

# Action item updates

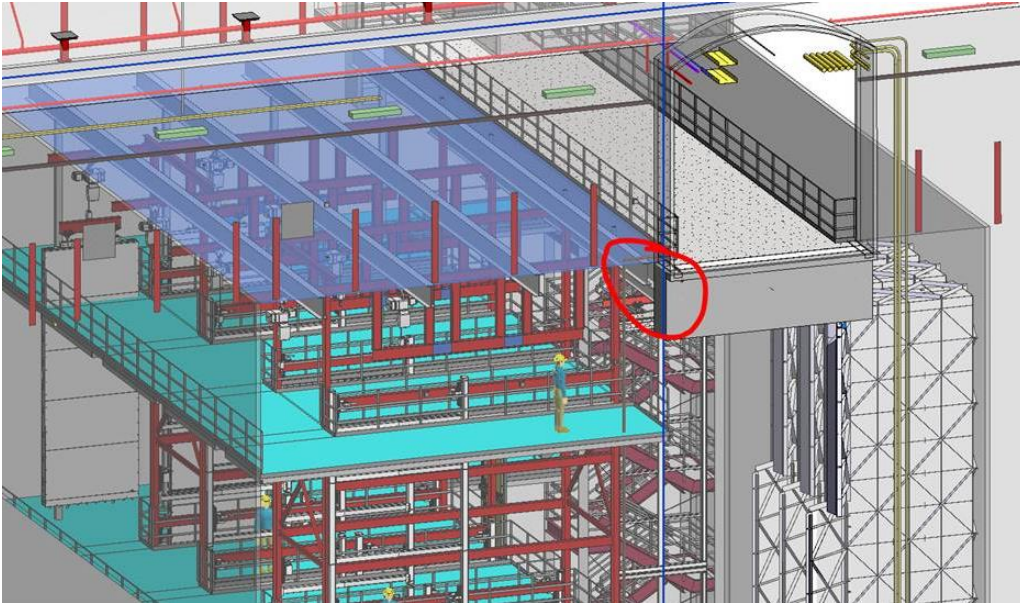
FS integration meeting

11-Sept-2019

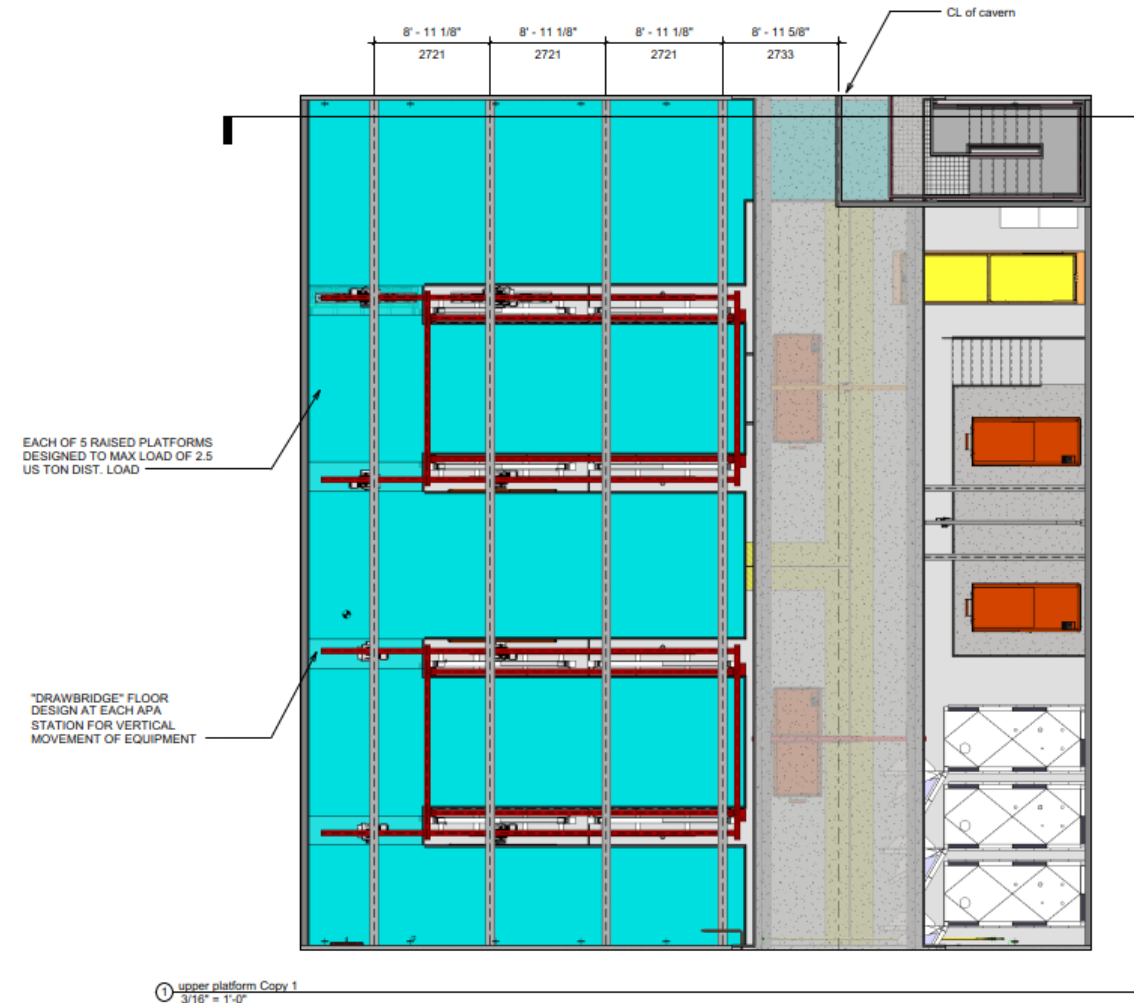
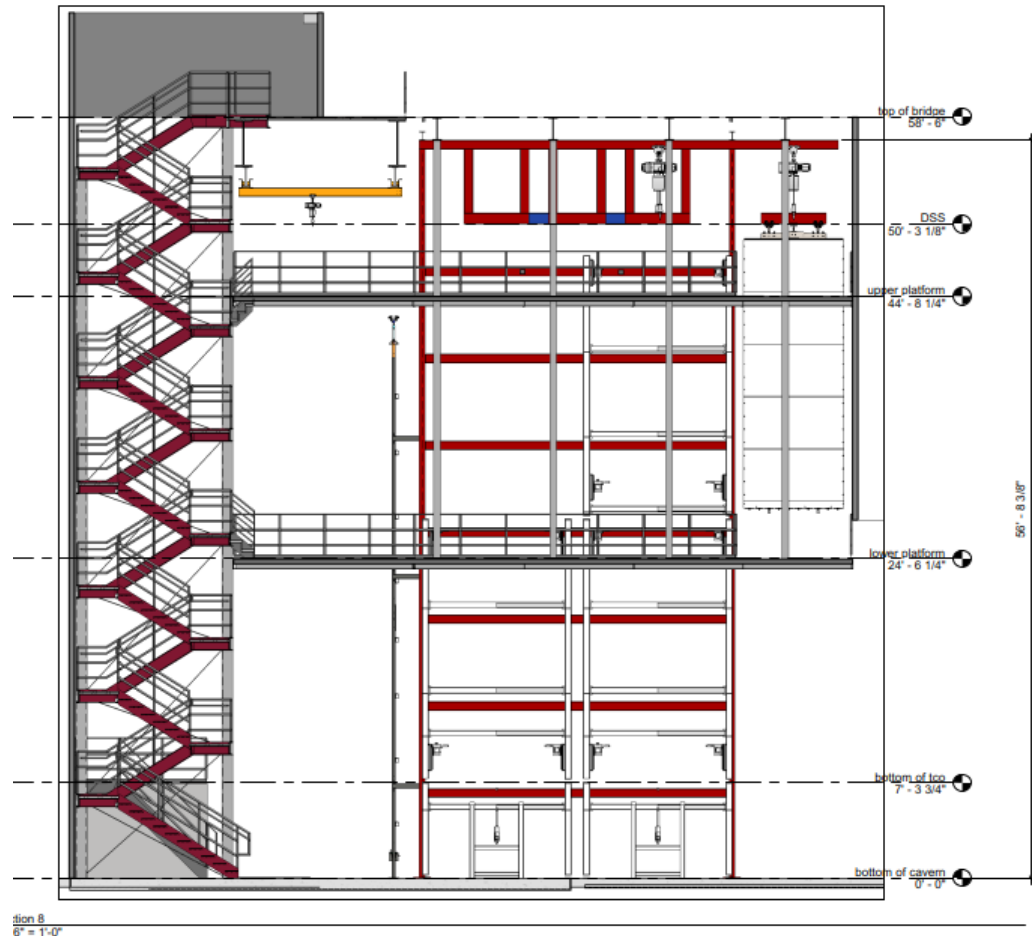
Fowler, Freitag, Mladenov

# Identify cleanroom support points for FSCF EXC package

- We have identified ASCE 7 as the code to follow for establishing the platform uniform loading. Working with 100 lbs/ft<sup>2</sup> or 480 kg/m<sup>2</sup>
- Once we have calculated the support loads for the beams, the information will be passed onto FSCF.
- The locations of the beam supports is known. See drawing on next sheet. Also need to work around possible conflict with bridge abutments.



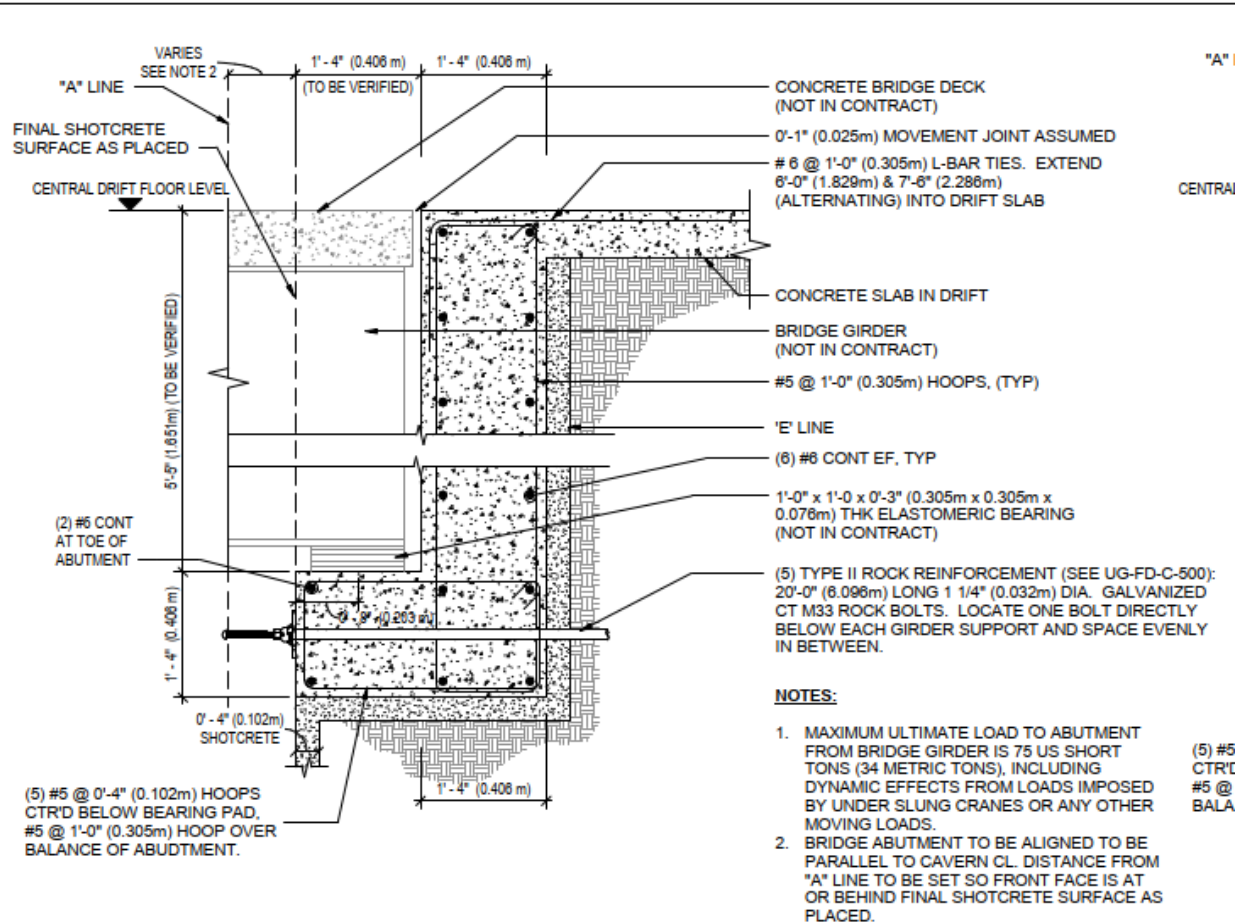
# Identify cleanroom support points for FSCF EXC package



## Evaluate cooling and power loads underground

- Update was given to the EFIG last week. This estimate is to support the new Nitrogen VE proposal.
- We evaluated the current known loads to determine if any excess capacity is available.

# Evaluate specification for N/S bridge abutments and bridge loading



## BRIDGE ABUTMENT SECTION AT 4850L

SCALE: 1" = 1'-0"

1

- Current abutment is designed to carry a bridge girder load of 75 US short tons or 34 metric tons.
- If 2 girders are used, these numbers are doubled for each end of the bridge.
- Dead load of the bridge is estimated at ??? 40 US short tons ???, beams are 10k kgs each
- Multiple under bridge crane loads
  - Two bridge hoists
  - must lift APA doublet (3800 lbs)
  - CPA (< 1 ton)
  - Scissor lift (~8000 lbs)
  - Other???
- Cage load limit 13k lbs, skip load limit 22k lbs

# Evaluate crane load capacity and rail capacity

## Crane bridge

Hoisting class .H2..., Stress group .B3..., according to DIN 15018  
Capacity:.....12.5...t  
Wheelloads without impact factor, per wheel  
Rmax:.....117...kN , Rmin:.....40...kN  
Hs:.....6.0.kN , , Pu:.....36...kN  
End carriage type:..HT20-40.....  
Travelling speed:.....4 -40...m/min  
.....2 x 2.20...kW, .....%ED  
Total weight:.....18800. kg = Crane:..16400. kg + Hoist:.....2400. kg

## Hoist

Mechanism group .2m... according to FEM  
Type...ASF7063-20 4/2-1... L3.  
Hoisting speed.....0.2 -10...m/min .....23.0...kW .....%ED  
Crab: type...ZUE-S 55.....  
Travelling speed:.....2.0 -20...m/min .....2 x 0.75...kW .....%ED

## Electrical equipment

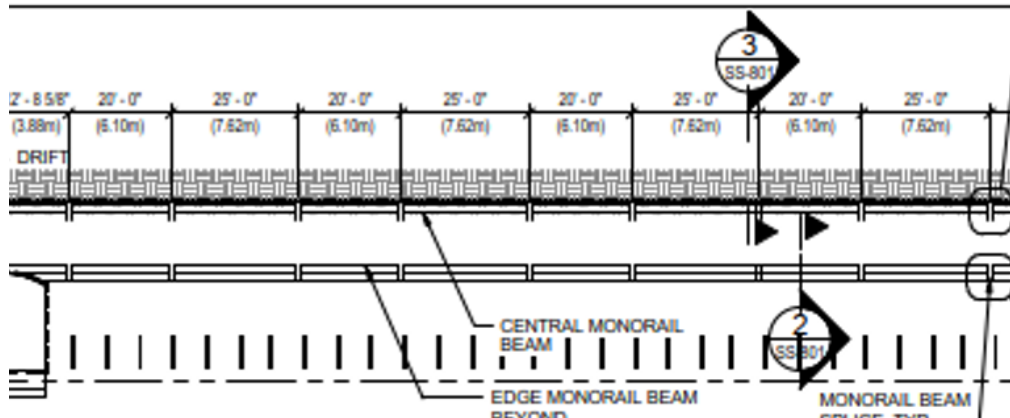
Supply voltage: .....400...V .....50...Hz  
Control voltage: .....48...V Mode of protection: ..IP54.....  
Control unit: sliding

}

Crane rail is supplied by: - Customer .....

Hoisting class .H2..., Stress group .B3... according to DIN 4132

Service conditions



- Crane hoist capacity 12.5 metric tons (13.8 US short tons) are we rounding up to 15 US short tons?
- Self weight crane and hoist 18800 kg (21 US short tons)
- Two rails will support 32.6 metric tons (36 US short tons, if use greater of the above)
- Span between rail supports 7.62 m and 6.10 m (25 and 20 ft.)

# Crane in the main cavern - Specification

<b>Main</b>		
	Building	SURF
	Installation type	Cavern
	Project type	New crane with new feeding line
	Use	Service crane for cavern
	Design temperature [°C]	0 / + 50
	Type	Single girder suspended crane
	Working load limit [ton]	12.5
	Span S [mm]	19700
	Main hoist range of lift [mm]	22000
	Lifting speed [m/min]	0.2 - 10 variable speed range with frequency converter
	Cross travel speed [m/min]	0.6 - 12 variable speed range with frequency converter
	Long travel speed [m/min]	0.7 - 15 variable speed range with frequency converter
	Total installed power [kW] (not to be exceeded)	35 to be confirmed by the contractor
	Main hook left approach [mm]	700
	Main hook right approach [mm]	700
	Longitudinal distance from axis of main hook to end buffer [mm]	1500
	Height of rail above floor [mm]	21500
	Clearance under girder from ground level [mm]	21500
	Clearance under main hook from ground level [mm]	21500
	Crane height from top of rail [mm]	1250
<b>Rails</b>		
	Type and size of rail	IPE /IPN to be defined
	End-stops	to be supplied
	Max static vertical reaction per wheel [KN]	29
	Max static horizontal transverse reaction per end cariage [KN]	23
	Max static horizontal longitudinal reaction per rail [KN]	17
<b>Bridge structure</b>		
	Number of girders	1
	The supply shall include proper means to avoid derailment of the crane in case of seismic event	applicable
	Number of motorized wheels per end-carriage	1
<b>Long-travel mechanisms</b>		
	New mechanism shall be supplied (see "Gen. Requirements" section 3.5.2)	applicable
	Number of motorized wheels	2
	Number of motors	2

# Crane in the main cavern - Specification

<b>Catwalks and access to crane</b>		
	Number of catwalks on bridge	1
	Access to the crane	to be defined
<b>Trolley structure</b>		
	The contractor shall supply a new trolley structure	applicable
	Proper means to avoid derailment of the trolley in case of seismic event or sudden release of the load shall be provided	applicable
	Number of motorized wheels	2
	Lamp maintenance platform	applicable
<b>Hoist</b>		
	Number of ropes coming out of the drum	2
	Bad winding of rope	detected and the lifting movement stopped
	Acceptable acceleration/deceleration with nominal load	$\pm 0,5 \text{ g}$
	Hook type	Single (DIN 15401)
	Hook size / material	12 / material to be communicated by contractor
<b>Feeding line and cubicles</b>		
	Crane feeding line	contractor shall supply and install a new line including its steel supports
	Building-mounted main switch	supplied by contractor
	Fixed electrical installation from switch to crane feeding line	supplied by contractor
	Crane feeding line	sliding contacts,
	Position of main switch	to be defined
	Length of feeding line [m]	150
	Trolley feeding line	cable festoon
	Cubicles position	on the crane girder
<b>Controls - safety</b>		
	Control system performance level	C
	Main operator control	remote control
	Emergency control	remote control
	Remote control storage cubicle	applicable
	Load measurement and display	applicable
	Time counter	applicable
	Safety zones	applicable; it shall be possible to define an adjustable rectangular area (in long and cross travel direction) where crane can access only if the hook is above a certain height; controlled with limit switches



## Crane bridge

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Wheelloads without impact factor, per wheel

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End carriage type: HT20-40.....

Travelling speed:.....4 -40...m/min

.....2 x 2,20...kW, .....%ED

Total weight:....18800. kg = Crane:....16400. kg + Hoist:....2400. kg

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Type: ASF7063-20 4/2-1... L3.

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## Electrical equipment

Supply voltage: .....400...V .....50...Hz

Control voltage: .....48...V Mode of protection: .IP54.....

Control unit: sliding

Crane rail is supplied by: - Customer .....

Hoisting class .H2..., Stress group .B3... according to DIN 4132

## Service conditions

Location: permanently outdoors

Ambient temperature: -10 bis +40°C

valable pour 380 V - 415 V / 50 Hz

Capacité de levage	16000 kg	vitesse de direction	5 / 20 m/min
Groupe FEM	2m / M5	vitesse de levage	1,3 / 8 m/min
course du crochet	30000 mm	voie du chariot	300 mm

#### entraînements

	réducteur de levage	motorisation (4 entraînements)
	exécution moteur H	Mécanisme de chariot E 160
puissance	3,8 / 25 kW	4 x 0,06 / 0,28 kW
facteur de marche	50 %	50 %
nombre de cycles	300 c/h	240 c/h
vitesse de régime nominal	455 / 2870 1/min	595 / 2770 1/min
courant nominal	20 / 44 A	0,35 / 0,83 A
courant de démarrage	46 / 310 A	0,57 / 3,2 A
cos phi <sub>v</sub>	0,62 / 0,92	0,65 / 0,84
cos phi <sub>ia</sub>	0,84 / 0,79	0,82 / 0,92
Les valeurs ED (c/h) représentent la somme de valeurs résultant de la PV et la GV Celles-ci sont réparties en 1/3 (2/3) service en PV et 2/3 (1/3) service en GV		

#### dimensions et poids

diamètre câble	20,2 mm	A	745 mm	M	507 mm	X	940 mm
Longueur câble	69050 mm	B	930 mm	N <sub>min</sub>	280 mm		
diamètre tambour	405 mm	C	1615 mm	N <sub>max</sub>	310 mm		
diamètre poulie	426,2 mm	D	160 mm	O	320 mm		
poids moufle inférieur	101,0 kg	E	43 mm	P	100 mm		
crochet de levage (E)	6,0 - V	F	40 mm	R	2083 mm		
		G	211 mm	RS	210 mm		
poids	2318 kg	H	180 mm	T	533,5 mm		
voie du chariot	300 mm	K	320 mm	T <sub>1</sub>	40 mm		

Galets appropriés pour être utilisés sur des ailes parallèles ; galets pour ailes inclinées sur demande  
en cas d'un aileur l'in de course de direction, la dimension H augmente de 55 mm  
Dimension C pour H > 300 mm sur demande  
Vitesse plus petites sur demande

#### données de charge sur le chemin de roulement selon DIN 4132

cas de charge H			cas de charge HZ		cas de charge HS	
R <sub>max</sub> <sup>1)</sup> / gale	RKA <sub>min</sub> <sup>2)</sup> / gale	RKA <sub>max</sub> <sup>3)</sup> / gale	FSKA <sup>4)</sup> / chariot	FMA <sup>5)</sup> / chariot	FPUKR <sup>6)</sup> / chariot	
32,03 kN	2,84 kN	22,46 kN	8,98 kN	3,41 kN	25,2 kN	

<sup>1)</sup> Réactions verticales gale pour position max. du crochet sans coefficient  
<sup>2)</sup> Réactions verticales gale sous poids mort sans coefficient  
<sup>3)</sup> Réactions vert. gale position max. du crochet sans coeff.

<sup>4)</sup> Charges transversales au chemin de roulement  
<sup>5)</sup> Charges horizontales dans direction du chemin de roulement  
<sup>6)</sup> Forces au niveau des tampons, valables en cas d'utilisation du tampons ABUS

ABUS Kranssysteme GmbH

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51647 Gummersbach

chariot monorail avec treuil à câble

GM 7000.16000 H-162.21.30000.1.U 160.20

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