

THE ADVANCED MODELING SUBMITTAL REVIEW CHECKLIST (CHX)

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US Army Corps
of Engineers



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FIRST, A FEW HELPFUL ACRONYMS:

CHX = Advanced Modeling Submittal
Review Checklist

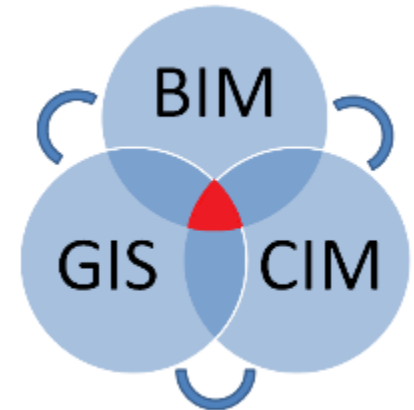
BIM = Building Information Modeling

CIM = Civil Information Modeling

PxP = Project Execution Plan



SECOND, A LITTLE BACKGROUND:



The CHX was developed by the USACE/Industry BIM and CIM Consortia (UIBCC)

- The UIBCC is led by Steve Hutsell, Chief of the Geospatial Section, Seattle District
- The UIBCC Advanced Modeling Submittal QA/QC Workgroup is led by Justin Jameson, Seattle District

MISSION OF THE UIBCC:

Push for innovation within an Advanced Modeling application-neutral context, yet ensure that the requirements are **fair**, **practical** and **reasonable** within the existing state of technology and standards.



THIRD, WHY IS THE CHX IMPORTANT?

The CHX is included as a submittal requirement in UFGS 01 33 16.00 10 (May 2016)

2.2.2 Advanced Modeling Submittal Checklist

Complete the USACE BIM/CIM Advanced Modeling Submittal Checklist and include with each submittal Download the Checklist from the USACE CAD/BIM Technology Center website.



WHAT IS THE PURPOSE OF THE CHX?



THINK ABOUT PAST SUBMITTALS RECEIVED:

How many times have you had to refuse a submittal because it was:

- Not reviewed prior to submission
- Incomplete
- Not according to contract requirements

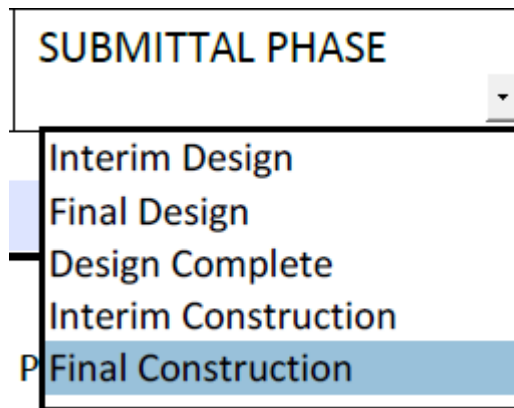


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AT WHAT SUBMITTAL PHASE SHOULD THE CHX BE USED?

The CHX is valid for use in Interim Design submittals as well as all the way up to Final Construction submittals



THE CHX WAS DEVELOPED TO REDUCE RESUBMITTALS!

This is achieved through 4 goals:

Goal 1: Help Submitters prepare organized, complete, and accurate Submittals

Goal 2: Establish a consistent set of review criteria for Submittals

Goal 3: Provide guidance to the Reviewer on which checks to complete and how to perform them

Goal 4: Reduce the amount of time needed to complete a review



ULTIMATE GOAL

Let's Get It Right the First Time!



SO, WHO ARE THE KEY PLAYERS IN THE CHX?



CHX KEY PLAYERS

Reviewer – The COR, OR a technical specialist (e.g., BIM Manager) delegated to conduct an Advanced Modeling Submittal review

Submitter – The Contractor
(Or Preparer, for In-House Design Team)

SUBMITTER QC <i>(See Note 1)</i>	REVIEWER QA <i>(See Note 6)</i>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>



CHX PROS VS. CONS

Cons

Submitter

Reviewer

One extra piece of information to fill out and submit



CHX PROS VS. CONS

Pros

Submitter

- Helps prepare organized and accurate submittals
- Review criteria is consistent from project to project
- Reduces chances of a resubmittal being required.

Reviewer

- Provides a base line of checks and guidance on how to complete them
- Reduces amount of time to complete a review and provide comments to Submittal Approving Authority.



THE 4 EVALUATION STAGES OF THE CHX



WHAT ARE THE 4 EVALUATION STAGES?

Stage 1 – PxP Prerequisite

Stage 2 – Content Inventory

Stage 3 – Content Verification

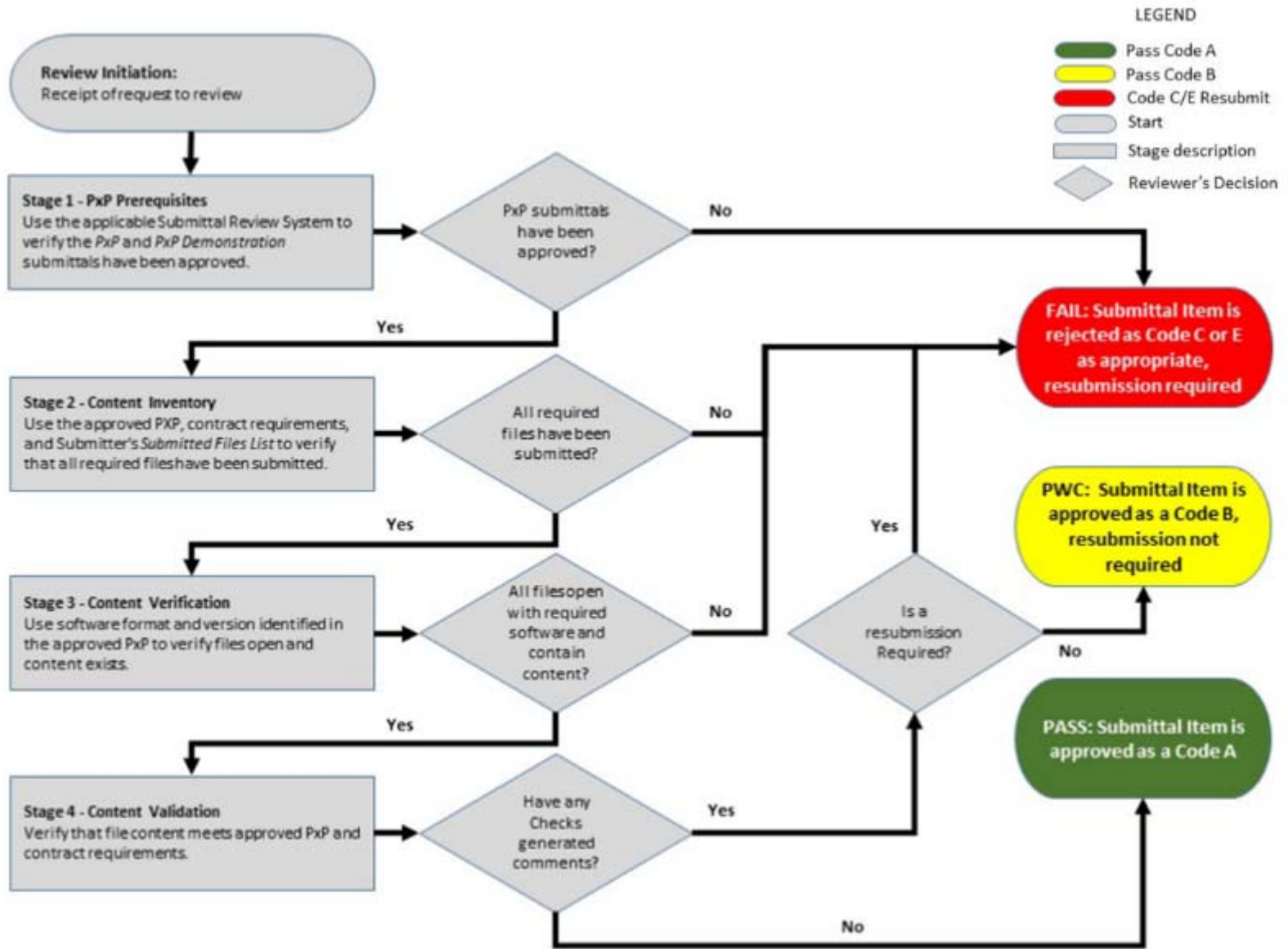
Stage 4 – Content Validation



KEEP IN MIND

1. Previous Stage must be completed and approved before moving to subsequent Stages.
2. Upon a Stage failure, the Reviewer may **RECOMMEND** that the submittal not be approved and not evaluate subsequent Stages until the Submittal Package is resubmitted.
3. HQUSACE and BIM CoP Leadership strongly suggest **NOT** approving a submittal if it fails a review in any Stage.





STAGE 1 – PXP PREREQUISITE

	STAGE 1 – PREREQUISITE	SUBMITTER QC <i>(See Note 1)</i>	REVIEWER QA <i>(See Note 6)</i>
1.1	The PxP was reviewed and approved.	<input type="checkbox"/>	<input type="checkbox"/>
1.2	The PxP Demonstration was reviewed and approved.	<input type="checkbox"/>	<div style="border: 1px solid black; padding: 2px;"> PASS FAIL </div>
STOP! BEFORE YOU CONTINUE!			
SUBMITTER: If you answered “No” to any check in Stage 1. DO NOT CONTINUE to next Stage. You must have an approved PxP and PxD			



WHY IS THE PXP A PREREQUISITE?

From ECB No. 2016-3 (January 2016)

(1) For in-house design projects, the Advanced Modeling PXP must be included in the Design Analysis (DA).

(2) For projects designed by AEs (e.g. D-B, contracted D-B-B), the Advanced Modeling PXP is a required submittal.

From UFGS - 01 33 16.00 10 (May 2016)

1.7.2 Advanced Modeling Project Execution Plan (PXP)

NOTE: The Project Execution Plan (PXP) submittal is mandatory for every project regardless of BIM/CIM/GIS/CAD deliverable type. DO NOT remove the requirement for a PXP submittal.



STAGE 1 – PXP PREREQUISITE

Summary: Were both the Pxp and Pxp Demonstration reviewed and approved?

Submitter QC Options: YES/NO

Note: If “No” is selected for any Check in Stage 1, the submittal should not be submitted to USACE.

Reviewer QA Options: PASS/FAIL

Note: If “Fail” is evaluated for any Check, do not continue to next Stage.



STAGE 2 – CONTENT INVENTORY

STAGE 2 - CONTENT INVENTORY		SUBMITTER QC <i>(See Note 1)</i>	REVIEWER QA <i>(See Note 6)</i>
2.1	All required electronic files were provided.		
.1	The <i>Submitted Files List</i> was submitted.	<input type="text"/>	<input type="text"/>
.2	All files identified in the <i>Submitted Files List</i> were provided.	<input type="text"/>	<input type="text"/>
.3	All files identified in the approved <i>PxP - Section L: Project Deliverables</i> were provided.	<input type="text"/>	<input type="text"/>
.4	One CAD sheet file (.dwg or .dgn) and one PDF sheet file exists for each sheet of the drawing set.	YES NO VARIANCE	<input type="text"/>

STOP! BEFORE YOU CONTINUE!



STAGE 2 – CONTENT INVENTORY

Summary: Were all required electronic files provided?

Submitter QC Options: YES/NO/VARIANCE

Note: If “Variance” or “No” is selected for any Check, details must be provided.

Reviewer QA Options: PASS/FAIL

Note: If “Fail” is evaluated for any Check, details must be provided and do not continue to next Stage.



STAGE 3 – CONTENT VERIFICATION

STAGE 3 - CONTENT VERIFICATION		SUBMITTER QC <i>(See Note 1)</i>	REVIEWER QA <i>(See Note 6)</i>
3.1	Files are in required software formats and versions, and contain appropriate content.		
.1	BIM Files	<input type="text"/>	<input type="text"/>
.2	CIM Files	<input type="text"/>	<input type="text"/>
.3	GIS Files	<input type="text"/>	<input type="text"/>
.4	CAD Files	<input type="text"/>	<div style="border: 1px solid black; padding: 5px;"> PASS FAIL </div>
.5	3D Interactive Review Model	<input type="text"/>	
.6	Industry Foundation Class (IFC) Coordination View	<input type="text"/>	
3.2	Quality Control Reports contain required content.		
.1	Model Standards Report	<input type="text"/>	<input type="text"/>
.2	A/E/C Graphic Standard Report	<input type="text"/>	<input type="text"/>
.3	A/E/C CAD Standard Report	<input type="text"/>	<input type="text"/>
.4	Interference Management (3D Coordination) Report	<input type="text"/>	<input type="text"/>



STAGE 3 – CONTENT VERIFICATION

Summary: Were all required electronic files in the correct format and contain content as specified in the contract and PxP?

Submitter QC Options: YES/NO/VARIANCE

Note: If “Variance” or “No” is selected for any Check, details must be provided.

Reviewer QA Options: PASS/FAIL

Note: If “Fail” is evaluated for any Check, details must be provided.



STAGE 4 – CONTENT VALIDATION

STAGE 4 - CONTENT VALIDATION		SUBMITTER QC <i>(See Note 1)</i>	REVIEWER QA <i>(See Note 6)</i>
4.1	BIM Files – See Reviewer Instruction 5.b		
.1	No errors when opening.	<input type="checkbox"/>	<input type="checkbox"/>
.2	No broken Links, References, or X-References.	<input type="checkbox"/>	<input type="checkbox"/>
.3	Minimized extraneous information.	<input type="checkbox"/>	<input type="checkbox"/>
.4	Content uses the Coordinate System defined in the approved PxP.	<input type="checkbox"/>	<input type="checkbox"/>
.5	Models share a common alignment point.	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> VARIANCE	<input type="checkbox"/>
.6	No unloaded Links, References, or X-Reference.		<input type="checkbox"/>
.7	Compressed/purged.		<input type="checkbox"/>
.8	Applicable Models include Space/Room data.	<input type="checkbox"/>	<input type="checkbox"/>
.9	Schedules were produced from the Models, in accordance with the approved PxP.	<input type="checkbox"/>	<input type="checkbox"/>



STAGE 4 – CONTENT VALIDATION

Summary: Does the content of submitted BIM, CIM, CAD, PDF, 3D Review Models, and IFC Coordination Views comply with PxP and contract requirements?

Submitter QC Options: YES/NO/VARIANCE

Note: If “Variance” or “No” is selected for any Check, details must be provided.

Reviewer QA Options: PASS/FAIL/PWC

Note: If “Fail” or “Pass With Comment (PWC)” is evaluated for any Check, details must be provided.



FINAL STEPS



SUBMITTER QUALITY CONTROL CERTIFICATION (QCC)

SUBMITTER QUALITY CONTROL CERTIFICATION (QCC) - Attach additional sheets as necessary	
<i>COMMENTS (Prefix detailed comments with the relevant Check Number, i.e. 4.1.1: Variance, justification...)</i>	
<i>I certify that I am a qualified quality control representative for the submitting party and the preceding QC evaluation is true and correct.</i>	
<div style="background-color: #e0e0ff; width: 150px; height: 30px; margin: 0 auto;"></div> <p><i>Date signed</i></p>	<div style="background-color: #e0e0ff; width: 300px; height: 30px; margin: 0 auto; position: relative;"><div style="position: absolute; top: -5px; left: 5px; width: 20px; height: 10px; background-color: #f00;"></div><div style="position: absolute; left: 5px; top: 5px;">x</div></div> <p><i>Submitter Quality Control Representative signature</i></p>



REVIEWER QUALITY ASSURANCE REVIEW (QAR)

REVIEWER QUALITY ASSURANCE REVIEW (QAR) - Attach additional sheets as necessary										
RECOMMENDED ACTION CODES TO BE INSERTED IN COLUMN i, SECTION I, ENG FORM 4025-R (attach additional sheets, when required)										
SUBMITTAL ITEM NO. (See Note 6)										
USACE ACTION CODE GIVEN (See Note 7)										
COMMENTS (Prefix detailed comments with the relevant Check Number, i.e. 4.1.1 - PWC: Comments...)										
	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> A B C E </div>									
<p>I certify that I am a qualified quality assurance representative for the Government and have read and understand the instructions for this form.</p>										
<input type="text"/> <p>Date signed</p>			<input type="text"/> <p>Reviewer signature</p>							

Reminder: this is the Reviewer's **recommendation** on the submittal. The COR has the **final** decision on what action code is given in RMS.



OVERWHELMED YET?



YOU AREN'T BEING THROWN INTO THE DEEP END OF THE POOL!

Check 1.1: The PxP was reviewed and approved.

Purpose: The Submitter's means and methods for meeting the contract requirements are documented in the approved PxP. The Reviewer needs to know and understand these processes and procedures to complete an effective Advanced Modeling submittal review. Without the approved PxP, the Reviewer lacks sufficient information to complete the submittal evaluation.

Step(s)	Rationale for response
Verify the PxP was approved:	Pass: PxP Submittal exists. Proceed to next Step.
1. Determine whether the Submittal Review System for the project includes a PxP Submittal	Fail: The PxP Submittal does NOT exist. Proceed to Conclusion of Stage 1.
2. Verify the PxP Submittal was reviewed and approved	Pass: Submittal Review System indicates the PxP was approved through an Action Code A or B, or by other means. Proceed to Check 1.2 Fail: Submittal Review System indicates the PxP was NOT approved through an Action Code C or E, or by other means. Proceed to Conclusion of Stage 1.

End of Check 1.1



WHERE CAN I FIND THE CHX?

BIM/CIM LINKS

Contract Requirements

A/E/C Work Structure

REVIT Templates

USACE BIM Roadmap

BIM Primer

CAVE-Lite

Note: A checklist for the PxP is in development and will be available Feb 2017

Specifications

USACE Bulletin, ECB 2016-3, "Advanced Modeling for USACE Projects", January 2016.

USACE Specification (UFGS) 01 33 16.00 10, "CONSTRUCTION (TER AWARD)", May 2016.

Checklist (CHX) and Guide

USACE Submittal Review Checklist (CHX)

V1.0 May 2016

USACE Advanced Modeling Submittal Review Checklist Guide (CHX Guide) May 2016 - optional for Contractors

Project Execution Plan (PxP)

USACE Advanced Modeling Project Execution Plan (PxP) Template V3.0

Minimum Modeling Matrix (M3)

USACE Minimum Modeling Matrix (M3) V1.3 20140919 (See below for associated M3 Resource files)

USACE M3 AECOsims Building Designer v1.1

USACE M3 Revit V1.1

CHX

PxP

M3

https://cadbimcenter.erdc.dren.mil/BIM_Contract_Requirements



RELATED DOCUMENTS

ECB 2016-3 – Advanced Modeling Requirements

ENG FORM 4025-R

UFGS 01 33 16.00 10

UFGS 01 78 00

USACE Advanced Modeling Project Execution Plan (PxP)
Template

USACE Minimum Modeling Matrix (M3)



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QUESTIONS?

