AUTODESK

Exam objectives

Autodesk Certified Civil 3D Professional for Infrastructure Design

Target audience

The Autodesk Certified Professional (ACP) certification is designed for candidates who have advanced skills and can solve complex challenges in workflow and design. This type of experience typically comes from having worked with the software on a regular basis for at least two years, or equivalent to approximately 400 hours (minimum) to 1,200 hours (recommended) of Autodesk software experience. Certification at this level demonstrates a comprehensive skill set that provides an opportunity for individuals to stand out in a competitive job market.

Candidates who obtain this certification have demonstrated professional skills in Civil 3D and in standard workflows, processes, and project objectives. Candidates include industry professionals (civil designers), educators, and students in the civil design and engineering field.

Prerequisite skills

It's expected that candidates will already know how to:

- Proficient in AutoCAD.
- Basic knowledge of Civil 3D and the user interface.
- Basic knowledge of Civil Design terminology.
- Comprehend technical drawings and plan sets.
- Use basic AutoCAD tools such as draw and modify tools, layer management, object snaps, printing and configuring layouts, annotation tools, blocks, external references (Xrefs), and templates.
- Use the AutoCAD Sheet Set Manager to create, open, and publish sheets.
- Apply basic theory of civil design.

- Apply basic computer skills.
- Use collaboration tools with team members.

Exam objectives

Here are some topics and software features that may be covered in the exam.
You won't have access to the software during the exam, as all questions are in a selected response format and are designed to be answered without the software user interface.
Learn more about our exam format and question types in our Autodesk Certification FAQs.

Exam outline

Here are some topics and software features that may be covered in the exam. The table lists the main content domains and their weightings, followed by. The complete exam content outline.

Exam domain	% on exam
Alignments, Profiles, and Sections	**21%**
Surfaces and Grading	**20%**
Pipe and Pressure Networks	**12%**
Data Management and Collaboration	**19%**
Points, Parcels, and Survey Data	**12%**
Corridors	**16%**

1. Alignments, Profiles, and Sections

1.1. Create, modify, and label alignments

1.1.a Create an alignment from objects.

i. May include understanding the relationship between the selected objects and the resulting alignment.

ii. May include understanding the issues that must be considered when generating an alignment from a pipe network.

iii. May include the importance of selecting pipes and structures in a specific order.

1.1.b Create offset alignments.

1.1.c Edit alignment constraints.

i. May include length; radius; angle; type and tangency constraints; and alignment grid view.

1.1.d Add lines, curves, and spirals to an alignment.

1.1.e Reverse the alignment direction.

1.1.f Apply widenings for a specified length along an alignment.

1.1.g Modify and apply an alignment label set.

1.1.h Determine the correct alignment type based on a given scenario.

i. May include connected alignment.

1.1.i Use alignment tables.

i. May include splitting a segment table.

1.1.j Label the lines, curves, spirals, and PIs of an alignment.

1.1.k Distinguish between station offset and station offset fixed point labels.

1.2. Create, modify, and label profiles

1.2.a Create a surface profile along an alignment.

i. May include how to indicate the value, setting style, sample offsets surface profiles, and setting stations.

1.2.b Use profile creation tools.

i. May include adding PVI, tangents, and curves (fixed, floating, and free); designing vertical profiles; and drawing tangents with curves.

1.2.c Edit layout profiles.

i. May include profile curve length; grade change; editing a design profile and erasing existing entities; and visually recognizing what tool adds a PVI.

1.2.d Describe the purposes, features, and functions of the profile grid view.

i. May include using Alignment Grid View to apply grade in and grade out.

1.2.e Apply different types of vertical curves based on design requirements.

1.2.f Utilize profile grips.

1.2.g Modify and apply a label set.

1.2.h Determine the correct profile label type based on a given scenario.

1.3. Create, modify, and label profile views

1.3.a Describe the relationship between profiles, profile views, and profile view bands.

1.3.b Identify available object types to project to a profile view.

i. May include blocks, 3D solids, 3D polylines, points, feature lines, and survey figures.

1.3.c Create a profile view.

i. May include creating multiple profile views simultaneously.

ii. May include using the Quick Profile tool.

1.3.d Split a profile view.

1.3.e Describe the placement of different types of profile view labels.

1.3.f Work with profile view labels.

i. May include major and minor stations labels; and profile station offset labels.

ii. May include horizontal and vertical geometry labels.

1.3.g Apply profile band sets and control the display of data band content.

1.4. Create, modify, and label sample lines and sections

1.4.a Create and label sample lines.

i. May include creating sample lines by Range of Stations.

1.4.b Edit sample line group properties.

i. May include modify ranges, change width, toggle on/off begin/end, add geometry points, etc.

ii. May include changing sampled items and styles.

1.4.c Label sections in section views.

i. May include code set styles.

1.4.d Modify section appearance in section views.

i. May include code set styles.

1.4.e Add and remove sample sources.

1.5. Create, modify, and label section views

1.5.a Create and. update section views.

i. May include creating multiple sections.

1.5.b Add and rearrange new views.

1.5.d Toggle code set styles.

1.5.e Create section sheets.

1.5.f View group organization.

i. May include draft mode, based on template sheet layout, spacing, etc.

i. May include updating section view group layout.

1.5.g Apply section view styles.

1.5.h Project objects to section views.

1.5.i Apply section view band sets.

1.5.j Add tables to section views.

2. Surfaces and Grading

2.1. Create, modify, and label surfaces

2.1.a Edit surfaces.

i. May include swapping and removing surface triangle edges.

ii. May include limiting data with crop surface or data clip.

2.1.b Create surfaces based on data type.

i. May include TIN surfaces, TIN volume surfaces, Grid surface, etc.

2.1.c Edit the properties of a surface definition.

2.1.d Demonstrate how to label slope, spot, and contours.

2.1.e Identify how to change surface style analysis types.

i. May include slope arrows, data bands, slope patterns, contours, etc.

2.1.f Identify the parameters and display settings of surface styles.

2.1.g Identify how a surface is built and how the surface data is used for calculations.

i. May include understanding how to diagnose complex surface builds when performing grading edits or building existing surfaces.

2.1.h Identify the data categories of a surface definition.

i. May include boundaries, breaklines, contours, DEM files, drawing objects, point files, point groups, point survey queries, figure survey queries, and listing the types of objects that can be added to a surface.

2.1.i Define surface boundary types.

2.1.j Manipulate surface draw order.

2.1.k Understand how and when to display Triangular Irregular Network (TIN) lines.

2.1.l Identify how to extract data from a surface.

2.2. Perform surface analysis

2.2.a Identify the properties of a surface analysis type.

i. May include display of contours, directions, elevations, slopes, slope arrows, user-defined contours, and watersheds.

2.2.b Set the analysis parameters for a surface style.

2.2.c Access and review surfaces statistics.

i. May include area and volume; minimum and maximum coordinates; and minimum, maximum, and mean elevations.

2.3. Create surface volume calculations

2.3.a Access and review surfaces statistics.

i. May include area and volume; minimum and maximum coordinates; and minimum, maximum, and mean elevations.

2.3.b Identify which surface should be the base surface vs. the comparison surface.

2.3.c Identify how a surface is built and how the surface data is used for calculations.

2.3.d Add volume tables.

2.3.e Apply a bounded volume to an existing volume surface in the Volumes Dashboard.

2.4. Create and modify feature lines

2.4.a Create feature lines.

i. May include different ways to create feature lines.

2.4.b Edit feature line horizontal geometry.

i. May include Break, Trim, Extend, Join, and Insert/Delete PI.

2.4.c Edit feature line elevations.

i. May include inserting a high or low elevation point on a feature line; raising and lowering feature lines; setting feature line elevations from a surface; and using the Grading Elevation Editor.

2.4.d Describe how feature lines interact when assigned to the same site.

2.4.e Work with relative feature lines.

2.4.f Edit feature line elevations.

2.4.g Work with relative elevations.

2.5. Create and modify Grading Creation Tools

2.5.a Create grading groups.

i. May include adjusting the cut and fill volumes for a grading group; and automatic surface creation.

2.5.b Use grading creation and editing tools.

i. May include setting target surface, creating infills, using the Grading Editor (Panorama) to edit unlocked criteria values for a grading object, and using grips to edit grading.

2.5.c Set and modify grading criteria.

2.5.d Describe how grading objects interact with each other when they are part of the same site.

2.5.e Create Grading Surface.

i. May include setting tessellation angle and distance.

3. Pipe and Pressure Networks

3.1. Create, modify, and label gravity pipe networks in plan, profile, and section views

3.1.a Demonstrate knowledge of Pipe Network Catalogs.

3.1.b Assign and utilize the parts lists.

3.1.c Identify the tools used to modify gravity pipe networks.

i. May include RIM/Invert elevations, slopes, etc.

3.1.d Demonstrate knowledge of the gravity pipe network flow direction settings.

3.1.e Utilize plan, profile, and section annotations for pipe network objects.

3.1.f Swap gravity pipe network parts.

3.1.g Create alignment from network parts.

3.1.h Create gravity pipe networks.

i. May include from objects, by layout.

3.1.i Configure the gravity pipe network.

i. May include reference surface/alignment, depth parameters, rules.

3.2. Create modify, and label pressure networks in plan, profile, and section views.

3.2.a Describe the purpose of the part catalog and parts list.

3.2.b Set the pressure part catalog location.

3.2.c Add and modify parts and part sizes in the parts list.

3.2.d Identify the tools used to modify pressure pipe networks.

i. May include elevations, slopes, pipe runs, etc.

3.2.e Add parts, pipes, fittings, and appurtenances to a profile view.

3.2.f Swap pipe network parts.

3.2.g Configure the pressure pipe network.

i. May include reference surface/alignment, depth parameters, diameter.

3.2.h Apply labels to network or network parts in plan, profile, and section.

3.2.i Create alignment from network parts.

3.2.j Create pipe networks.

i. May include from objects, by layout, or from pipe run.

4. Data Management and Collaboration

4.1. Share Civil 3D data between files

4.1.a Utilize points from other sources including a Survey Database, ASCII-formatted files.

4.1.b Create and manage Data Shortcuts.

i. May include subfolders.

4.1.c Identify when to use a Data Reference or an External Reference.

4.1.d Create a Data Reference.

4.2. Reference templates

4.2.a Manage links to reference templates.

4.2.b Respond to template setting conflict warnings.

4.2.c Work with referenced components.

4.2.d Understand load/unload reference templates.

4.3. Create sheets using plan production tools

4.3.a Create view frames.

i. May include creating view frames based on the alignment in a drawing, a designated plan, or profile view.

4.3.b Create sheets from a view frame group.

i. May include the number of layouts per new drawing, all layouts in one new drawing, or all layouts in the current drawing.

4.3.c Describe what controls the sheet layout, viewports, and data displayed in the view ports.

i. May include size, shape, and type.

4.4. Utilize Reports Manager tools

4.4.a Access report creation tools.

4.4.b Execute reports.

4.5. Utilize import and export tools

4.5.a Identify object types that can be transferred using LandXML, FBX, SHP, and ASCII-formatted files.

4.5.b Identify different ways to import Civil 3D objects.

i. May include points and surfaces.

4.5.c Export feature lines.

4.5.d Export Civil 3D content as solids.

4.6. Demonstrate knowledge of sites.

4.6.a Create and modify sites.

i. May include site definition; adding objects to a site; and moving or coping objects to another site.

4.6.b Describe how objects within a site interact with other objects in that same site.

46.c List objects that can be in a site and identify which ones must be in a site and which are optional.

4.7. Modify and apply Civil 3D styles

4.7.a Identify how to apply Civil 3D styles to 3D objects.

4.7.b Recall how to add additional data to a Civil 3D label style.

i. May include N/E, Lat/Long, and Reference Data (Alignments, Surfaces, etc.).

4.7.c Modify and apply Civil 3D styles for labels and objects.

4.7.d Recognize the ways Civil 3D styles can be accessed and managed.

4.7.e Renumber tag labels using appropriate Civil 3D tools.

4.7.f Modify a label's association to a different object.

4.8. Assign coordinate systems and create Shared Reference Points

4.8.a Identify the current coordinate system of a file.

4.8.b Assign the appropriate coordinate system to a Civil 3D drawing.

4.8.c Identify the process to execute the Shared Reference Point for Autodesk Revit.

4.8.d Identify what data types are exchanged between Revit and Civil 3D to create a shared Reference Point.

5. Points, Parcels, and Survey Data

5.1. Import, create, and modify points

5.1.a Describe the difference between Survey and Coordinate Geometry (COGO) points.

5.1.b Create COGO points.

5.1.c Specify point parameters.

i. May include points creation, point identity, default layer, default styles, default name format, default description and dropdown options from Point Creation Tools.

5.1.d Assign point styles.

i. May include point markers and description key sets.

5.2. Modify and apply point labels.

5.2.a Add and edit point labels.

5.2.b Assign point label styles.

i. May include point groups and description key sets.

5.3. Create and modify point groups

5.3.a Create and modify Point Groups.

i. May include equipment, plumbing fixtures, duct and pipe, accessories, space, and air terminal tags.

5.3.b Apply Point Group label and style overrides.

5.3.c Apply point group filter and query

5.3.d Manage Point Group display.

i. May include Point Group display order and updating Point Groups.

5.4. Create, modify, and label parcels

5.4.a Create a parcel from drawing objects.

i. May include understanding what objects can be converted to parcels and understand the difference between a parcel and a parcel segment.

5.4.b Create a parcel by layout .

i. May include using parcel layout and sizing tools, swing line or side line, parcel creation default settings, and specifying minimum frontage at a frontage offset.

5.4.c Create parcels by subdividing an existing parcel .

i. May include creating slide or swing lines; and dividing a parcel into equal segments with remainder distribution.

5.4.d Manage parcel properties.

i. May include assigning a parcel style, an area label style, renumbering parcels, set Point of Beginning (POB), and changing the display order of parcels contained within a site.

5.4.e Identify and apply labels.

i. May include area, tag, line, parcel and parcel segment labels.

5.4.f Edit parcel segments with Modify Geometry Tools.

5.4.g Creating Parcel segment and area tables.

5.4.h Create Right of Way parcels.

6. Corridors

6.1. Create and modify corridors

6.1.a Create a corridor.

i. May include creating a corridor from an alignment/profile (one baseline, multiple regions like add, split, and merge) and creating a corridor from feature lines.

6.1.b Add multiple baselines to a corridor.

6.1.c Clear corridor bowties.

6.1.d Rebuild corridors.

6.1.e Create objects from a corridor.

i. May include extracting objects, corridor surfaces, and including boundaries.

6.1.f Modify corridor properties.

i. May include assigning code set styles, targets, or frequencies.

6.1.g Explain the difference between baselines created from alignments and those created from feature lines.

6.1.h Utilize corridor tools to edit the targets and frequency.

6.1.i Split and merge corridor regions.

6.2. Create and modify corridors

6.2.a Create assemblies.

i. May include assembly specific copy, mirror, or move commands.

6.2.b Modify subassembly properties

i. May include multiple subassemblies.

6.2.c Modify assembly properties.

i. May include assigning code set styles.

6.3. Create corridor surfaces

6.3.a Create a corridor surface.

i. May include creating a corridor from an alignment/profile (one baseline, multiple regions like add, split, and merge) and creating a corridor from feature lines.

6.3.b Apply boundaries to a corridor surface.

i. May include utilizing different types of data, feature lines and links (point codes, link codes).

6.3.c Apply appropriate overhang correction.

i. May include automatic, corridor extents, polylines, interactive, etc.

6.4. Utilize Calculate material quantities

6.4.a Compute Materials.

i. May include using a cut/fill material.

6.4.b Name the different types of quantities that can be computed via corridor models.

6.4.c Identify the difference between the QTO tools and the Compute Quantities command.

6.4.d Identify the prerequisites of using the Compute Quantities command.

6.5. Utilize custom PKTs

6.5.a Import custom subassemblies (PKT) into the drawing.

6.5.b Update custom subassemblies (PKT) with a newer/revised version.