
Advanced Modeling Submittal Review Checklist (CHX) Guide – V2.0

for

US Army Corps of Engineers



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This Guide is a supplement to the USACE Advanced Modeling Submittal Review Checklist (CHX). USACE Reviewers must use the Checklist and Guide to evaluate Advanced Modeling submittals. Contractors and other submitters are required to include a completed Checklist with their submittals and may find the Guide valuable when preparing the Checklist.

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Overview

Summary and Intended Audience

The US Army Corps of Engineers (USACE) Advanced Modeling Submittal Review Checklist (CHX) and this supplemental Advanced Modeling Submittal Review Checklist Guide (Guide) were developed by the USACE/Industry BIM and CIM Consortia (UIBCC). The Guide defines the methodology and criteria for a technical specialist, typically a BIM Manager or delegate (Reviewer), and provides transparency of the CHX and review methods to Contractors (Submitter) or Government In-house Design teams (Submitter). The Guide is not mandatory for Submitters; however, it may be of value in preparing an Advanced Modeling Submittal and respective CHX.

About the CHX

The CHX addresses four goals.

1. Increase the likelihood that a Reviewer will recommend approval of an Advanced Modeling Submittal on the first submission, by helping Submitters prepare organized, complete, and accurate submittals.
 2. Establish a methodology and a consistent set of criteria for the review of Advanced Modeling Submittals.
 3. Provide guidance to the Reviewer on which Checks to complete and how to perform them.
 4. Reduce the amount of time needed to complete a review and provide comments to the Submittal Approving Authority.
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Overview

Advanced Modeling Submittal Review Process

Introduction

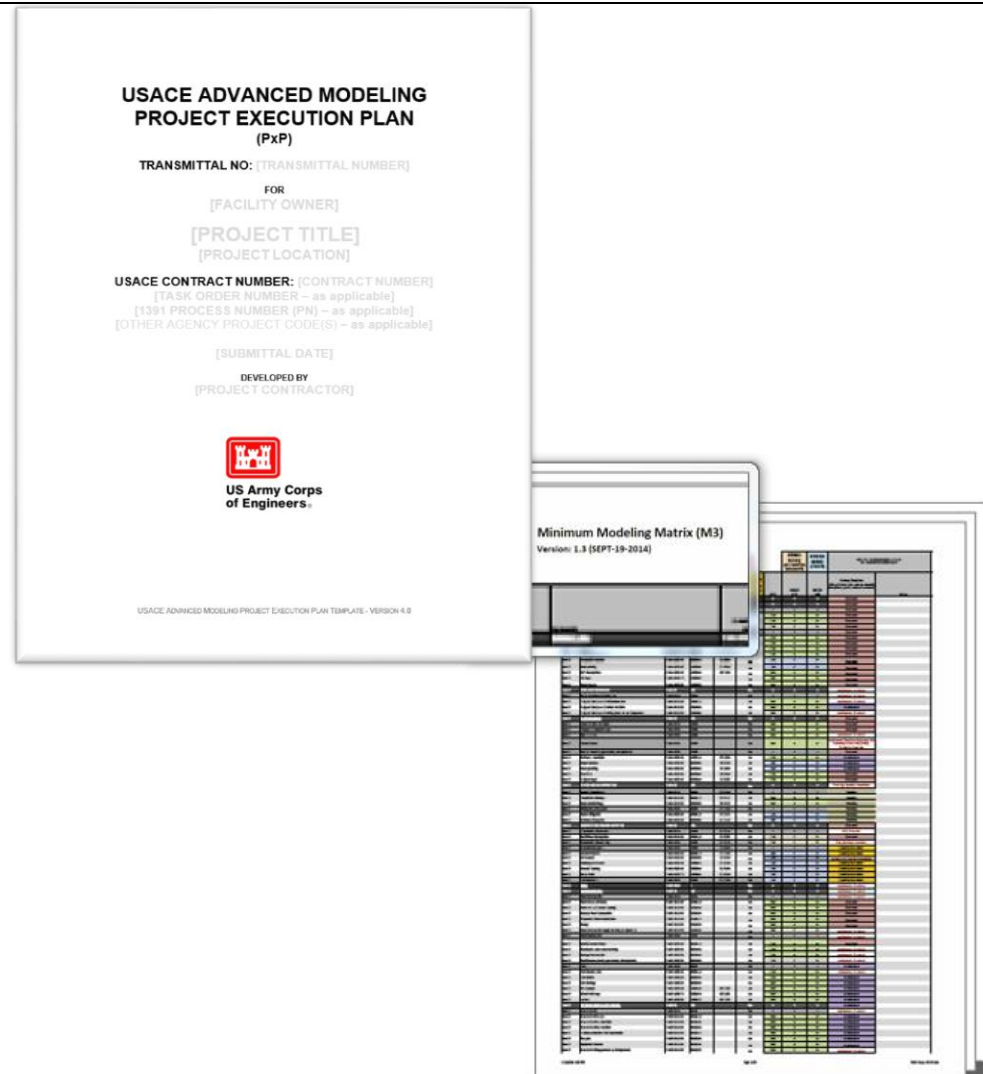
It is to the mutual benefit of the Submitter and the Reviewer to have an organized, complete, and accurate Advanced Modeling Submittal. The absence of any content prevents the Reviewer from conducting an appropriate evaluation, resulting in resubmissions by the Submitter.

Advanced Modeling PxP Submittal Prerequisite

The first project Advanced Modeling Submittal Item is the *SD-01 Advanced Modeling PxP*, which includes the Minimum Modeling Matrix (M3) document.

After the submitted PxP has been approved by a Submittal Approving Authority, the Submitter must schedule and perform an *Advanced Modeling PxP Demonstration Meeting* with the Reviewer to validate their ability to execute the functions and requirements documented in the approved PxP. See UFGS Section 01 33 16.00 10 for more information.

The results of the *Advanced Modeling PxP Demonstration Meeting* must be approved before the Reviewer can proceed with reviews of subsequent Advanced Modeling submittals.



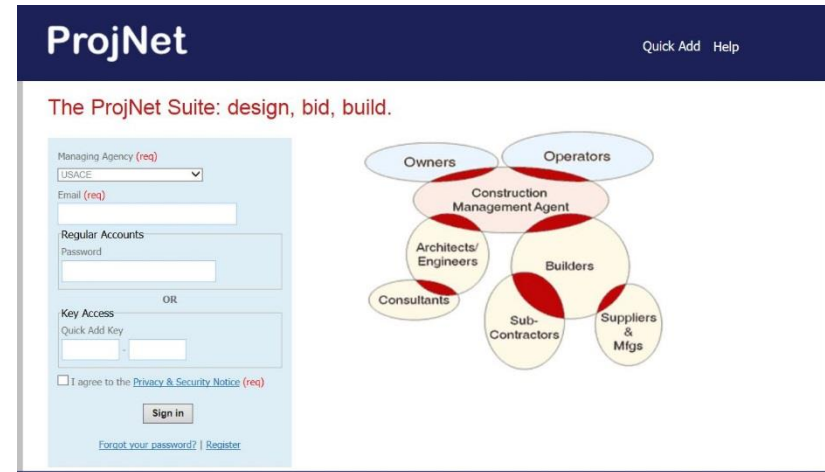
Overview

Submittal Review Systems

An Advanced Modeling Submittal package will be provided to the Reviewer, either through the ProjNet/DrChecks Design Review and Checking System <https://www.projnet.org> or the USACE Resident Management System (RMS) <http://rms.usace.army.mil/>.

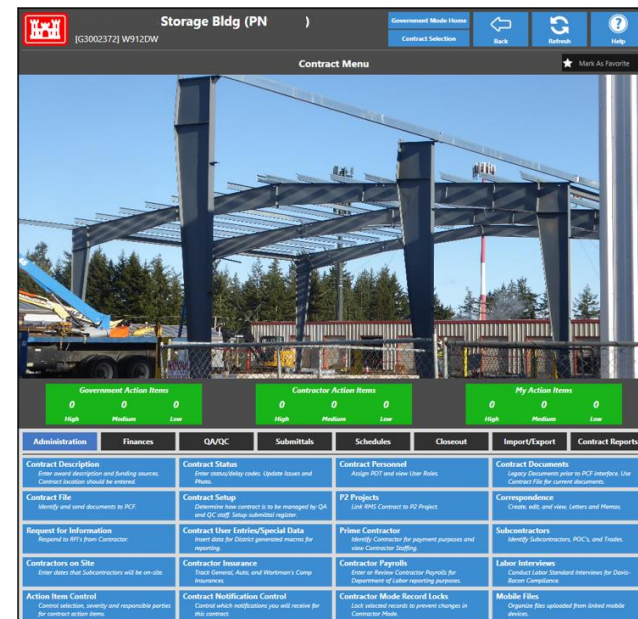
ProjNet/DrChecks Design Review and Checking System

The DrChecks System is typically used for Design services contracts, or for projects designed by USACE in-house design teams. A Project Manager will notify the Reviewer when an Advanced Modeling Submittal package is ready for review, and provide system access information.



USACE Resident Management System (RMS)

RMS is typically used for Design-Build or Construction services contracts. A Project Engineer or delegate will forward Advanced Modeling Submittal packages to the Reviewer when received from a Contractor. The submittal package consists of the ENG FORM 4025-R submittal form, and the associated Advanced Modeling Submittal documents.



Overview

Checklist Evaluation Stages

The CHX has four Stages and (2) Appendices containing a series of statements followed by standardized checks (Checks). The Checks evaluate Submitter's compliance with the approved PxP, contract submittal requirements, and A/E/C CAD and Graphics Standards.

- Before beginning Stages 2, 3, or 4, Stage 1 must be completed and approved.
- USACE will NOT approve an Advanced Modeling Submittal Item if it fails a review in any Stage.
- Upon failure of any Stage, the Reviewer may recommend that the Submittal Approving Authority suspend the review process and not evaluate any subsequent Stages until the Submitter resubmits a complete submittal package.

Stage 1 - Prerequisite

Use the applicable Submittal Review System to verify the *PxP* and *PxP Demonstration* submittals have been approved.

Stage 2 - Content Inventory

Use the approved PxP, contract requirements, and Submitter's *Submitted Files List* to evaluate that all required files have been submitted.

Stage 3 - Content Verification

Use software format and version identified in the approved PxP to verify files open and content exists.

Stage 4 - Content Validation

Determine if file content meets approved PxP and contract requirements.

APPENDIX A – A/E/C CAD Standard Review Checklist

Determine if submitted content meets A/E/C CAD Standard requirements.

APPENDIX B – A/E/C Graphics Standard Review Checklist

Determine if submitted content meets A/E/C Graphics Standard requirements.

Submitter QC and Reviewer QA columns

Both the *Submitter QC* and *Reviewer QA* columns of the CHX are comprised of the same series of statements, and addressed accordingly by Submitter and Reviewer.

Overview

Submitter Quality Control Certification (QCC)

Completion of the Quality Control Certification (QCC) section of the CHX is a required action by the Submitter in all Advanced Modeling submittals. The Submitter's signature certifies the QC evaluation is true and correct.

Reviewer Quality Assurance Review (QAR)

Completion of the Quality Assurance Review (QAR) section of the CHX and use of the Guide are mandatory for USACE Reviewers. The Reviewer's signature certifies the QA evaluation is true and correct, and informs the Submitter that either:

- Reviewer agrees that the Submittal Item meets the contractual requirements.
- Reviewer disagrees and identifies specific deficiencies in the Submittal Item meeting contract requirements.
- Reviewer routes completed CHX back to the Submittal Approving Authority, with a recommended Action Code per Submittal Item

Submittal Item Evaluation Action Codes

The Action Code provides the Reviewer's recommendation to the Submittal Approving Authority concerning acceptability of the Submittal Item.

- **IMPORTANT:** The Action Codes below are applicable for Advanced Modeling Submittal Reviews within the USACE Resident Management System (RMS) and ProjNet/DrChecks submittal review systems.

Code "A" - Approved as Submitted.

Example

Reviewer has no questions or concerns regarding a Submittal Item meeting contractual requirements.

Reviewer Action

Submittal Item is recommended as approved to the Submittal Approving Authority.

Code "B" - Approved, except as noted in comments. Resubmission is NOT required.

Example(s)

- Reviewer notes unloaded Links, References, or X-references in an Interim Submittal, but expects corrections by the Design Complete submittal.

Reviewer Action

- Submittal Item is recommended as approved, except as noted in comments, to the Submittal Approving Authority.
- Communicate Submittal Item discrepancies via comments in the CHX.

Overview

Code "C" - Approved, except as noted in comments. Resubmission required.

Example(s)

- Submitter identified a Step on the CHX as a Variance, without justification in a Model Standards Report or approved PxP.
- Submitter did NOT provide a response or make corrections to a previous "C"-coded Submittal Item.
- Design Complete or Final Record submittals do NOT contain complete content.

Code C Reviewer Actions

- Submittal Item is recommended as approved, except as noted in comments, to the Submittal Approving Authority.
 - Communicate Submittal Item discrepancies via comments in the CHX.
 - With the second and subsequent rejections, Reviewer could suggest a Quality Control Review meeting with the following attendees, at the discretion of the Submittal Approving Authority:
 - USACE Reviewer and Project Manager
 - Submitter's Quality Control Representative and Project Manager
 - A Quality Control Review meeting is the Submitter's opportunity to request guidance and clarification on the CHX, PxP, M3, and contract requirements.
-

Code "E" - Disapproved. Refer to comments.

Example(s)

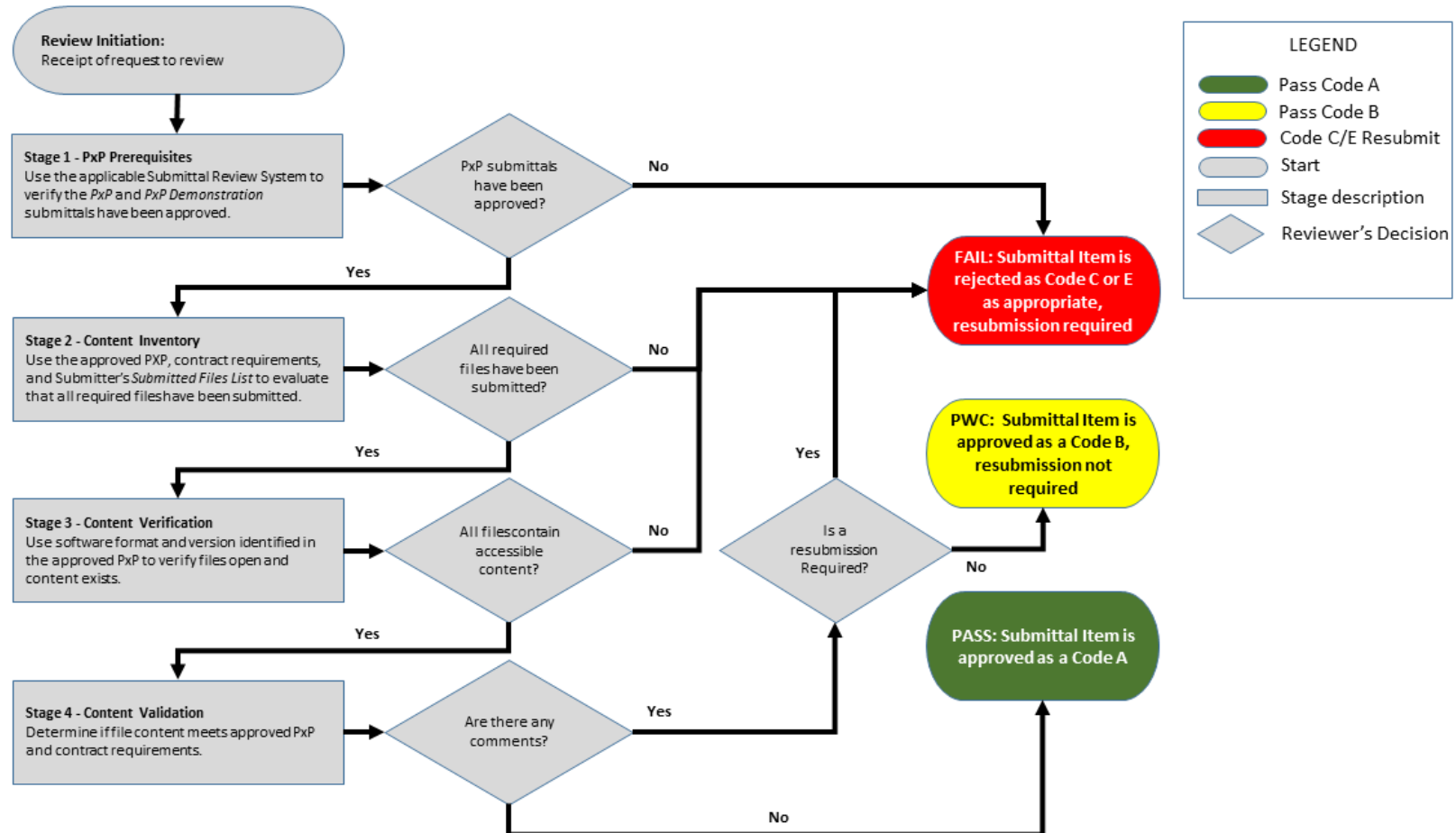
- The CHX was NOT provided.
- An Advanced Modeling Submittal Item was received for review before a PxP Submittal had been approved.
- Submitter did NOT provide a response or make corrections to a previous "C" or "E" coded Submittal Item.
- Any discipline missing from an Advanced Modeling Submittal.

Code E Reviewer Actions

- Submittal Item is recommended as disapproved to the Submittal Approving Authority.
- Communicate Submittal Item discrepancies via comments in the CHX.
- Reviewer could suggest to conduct a Quality Control Review Meeting with the following attendees, at the discretion of the Submittal Approving Authority:
 - USACE Reviewer and Project Manager
 - Submitter's Quality Control Representative and Project Manager

A Quality Control Review meeting is the Submitter's opportunity to request guidance and clarification on the CHX, PxP, M3, and contract requirements.

Overview

Submittal Evaluation Workflow

Stage 1 - Prerequisite

The Checks in this Stage are based on the *UFGS Specification 01 33 16.00 10, PxP, M3, and PxP Demonstration* submittal requirements.

Stage 1 Checks determine if the PxP, M3 and PxP Demonstration submittals were previously approved.

Check 1.1: The PxP was approved.

Purpose: The Submitter's means and methods to meet the contract requirements are documented in the approved PxP. The Reviewer needs to know and understand these processes and procedures to complete an effective 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 RMS Submittal Register shows a PxP Submittal	Fail: The PxP Submittal does NOT exist. Proceed to Conclusion of Stage 1.
2. Verify the project PxP Submittal was approved	Pass: RMS Code A or B indicates approval. Proceed to Check 1.2 Fail: RMS Code C or E indicates the Submittal was NOT approved. Proceed to Conclusion of Stage 1.
End of Check	

Check 1.2: The PxP Demonstration was approved.

Purpose: The PxP Demonstration validates the Submitter’s ability to execute the functions and requirements listed in the approved PxP and afford an opportunity to clarify expectations and rectify ambiguities the Submitter may have concerning deliverables.

Step(s)	Rationale for response
Verify the PxP Demonstration was approved:	Pass: PxP Demonstration Submittal exists. Proceed to next Step. Fail: The PxP Demonstration Submittal does NOT exist. Proceed to Conclusion of Stage 1 .
1. Determine whether the RMS Submittal Register shows a PxP Demonstration Submittal.	
2. Verify the PxP Demonstration Submittal was evaluated.	Pass: RMS Code A or B indicates approval. Proceed to Conclusion of Stage 1 . Fail: RMS Code C or E indicates the Submittal was NOT approved. Proceed to Conclusion of Stage 1 .
End of Check	
Conclusion of Stage 1	
	Rationale for response
Result of Stage 1	Pass: All Checks in Stage 1 passed. Proceed to Stage 2. Fail: One or more Checks failed in Stage 1. Proceed to REVIEWER QAR . DO NOT PROCEED TO NEXT STAGE.
End of Stage 1	

Stage 2 - Content Inventory

This Stage is based on the *Submitted Files List* and the approved *PxP - Section 11: Project Deliverables* contract requirements.

Check 2.1: All required electronic files were provided.

Purpose: Availability of all files is imperative to complete the review, however sometimes the files intended to be submitted were not received by the Reviewer. The *Submitted Files List* of all submitted files (including all reference files) is required to verify that all intended files were provided. Reference contract requirements for all content required in the *Submitted Files List*.

Step(s)	Rationale for response
1. The <i>Submitted Files List</i> file was submitted.	Pass: The ' <i>Submitted Files List</i> ' was provided. Proceed to next Step. Fail: The ' <i>Submitted Files List</i> ' was NOT provided. Proceed to Conclusion of Stage 2 .
2. All files in the <i>Submitted Files List</i> were provided.	Pass: All files were provided. Proceed to next Step. Fail: All files were NOT provided. Proceed to Conclusion of Stage 2
3. All files identified in the approved <i>PxP - Section 11: Project Deliverables</i> were provided.	Pass: All files were provided. Proceed to next Step. Fail: All files were NOT provided. Proceed to Conclusion of Stage 2 .
4. One CAD sheet file (.dwg or .dgn) and one PDF sheet file exists for each sheet of the drawing set.	Pass: One CAD and one PDF sheet file for each sheet of the construction documents were provided. Proceed to Conclusion of Stage 2 . PWC: One CAD and one PDF sheet file for each sheet of the construction documents were NOT provided, but acceptable justification was provided. Proceed to Conclusion of Stage 2 . Fail: One CAD and one PDF sheet file for each sheet of the construction documents were NOT provided. Proceed to Conclusion of Stage 2 .
End of Check	

Conclusion of Stage 2	
	Rationale for response
Result of Stage 2	Pass: All Checks in Stage 2 passed. Proceed to Stage 3. Fail: One or more Checks failed in Stage 2. Proceed to REVIEWER QAR . DO NOT PROCEED TO NEXT STAGE.
End of Stage 2	

Stage 3 – Content Verification

These Checks verify that submitted files are in the required software file format and version, and contain content, as specified in awarded contract requirements and approved *PxP*.

Check 3.1: Files are in required software formats and versions, and contain appropriate content.

Purpose: The contract specifies software native file formats and versions to facilitate stakeholder internal and downstream processes. This Check verifies the required software file format and version were used, and the files contain content applicable to each discipline identified in the *PxP*

NOTE: For Steps 1-4 below, open and check all files if the submittal consists of less than 10 files per Step. If the submittal consists of 10 or more files per Step, spot-check a minimum of 10 files per discipline.

Step(s)	Rationale for response
Determine if files open with appropriate software file format and version, and content exists for each discipline identified in the approved <i>PxP</i> :	Pass: Files open with required format and version, and content exists for each discipline. Proceed to next Step. PWC: One or more files did NOT open with required format and version, or content did NOT exist for each discipline, but acceptable justification was provided. Proceed to next Step Fail: One or more files did NOT open with required format and version, or content did NOT exist for each discipline. Proceed to next Step.
1. BIM Files	
2. CIM Files	Follow rationale response of Step 1 above. Proceed to next Step.
3. GIS Files	Follow rationale response of Step 1 above. Proceed to next Step.
4. CAD files	Follow rationale response of Step 1 above. Proceed to next Step.
5. 3D Interactive Review Model	Follow rationale response of Step 1 above. Proceed to next Step.
6. Industry Foundation Class (IFC) Coordination View	Follow rationale response of Step 1 above. Proceed to Check 3.2
End of Check	

Check 3.2: Quality Control Report contains required content.

Purpose: This check is to verify that the reports contain required content and meet contractual requirements. Each report lends to the overall Submittal integrity.

Step(s)	Rationale for response
Determine if the following reports contain required content:	Pass: The report contains required content. Proceed to next Step.
1. Model Standards Report (CHX)	PWC: The report did NOT contain required content, but acceptable justification was provided. Proceed to next Step.
2. A/E/C CAD Standard Report (CHX APPENDIX A)	Fail: The report did NOT contain required content. Proceed to next Step.
3. A/E/C Graphics Standard Report (CHX APPENDIX B)	Follow rationale response of Step 1 above. Proceed to next Step.
4. Interference Management (3D Coordination) Report	Follow rationale response of Step 1 above. Proceed to next Step.
	Pass: The report contains required content. Proceed to Conclusion of Stage 3 .
	PWC: The report did NOT contain required content, but acceptable justification was provided. Proceed to Conclusion of Stage 3
	Fail: The report did NOT contain required content. Proceed to Conclusion of Stage 3 .
End of Check	
Conclusion of Stage 3	
	Rationale for response
Result of Stage 3	Pass: All Checks in Stage 3 passed. Proceed to Stage 4.
	Fail: One or more Checks failed in Stage 3. Proceed to REVIEWER QAR . DO NOT PROCEED TO NEXT STAGE.
End of Stage 3	

Stage 4 – Content Validation

This Stage verifies that the content of the submitted files meet the contract requirements.

Check 4.1: BIM Files

Purpose: The content of BIM files is validated for compliance with the approved PxP and contract requirements.

Note: For Design Complete (*Specification 01 33 16.00 10*) and Final Record (*Specification 01 78 00*) submittals, **PASS/FAIL** are the ONLY applicable Reviewer responses.

Step(s)	Rationale for response
1. No errors when opening.	Pass: No errors were present during opening. Proceed to next Step. PWC: Errors were present during opening, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. Fail: Errors were present during opening. Proceed to next Step.
2. No broken Links, References, or X-References.	Pass: No errors exist. Proceed to next Step. PWC: Errors exist, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. Fail: Errors exist. Proceed to next Step.
3. No unloaded Links, References, or X-References.	Pass: No unloaded content exists. Proceed to next Step. PWC: Unloaded content exists, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. Fail: Unloaded content exists. Proceed to next Step.
4. Minimized extraneous information.	Pass: Minimal extraneous information exists, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. PWC: Excessive extraneous information exists, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. Fail: Extraneous information exists. Proceed to next Step.
5. Content uses the Coordinate System defined in the approved PxP.	Pass: The defined Coordinate System was used as described in the PxP. Proceed to next Step. Fail: The defined Coordinate System was NOT used. Proceed to next Step.
6. Models share a common alignment point.	Pass: A common alignment point was shared. Proceed to next Step. PWC: A common alignment point was NOT shared, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. Fail: A common alignment point was NOT shared. Proceed to next Step.

Step(s)	Rationale for response
7. Compressed/purged.	Pass: Content was compressed/purged. Proceed to next Step. PWC: Unused information exists, but was NOT excessive. Proceed to next Step. Fail: Content was NOT compressed/purged. Proceed to next Step.
8. Applicable Models include Space/Room data.	Pass: Space/Room data was accurate/complete. Proceed to next Step. PWC: Space/Room data was NOT accurate/complete, but was appropriate for this submittal phase. Proceed to next Step. Fail: Space/Room data was NOT included or was inaccurate. Proceed to next Step.
9. Schedules were produced from the Models, in accordance with the approved PxP.	Pass: Schedules were produced from the Models. Proceed to Check 4.2. PWC: Some schedules were NOT produced from the Models. Proceed to Check 4.2. Fail: Schedules were NOT produced from the Models. Proceed to Check 4.2.
End of Check	

Check 4.2: CIM Files

Purpose: The content of CIM files is validated for compliance with the approved PxP and contract requirements.

Note: For Design Complete (*Specification 01 33 16.00 10*) and Final Record (*Specification 01 78 00*) submittals, **PASS/FAIL** are the ONLY applicable Reviewer responses.

Step(s)	Rationale for response
1. No errors when opening.	Pass: No errors were present during opening. Proceed to next Step. PWC: Errors were present during opening, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. Fail: Errors were present during opening. Proceed to next Step.
2. No broken Links, References, or X-References.	Pass: No errors exist. Proceed to next Step. PWC: Errors exist, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. Fail: Errors exist. Proceed to next Step.
3. No unloaded Links, References, or X-References.	Pass: No unloaded content exists. Proceed to next Step. PWC: Unloaded content exists, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. Fail: Unloaded content exists. Proceed to next Step.
4. Minimized extraneous information.	Pass: Minimal extraneous information exists, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. PWC: Excessive extraneous information exists, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. Fail: Extraneous information exists. Proceed to next Step.
5. Content uses the Coordinate System defined in the approved PxP.	Pass: The defined Coordinate System was used. Proceed to next Step. Fail: The defined Coordinate System was NOT used. Proceed to next Step.
6. Models share a common alignment point.	Pass: A common alignment point was shared. Proceed to next Step. PWC: A common alignment point was NOT shared, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. Fail: A common alignment point was NOT shared. Proceed to next Step.
7. Compressed/purged.	Pass: Content was compressed/purged. Proceed to Check 4.3. PWC: Unused information exists, but was NOT excessive. Proceed to Check 4.3. Fail: Content was NOT compressed/purged. Proceed to Check 4.3.
End of Check	

Check 4.3: CAD Files

Purpose: The content of CAD files is validated for compliance with the approved PxP and contract requirements.

Note: For Design Complete (*Specification 01 33 16.00 10*) and Final Record (*Specification 01 78 00*) submittals, **PASS/FAIL** are the ONLY applicable Reviewer responses.

Step(s)	Rationale for response
1. No errors when opening.	Pass: No errors were present during opening. Proceed to next Step. PWC: Errors were present during opening, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. Fail: Errors were present during opening. Proceed to next Step.
2. No broken Links, References, or X-References.	Pass: No errors exist. Proceed to next Step. PWC: Errors exist, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. Fail: Errors exist. Proceed to next Step.
3. Minimized extraneous information (undefined, incorrectly defined, or duplicated elements).	Pass: Minimal extraneous information exists, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. PWC: Excessive extraneous information exists, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. Fail: Extraneous information exists. Proceed to next Step.
4. Compliant with APPENDIX A – A/E/C CAD STANDARD REVIEW CHECKLIST.	Pass: Files complied with requirements of the APPENDIX A – A/E/C CAD STANDARD REVIEW CHECKLIST. Proceed to next Step. PWC: Files did NOT comply, but acceptable justification was provided in the A/E/C CAD Standard Report. Proceed to next Step. Fail: Files did NOT comply. Proceed to next Step.
5. Compressed/purged.	Pass: Content was compressed/purged. Proceed to Check 4.4. PWC: Unused information exists, but was NOT excessive. Proceed to Check 4.4. Fail: Content was NOT compressed/purged. Proceed to Check 4.4.
End of Check	

Check 4.4: PDF Drawings

Purpose: Verifies that all PDF Electronic Drawings were derived from the Advanced Modeling content, in accordance with the approved PxP, and with the exception of Details and Enlarged Sections as specified in the contract.

Note: For Design Complete (*Specification 01 33 16.00 10*) and Final Record (*Specification 01 78 00*) submittals, **PASS/FAIL** are the ONLY applicable Reviewer responses.

Step(s)	Rationale for response
1. All Drawings were derived from the Advanced Modeling content with the exception of Details and Enlarged Sections as specified in the contract.	Pass: All PDF Electronic Drawings were derived from the Advanced Modeling content. Proceed to Check 4.5. PWC: All PDF Electronic Drawings were NOT derived from the Advanced Modeling content, but acceptable justification was provided. Proceed to Check 4.5. Fail: All PDF Electronic Drawings were NOT derived from the Advanced Modeling content. Proceed to Check 4.5.
2. Compliant with APPENDIX B – A/E/C GRAPHICS STANDARD REVIEW CHECKLIST.	Pass: Files complied with requirements of APPENDIX B – A/E/C GRAPHICS STANDARD REVIEW CHECKLIST. Proceed to next Step. PWC: Files did NOT comply, but acceptable justification was provided in the A/E/C Graphics Standard Report. Proceed to next Step. Fail: Files did NOT comply. Proceed to next Step.
End of Check	

Check 4.5: 3D Interactive Review Model

Purpose: The content of the 3D Interactive Review Model is validated for compliance with the approved PxP and contract requirements.

Note: For Design Complete (*Specification 01 33 16.00 10*) and Final Record (*Specification 01 78 00*) submittals, **PASS/FAIL** are the ONLY applicable Reviewer responses.

Step(s)	Rationale for response
1. No errors when opening.	Pass: Errors were NOT present during opening. Proceed to next Step. PWC: Errors were present during opening, but acceptable justification was provided. Proceed to next Step. Fail: Errors were present during opening. Proceed to next Step.
2. Content exists for each discipline identified in the approved PxP.	Pass: Content for each identified discipline was provided. Proceed to next Step. PWC: For Interim Submittals Only – Content for each identified discipline was NOT provided, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. Fail: Content for each identified discipline was NOT provided. Proceed to next Step.
3. Models share a common alignment point.	Pass: A common alignment point was shared. Proceed to Check 4.6. PWC: A common alignment point was NOT shared, but acceptable justification was provided in the Model Standards Report. Proceed to Check 4.6. Fail: A common alignment point was NOT shared. Proceed to Check 4.6.
End of Check	

Check 4.6: Industry Foundation Class (IFC) Coordination View

Purpose: The content of the IFC file(s) is validated for compliance with the approved PxP and contract requirements.

Note: For Design Complete (*Specification 01 33 16.00 10*) and Final Record (*Specification 01 78 00*) submittals, **PASS/FAIL** are the ONLY applicable Reviewer responses.

Step(s)	Rationale for response
1. No errors when opening.	Pass: Errors were NOT present during opening. Proceed to next Step. PWC: Errors were present during opening, but acceptable justification was provided. Proceed to next Step. Fail: Errors were present during opening. Proceed to next Step.
2. Minimized extraneous information	Pass: Minimal extraneous information exists. Proceed to next Step. PWC: FOR INTERIM SUBMITTALS ONLY – Excessive extraneous information exists, but acceptable justification was provided in the Model Standards Report. Proceed to next Step. Fail: Excessive extraneous information exists. Proceed to next Step.
3. Content exists for each discipline identified in the approved PxP.	Pass: Content for each identified discipline was provided. Proceed to Conclusion of Stage 4. PWC: For Interim Submittals Only – content for each identified discipline was NOT provided, but acceptable justification was provided in the Model Standards Report. Proceed to Conclusion of Stage 4. Fail: Content for each identified discipline was NOT provided. Proceed to Conclusion of Stage 4.

End of Check**Conclusion of Stage 4**

	Rationale for response
1. Result of Stage 4	Pass: All Checks in Stage 4 passed. Proceed to REVIEWER QAR. PWC: Discrepancies exist, but no Checks in Stage 4 failed. Proceed to REVIEWER QAR. Fail: One or more Checks failed in Stage 4. Proceed to REVIEWER QAR.

End of Stage 4**REVIEWER QAR**

At the conclusion of the review, refer to the REVIEWER INSTRUCTIONS of the CHX on how to proceed, and to the **Overview - Submittal Item Evaluation Action Codes** section in this Guide for additional information.

Supplement A – References

USACE BIM/CIM Contract Requirements References

The USACE BIM/CIM Contract Requirements include:

- Contract Language
- PxP
- M3
- CHX

Note: References throughout the CHX and Guide correspond to template contract requirements, and that this may vary from the contract requirements for a specific Project. Always refer to the current Project contract requirements as the source for compliance.

Reference Documents

The Guide references the following documents:

USACE Advanced Modeling Project Execution Plan (PxP)

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

USACE BIM Minimum Modeling Matrix (M3)

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

USACE Advanced Modeling Submittal Review Checklist (CHX)

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

Recommended Resources

The Guide references the following tools and resources:

Revit Model Checker by CADD Microsystems Inc.

<https://caddmicrosystems.com/custom-software-development/revit-model-checker>

Supplement B – General Terminology

A-1 General

A-1.1 Software Applications

1. **Autodesk Revit (Architecture, MEP, Structural), Bentley Systems AECOsim:** The two Model-based facility design-authoring platforms, also referred to as BIM (Building Information Modeling), whose file formats are most commonly required by USACE Customers for submittals.
2. **Autodesk Civil 3D, Bentley Systems InRoads:** The two Model-based Civil/Site design authoring tools, also referred to as CIM (Civil Information Modeling), whose file formats are most commonly required by USACE Customers for submittals.
3. **Autodesk AutoCAD, Bentley Systems MicroStation:** The two CAD tools whose file formats are most commonly required by USACE Customers for submittals.
4. **IFC Viewers:** Solibri, Tekla BIM-Site, IFCwiki.org

A-1.2 USACE BIM Process Terms and References

1. Requirements:
 - a. ECB 2018-7 Advanced Modeling Requirements on USACE Projects. This ECB directs the use of BIM processes and related technologies in all Military and Civil Works Projects, in accordance with the requirements identified.
https://www.wbdg.org/FFC/ARMYCOE/COEECB/ecb_2018_7.pdf
2. USACE Advanced Modeling Contract Requirements
 - a. Attributes, Parameters, Facility/Site Data
 - b. Project Execution Plan (PxP)
 - i. Model Uses
 - c. Minimum Modeling Matrix (M3)
 - d. Advanced Modeling Submittal Review Checklist (CHX) and Guide
3. Record Documentation
 - a. Model: The final submitted Model files
 - b. CAD: The final submitted CAD files derived from the Record Model
 - c. The Record CAD must be derived from the Record Model

A-2 Autodesk Revit Terminology

A-2.1 File Types and Organization

1. Central, Local, e-Transmit, DWFX, NWC, Linking
2. Project Files Location
3. Documentation File Location

A-2.2 View Types

1. Views, View Types, Export Views
2. Schedules
3. Sheets

A-2.3 Object Organization

1. Categories, Families, Types, Instances
2. Nested Families, Hosting, Groups
3. Vendor Delivered Content, USACE Revit Templates

A-2.4 Parameters**A-2.5 Appearance**

1. Visibility Graphics, Hiding in View, Model Lines, Detail Lines, Schedule Headers

A-2.6 Intentional Duplication

1. Copy Monitor, Design Options.

A-3 Bentley Systems AECOsim Terminology

None provided.

A-4 Sources for More Information

1. Autodesk Revit: <http://wikihelp.autodesk.com/Revit/>
2. Autodesk Civil3D: <http://docs.autodesk.com/CIV3D/2014/ENU/>
3. Bentley Systems AECOsim Building Designer: <http://docs.bentley.com/en/ArchitecturalBuildingDesigner/index.php>
4. Bentley Systems InRoads: <http://docs.bentley.com/es/InRoads/index.php>

Supplement C – Software Application Specific Directions

Reviewer's Directions Stage 1 - Prerequisite

Directions to complete Check 1.1: The PxP was reviewed and approved.

1. Log into RMS
2. Verify PxP Submittal was reviewed and approved.

<http://rms.usace.army.mil/>

Pass: RMS Code A or B indicates approval. Proceed to Check 1.2

Fail: RMS Code C or E indicates the Submittal has NOT approved.

Directions to complete Check 1.2: The PxP Demonstration was reviewed and approved.

1. Log into RMS
2. Verify PxP Demonstration was completed.

<http://rms.usace.army.mil/>

Pass: RMS Code A or B indicates approval. Proceed to Check 1.2

Fail: RMS Code C or E indicates the Submittal was NOT approved.

End of Directions Stage 1

Reviewer's Directions Stage 2 - Content Inventory

Directions to complete Check 2.1. All required electronic files were provided.

1. Determine if the '*Submitted Files List*' file exists in the submittal folder.
2. Verify all documents from the '*Submitted Files List*' were provided.

Create a list of files from the submittal to compare to the Submitter's list of files

1. Open the submittal .zip or CD
2. Download the files [at the USACE CAD/BIM Technology Center]
3. Place *List_of_files.bat* in the root directory of the submittal
 - i. *List_of_files.bat* contains the following code:
Text{dir /b /s > List_of_files.txt}
4. Run List_of_files.bat
 - ii. *List_of_files.bat* will generate *List_of_files.txt*
5. Visually compare List_of_files.txt to the Submitter's list of files.

3. All files identified in the approved *PxP - Section 11: Project Deliverables* were provided.

Compare against the files identified in the approved *PxP Section 11: Project Deliverables*.

4. Verify one CAD sheet file (.dwg or .dgn) and one PDF sheet file exists for each sheet of the drawing set.

Count the number of .dwg or .dgn files and compare to the number of PDF sheets submitted.

End of Directions Stage 2

Reviewer's Directions Stage 3 - Content Verification

Directions to complete Check 3.1. Files are in required software formats and versions, and contain appropriate content.

Approved *PxP Section 9: Technological Infrastructure Needs* defines disciplines and software versions used in the project.

1. BIM Files

Attempt to open files with the indicated software version

2. CIM Files

NOTE: note any errors or warnings upon opening in Check 4.1/4.2 as appropriate.

3. GIS Files

Attempt to open files with the indicated software version

4. CAD Files

Attempt to open files with the indicated software version

NOTE: note any errors or warnings upon opening in Check 4.3

5. 3D Interactive Review Model

Open file and verify that all content has a common alignment point. Leave open for Check 4.5 (or complete Check 4.5 at this time).

6. Industry Foundation Class (IFC) Coordination view

Open with Solibri and verify that all content has a common alignment point. Leave open for Check 4.6 (or complete Check 4.6 at this time).

Directions to complete Check 3.2. Quality Control Reports contain required content.

1. Model Standards Report

The report is the CHX V2.0.

2. A/E/C CAD Standard Report

This is APPENDIX A of the CHX V2.0.

3. A/E/C Graphics Standard Report

This is APPENDIX B of the CHX V2.0.

4. Interference Management (3D Coordination) Report

This report should show that the Mandatory Model Use 'Interference Management' was used, and to show the progress made to limit the number of interferences.

End of Directions Stage 3

Reviewer's Directions Stage 4 - Content Validation**Directions to complete Check 4.1. BIM Files.**

1. No errors when opening.	Check for comments from Check 3.1.
2. No broken Links, References, or X-References.	Revit: Broken Links AECOSim Building Designer: Broken References
3. No unloaded Links, References, or X-References exist.	Similar to Revit: Broken Links , but Status is 'Not Loaded' Similar to AECOSim Building Designer: Broken References , but the check mark under the camera icon is unchecked.
4. Minimized extraneous information (undefined, incorrectly defined, or duplicated elements).	
5. Content uses the coordinate system defined in the approved PxP.	See approved <i>PxP Section 10: Model Organization, Paragraph 10.3. Measurement and Coordinate Systems.</i> Revit: Location AECOSim Building Designer: Geographic Coordinate System
6. Models share a common alignment point.	Visually verify
7. Models were compressed and purged.	Revit: Minimal Imported Object Styles, Line Styles, and Purgeable Items AECOSim Building Designer: Purged and compressed
8. Applicable Models include Space/Room data	Revit: Verify Spatial Data AECOSim Building Designer: Verify Spatial Data
9. All schedules were produced from the Models, in accordance with the contract requirements and approved PxP.	Revit: Schedules AECOSim Building Designer: Schedules • Schedules shall be placed on 600 series sheets • Identify in the approved PxP accepted variances of schedules NOT produced from BIM.

Directions to complete Check 4.2. CIM Files.

1. No errors when opening.	Check for comments from Check 3.1.
2. No broken Links, References, or X-References.	AECOSim Building Designer: Broken References AutoCAD/Civil 3D: Broken X-References
3. No unloaded Links, References, or X-References exist.	Similar to AECOSim Building Designer: Broken References , but the check mark under the camera icon is unchecked.

Reviewer's Directions Stage 4 - Content Validation

4. Minimized extraneous information (undefined, incorrectly defined, or duplicated elements).

See approved *PxP Section 10: Model Organization, Paragraph 10.3. Measurement and Coordinate Systems.*

5. Content uses the coordinate system defined in the approved PxP.

[AECOSim Building Designer: Geographic Coordinate System](#)
[Civil 3D: Geographic Coordinate System](#)

6. Models share a common alignment point.

CIM files are aligned to each other and to the project survey point based on the geographic location and orientation on the project site

7. Compressed/purged.

Visually verify

Directions to complete Check 4.3. CAD Files

1. No errors when opening.
2. No broken Links, References, or X-References.

Check for comments from Check 3.1.

[In-Roads: Broken References](#)
[AutoCAD: broken X-References](#)

3. Minimized extraneous information (undefined, incorrectly defined, or duplicated elements)

4. Compliant with the A/E/C CAD Standard. See CHX APPENDIX A - A/E/C CAD STANDARD REVIEW CHECKLIST.

[AECOSim Building Designer/In-Roads: A/E/C CAD Standard](#)

5. Files were compressed/purged.

Visually verify

Directions to complete Check 4.4. PDF Drawings

1. All drawings were derived from the Advanced Modeling content, in accordance with the approved PxP.
2. Compliant with the A/E/C Graphics Standard. See CHX APPENDIX B - A/E/C GRAPHICS STANDARD REVIEW CHECKLIST

[Revit: Content was derived from the models](#)
[AECOSim Building Designer: Drawings derived from the model](#)

Directions to complete Check 4.5. 3D Interactive Review Model

1. No errors when opening.
2. Content exists for each discipline identified in the approved PxP.

Check for comments from Check 3.1.

Visually verify

3. Models share a common alignment point.

Visually verify Interactive Review Model elements are aligned to each other and to the project survey point based on the geographic location and orientation on the project site.

Directions to complete Check 4.6. Industry Foundation Class (IFC) Coordination View Files

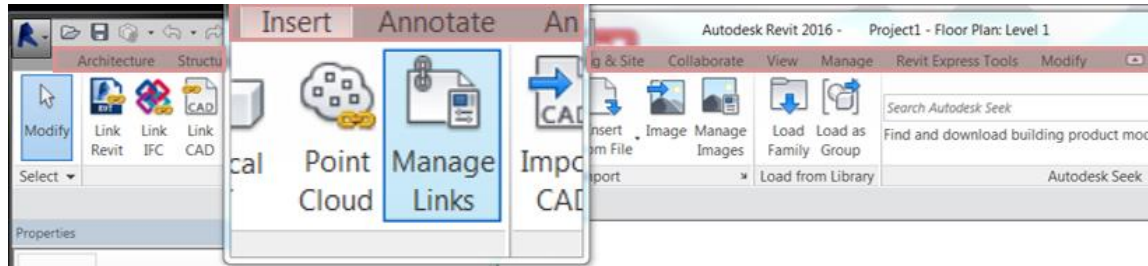
Reviewer's Directions Stage 4 - Content Validation

- | | |
|--|------------------------------------|
| 1. No errors when opening. | Check for comments from Check 3.1. |
| 2. Minimized extraneous information (undefined, incorrectly defined, or duplicated elements) | |
| 3. Content exists for each discipline identified in the approved PxP. | |

End of Directions Stage 4

Revit Specific Instructions

Check 4.1.2, Revit: Broken Links

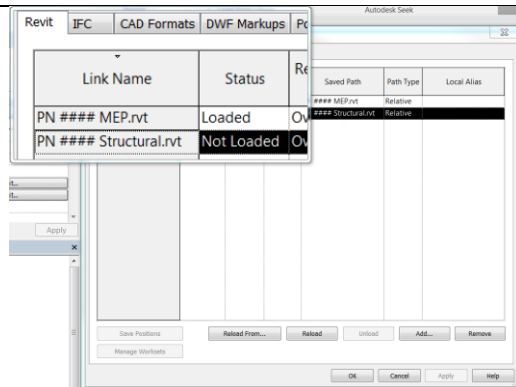


From Check 3.1: if Broken Links exist, Revit will notify the user upon opening.

1. On the Ribbon, navigate to the **Insert** tab.

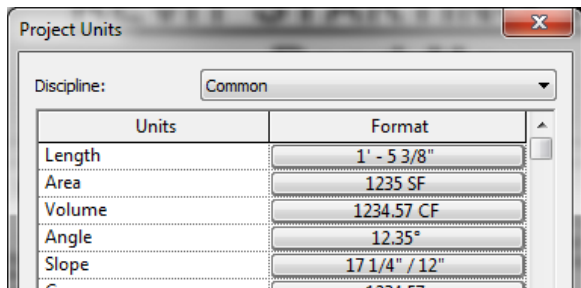
2. click on **Manage Links**

3. In the opened Manage Links Dialog box, Verify Status is *Loaded* for all linked items in all tabs.



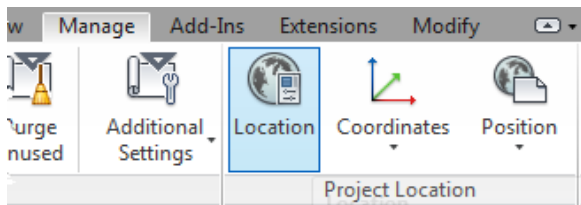
End of Check 4.1.2, Revit: Broken Links

Check 4.1.4, Revit: Location



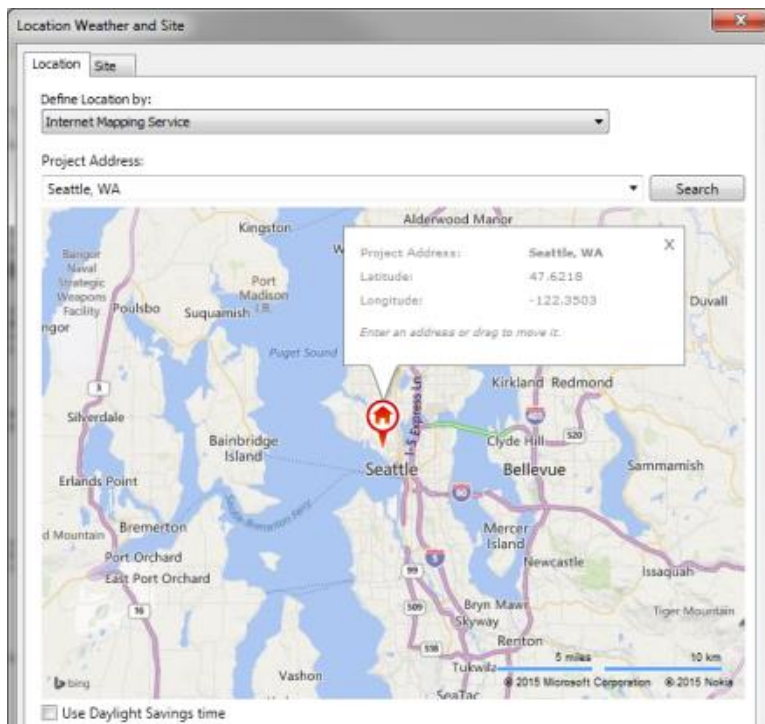
Verify the files use the correct Length units

1. Navigate to the **Manage** tab
2. Select **Project Units**
3. In the Project Units dialog box select **Common** from the Discipline drop-down menu
4. Verify that Length format is the same as identified in the approved PxP



Verify the files use the correct Geographic Coordinate System

1. Navigate to the **Manage** tab
2. Select **Location**



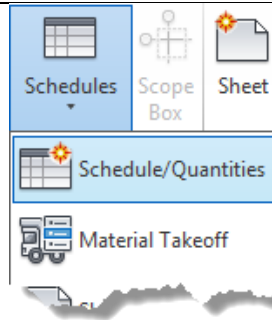
3. Verify the Project Address matches the location of the Project as identified in the approved PxP

End of Check 4.1.4, Revit: Location

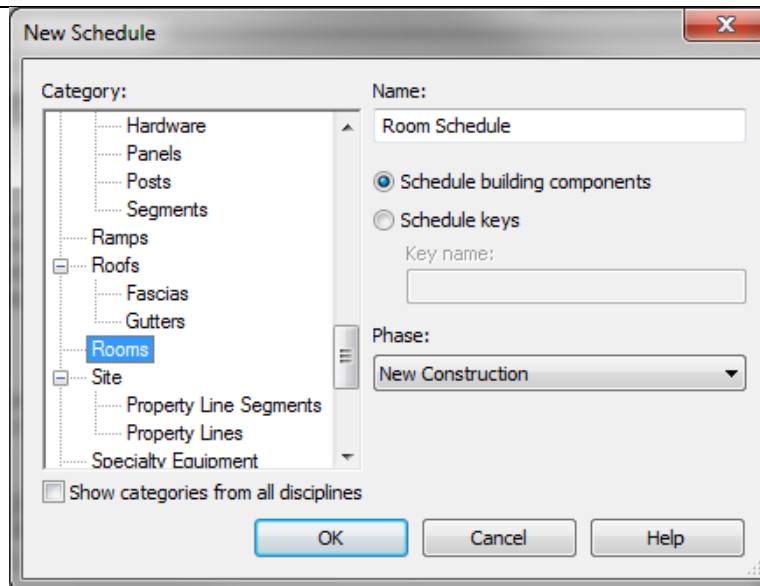
Check 4.1.8, Revit: Verify Spatial Data

Checking by Schedule:

Open the Revit Model(s) which include room and space data
(Architecture and Mechanical)

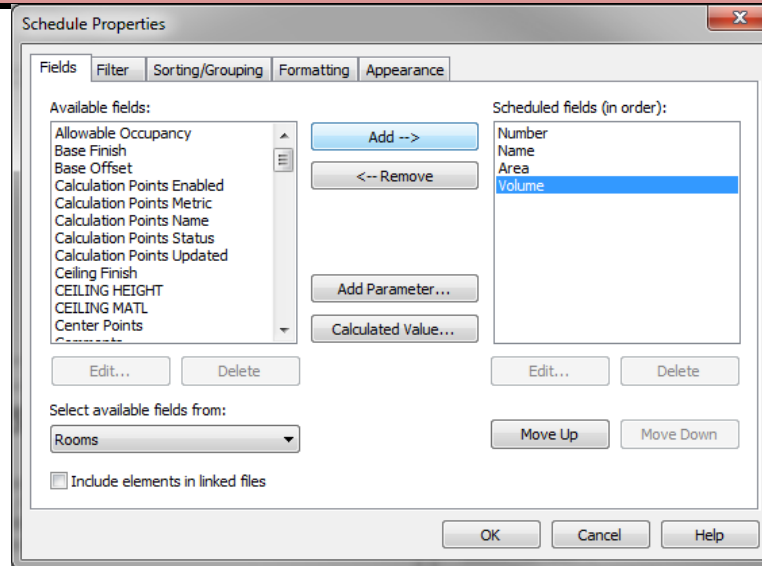
**Create a temporary Schedule of Rooms**

1. Navigate to the **View** tab, select **Schedule/Quantities**



2. In the **Category** Panel select **Rooms**, click **OK**

Check 4.1.8, Revit: Verify Spatial Data



3. In the **Available Fields** Panels select **Number**

4. Click **Add -->**

5. Repeat Steps 3 and 4 for the fields **Name**, **Area** and **Volume**

Click **OK**

Room Schedule			
Number	Name	Area	Volume
214	DORM	143 SF	1289.90 CF
213	DORM	143 SF	1289.90 CF
114	TRAINING RM	893 SF	7141.33 CF
114A	STO	43 SF	340.59 CF
108	SPRINKLER	113 SF	903.97 CF
115	CORR	490 SF	3917.71 CF
222	CORR	601 SF	4801.59 CF
216	SAUNA	Not Placed	Not Placed
221	CORR	273 SF	2183.65 CF
102	LOBBY	330 SF	2610.55 CF

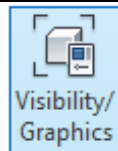
6. Use the schedule to check that all Rooms have a Number, Name, Area, and Volume defined

If any Room does NOT have a Number or Name defined, then document in the CHX as a discrepancy.

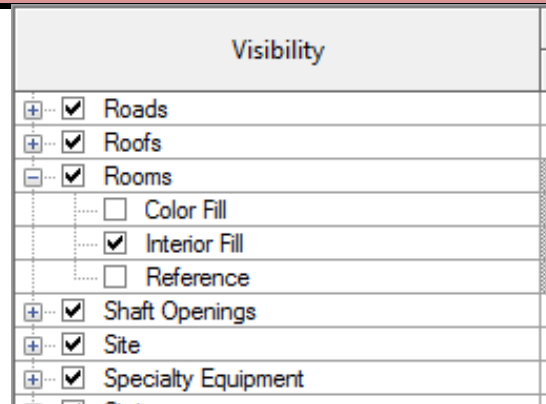
Checking Graphically

Only proceed with the following Steps if the number of Room objects in the schedule DOES NOT seem large enough for the size of the project. The following Steps will visually check that all spaces in the Model have Room objects modeled.

Use the Project Browser to open a Floor Plan View of each floor in the Project.



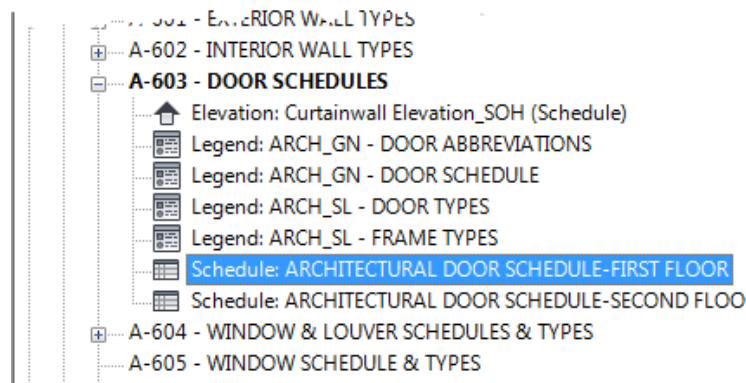
1. Use Visibility/Graphics (shortcut bb) to turn on Interior Fill for Rooms

Check 4.1.8, Revit: Verify Spatial Data

2. Check the **Visibility** box next to **Rooms**
3. Click the **Plus Sign** next to **Rooms** to open the selection tree
4. Check the **Visibility** box next to **Interior Fill**
click **OK**

5. Check the Floor Plan View for major spaces that do NOT have Rooms modeled

If any major space on the plan is NOT filled with color, this is indicative that a Room object was NOT modeled for this space and the Model FAILS this check

End of Check 4.1.8, Revit: Verify Spatial Data**Check 4.1.9, Revit: Schedules**

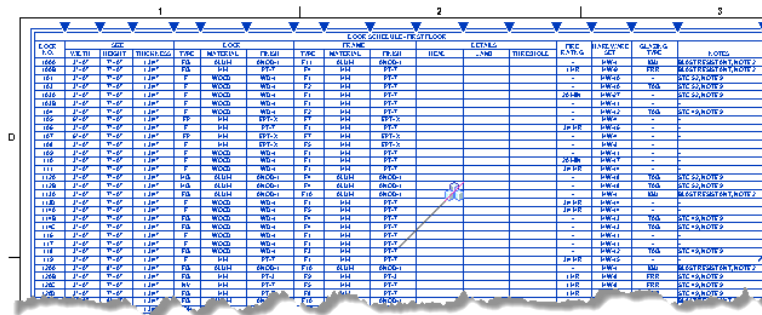
In the Project Browser navigate to the 600 series sheets

Option #1

1. Click the Plus Sign to expand the browser hierarchy for the sheet
2. Count the number of Schedule Views and compare to the number of schedules shown on the PDF set

Option #2

1. Open the sheet and select each schedule
2. Check that the schedule is identified as Schedule Graphics in the Properties Dialog



End of Check 4.1.9, Revit: Schedules

Check 4.4.1 Revit: Content was derived from the models

Visually check that the Revit Sheets in the Model match the PDF sheets (spot check except for Design Complete and Final Record submittals)

Number of sheets in Revit vs number of dwg/PDF sheets (refer to prior check for number of PDF sheets)

- a. Visually compare sheets side by side to identify discrepancies. Generate PDF sheet files from the Revit Model for exhaustive or spot-checking.

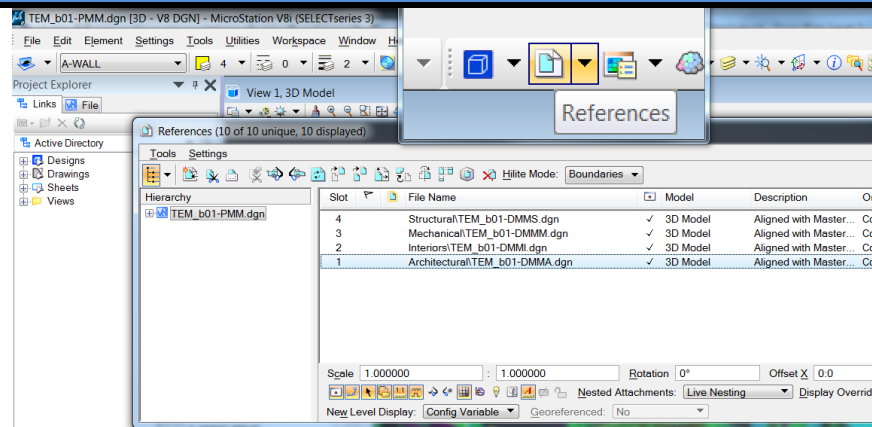
Check 4.4.1 Revit: Content was derived from the models

- i. Spot check: on a sampling of the sheets (10% is suggested), perform a manual or automated comparison of the documents
-OR-
- ii. Exhaustive check: use software such as Bluebeam Revu or Nemetschek Allplans to compare each sheet in the two PDF sets

End of Check 4.4.1 Revit: Content was derived from the models

AECOSim Building Designer Specific Instructions.

Check 4.1.2 and 4.2.2, AECOSim Building Designer/In-Roads: Broken References

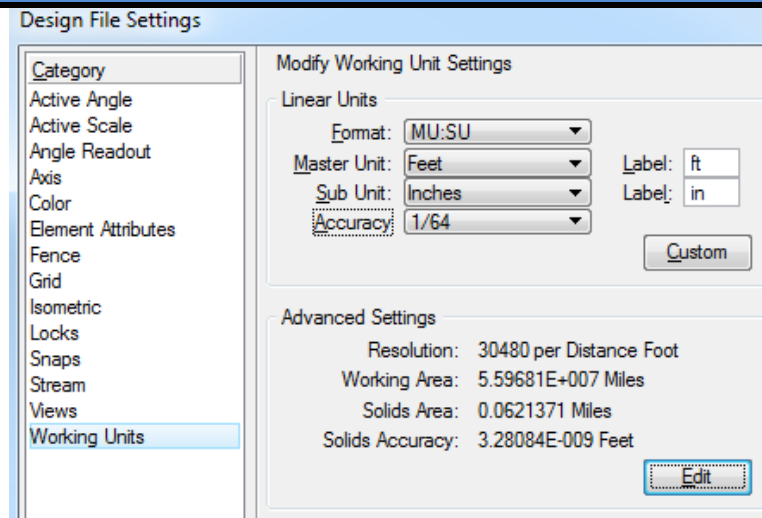


In the ribbon click on the **References** radio button

In the References dialog box any Broken References will show as color **Red**

End of Check 4.1.2, AECOSim Building Designer: Broken References

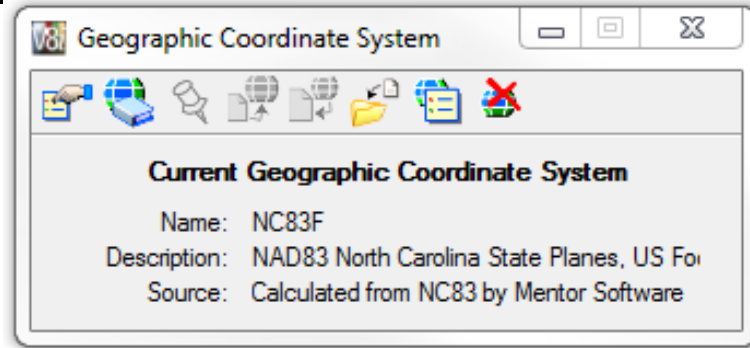
Check 4.1.4 and 4.2.4, AECOSim Building Designer/In-Roads: Geographic Coordinate System



Verify the files use the correct units

1. Navigate to **Settings**
2. Select **Design File**
3. Select **Working Units**
4. Verify the Linear Units format is the same as identified in the approved PxP

Check 4.1.4 and 4.2.4, AECOSim Building Designer/In-Roads: Geographic Coordinate System

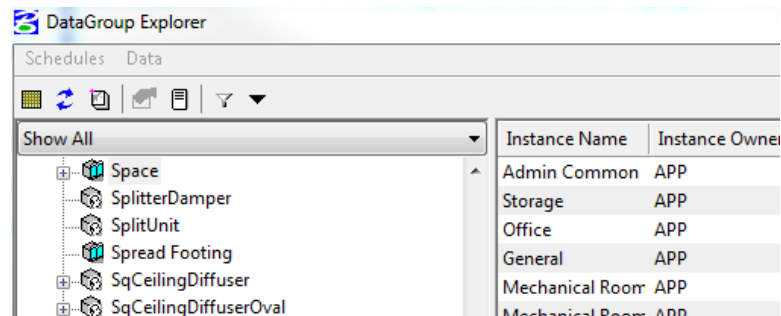


Verify the files use the correct Geographic Coordinate System

1. Navigate to **Tools**
2. Under **Geographic** – Select **Geographic Coordinate System**
3. Verify that the correct coordinate system is the same as identified in the approved PxP

End of Check 4.1.4 and 4.2.4, AECOSim Building Designer: Geographic Coordinate System

Check 4.1.8, AECOSim Building Designer: Verify Spatial Data

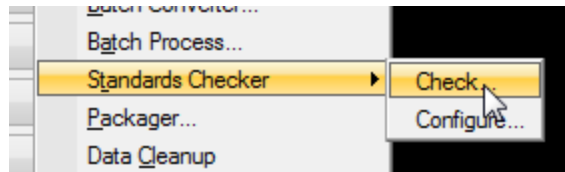


1. Open the Architectural Composite Model or the individual federated Model containing the Space Programming information.
2. Navigate to **Building Designer**
3. Select **DataGroup – Building Components**
4. Select Open **DataGroup Explorer**
5. Scroll down and select **Space**
6. Sort by room number
7. Compare the view to verify all rooms have spaces

End of Check 4.1.8, AECOSim Building Designer: Verify Spatial Data

Check 4.1.9, AECOSim Building Designer: Schedules

1. Locate delivered spreadsheets with exported AECOSim data in delivered submittal.
2. Open sheet with schedule (Finish Schedule, Door Schedule, etc.)
3. Validate Schedule has accompanying template and setup in DataGroup Explorer
4. Validate the Schedule is a linked item from Spreadsheet
5. Spot check individual items in sheet and determine if accompanying data is on the BIM object.

End of Check 4.1.9, AECOSim Building Designer: Schedules**Check 4.3.5 AECOSim Building Designer/In-Roads: A/E/C CAD Standard**

1. Check the CadStandardsCompliance.xml report file for levels, text styles, dimension styles, and line styles are correct per the A/E/C CAD Standard.
2. To verify the report, open any sheet file from the Project in AECOSim, then run Standards Checker to verify that the levels, text styles, dimension styles, and line styles are correct per the A/E/C CAD Standard.

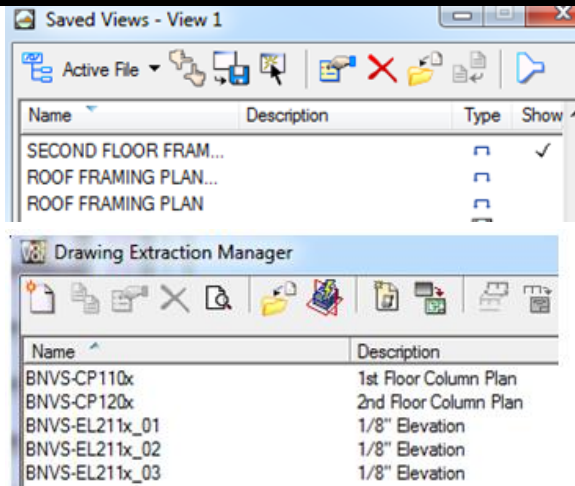
Levels – Check for nonstandard levels: byLevel color, weight and style; and Override color, weight and style.

Text Styles – Check for nonstandard text styles.

Dimension Styles – Check for standard and nonstandard dimension styles.

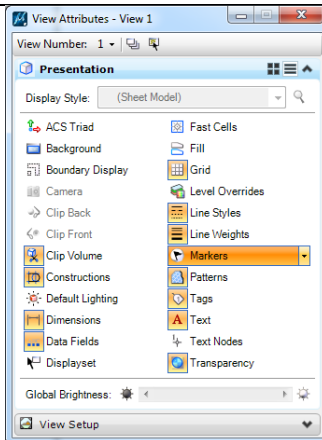
Line Styles – Check for nonstandard line styles.

Check 4.4.1, AECOSim Building Designer/In-Roads: Drawings derived from the model



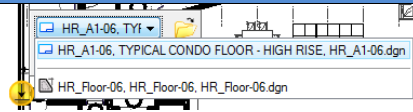
1. Open the AECOSim Master Model(s) and determine the method of sheet production that was used.
 - a. If Extractions were used to produce sheets:
 - i. Spot check: In the Discipline Master Model, open the Drawing Extraction Manager and check for drawing extraction definitions.
 - ii. Open one or more of the extraction definitions to verify that Mechanical and Structural resymbolization rules are used.
 - iii. Copy one or more of the extraction definitions, then extract and compare to the original extraction to see if there are differences.
 - b. If Dynamic Views were used to produce sheets:
 - i. Spot check: In the Discipline Master Model, open the Saved Views (Utilities/**Saved Views**) to see the list of saved views.
2. If the Extraction process was used, open sheet files and follow the reference file attachment chain.

To verify that the extractions are used throughout the Project, open a few of the sheet files (plans, elevations, building sections, etc.) and follow the reference chain back to the extraction.



1. Open the sheets.
2. Open View Settings and turn on Markers

Check 4.4.1, AECOSim Building Designer/In-Roads: Drawings derived from the model



Hover over the markers and check to see if they reference back to the Models.

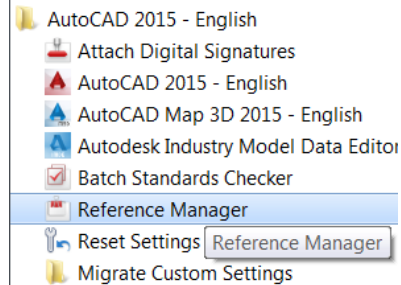
Slot	File Name	Model Description	Logical	Orientati	Presentation	Visible Edges			
1	... \Arc...	B...	30x42 Inches	Border	Coinc...	Wireframe	✓	✓	✓
2	... \HR...	H...	Standard Top	HR...	Stan...	Wireframe	✓	✓	✓
3	... \HR...	H...	HR_BLDGSECTIO...	HR...	Stan...	Wireframe	✓	✓	✓
4	__Mas...	___	Master Model	Mast...	HR_F...	(From Clip ...	Cached	✓	✓

Open the Reference file dialog and verify the dynamic views are NOT set to “Cached Visible Edges”.

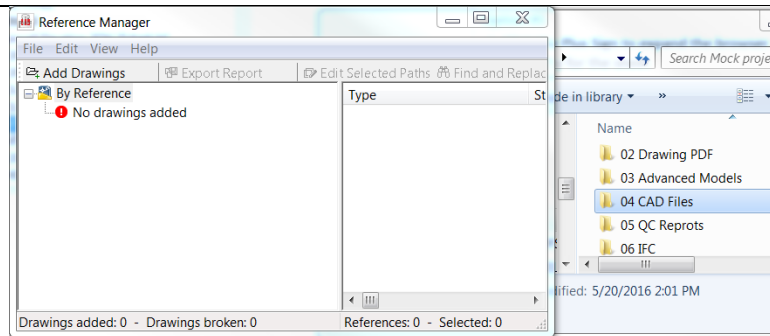
End of Check 4.4.1, AECOSim Building Designer/In-Roads: Drawings derived from the model

Civil 3D Specific Instructions

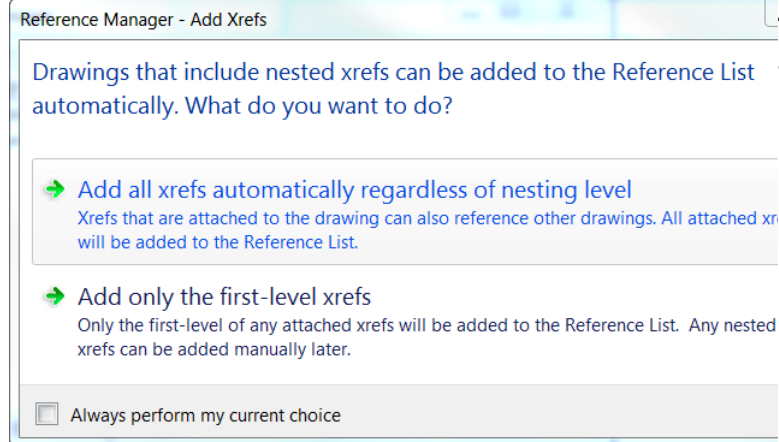
Check 4.2.2 and 4.3.2, AutoCAD/Civil 3D: broken X-References



1. Navigate to **Start -> All Programs -> AutoCAD** folder.
2. Select **Reference Manager**

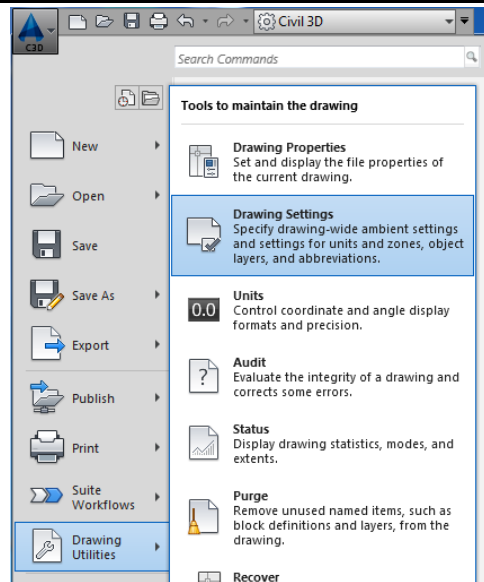


3. Drag the folder containing all CAD files and drop in working area.



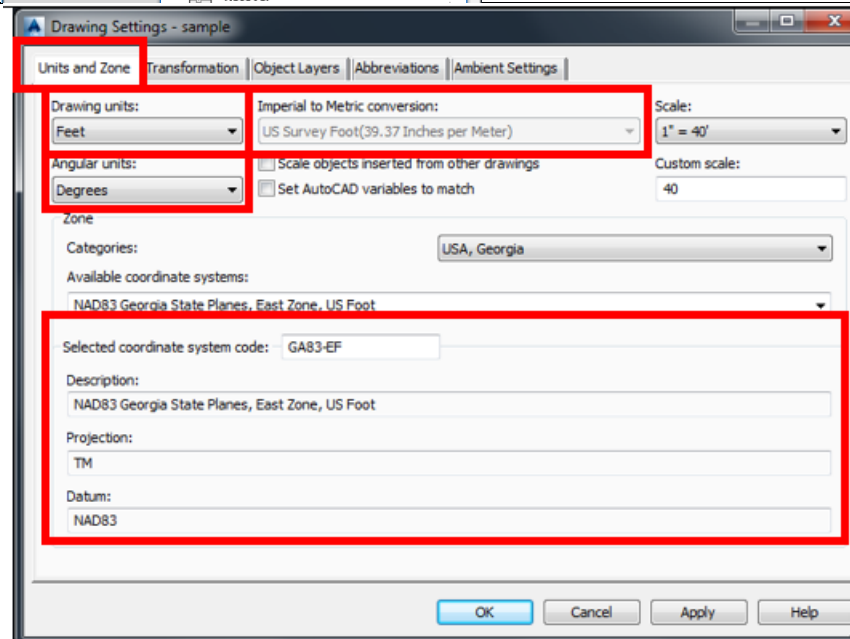
4. Click '*Add all xrefs automatically regardless of nesting level*'
5. A report is automatically generated upon completion of task.

End of Check 4.2.2, Civil 3D: No broken X-References

Check 4.2.5, Civil 3D: Geographic Coordinate System

Verify that the files use the correct Drawing Units

1. Navigate to Drawing Settings (Application button>Drawing Utilities>Drawing Settings).



2. On the Units and Zone tab Verify

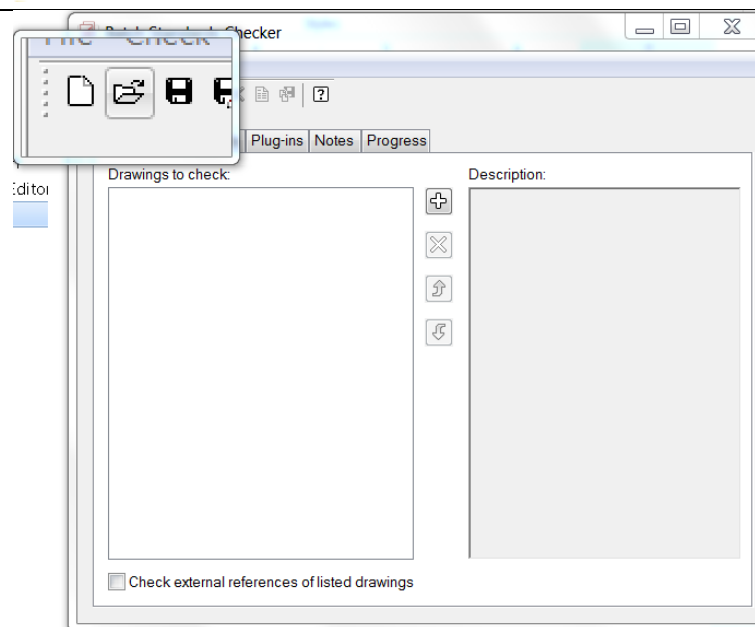
- a. Project units: (Feet or Meters)
- b. Imperial to Metric Conversion: (U.S. Survey Foot or International Foot).
- c. Angular Units: (Degrees, Grads, Radians)
- d. Coordinate System Zone

End of Check 4.2.4, Civil 3D: Geographic Coordinate System

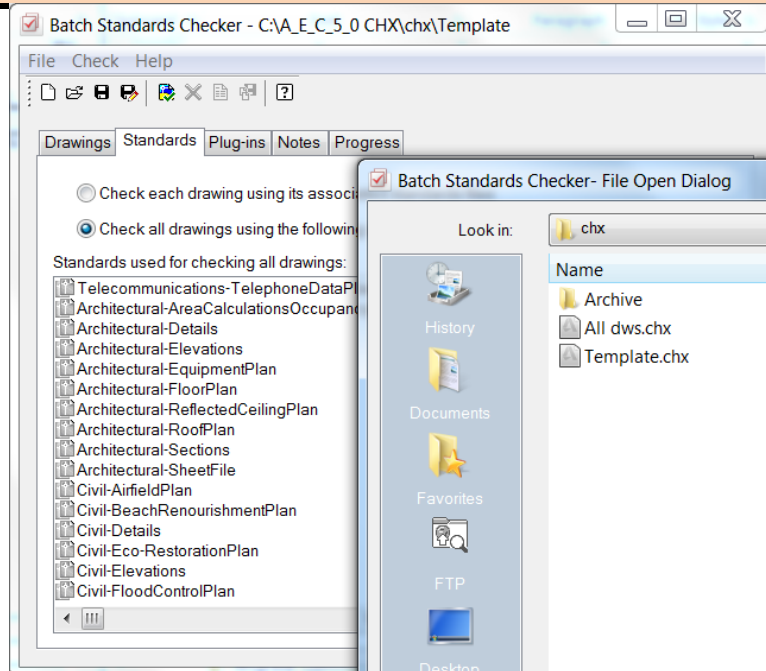
Check 4.3.4 AutoCAD/Civil 3D: A/E/C CAD Standard

- AutoCAD 2015 - English
- Attach Digital Signatures
- AutoCAD 2015 - English
- AutoCAD Map 3D 2015 - English
- Autodesk Industry Model Data Editor
- Batch Standards Checker**
- Reference Manager
- Reset Settings to Default
- Migrate Custom Settings

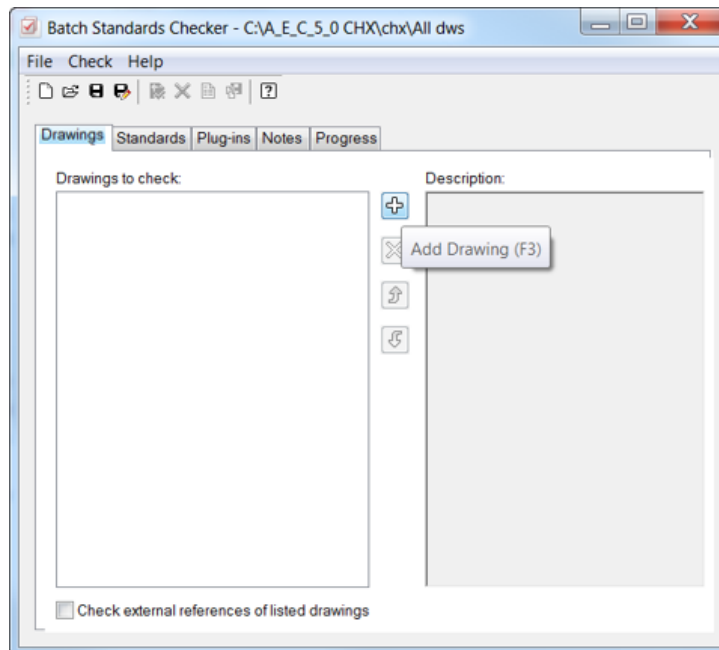
1. Navigate to **Start -> All Programs -> AutoCAD** folder.
2. Select **Batch Standards Checker**



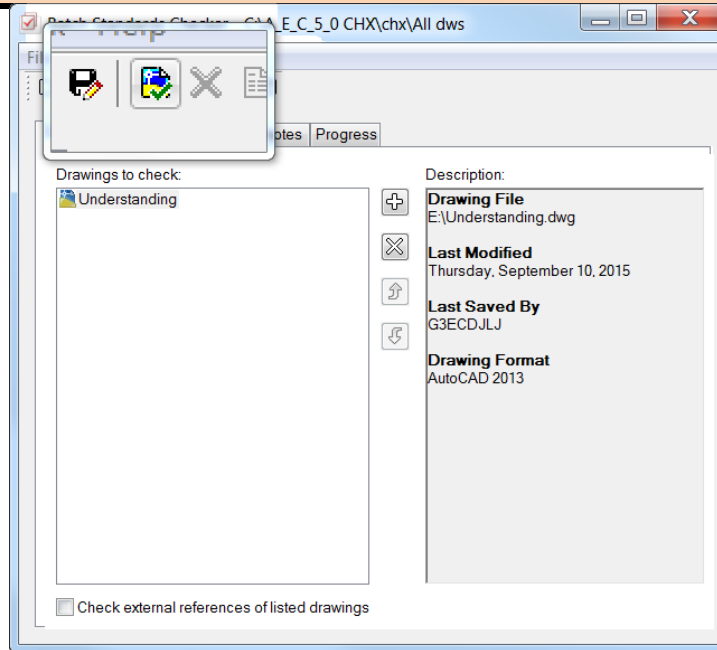
3. In the Batch Standards Checker, select the **Folder** icon to load the Standards files.

Check 4.3.4 AutoCAD/Civil 3D: A/E/C CAD Standard

4. Load the appropriate .chx file by double clicking the file.



5. Click on the **Drawings** tab, click on the **plus** sign to add drawings from the project directory.

Check 4.3.4 AutoCAD/Civil 3D: A/E/C CAD Standard

6. Click on **Start Check**, report automatically generates upon completion of task.

End of Check 4.3.5 AutoCAD: A/E/C CAD Standard

Supplement D – Version History with Reference to Contract Version

3 February 2014

1. Created.

Supplement E – Glossary

CHX: Advanced Modeling Submittal Review Checklist

Duplicate: An erroneous element that exists in the same place with same orientation

ENG FORM 4025-R: Standard USACE form for all submittals

ER 1415-1-10: Outlines requirements of ENG FORM 4025-R

Erroneous: Content that is misrepresented or incorrect

Extraneous: Content that is irrelevant or unrelated to the project

Guide: Submittal Review Guide

M3: USACE Minimum Modeling Matrix

PE: USACE Project Engineer

PWC: Pass With Comment

PxP: Project Execution Plan

QAR: Quality Assurance Review, performed by a Submitter

QCC: Quality Control Certification, performed by a Reviewer

Reviewer: A technical specialist, typically the BIM Manager or delegate, authorized to conduct an Advanced Modeling Submittal review

RMS: Resident Engineer Management System

Submitter: Contractor or in-house Government design team

UIBCC: USACE/Industry BIM and CIM Consortia

Undefined: Modeled content that does not have correct intelligence associated to it