



SUMMARY SESSION CIVIL ENGINEERING FOR THE FCC

Timothy WATSON

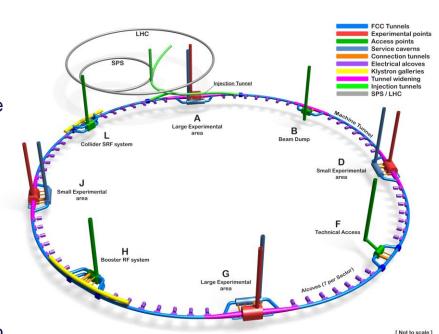
Civil Engineering Coordinator

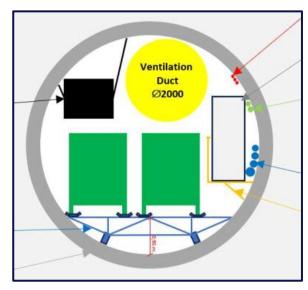
Contents

- 1. Underground Civil Engineering
- 2. Surface Civil Engineering
- 3. Site Investigations
- 4. Look ahead to Post- Feasibility Study

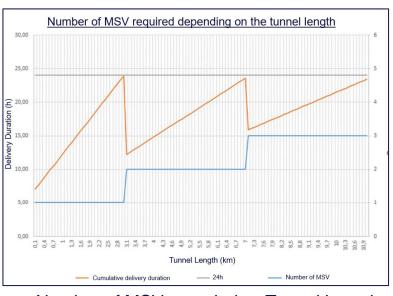
Underground Civil Engineering

- Liam Bromiley (Fellow SCE-SAM) presented ongoing work relating to the underground civil engineering for the FCC
- The results of the study into safety, ventilation and logistics aspects of driving a 5.5m diameter "blind" tunnel up to 11 km in length.
- Desktop study of recent tunnels where ground squeezing resulted in issues for the TBM drives
- Explanation of shaft sinking using ground freezing technique to minimize risk of groundwater contamination
- Summary of changes being considered since Mid-Term review, highlighting the need for all requirements to be frozen by interfacing systems (and Integration Team) before end of September 2025





Schematic View - Section Through Tunnel

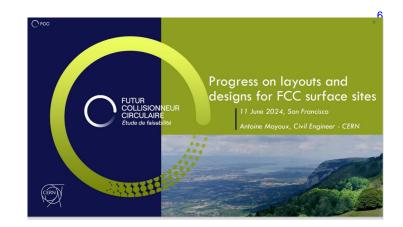


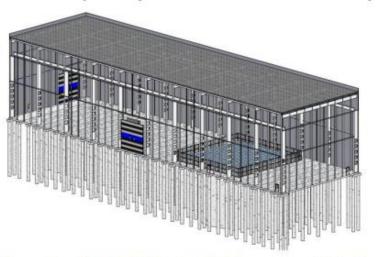
Number of MSVs needed vs Tunnel Length



Surface Civil Engineering

- Antoine Mayoux (SCE-PPM) presented ongoing work relating to the surface civil engineering for the FCC
- The results of the collaboration with Fermilab were shown.
- A number of schematic layouts for some of the Eight surface sites were presented.
- The strong coordination with the Implementation team and Integration team was highlighted.
- Layouts for all sites to be completed in July for handove to external consultants to undertake cost estimates as input for final feasibility study cost report.
- From the Environmental Initial State Analysis, in collaboration with Placement team and ecologists, integrate environmental constraints and opportunities.





Example of 3D BIM Model: FCC-ee assembly hall

Draftsman

Credit to:

Final Report ongoing updates -

Drawing activities

Final material for Surface Sites:

Production of layouts for each surface sites with various level of details to serve as baseline to:

- Assess Cost & Schedule
- Confirm space compatibility
- Precise tunnel connexions



Technical layouts: Baseline for the final report

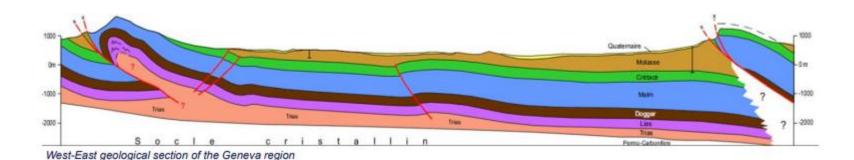




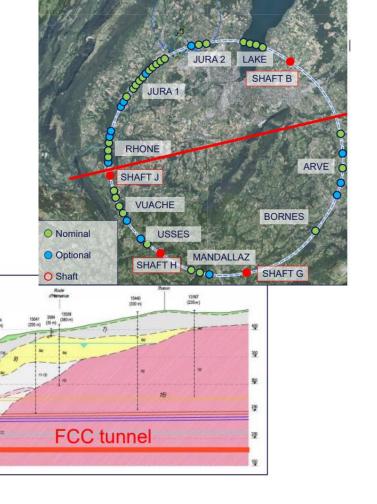
Simplified versions: For integration discussions

Underground Civil Engineering

- Roddy Cunningham (SCE-SAM) presented ongoing work relating to the underground civil engineering for the FCC.
- Background to the currently planned Site Investigation was given with focus on locating the interfaces between Moraine/molasse and Molasse limestone.
- The procurement process and scope of the current planned site investigation was given. It consists of about 30 Boreholes and 80 km of seismic investigation.
- A look ahead to future site investigations that will be necessary prior to detailed design and construction phases of the project.



Underground Civil Engineering

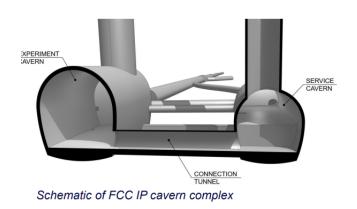


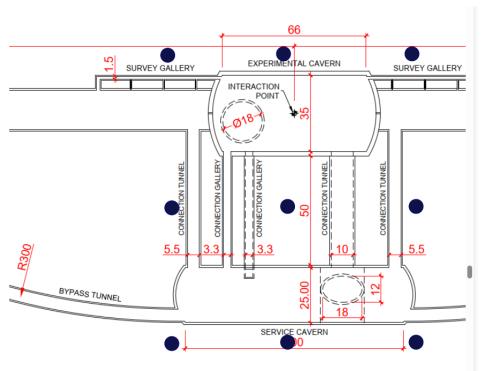
Geological profile below Lake Geneva

Future Circular Collider

Future Site Investigation

 A 3x3 layout of targeted boreholes will allow a detailed 3d model of the cavern complexes to be created





Critical Path Scope to Construction Start

Task Name	Start Finish	Duration	Predecessors	2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 O1 O1 O2 O3 O4 O1 O2 O3
FCC Civil Engineering	23/03/22 01/01/33	2813 days?		
Mid-term Review	30/09/23 30/09/23	0 days		Mid-term Review ♦ 30/09
CERN Council Special FCC Meeting	02/02/24 02/02/24	0 days		♦ (02/02)
Updated Baseline for Feasibility Study	02/02/24 04/04/25	306 days?		ted Baseline for Feasibility Study
Tunnel Safety and Logistics	15/01/24 04/07/24	124 days		Tunnel Safety and Logistics
Contract Strategy Reviews with Industry	02/02/24 01/11/24	196 days		t Strategy Reviews with Industry g
Surface Civil Engineering	02/02/24 02/05/24	65 days		Surface Civil Engineering [-1]
UNIGE Collaboration	23/03/22 01/01/33	2813 days		
Minor Contracts	02/01/26 09/05/31	1395 days		Minor Contracts 1
Support to CE Internal Team	05/10/27 05/10/27	0 days	99SS-131 days	Support to CE Internal Team > 05/10
Health and Safety Coordinators for CE Works	05/04/28 05/04/28	0 days	9955	Health and Safety Coordinators for CE Worksp. 05/04
Surveying services for underground works	09/05/31 09/05/31	0 days	10755	Surveying services for underground works o 09/05
Architects and Landscaping design	02/01/26 02/01/26	0 days	9755	Architects and Landscaping design 02/01
Adjudication Panel	04/01/27 04/01/27	0 days	9855	Arjudication Panels 04/01
Legal Services	03/07/26 03/07/26	0 days	9855-131 days	Legal Services 03/07
Post Feasibility Study	01/01/24 04/04/33	2416 days?		Post Feasibility Study
Site Investigations	01/09/24 07/08/30	1548 days		Site Investigations
CERN Prepare MS Docs for SI and permitting	01/09/24 29/11/24	66 days		RN/Prepare MS Docs for SI and permitting NA
MS for SI and permitting consultants	02/12/24 02/06/25	131 days	79	MS for SI and permitting consultants 02/06
CFT for SI and permitting consultants	03/06/25 02/12/25	131 days	80	CFT for SI and perinitting consultants ,02/12
Sign Contract for SI and Permitting Consultants	02/12/25 02/12/25	0 days	81	Sign Contract for SI and Permitting Consultants 20/12
Prepare MS documentation for Site Investigations	03/12/25 03/04/26	88 days	82	Prepare MS documentation for Site Investigations 03/04
MS for Site Investigations	06/04/26 05/10/26	131 days	83	MS for Site Investigations 05/10
Undertake Environmental Investigation	03/12/25 02/09/26	196 days	82	Undertake Environmental Investigation 02/09
Prepare and obtain Permits	06/07/26 04/01/27	131 days	85FF+88 days	Prepare and obtain Permits 04/01,
Prepare Tender Documents for Site Investigations		131 days	82	Prepare Tender Documents for Site Investigations 83/06
CfT for Site Investigations	03/12/25 03/06/26 06/10/26 06/07/27	196 days	87,84	Cff for Site Investigations 06/07
•			88	Sign Contract for Site Investigations (Order 1) & 05/07
Sign Contract for Site Investigations (Order 1) Site Investigations Phase 1	06/07/27 06/07/27 07/07/27 04/01/29	0 days	89.86	Site Investigations Phase 1 04/01
		392 days	,	
Sign Order 2 for Site Investigations	05/01/29 05/01/29	0 days	92SF-22 days	Sigh Order 2 for Site Investigations 05/01
Site Investigations Phase 2	06/02/29 07/08/30	392 days	100	
Finalise Contract Strategy for FCC Civil Works	01/01/25 02/07/25	131 days		Finalise Contract Strategy for FCC Civil Works NA
CE Consultants	03/07/25 06/02/32	1722 days?		CE Consultants
Prepare MS documents for CE Consultants	03/07/25 01/01/26	131 days	93	Prepare MS documents for CE Consultants 01/01
MS for CE Consultants	02/01/26 02/10/26	196 days	95	MS for CE Consultants Q2/10
Prepare CFT documents for CE Consultants	02/01/26 01/01/27	261 days	95	Prepare CFT documents for CE Consultants. 01/01
CfT for CE Consultants	04/01/27 03/01/28	261 days	97	Cff for CE Consultants 43/01
Sign Contracts for CE Consultants	04/04/28 04/04/28	0 days?	98FS+66 days	Sign Contracts for CE Cobsultants 04/04
Prepare Preliminary Designs and MS Documents	06/04/28 05/02/29	218 days	90SS+196 days,9	
Prepare Tender Designs and CfT Document	06/02/29 05/02/30	261 days	100,90	Prepare Tender Designs and CFT Document 05:02.
Construction Designs	08/08/30 06/02/32	392 days	101,92	Construction Designs 66/02
Tender for CE Works Works	06/02/29 06/02/32	784 days		Tender for CE Works Works I
MS for CE Works	06/02/29 06/11/29	196 days	100	MS for CE Works 06/11
CfT for CE Works	06/02/30 06/11/30	196 days	101,104	CfT for CE Works 06/11
Adjudication and Contract Signature for CE Works	07/11/30 08/05/31	131 days	105	Adjudication and Contract Signature for CE Works , 08/05
CE Preparatory Works	09/05/31 06/02/32	196 days	106	CE Preparatory Works 06/02
CE Groundbreaking	06/02/32 06/02/32	0 days	107	CE Groundbreaking \$706/02



Thank you for your attention.