



AUTODESK CONSTRUCTION CLOUD™



AUTODESK

pilvelahendused ehitajale

LEKTOR

Hendrik Park

29.04.2021

BIM KEVADSEMINAR



BIM kevadseminar 2021

28.-29. aprillil toimuvad Usesofti koolituskeskuse Autodeski lahendusi tutvustavad veebipõhised lühiseminarid

Vaata kava

usesoft.ee/bim-kevadseminar-2021



IT-lahendused ja konsultatsioon:

➤ CAD/BIM ja äritarkvara:

- ✓ Koolitused, konsultatsioon ja müük;
- ✓ **ehituse-** ning **tootmise** andmete juhtimine ja visualiseerimine;

➤ IT-tugiteenused

➤ Tarkvaraarendus

Specialization
Architecture, Engineering &
Visualization

Value Added Services
Authorized Training Center
Authorized Certification
Center



Töölane kogemus:



**Digitaalehituse
konsultant**
2018 -

Erialane organisatoorne tegevus:



EVS/TK 50
Ehitusinformatsiooni
modelleerimine (BIM)



**Digitaalehituse
Klaster**

Haridus:



www.emu.ee

Eesti Maaülikool
Estonian University of Life Sciences

Maaehitus (MSc)

(Diplomeeritud ehitusinseneri
esmane kutse üldehituses, tase 7)
... - 2018

BRiDEN

Co-Founder
2020 -

INTELSYS BUILD

**IT-arenduse
tootejuht**
2018 - 2020



**Projekteerimise
projektijuht**
2017 - 2018



**Objektijuht /
Projektijuht**
2013 - 2017

**TAL
TECH**

**Infosüsteemide analüüs
ja kavandamine (MSc)**
2019 - ...

ETTEKANDE ÜLESEHITUS

1) EHITUSPROJEKTIDES KOOSTÖÖ KORRALDUSEST

Hetkeiseis ja vahetuma koostöö korraldamise vajadusest

29.04.2021 | BIM kevadseminar – Autodesk pilvelahendused ehitajale

6



2) AUTODESK CONSTRUCTION CLOUD™

Lahendustest ehitajale

29.04.2021 | BIM kevadseminar – Autodesk pilvelahendused ehitajale

14



3) KOKKUVÕTE JA QA

29.04.2021 | BIM kevadseminar – Autodesk pilvelahendused ehitajale

32



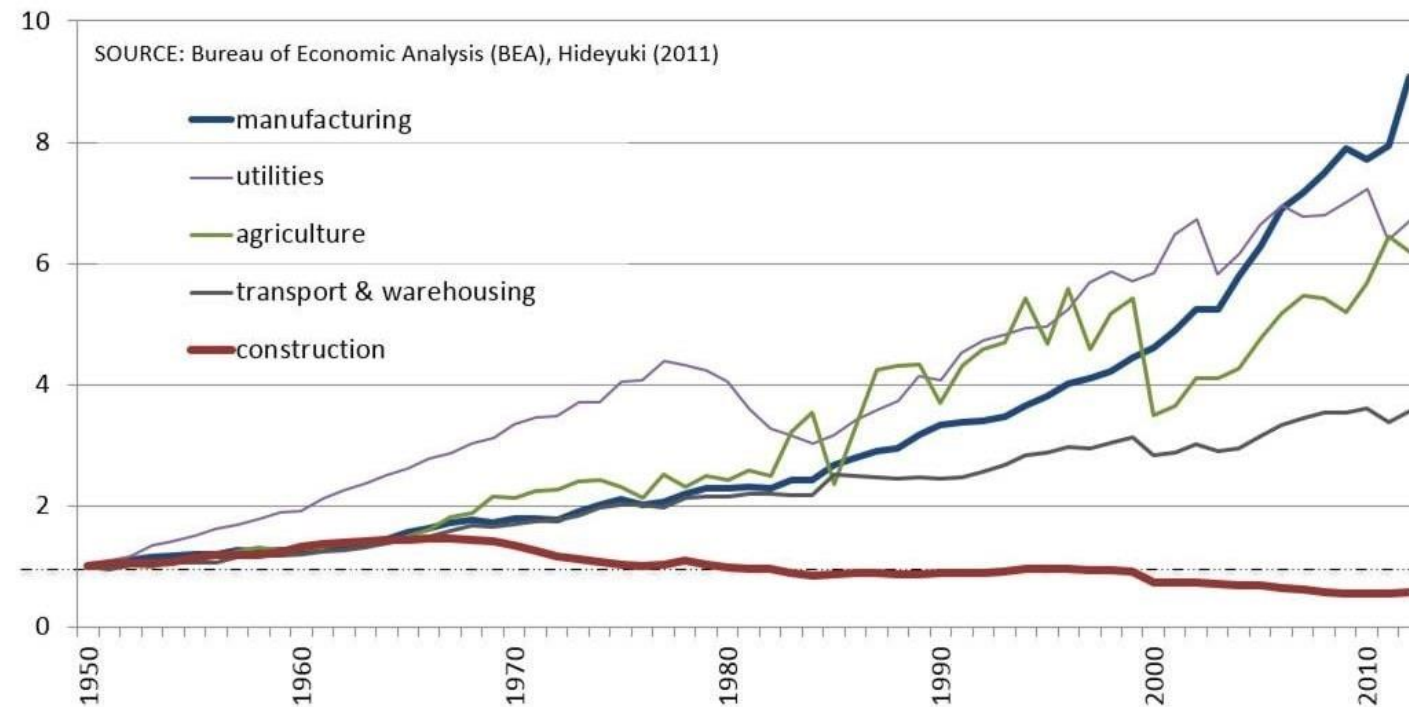
1) EHITUSPROJEKTIDES KOOSTÖÖ KORRALDUSEST

Hetkeseis ja vahetuma koostöö korraldamise vajadusest

SEKTORI TOOTLIKKUS

Construction productivity 1950-2012

Real productivity (GDP value-add per employee) by industry in the US
Indexed; 1950 = 1.0



Construction matters for the world economy
... but has a long record of poor productivity

Construction-related spending
accounts for
13%
of the world's GDP

...but the sector's annual productivity
growth has only increased
1%
over the past 20 years

\$1.6 trillion
meeting half the world's infrastructure need

of additional value added could be
created through higher productivity,

Allikas: McKinsey & Company 2017

Tänased ehitussektori väljakutsed



**Madalad
margiaalid**



Pidev ajasurve



**Killustunud info-
vahetus**



Tööjõu puudus



**Distsantsil
meeskonnad**



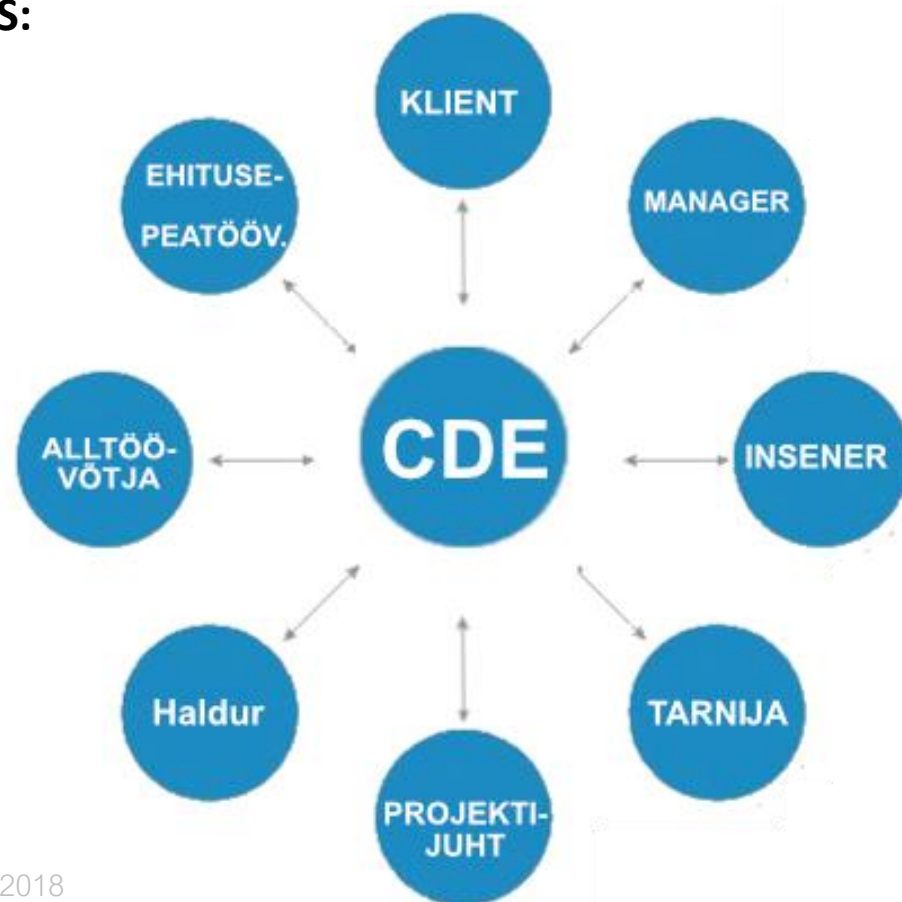
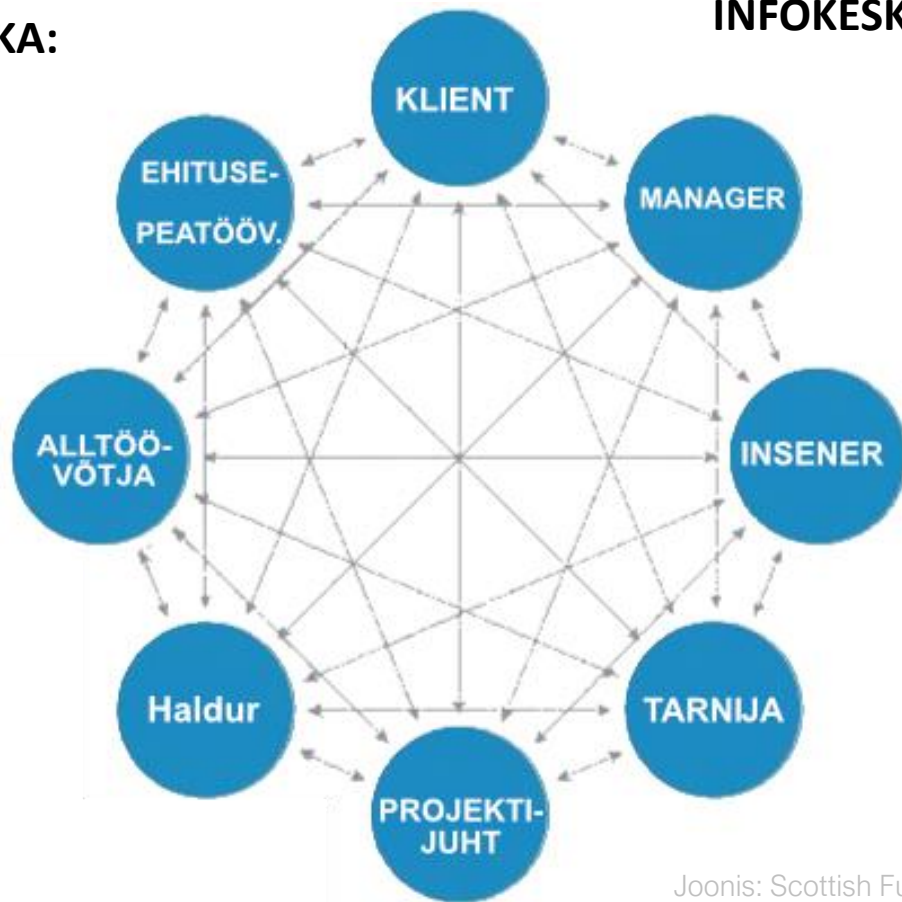
Ebakindlus

PROJEKTI OSAPOOLED & ANDMED

PS! Tehniline keskkond +
ühised projektipõhise
koostöö põhimõtted!

TÄNANE
PRAKTIKA:

ÜHTSES
INFOKESKKONNAS:



Joonis: Scottish Futures Trust, 2018

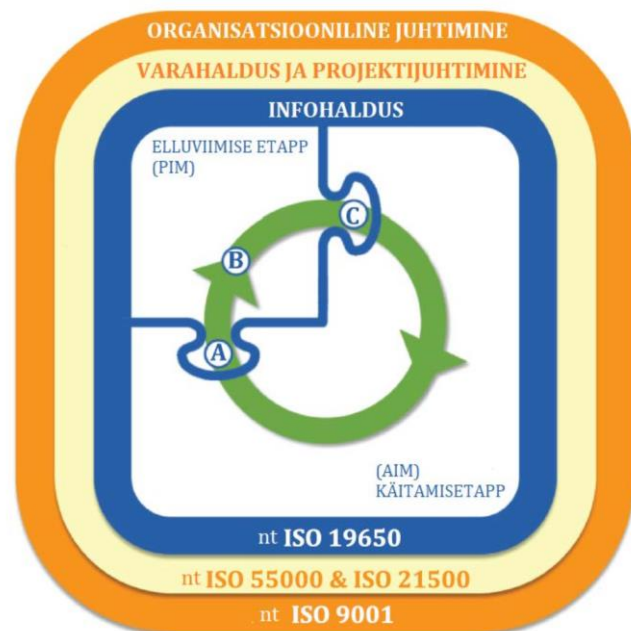
PROJEKTI OSAPOOLED & ANDMED



EVS TK 50
AST BIM nõuded



EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION



EESTI STANDARD

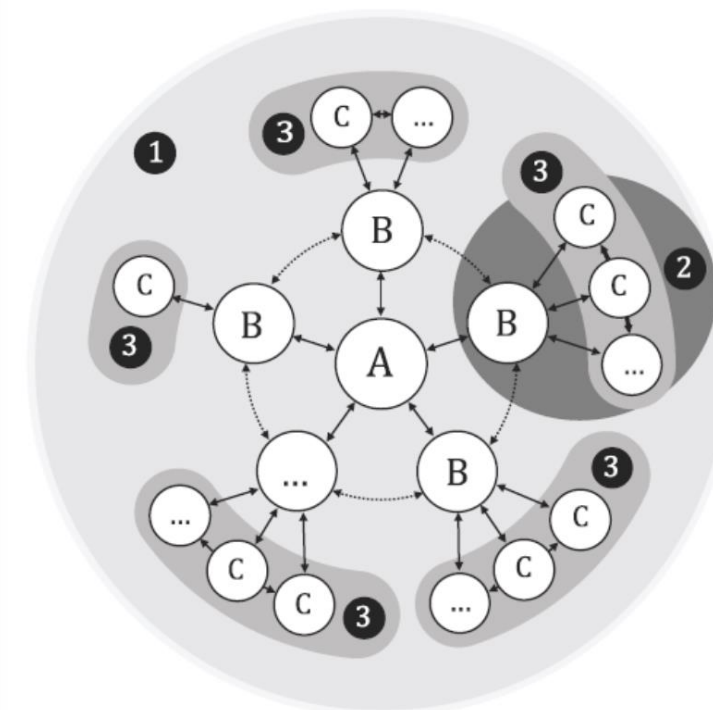
EVS-EN ISO 19650-1:2018

Avaldatud eesti keeles: detsember 2019
Jõustunud Eesti standardina: jaanuar 2019

**HOONETE JA RAJATISTEGA SEOTUD INFO, SEALHULGAS
EHITUSINFORMATSIOONI MODELLEERIMISE (BIM)
KORRALDAMINE JA DIGITALISEERIMINE**
Infohaldus ehitusinformatsiooni modelleerimise abil
Osa 1: Mõisted ja põhimõtted

Organization and digitization of information about
buildings and civil engineering works, including
building information modelling (BIM)
Information management using building information
modelling
Part 1: Concepts and principles
(ISO 19650-1:2018)

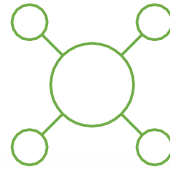
EESTI STANDARDIKESKUS **EVS**
ESTONIAN CENTRE FOR STANDARDISATION



Eelnevast tulenevalt võimalikud lahendused



**Vahetu koostöö
suurendamine**



**Kesksed
infoväljad**



**2D ja 3D
maailmade
ühendamine**



**Andmete täpsuse
suurendamine**

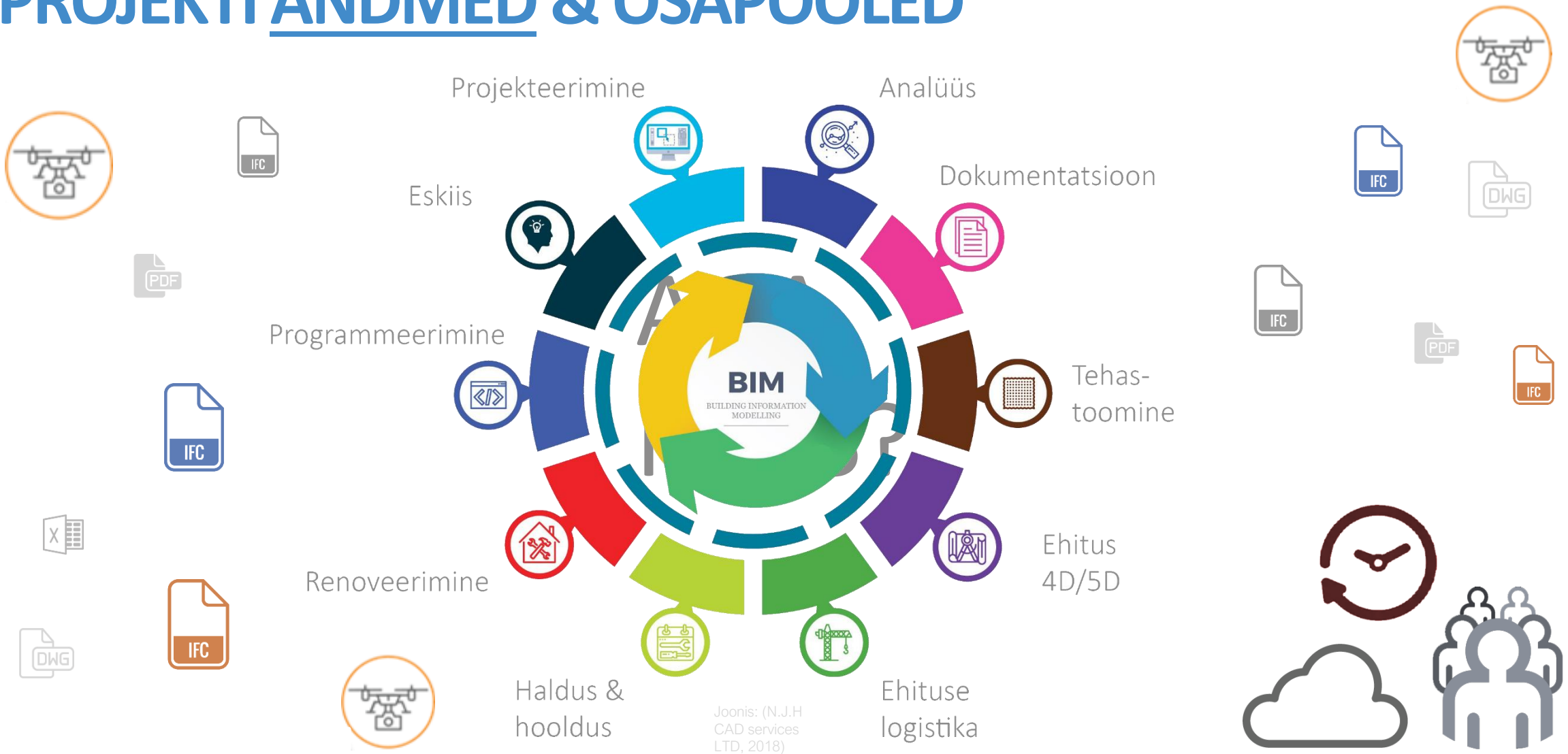


**Standardi -
seerimine**



Digitaliseerimine

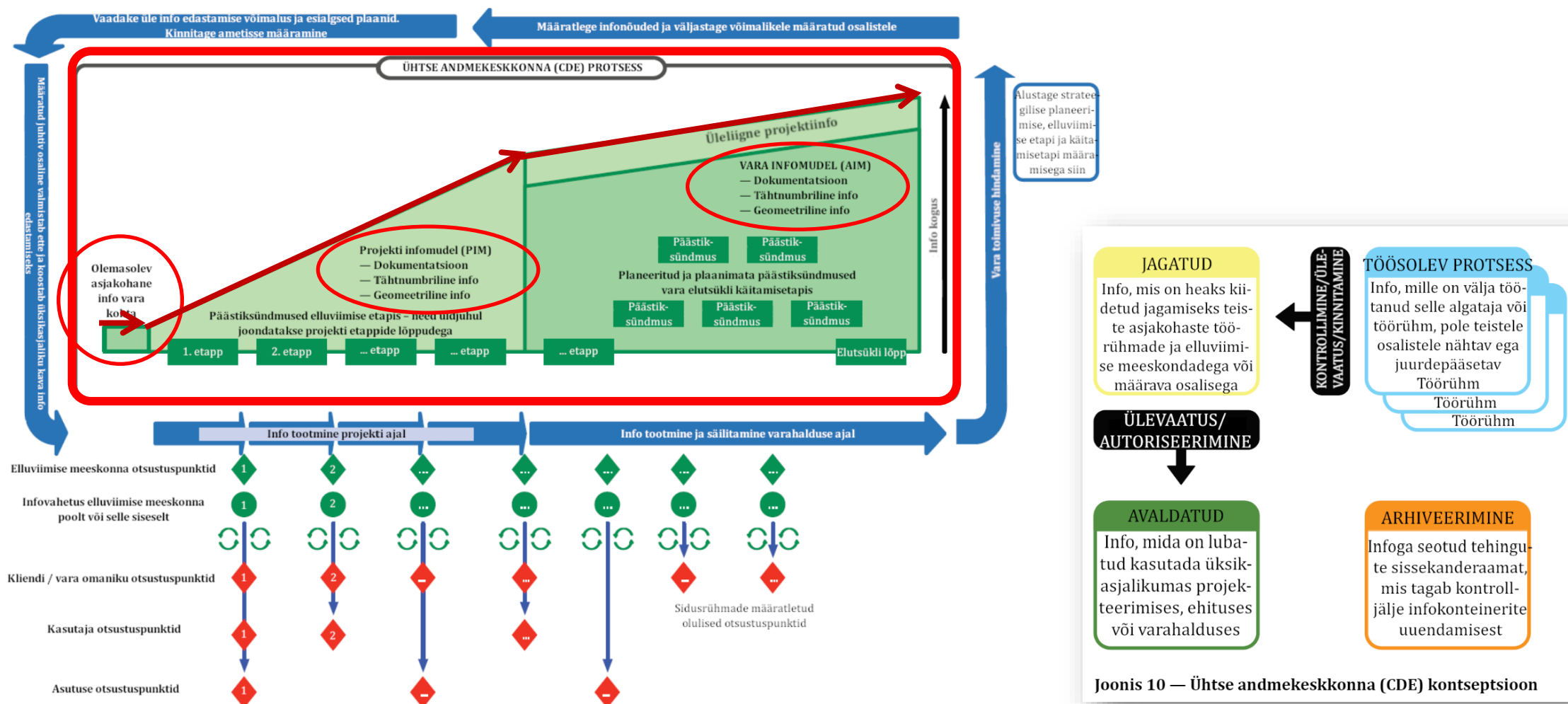
PROJEKTI ANDMED & OSAPOOLED



PROJEKTI ANDMED & OSAPOOLED



EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION



Joonis 10 — Ühtse andmekeskonna (CDE) kontseptsioon

2)

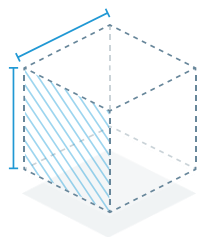


AUTODESK CONSTRUCTION CLOUD™

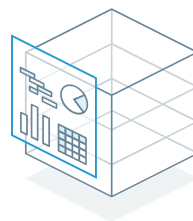
Lahendustest ehitajale



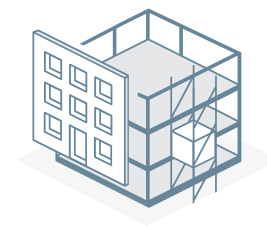
AUTODESK CONSTRUCTION CLOUD™



**AUTODESK®
BIM COLLABORATE**



**AUTODESK
TAKEOFF**



**AUTODESK®
BUILD**

AUTODESK® DOCS

Models · Drawings · Issues · Specifications · RFIs · Cost · Assets · As-Built · Photos · Videos

INSIGHT

Dashboards · Reports · Construction IQ · Data Connector

ADMINISTRATION

User Management · Autodesk ID · Project Administration





AUTODESK CONSTRUCTION CLOUD™



AUTODESK®
BIM COLLABORATE



AUTODESK
TAKEOFF



AUTODESK®
BUILD

AUTODESK® DOCS

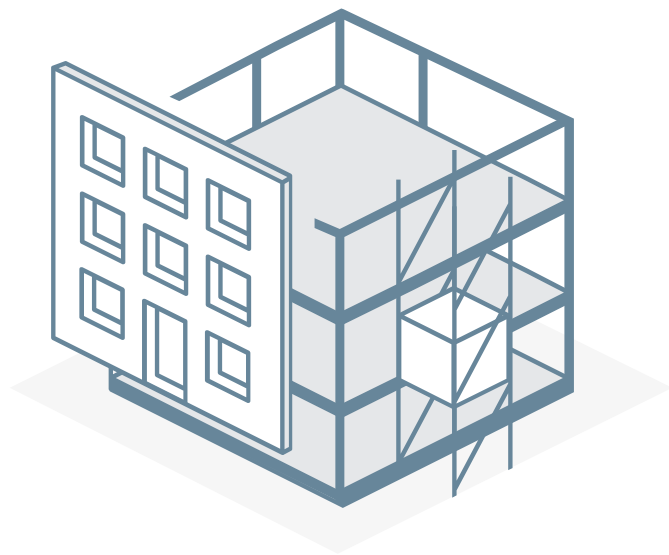
Models · Drawings · Issues · Specifications · RFIs · Cost · Assets · As-Builts · Photos · Videos

INSIGHT

Dashboards · Reports · Construction IQ · Data Connector

ADMINISTRATION

User Management · Autodesk ID · Project Administration



AUTODESK[®] BUILD

Autodesk Build väärtuspakkumus



Ühendatud
meeskond



Ühendatud
töövood

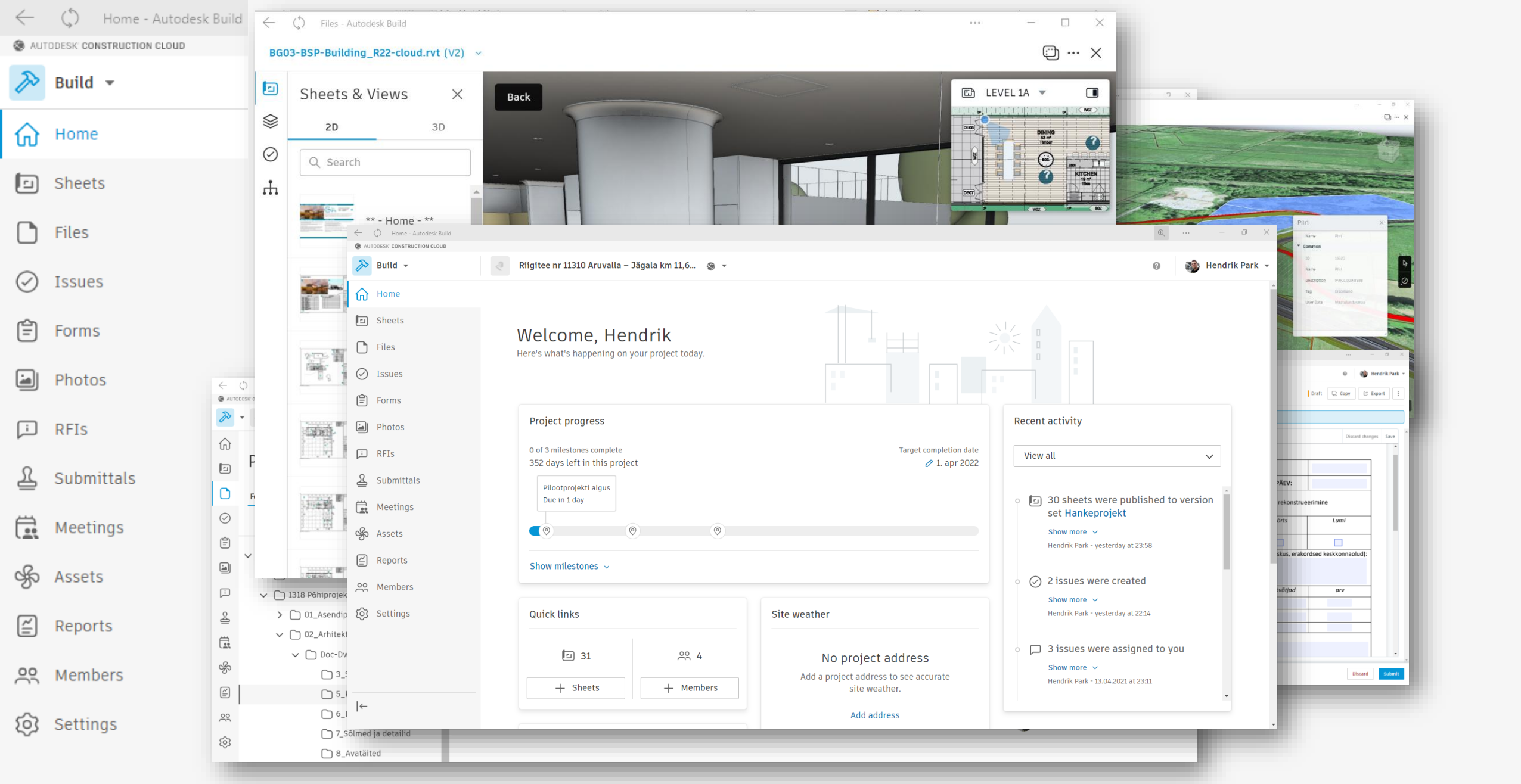


Sidusad
andmed



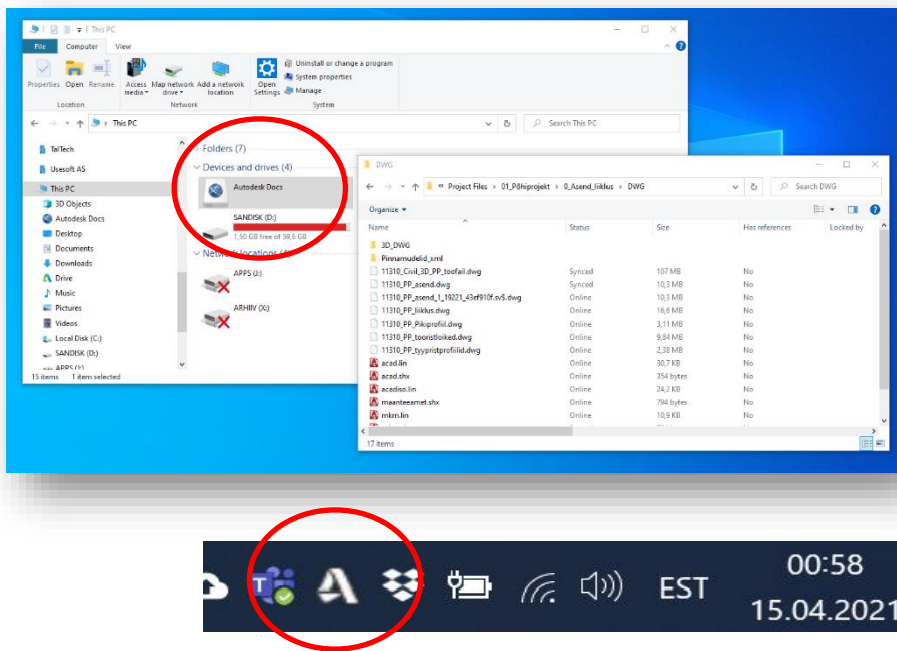
AUTODESK BUILD

Võimekused	 Dokumendihaldus	 Eelarve haldus	 Projektijuhtimine	 Kvaliteedi tagamine	 Tööohutus	 Teostusdok.
Töövood	• Projektipank - CDE • Versioneerimine koos võrdlus-võimekusega • DWG 2D/3D, RVT, NWD, IFC, DGN, DOCX, XLSX, ...70tk • Sisseehitatud töövood. • ***	• Eelarve haldamine • Muudatuste haldamine • Raamatupidamis-tarkvarade integratsioon. • Trendide analüüs	• Ametlikud infopäringud (RFI) • Teostusdokumentat-siooni haldus (Submittals) • Koosolekuprotokollid (Meetings) • Erinevad teostus-dokumendid (Forms)	• Kvaliteedi planeerimine • QA/QC • Punchlists • Vigade haldus (Issues)	Erinevad sisseehitatud tööriistad planeerimiseks, kontrollimiseks ja manageerimiseks.	Erinevad sisseehitatud tööriistad planeerimiseks, kontrollimiseks ja manageerimiseks.
Andmed	BIM mudelid · Joonised · Dokumendid · Eelarve · Varad · Pildid, videod, punktipilved, fotogrammeetria					
Insight	Infokoonde avalehed · Infoväljavõtte-raportid · Andmete eksport · Masinõppel ennustus					
Admin	Projektide haldamine · Kasutajate haldamine · Ettevõtte konto haldamine					



KESKKONDA LIGIPÄÄS SEADMETI

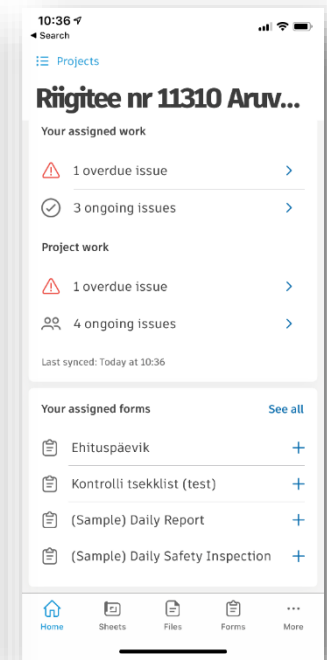
PC desktopil (lisaks veebirakendusele)



Tahvelarvutis

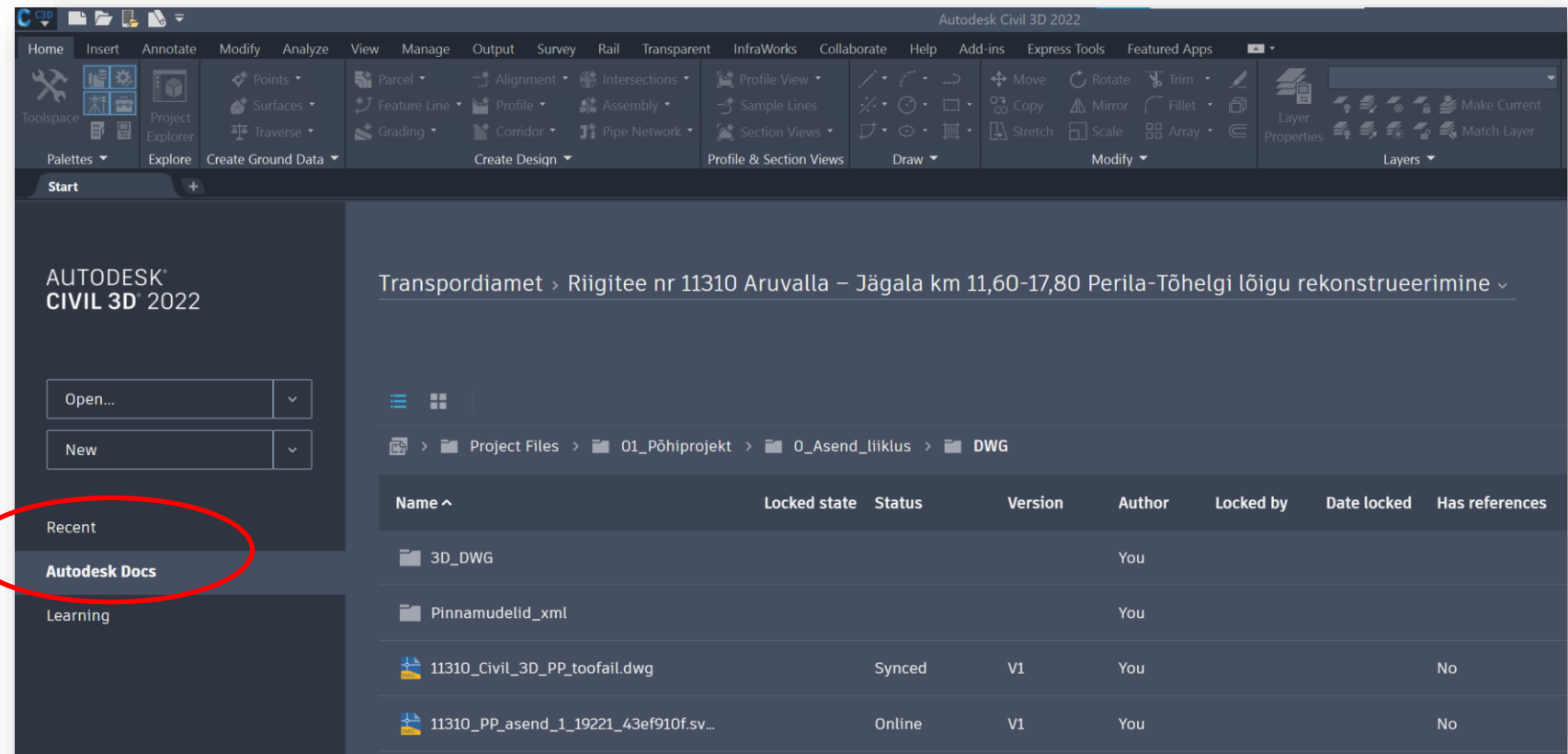


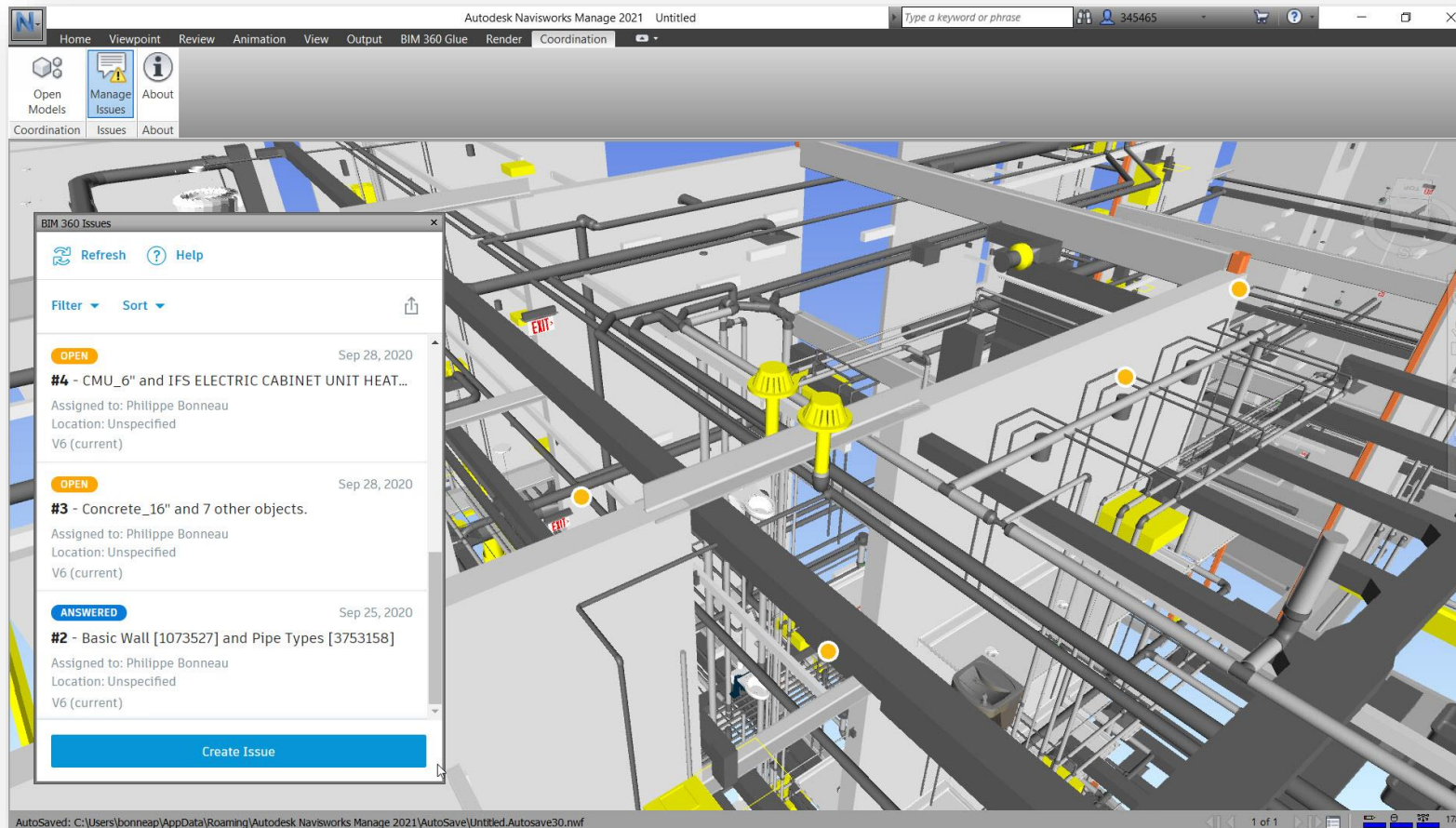
Mobiilis



KESKKONDA LIGIPÄÄS TARKVARATI

NB! Autodesk AEC
Collection omanikele on
Autodesk Docs tasuta





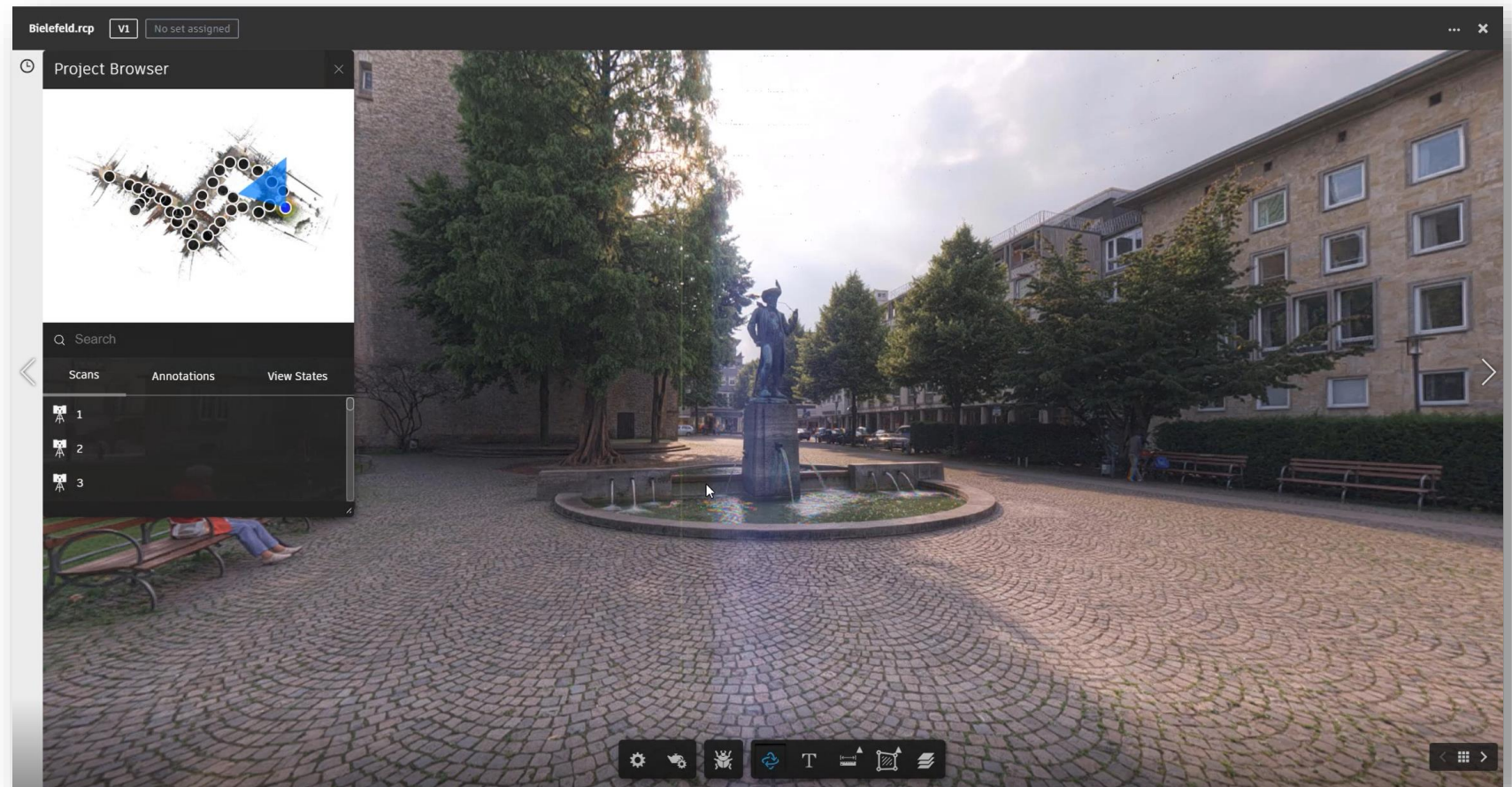
- Osamudelid keskses pilves
- Koondmudel vaadatav veebis
- Veateadete keskne haldus

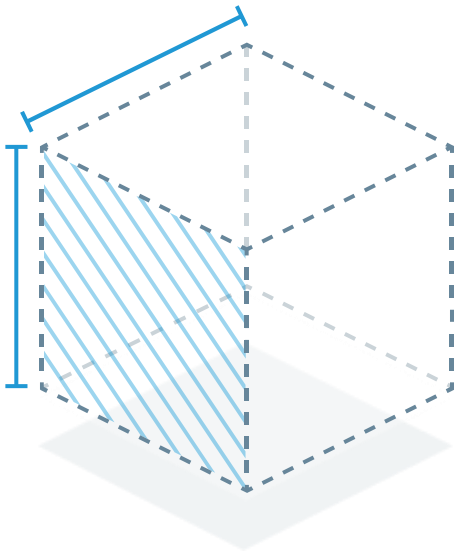
■ FAILID PILVES -

ReCap failide
eksportimine otse
projekti pilve.

■ ReCap RealView VEEBIVAATUR –

Vastavate .RCP failide
vaatamine otse pilves.





AUTODESK® BIM COLLABORATE

C AUTODESK® BIM COLLABORATE



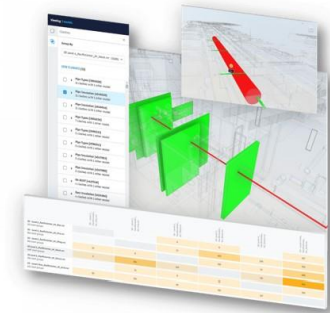
Docs

- 50+ avatavat faili-formaati
- Põjalik ligipääsuõiguste haldus
- 2D ja 3D võrdlus
- Veateated ja märkmed otse sisule



Model Coordination

- Automaatne ristumiste kontroll
- Ristumiste grupeerimine
- Koordinatsiooni kohased veateated



AUTODESK®
REVIT®

CIVIL 3D®



Design Collaboration

- Sisukomplektide süsteemne publitseerimine
- Ülevaatuste teostamine & projekti jagamine
- Visuaalne versioonivõrdlus
- Projekteerimise veateated ja nende haldus

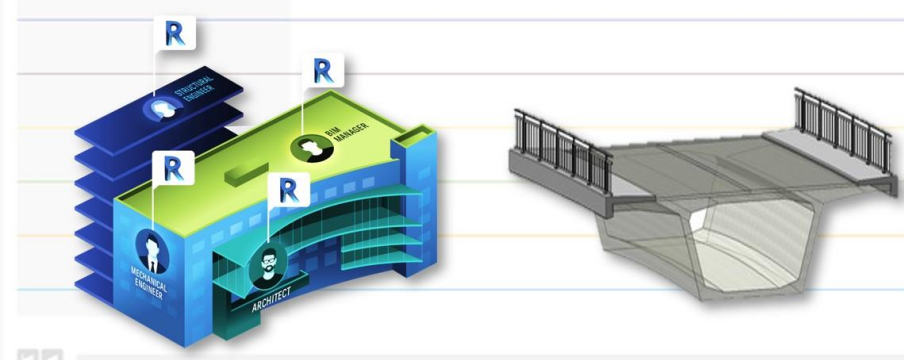
AUTODESK® CONSTRUCTION CLOUD

Design Collaboration

East Residence Hall

- Civil
- Coordination
- Landscape
- MEP
- Structure
- Architecture

Filter



C AUTODESK® BIM COLLABORATE PRO

LISAKS SISALDAB

Revit Cloud Worksharing

- Distsantsilt projektis osalemine
- Pilvepõhiselt projektmeeskonnas üheaegse koosöö teostamine



Collaboration for Civil 3D

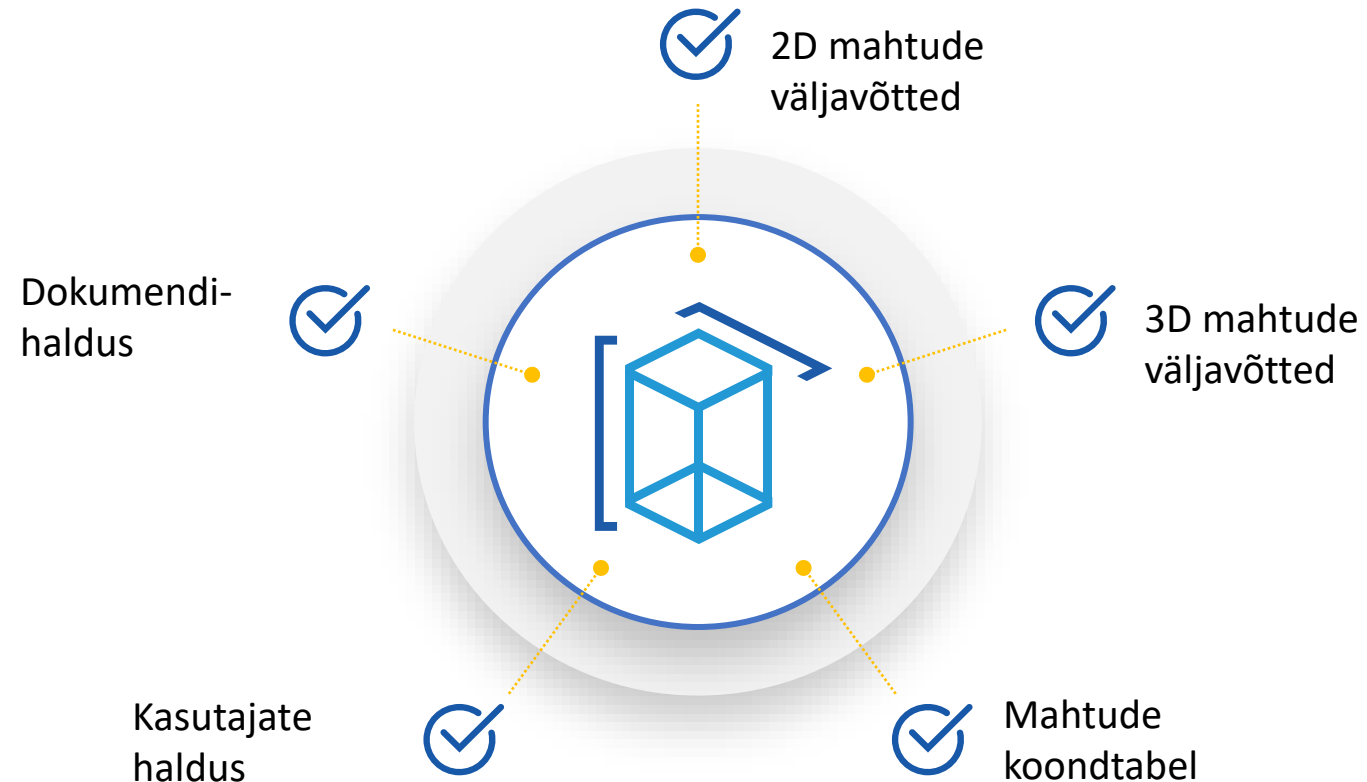
- Projektide haldamine pilves
- Loo & kaasa *Data Shortcuts*'e
- Automaatne failide lukustamine





AUTODESK TAKEOFF

MAHUVÄLJAVÕTETE INTEGREERUV TÖÖRIIST



Finishes

Documents

32 documents

Search

Oct 8, 2020 1:48 PM

V1

A700

OFFICE - FINISH PLANS - B...

Oct 8, 2020 1:48 PM

V1

A701

OFFICE - FINISH PLANS - L...

Oct 8, 2020 1:48 PM

V1

A702

OFFICE - FINISH PLANS - L...

Oct 8, 2020 1:48 PM

V1

A703

OFFICE - FINISH SCHEDUL...

Oct 8, 2020 1:48 PM

V1

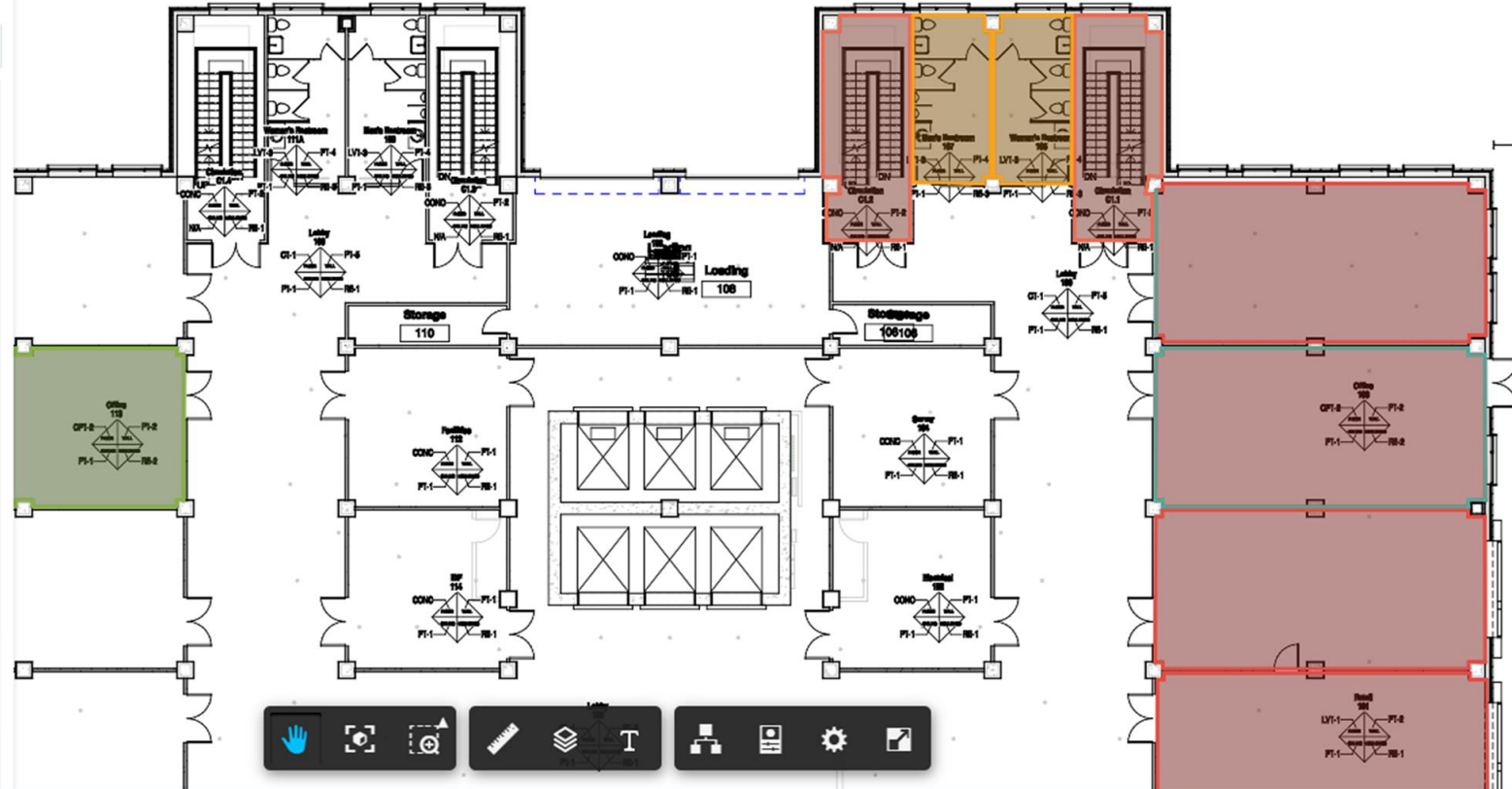
New Construction

Inventory

Group by:

Classification

Name ^	Count	Quantity	Unit	Classification	Document
▼ 030000 - Concrete	2	5.34	CY	035300 - Concrete Topping	A701
▶ 035000 - Cast Decks and Und...	2	5.34	CY	035300 - Concrete Topping	A701
▼ 090000 - Finishes	10				
▶ 096000 - Flooring	8				



Ceiling Finishes & Fixtures (2d only)

Takeoff Types

1

2x4 Fluorescent

119 EA

1

2x4 Fluorescent 2

ACT - 2x2

5428.25 SF

GWB Ceiling - Painted

2023.86 SF

1

Pendant 1x8 Indirect

12 EA

1

Recessed cove lighting 1x8

12 EA

Wall

With Secondary Classification

Structural

Takeoff

12" Shell Brick

25348.00 SF

HSS12X12X1/2

1826.00 LF

HSS12X12X1/2

HSS12X12X1/4

Round Column 12"

1375.50 LF

W10X33

W40X149

240.00 LF

W40X149

W8X10

Inventory

Group by

Primary Output

Name ^	Count	Quantity	Unit	Classification	Code
> 090000 - Finishes	27				
> 260000 - Electrical	158	158	EA	265113 - Interior Lighting Fixtures, Lamps, ...	265113
> 265000 - Lighting	158	158	EA	265113 - Interior Lighting Fixtures, Lamps, ...	265113
> 265100 - Interior Lighting	158	158	EA	265113 - Interior Lighting Fixtures, Lamps, ...	265113
> 265113 - Interior Lighti...	158	158	EA	265113 - Interior Lighting Fixtures, Lamps, ...	265113
2x4 Fluorescent	119	119	EA	265113 - Interior Lighting Fixtures, Lamps, ...	265113

Inventory

Group by:

Takeoff

Name ^	Count	Quantity	Unit	Classification	Document
12" Shell Brick	6	25348.00	SF	040000 - Masonry	New Construct
HSS12X12X1/2	44	1826.00	LF	051000 - Structural Metal Framing	New Construct
Round Column 12"	21	1375.50	LF	050000 - Metals	New Construct
W40X149	4	240.00	LF	050000 - Metals	New Construct

Round Column 12"

Takeoff Name	Quantity	Unit	Document
Round Column 12"	65.50	LF	New Construction
Round Column 12"	65.50	LF	New Construction
Round Column 12"	65.50	LF	New Construction
Round Column 12"	65.50	LF	New Construction
Round Column 12"	65.50	LF	New Construction
Round Column 12"	65.50	LF	New Construction
Round Column 12"	65.50	LF	New Construction

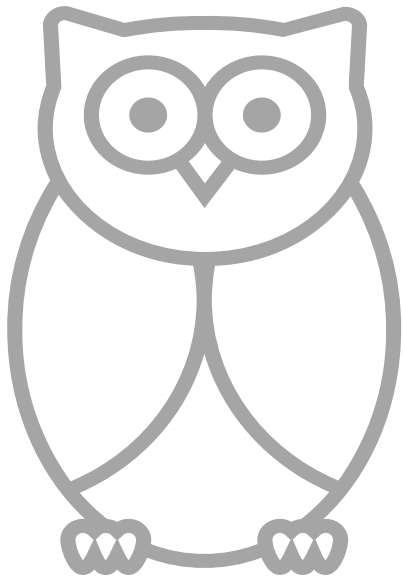
Item Count: 21

3) KOKKUVÕTE JA QA

ETTEKANDE KOKKUVÕTE

PS! aka
TOP3
meelespea!

Vajalikud on:

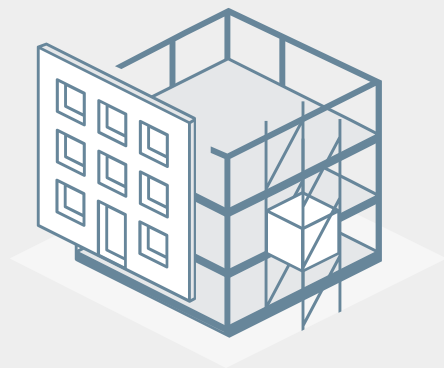


1. **IT lahendused**, mis toetaksid vahetut koostööd.
2. Koostöö korraldusel **ühtsed & selged põhimõtted**.

...aga:

3. Esimesest ei ole suuremat abi teiseta!

VEEBI-KOOLITUSED



AUTODESK® BUILD



Getting Started

Learn how to get started on Autodesk Build with some of the basics!

FREE

23 min



Project Templates

Learn how to streamline the process of creating multiple projects by setting up Project Templates.

FREE

15 min



Sheets

Learn how to upload, publish, view, edit, mark up, and export sheets.

FREE

83 min



Issues

Learn how to use Issues in Autodesk Build.

FREE

30 min



Forms

Learn about the Forms tool, which enables anyone on the job to securely fill out, review, and manage project forms.

FREE

20 min



Photos

Learn how to upload, organize, and share your photos and videos within Autodesk Build.

FREE

27 min



RFIs

Learn how to create, manage, review, and view RFIs.

FREE

26 min

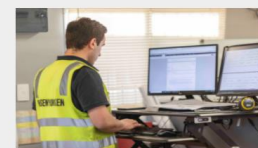


Submittals

Learn how to create, manage, review, and view Submittals.

FREE

27 min

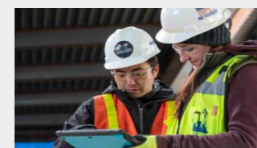


Reports

Learn how to access to all reported data relevant to your project role across all workflows and features of Autodesk Build.

FREE

12 min



Files

COMING SOON! Learn how to manage, access, and review project files on the web and on your mobile device.

Not currently available



Meetings

COMING SOON! Learn how to create agendas, add meeting invitees, capture decisions made, and assign individuals to specific action items.

Not currently available



Assets

COMING SOON! Learn how to easily track and manage the lifecycle of a project's assets and equipment, from design through commissioning and hand-over.

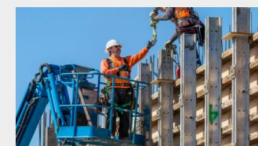
Not currently available



Cost

COMING SOON! Learn how to create, manage, review and view financial documents.

Not currently available



Insight

COMING SOON! Learn how use to assess project data trends and patterns to improve efficiencies by apprising you of your project's progress.

Not currently available



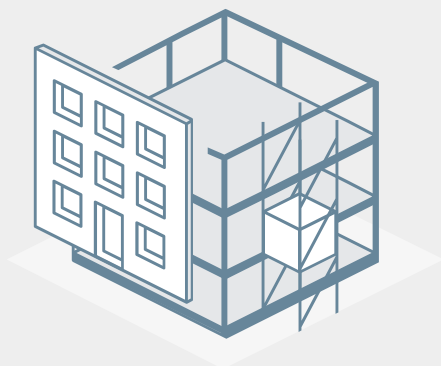
Administration

COMING SOON! Learn about what Account Administrators and Project Administrators can do within Autodesk Build.

Not currently available

<https://learnacc.autodesk.com/page/autodesk-build>

HELP DOKUMENT- ATSIOON



AUTODESK® BUILD

A screenshot of the Autodesk Build help page in a web browser. The browser's address bar shows the URL 'https://help.autodesk.com/view/BUILD/ENU/'. The page has a dark header with the 'AUTODESK BUILD' logo and a search bar. On the left, there is a vertical navigation menu with various topics like 'About the Autodesk Construction Cloud', 'What is Autodesk® Build?', 'Getting Started', 'Templates', 'Project Home', 'Sheets', 'Files', 'Issues', 'Forms', 'Photos', 'RFIs', 'Meetings', 'Submittals', 'Assets', 'Reports', 'Members', 'Docs', 'Cost', 'Insight', and 'Administration'. The main content area is titled 'Welcome to the help for Autodesk Build' and features a large image of construction workers on a building site. Below the image, there are sections for 'The Basics' (including links to 'What is Autodesk Build?', 'Get started with Autodesk Build', 'Work with project templates', 'Discover Project Home', and 'Learn about administration') and 'Useful Resources' (including 'Autodesk Construction Cloud website', 'Construction Blog', and 'Customer Success Learning Hub').

help.autodesk.com/view/BUILD/ENU

PÕHJALIKUM VEEBIKURSUS

„Ehitusprojektis pilvepõhise koostöö korraldamine“

Ülevaate tänastest parimatest praktikatest ehitusprojekti pilvepõhise koostöö korraldamisel, tutvustades **Microsoft 365** ja **Autodesk Construction Cloud** tänaseid võimalusi.

- 31. mai ja 2. juuni 2021
- Reaalajas veebukursis
- Kokku 2 x 4 akadeemilist tundi

usesoft.ee/koolituskalender



KÜSIMUSI?

1) EHTUSPROJEKTIDES KOOSTÖÖ KORRALDUSEST

Hetkeiseis ja vahetuma koostöö korraldamise vajadusest

29.04.2021 | BIM kevadseminar – Autodesk pilvelahendused ehitajale

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Lahendustest ehitajale

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3) KOKKUVÕTE JA QA

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TÄNUD KUULAMAST

Hendrik Park

Usesoft AS

hendrik.park@usesoft.ee