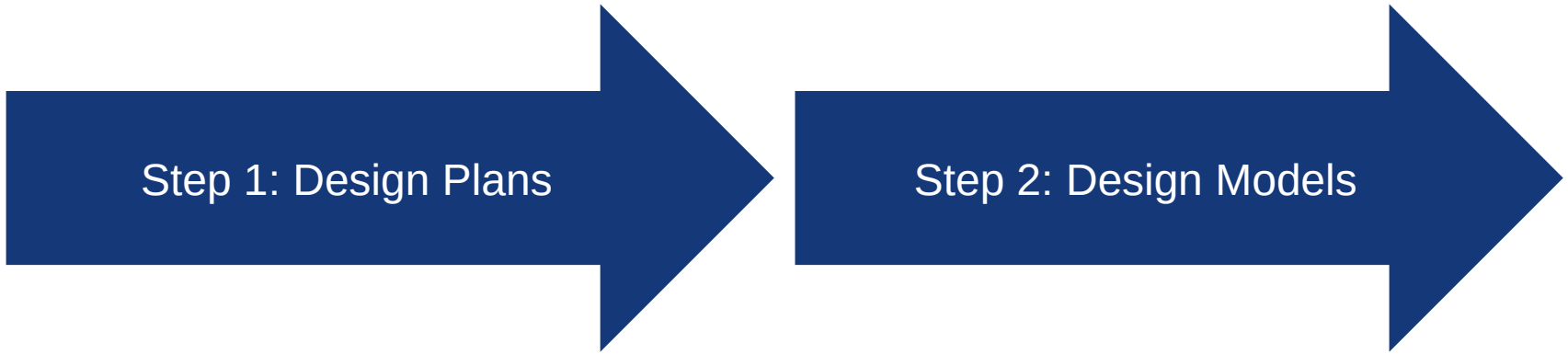
Quality in 3D Model Reviews

Presented by: Gabor Chiorean, PE

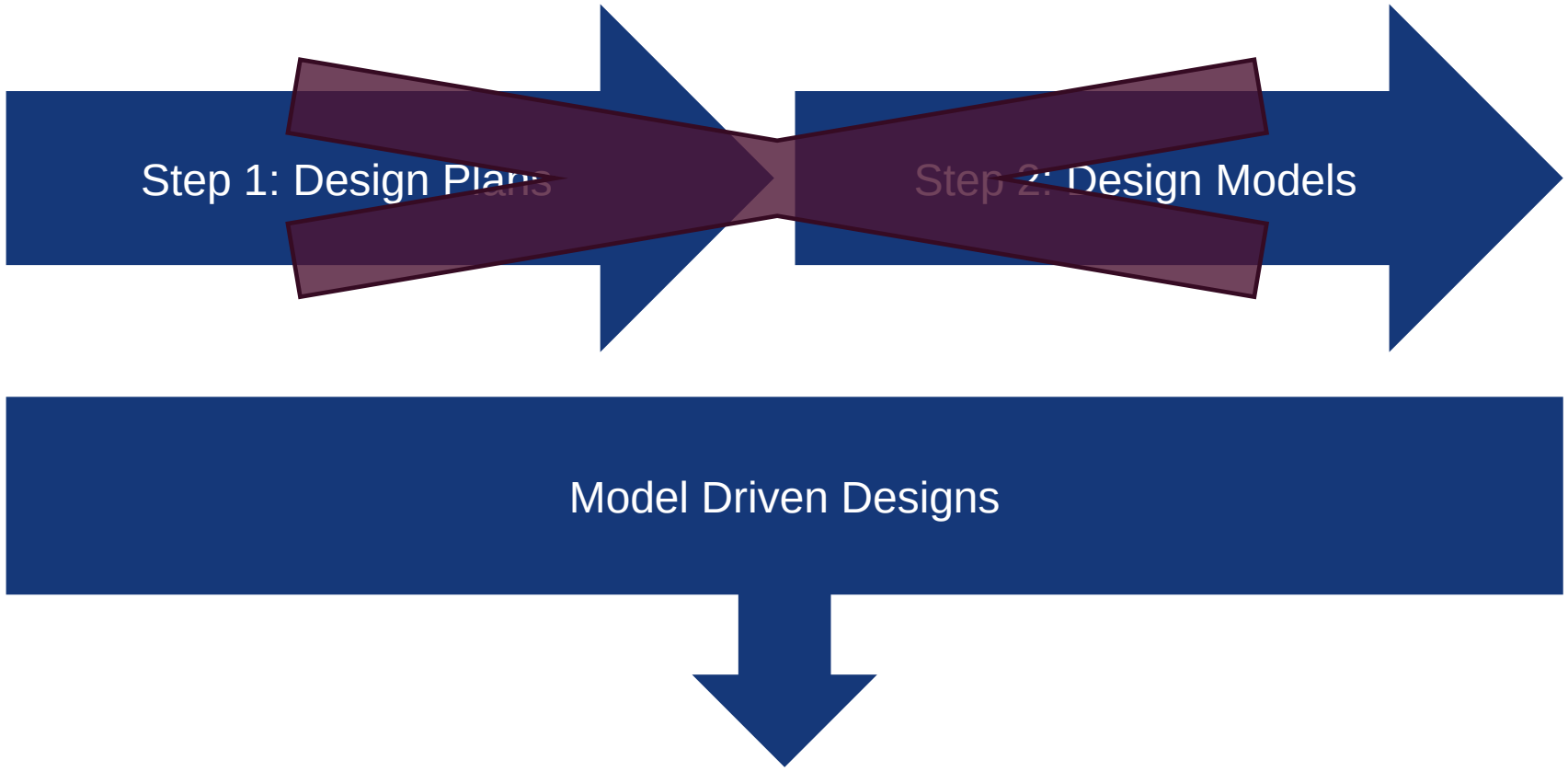
Agenda

- 3D Models – Past/Present/Future
- D5 Suggestions
- D5 Schedule Templates
- What to do if you have a 3D Model on your project?
- Model Management FDM 911
- Project Managers' Responsibilities

3D Models – Past/Present/Future



3D Models – Past/Present/Future



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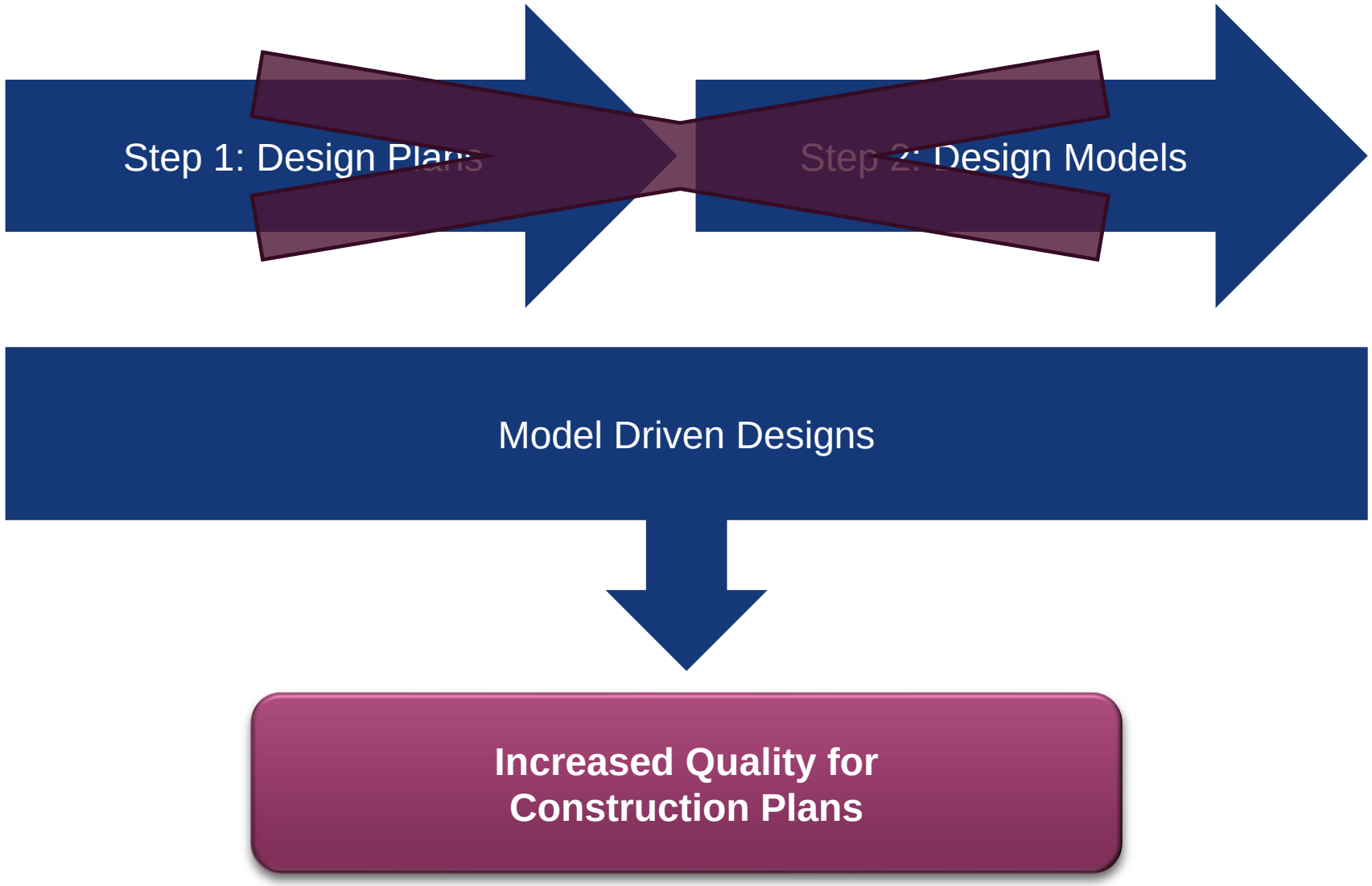
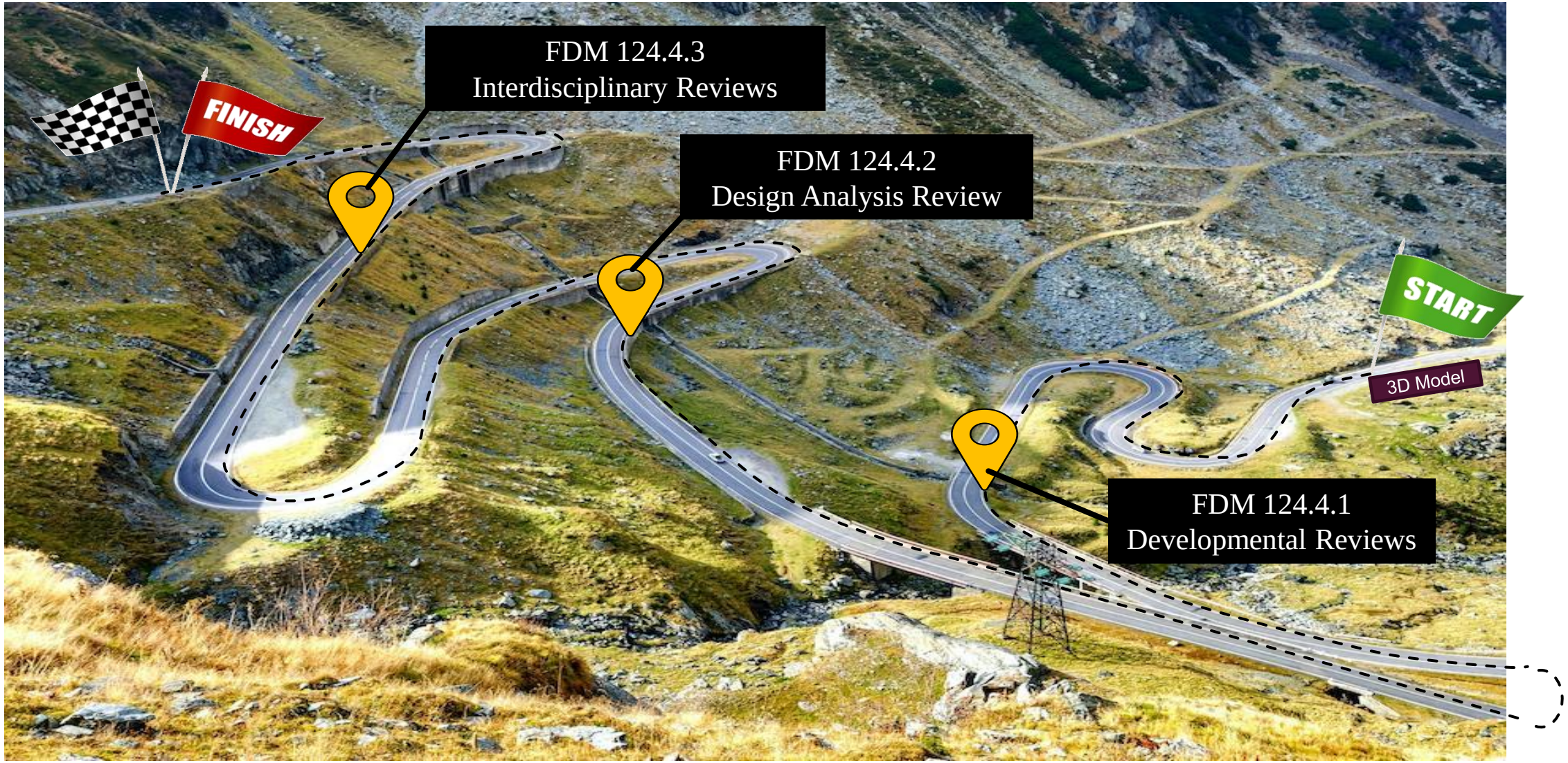


How to Ensure Quality for 3D Models?

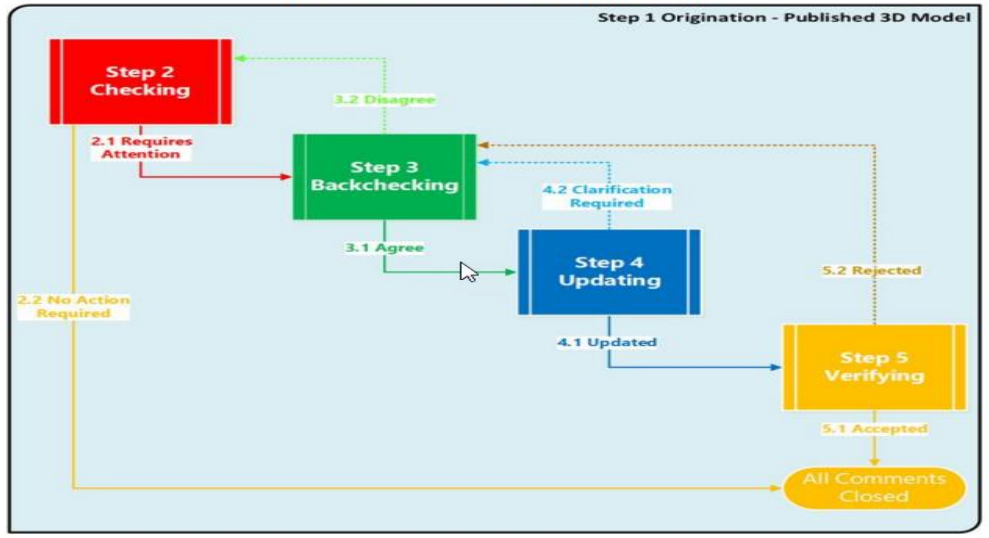


BIM Review Log

Table 124.4.1 Example BIM Review Log

Review Description	Reviewer	Developmental Review			Design Analysis Review	Inter-disciplinary Review
		Conform.	Complete.	Consist.		
Initial Geometrics	Sabrina Ren, PE	12/10/2020			12/12/2020	
Existing Utilities	Sabrina Ren, PE	2/14/2021			2/15/2020	
Phase I BIM	Tye Down, PE	3/25/2021	3/27/2021	3/28/2021	3/28/2021	3/29/2021
Initial Drainage	Dep Abillaba, PE	4/20/2021			4/21/2021	
Final Geometrics	Sabrina Ren, PE	4/26/2021			4/28/2021	
Phase II BIM	Tye Down, PE	8/9/2021	8/10/2021	8/12/2021	8/13/2021	8/15/2021
QTDSRD files	Sabrina Ren, PE					
Final Drainage	Dep Abillaba, PE					
Phase III BIM	Tye Down, PE					
Phase IV BIM	Tye Down, PE					
Final BIM	Tye Down, PE					

Figure 124.4.1 QC Review Steps



QC Stamp

Submittal:

Step	By	Date
Origination		
Checked Correct - Yellow Highlight Change - Red Comments		
Concurrence Agree - Green Check No change - Green 'X'		
Changes Made Green Highlight		
Changes Verified Blue Check		

D5 Suggestion

5-Step Review Process

FDOT D5 3D Model Review Guidelines

FPID:	
ORIGINATOR (EOR):	
REVIEWER:	
DATE:	

	WHAT DOES THE REVIEW INCLUDE?	ORIGINATION		CHECKED			CONCURRENCE	CHANGES MADE	CHANGES VERIFIED
		BY	DATE	BY	DATE	COMMENTS	BY	BY	BY
DESIGN PHASE									
PHASE I	No review needed								
PHASE II	Full Review **(See below)**								
PHASE III	1. Follow up on comments from previous submittal.								
	2. Full Review **(See below)**								
	3. Review detail modeling that wasn't included in the Phase II submittal **(See below)**								
FINAL	1.Follow up on comments from previous submittal								
	2.Import 3D Deliverables (xml alignment, xml surfaces, 3D break lines) and check against proposed model.								
FULL REVIEW OF 3D MODEL INCLUDES (AT A MINIMUM)*:	1. Check that all existing features have been modeled (utilities, pavement, concrete, etc.)								
	2. Check that horizontal and vertical alignments match what's shown in the plans.								
	3. Check that the proposed templates match the typical sections in the plans.								
	a. Pavement, base, concrete, etc. depths match what's shown in the plans.								
	b. Lane, shoulder, sidewalk, etc. widths match what's shown in the plans.								
	c. Lane, shoulder, sidewalk, etc. cross slopes match what's shown in the plans.								
	4. Check that the proposed cross slopes, superelevation, and superelevation transitions match the plans.								
	5. Check that 3D model break lines match the 2D planimetric lines.								
	6. Check that the proposed cross slope correction and overbuild limits match what's shown in the plans.								
	7. Check model cross sections at critical locations (PC/PT of curves, begin/end of tapers, drainage structures, etc.) to ensure that station, offset, and elevation match what's shown in the plans.								
	8. Check all critical elements that effect limits of construction or right of way (wall, driveways, turnouts, side streets, curb elements, ponds) to ensure they match what's shown in the plans.								
	9. Check that the proposed model matches existing at the beginning and end of the project.								
	10. Check for gaps, spikes, or overlaps between corridors, and template drops.								
	11. Check that anticipated utility, wetland, and right of way impacts match what's shown in the plans.								
	12. Check that the proposed surface conveys/directs water correctly.								
	13. Check that any proposed utility information shown in the plans should also be shown in the model.								
	14. Check that all the drainage structures shown in the plans are modeled correctly.								
REVIEW OF PHASE III 3D MODEL DETAILS INCLUDES:	1. Check to ensure that all incidental roadway elements shown in the plans have been modeled (channelizing islands, guardrail, traffic separators, detailed grading areas, etc.)								
	2. Check curb transitions at curb ramps and driveway locations.								
	3. Check that existing utilities have been updated based on Vvh information.								
	4. Check that proposed utilities match what's shown in the plans.								
	5. Verify that proposed top and bottom surfaces points in all templates have the correct feature definition and that the corresponding break lines show correctly in the model.								

To be included with ERC submittal

D5 Suggestion

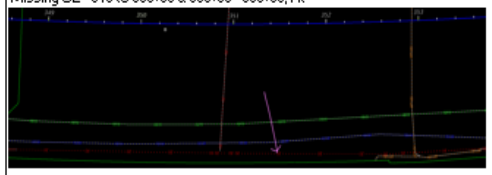
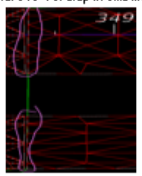
1. Check that all existing features have been modeled (utilities, pavement, concrete, etc.)	FDM 124.4.1.2 COMPLETENESS
2. Check that horizontal and vertical alignments match what's shown in the plans.	
3. Check that the proposed templates match the typical sections in the plans.	FDM 124.4.1.3 CONSISTENCY
a. Pavement, base, concrete, etc. depths match what's shown in the plans.	
b. Lane, shoulder, sidewalk, etc. widths match what's shown in the plans.	
c. Lane, shoulder, sidewalk, etc. cross slopes match what's shown in the plans.	
4. Check that the proposed cross slopes, superelevation, and superelevation transitions match the plans.	
5. Check that 3D model break lines match the 2D planimetric lines.	
6. Check that the proposed cross slope correction and overbuild limits match what's shown in the plans.	
7. Check model cross sections at critical locations (PC/PT of curves, begin/end of tapers, drainage structures, etc.) to ensure that station, offset, and elevation match what's shown in the plans.	
8. Check all critical elements that effect limits of construction or right of way (wall, driveways, turnouts, side streets, curb elements, ponds) to ensure they match what's shown in the plans.	
9. Check that the proposed model matches existing at the beginning and end of the project.	
10. Check for gaps, spikes, or overlaps between corridors, and template drops.	FDM 124.4.3 DESIGN ANALYSIS REVIEWS
11. Check that anticipated utility, wetland, and right of way impacts match what's shown in the plans.	
12. Check that the proposed surface conveys/directs water correctly.	
13. Check that any proposed utility information shown in the plans should also be shown in the model.	
14. Check that all the drainage structures shown in the plans are modeled correctly.	

1. Check to ensure that all incidental roadway elements shown in the plans have been modeled (channelizing islands, guardrail, traffic separators, detailed grading areas, etc.)	
2. Check curb transitions at curb ramps and driveway locations.	
3. Check that existing utilities have been updated based on Vvh information.	
4. Check that proposed utilities match what's shown in the plans.	FDM 124.4.1.1 CONFORMANCE
5. Verify that proposed top and bottom surfaces points in all templates have the correct feature definition and that the corresponding break lines show correctly in the model.	

D5 Suggestion

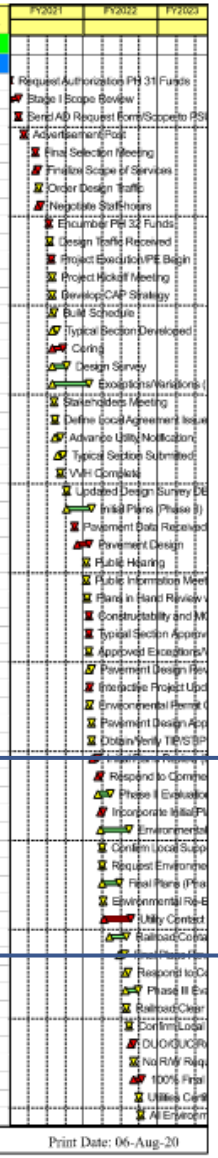
FDOT D5 3D Model Review Guidelines

FPID:	445210-1-52-01
ORIGINATOR (EOR):	Naziru Isaac, P.E. (EOR), Celine Bounds (Designer), Brittany Nesbitt (Designer), Justin Lindquist, P.E. (Internal QC Reviewer)
REVIEWER:	Jeremy Farwick
DATE:	7/23/2021

DESIGN PHASE	WHAT DOES THE REVIEW INCLUDE?	ORIGINATION		CHECKED			CONCURRENCE	CHANGES MADE	CHANGES VERIFIED
		BY	DATE	BY	DATE	COMMENTS	BY	BY	BY
PHASE I	No review needed								
PHASE II	Full Review **(See below)**								
	1. Follow up on comments from previous submittal.								
PHASE III		Justin Lindquist, P.E.	7/23/2021	Jeremy Farwick	9/19/2021				
	2. Full Review **(See below)**	Justin Lindquist, P.E.	7/23/2021	Jeremy Farwick	9/19/2021				
	3. Review detail modeling that wasn't included in the Phase II submittal **(See below)**	Justin Lindquist, P.E.	7/23/2021	Jeremy Farwick	9/19/2021				
FINAL	1.Follow up on comments from previous submittal								
	2.Import 3D Deliverables (xml alignment, xml surfaces, 3D break lines) and check against proposed model.								
	1. Check that all existing features have been modeled (utilities, pavement, concrete, etc.)	Justin Lindquist, P.E.	7/23/2021	Jeremy Farwick	9/17/2021	Missing OE - 349 to 353+50 & 355+60 - 363+00, Rt 	Celine Bounds	Celine Bounds	Brittany Nesbitt
						Sta. 348+70: Gap in existing pavement 	Celine Bounds	Celine Bounds	Brittany Nesbitt
						Existing sidewalks not modeled; Sta. 356 - 383	Justin Lindquist	Justin Lindquist	Brittany Nesbitt
						Multiple existing driveways not modeled. See Sta. 323 to 348 as an example.	Justin Lindquist	Justin Lindquist	Brittany Nesbitt
	2. Check that horizontal and vertical alignments match what's shown in the plans.	Justin Lindquist, P.E.	7/23/2021	Jeremy Farwick	9/17/2021				
	3. Check that the proposed templates match the typical sections in the plans.	Justin Lindquist, P.E.	7/23/2021	Jeremy Farwick	9/19/2021				
	a. Pavement, base, concrete, etc. depths match what's shown in the plans.	Justin Lindquist, P.E.	7/23/2021	Jeremy Farwick	9/19/2021				
	b. Lane, shoulder, sidewalk, etc. widths match what's shown in the plans.	Justin Lindquist, P.E.	7/23/2021	Jeremy Farwick	9/19/2021				
	c. Lane, shoulder, sidewalk, etc. cross slopes match what's shown in the plans.	Justin Lindquist, P.E.	7/23/2021	Jeremy Farwick	9/19/2021				

D5 Schedule Templates

Activity ID	Activity Name	Al Comp Duration	Start	Finish	Total Float
CONSULTANT MINORDrft Minor Consultant 16M PE to Prod					
TEMPLATE VALUE					
299010	Request Authorization PH 31 Funds	1	30-Jun-20	30-Jun-20	0
164010	Stage I Scope Review	30	01-Jul-20	11-Aug-20	0
231010	Send AD Request Form/Scope to PSU	1	12-Aug-20	12-Aug-20	0
232010	Advertisement Post	1	09-Sep-20	09-Sep-20	0
402010	Final Selection Meeting	1	04-Nov-20	04-Nov-20	0
900020	Finalize Scope of Services	10	05-Nov-20	18-Nov-20	0
256010	Order Design Traffic	1	19-Nov-20	19-Nov-20	86
164030	Negotiate Staff-hours	10	19-Nov-20	02-Dec-20	0
233020	Encumber PH 32 Funds	1	07-Jan-21	07-Jan-21	0
257010	Design Traffic Received	1	15-Jan-21	15-Jan-21	86
250010	Project Execution/PE Begin	1	22-Jan-21	22-Jan-21	0
900030	Project Kickoff Meeting	1	25-Jan-21	25-Jan-21	2
290010	Develop CAP Strategy	1	25-Jan-21	25-Jan-21	52
900010	Build Schedule	10	25-Jan-21	05-Feb-21	43
294010	Typical Section Developed	20	25-Jan-21	19-Feb-21	91
304010	Coring	40	25-Jan-21	19-Mar-21	0
106010	Design Survey	50	26-Jan-21	05-Apr-21	2
367010	Exceptions/Variations (Include Utility Design Alternatives)	130	26-Jan-21	26-Jul-21	11
900070	Stakeholders Meeting	1	05-Feb-21	05-Feb-21	43
933020	Define Local Agreement Issues	1	08-Feb-21	08-Feb-21	132
264000	Advance Utility Notification	20	08-Feb-21	05-Mar-21	112
294020	Typical Section Submitted	20	22-Feb-21	19-Mar-21	91
587010	VVH Complete	1	08-Mar-21	08-Mar-21	112
106020	Updated Design Survey DB Submittal	1	06-Apr-21	06-Apr-21	91
113020	Initial Plans (Phase II)	90	06-Apr-21	09-Aug-21	2
313010	Pavement Data Received	1	17-May-21	17-May-21	0
197010	Pavement Design	40	01-Jun-21	26-Jul-21	0
262010	Public Hearing	1	12-Jul-21	12-Jul-21	2
292010	Public Information Meeting	1	12-Jul-21	12-Jul-21	2
900045	Plans in Hand Review w Construction & Utilities	1	19-Jul-21	19-Jul-21	2
197020	Constructability and MOT Review Meeting	1	27-Jul-21	27-Jul-21	0
260010	Typical Section Approved	1	27-Jul-21	27-Jul-21	0
367020	Approved Exceptions/Variations and Submittal of Utility Design Alternatives	1	27-Jul-21	27-Jul-21	11
197030	Pavement Design Review	10	27-Jul-21	09-Aug-21	2
900060	Interactive Project Update Meeting	1	28-Jul-21	28-Jul-21	0
145040	Environmental Permit Coordination Meeting	1	28-Jul-21	28-Jul-21	85
197040	Pavement Design Approved	1	09-Aug-21	09-Aug-21	2
450010	Obtain/Verify TIP/STIP Approval	1	10-Aug-21	10-Aug-21	310
302010	Initial Plans Review (Phase II)	20	12-Aug-21	08-Sep-21	0
302030	Respond to Comments Initial Plans (Phase II)	10	09-Sep-21	22-Sep-21	0
238020	Phase II Evaluation of Consultant	45	09-Sep-21	10-Nov-21	244
302040	Incorporate Initial Plans (Phase II) Review Comments	10	23-Sep-21	06-Oct-21	0
272010	Environmental Permit Agency Review	100	23-Sep-21	09-Feb-22	45
359010	Confirm Local Support for Initial Plans	1	30-Sep-21	30-Sep-21	13
329010	Request Environmental Review (If Needed)	1	01-Oct-21	01-Oct-21	148
113030	Final Plans (Phase III)	60	01-Oct-21	23-Dec-21	13
329020	Environmental Re-Evaluation/Certification Complete	1	04-Oct-21	04-Oct-21	148
264010	Utility Contact	95	07-Oct-21	16-Feb-22	0
267010	Railroad Contact	60	04-Nov-21	26-Jan-22	54
303010	Final Plans Review (Phase III)	20	24-Dec-21	20-Jan-22	13
303030	Respond to Comments Final Plans (Phase III)	10	21-Jan-22	03-Feb-22	13
238030	Phase III Evaluation of Consultant	45	21-Jan-22	24-Mar-22	148
279010	Railroad Clear Memo	1	27-Jan-22	27-Jan-22	54
359020	Confirm Local Support for Final Plans	1	11-Feb-22	11-Feb-22	13
264040	DUO/CUC Review	10	17-Feb-22	02-Mar-22	0
187010	No R/W Required Certification	1	03-Mar-22	03-Mar-22	20
310010	100% Final Production Plans Coordination	30	03-Mar-22	13-Apr-22	0
266010	Utilities Certified	1	31-Mar-22	31-Mar-22	10
222010	All Environmental Permits Clear	1	08-Apr-22	08-Apr-22	4



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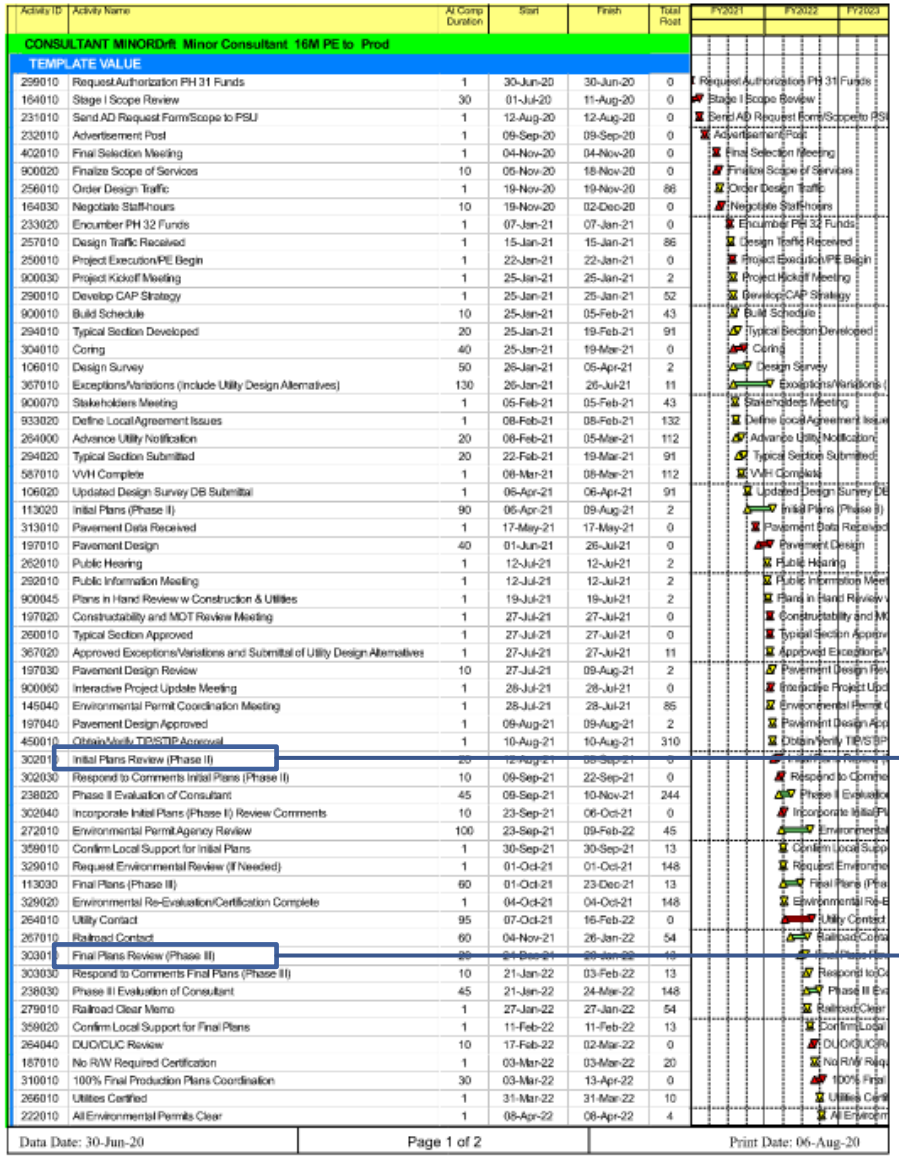
Initial Plans Review (Phase II)

Final Plans Review (Phase III)

D5 Schedule Templates



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Initial Plans ~~[illegible]~~ hase II)

Initial Plans and 3D Model Review (Phase II)

Final Plans ~~[illegible]~~ Phase III)

Final Plans and 3D Model Review (Phase III)

What to do if you have a 3D Model on your project ?

Quality Forum Presentation September 2019:

A project shall be identified during the negotiations by the assigned roadway advisor if it will require a 3D model Review

→

The PM shall deliver all CADD files in a zipped folder named “BIM files for 3D Review”, along with the PDF documents to ERC at the beginning of each review phase

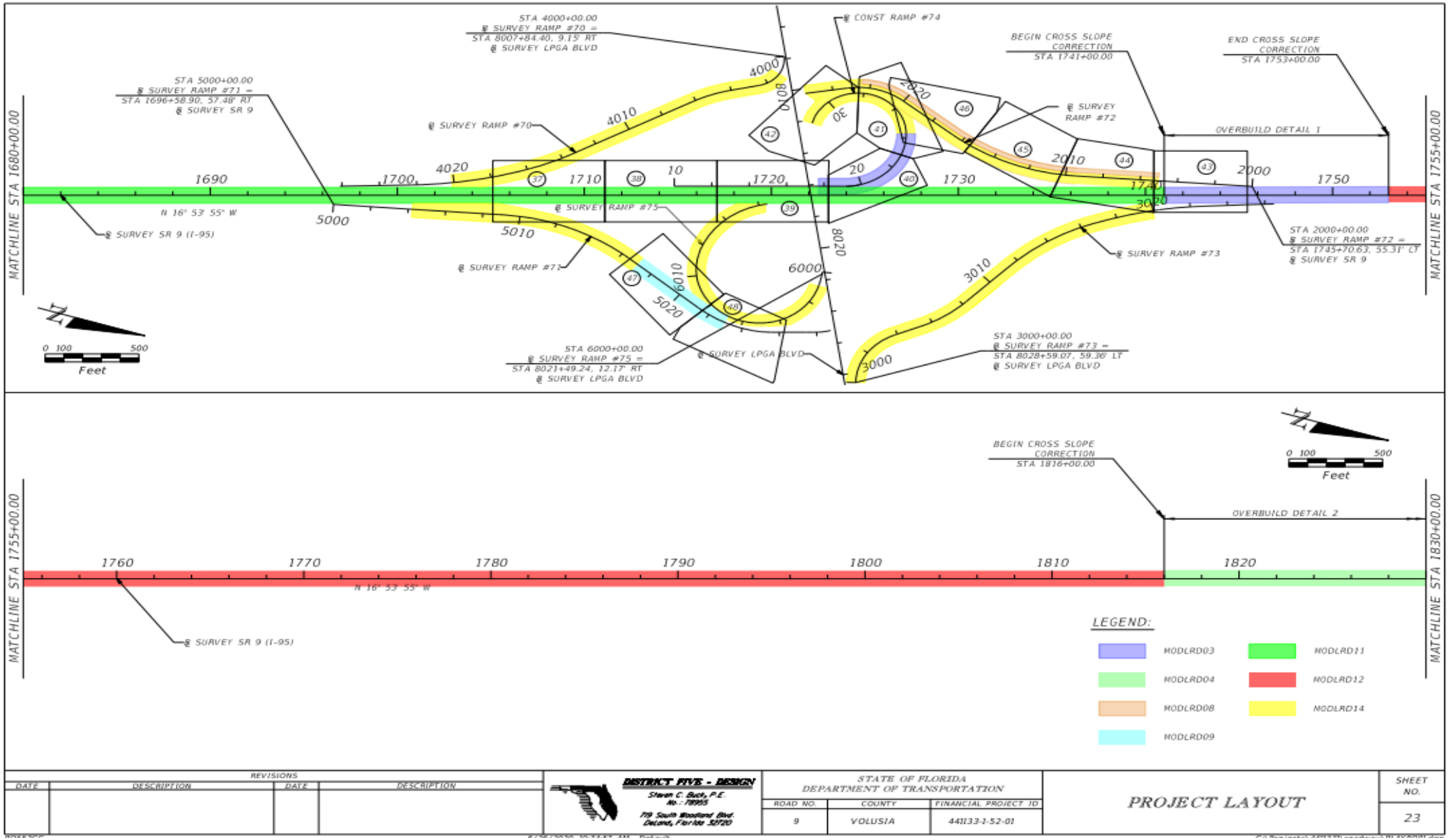
→

The QA/QC contract manager (Jim Harkrider) assigns the 3D model reviewer in the ERC system

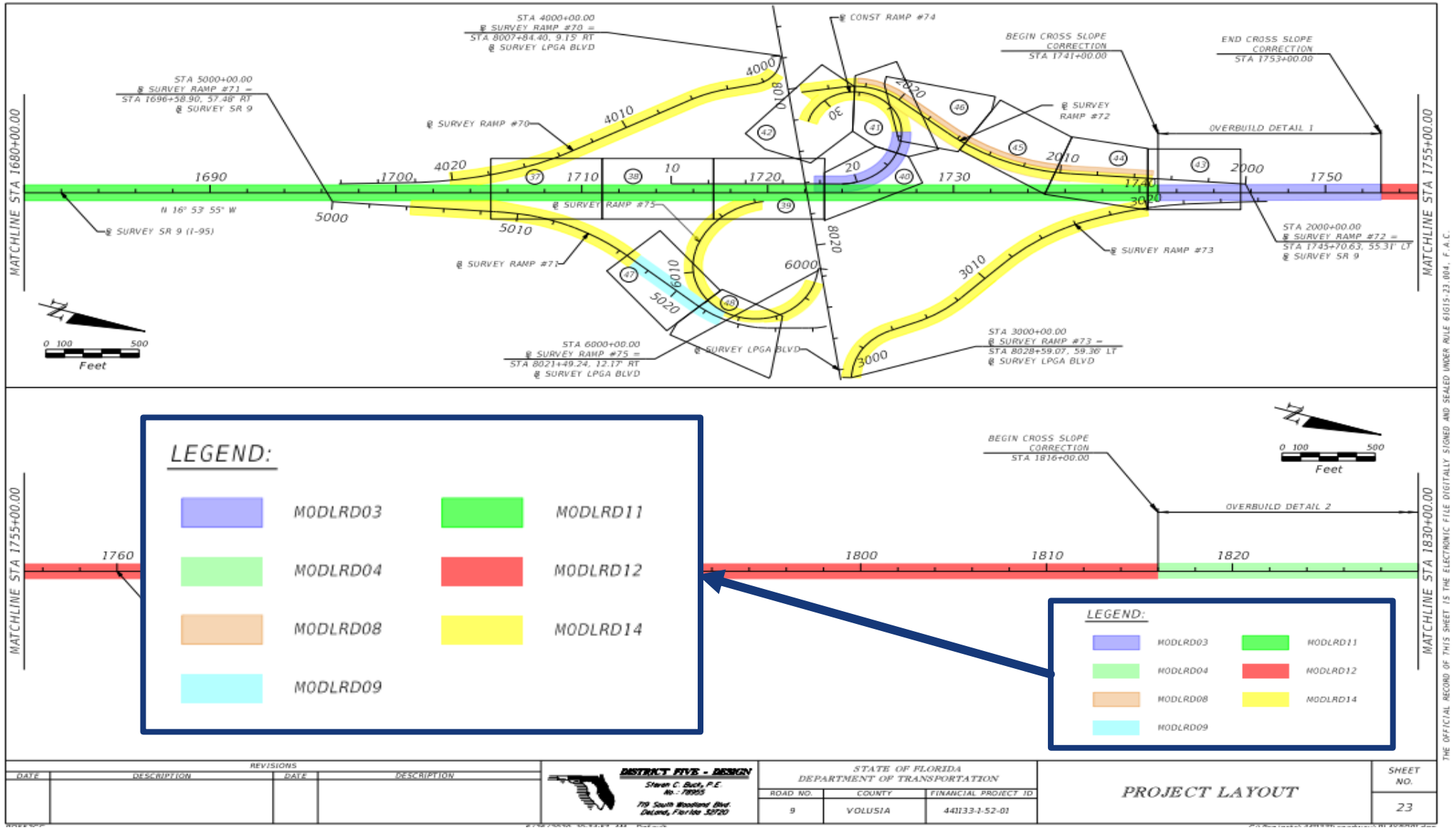
→

The 3D Model Reviewer, shall review the model

Model Management FDM 911



Model Management FDM 911



Project Managers' Responsibilities

Questions ???

Lori.Trebitz@dot.state.fl.us
Gabor.Chiorean@dot.state.fl.us