR THE DESIGN OF THE PLANS AT THE TIME OF THE REVIEW. FOR THIS REASON THE FBC SUBMITTAL SHOULD NOT BE MADE UNTIL ALL ADDENDA HAVE BEEN PROVIDED AND INCORPORATED INTO THE PLANS. UPDATE THE LETTING DATE AS NECESSARY.

Lessons Learned

- PLANS RECEIVE AN OPTIMAL REVIEW WHEN ALL THE ESTABLISHED SUBMITTAL REQUIREMENTS ARE MET.
- THERE IS A RELATIONSHIP BETWEEN PLANS THAT ARE RUSHED THROUGH THE DEVELOPMENT PROCESS AND PLAN QUALITY.
- THERE IS A RELATIONSHIP BETWEEN PLAN QUALITY AND EASE OF CONSTRUCTION.
- IF THE PLAN DEVELOPMENT IS NOT ON SCHEDULE THEN THE PROJECT IS NOT ON SCHEDULE. TRANSMITTING PLANS TO BE REVIEWED WHEN THEY ARE NOT READY TO BE REVIEWED DOES NOT MEAN THE PROJECT IS ON SCHEDULE.

Common Plan Sheet Comments



Title Sheet

- DESCRIPTION OF PROJECT DOES NOT MATCH THE CPMS PROJECT DESCRIPTION (BASED ON THE 9 DIGIT CONSTRUCTION NUMBER)
- MISSING OR INCORRECT CHARGE NUMBER
- CONSTRUCTION NUMBER HAS NOT BEEN REQUESTED
- TRAFFIC COUNTS NEED TO BE UPDATED TO CURRENT LETTING YEAR
- MILEAGE BOX IS WRONG
- INCOMPLETE BIN INFORMATION

Index to sheets

- SHEETS ARE CALLED OUT BUT NOT IN PLANS (HANDLED AS OMITTED)
- DESCRIPTION SHOWN DOES NOT MATCH DESCRIPTION OF THE SHEET BEING REFERENCED
- INCOMPLETE DUE TO SHEETS MISSING FROM PLANS SUCH AS SPECIAL PROJECT DETAILS, CULVERT DRAWINGS, ETC....
- SPELLING MISTAKES

Index to Special and Standard Drawings

- SHEETS REFERENCED THAT SHOULD NOT BE. USUALLY HAPPENS WHEN THE DRAWING BECOMES A SPD.
- SHEETS NOT REFERENCED THAT SHOULD BE.
- INCORRECT DRAWING YEAR

Primary Survey Control Sheet

- ADD OR CORRECT THE DATUM NOTE
- LABEL THE CENTERLINE OF CONSTRUCTION
- LABEL BENCHMARKS AND TIE THEM TO CENTERLINE OF CONSTRUCTION
- BEARINGS, CURVE IDENTIFIER(S), CARDINAL STATION(S), PI STATION(S), ALIGNMENT TYPE, ROUTE TYPE, ROUTE NUMBER, AND OF INTERSECTIONS BETWEEN MAINLINE/SIDE ROADS, BEGIN/END WORK STATIONS FOR MAINLINE AND END WORK STATIONS FOR SIDE ROADS
- TIE STATIONS OF INTERSECTION CENTERLINES
- SHOW ALL HORIZONTAL CURVE DATA

Typical Sections

- OFTEN LACK RECOMMENDATIONS OF THE MATERIALS REPORT OR CONFLICTS WITH THE RECOMMENDATIONS.
- LACK OF AGREEMENT BETWEEN TYPICAL SECTIONS, PLAN SHEETS, PAVING LAYOUTS, AND CROSS SECTIONS.
- DIMENSIONING NOT ALWAYS TIED TO CENTERLINE OF CONSTRUCTION.
- PAVEMENT LAYERS NOT LABELED CORRECTLY OR MISSING.
- ANNOTATIONS OR DIMENSIONING INCORRECT OR MISSING.
- TYPICAL SECTION STATIONING HAS GAPS OR OVERLAPS
- NO SPECIAL DITCH TYPICAL SECTIONS
- LACK SEATING DETAILS FOR TYPE C CURB AND GUTTER OR TYPE N CURB.

Project Notes

- MAKE SURE ALL PROJECT NOTES ARE KEYED TO THE APPROPRIATE PLAN SHEETS.
- MAKE SURE PROJECT NOTES FROM MATERIALS REPORT ARE INCLUDED.
- MAKE SURE PROJECT NOTES DO NOT RE-STATE THE SPECIFICATIONS.
- MATERIALS NOTES ARE 200. SOQ NOTES ARE 300. PLAN NOTES ARE 400. EACH SERIES HAS ITS OWN CATEGORY. NUMBER IT ACCORDINGLY.
- CHECK FOR SPELLING AND GRAMMAR.

Summary of Quantities

- INCORRECT OR MISSING PAY ITEMS
- INCORRECT PAY ITEM DESCRIPTIONS. PAY ITEM DESCRIPTIONS FOR SOQ, BOX SHEETS, AND UNIQUE ITEMS LIST FOR ANY GIVEN PAY ITEM NUMBER MUST MATCH
- SOQ QUANTITIES AND BOX SHEET QUANTITIES DON'T MATCH.
- MAKE SURE 300 SERIES NOTES ARE KEYED TO APPROPRIATE PAY ITEM.

Plan sheets

- SHOW AND LABEL ALL CONSTRUCTION LIMITS, PRESENT ROW, AND ACQUIRED ROW.
- MAKE SURE WHATEVER IS BEING DONE TO THE EXISTING PAVEMENT IN THE TYPICAL SECTIONS IS BEING SHOWN IN THE PLAN SHEETS.
- PROVIDE DISPOSITIONS FOR ALL IN-PLACE STRUCTURES WITHIN THE WORK LIMITS.
- IDENTIFY AND LABEL ALL REQUIRED STRUCTURES, SUCH AS DRAINAGE ITEMS AND GUARDRAIL.
- PROJECT NOTES AND GN-2 NOTES.
- MAKE SURE EXISTING TOPO AND PROPERTY OWNERS ARE SHOWN.
- SHOW TIE STATIONS, TIE ANGLES, FOR MAINLINE AND CROSSING ROADS
- SHOW ALL DRAINAGE

Profile sheets

- MAKE SURE ELEVATIONS OF EXISTING GROUND AND PROFILE GRADE ARE SHOWN AND THAT THE PROFILE GRADE ELEVATIONS MATCH WHAT IS SHOWN ON CROSS SECTIONS.
- SHOW MINIMUM VERTICAL CLEARANCES FOR BRIDGES, ROADWAYS, RAILROADS, ETC.
- MAKE SURE THE HIGH WATER ELEVATIONS ARE SHOWN AND MATCH BRIDGE HYDRAULIC REPORT.
- MAKE SURE ALL VERTICAL CURVE INFORMATION (PVC, PVI, PVT, L, K VALUES, GRADES) IS SHOWN AND THAT DESIGN SPEED THE VERTICAL CURVE MEETS IS SUFFICIENT.
- SHOW EXISTING AND REQUIRED DRAINAGE (BRIDGES, BRIDGE CULVERTS, CULVERTS, ROADWAY PIPES) WITH APPROPRIATE ANNOTATION
- SHOW SUPERELEVATION TRANSITIONS
- SHOW SPECIAL DITCHES WITH APPROPRIATE ANNOTATION.

Paving Layout sheets

- MAKE SURE THE PROPOSED PAVEMENT CONFIGURATION IN THE TYPICAL SECTIONS MATCHES WHAT IS BEING SHOWN IN THE PAVING LAYOUT SHEETS
- SHOW LABELS FOR TURN LANES, RAMP TIES, GORES, MEDIAN NOSES, WHEN RELEVANT
- SHOW LABELS FOR ALL RADII THAT WILL REMAIN IN-PLACE, AND BE CONSTRUCTED
- TIE ALL PROPOSED GUARDRAIL/END ANCHORS TO CENTERLINE OF CONSTRUCTION.

Utility sheets

- KEY 800 SERIES NOTES TO THESE SHEETS.
- SHOW ALL UTILITY OWNERS
- SHOW ALL PROPOSED DRAINAGE TO HELP AVOID UTILITY RELOCATION CONFLICTS.

Cross section sheets

- MAKE SURE CUT/FILL VOLUMES ARE SHOWN ON EACH CROSS SECTION OR IN A TABLE.
- MAKE SURE ALL PAVEMENT BREAKS, PROFILE GRADE LOCATIONS, TIE POINTS TO EXISTING GROUND, AND DITCH BOTTOMS HAVE ELEVATION AND OFFSET LABELS
- MAKE SURE DESIGN SURFACES TIE TO EXISTING GROUND.
- MAKE SURE ACQUIRED ROW LOCATIONS IN CROSS SECTIONS AND PLAN SHEETS AGREE.
- ANNOTATE EXISTING EDGES OF PAVEMENT.
- SHOW UNDERCUTTING LIMITS IN CROSS SECTIONS WHERE APPLICABLE.
- CLEAN UP TEXT ON TEXT

Earthwork Summary

- MAKE SURE ALL EARTHWORK CALCULATIONS ARE DONE IN ACCORDANCE WITH GFO 3-11
- MAKE SURE ALL EARTHWORK QUANTITY PAY ITEMS ARE SHOWN AND THAT THEIR QUANTITIES MATCH THE SUMMARY OF QUANTITIES.

Questions or comments?

