Your ref
Our ref 260684
File ref

ARUP

Level 10 201 Kent Street
PO Box 76 Millers Point
Sydney NSW 2000
Australia

t +61 2 9320 9320
d +61 2 93209983
f +61 2 9320 9321

max.hough@arup.com
www.arup.com

James Kingston
Senior Planner
City Plan Services
120 Sussex St,
Sydney NSW 2000

28th June 2019

Dear James,

Goulburn Base Hospital Redevelopment SSDA Modification

Please find the attached hydraulic and fire services documents, which have been updated to correspond with the updated architectural layout of the proposed building.

The hydraulic and fire services strategy remains unchanged, with the exception of the following:

- The provision of reverse osmosis (RO) treatment plant and RO pipework reticulation system associated with the addition of a Sterile Supply Unit (SSU).

The above amendments to hydraulic and fire services documentation will not have a substantial impact on the existing utility infrastructure serving the site.

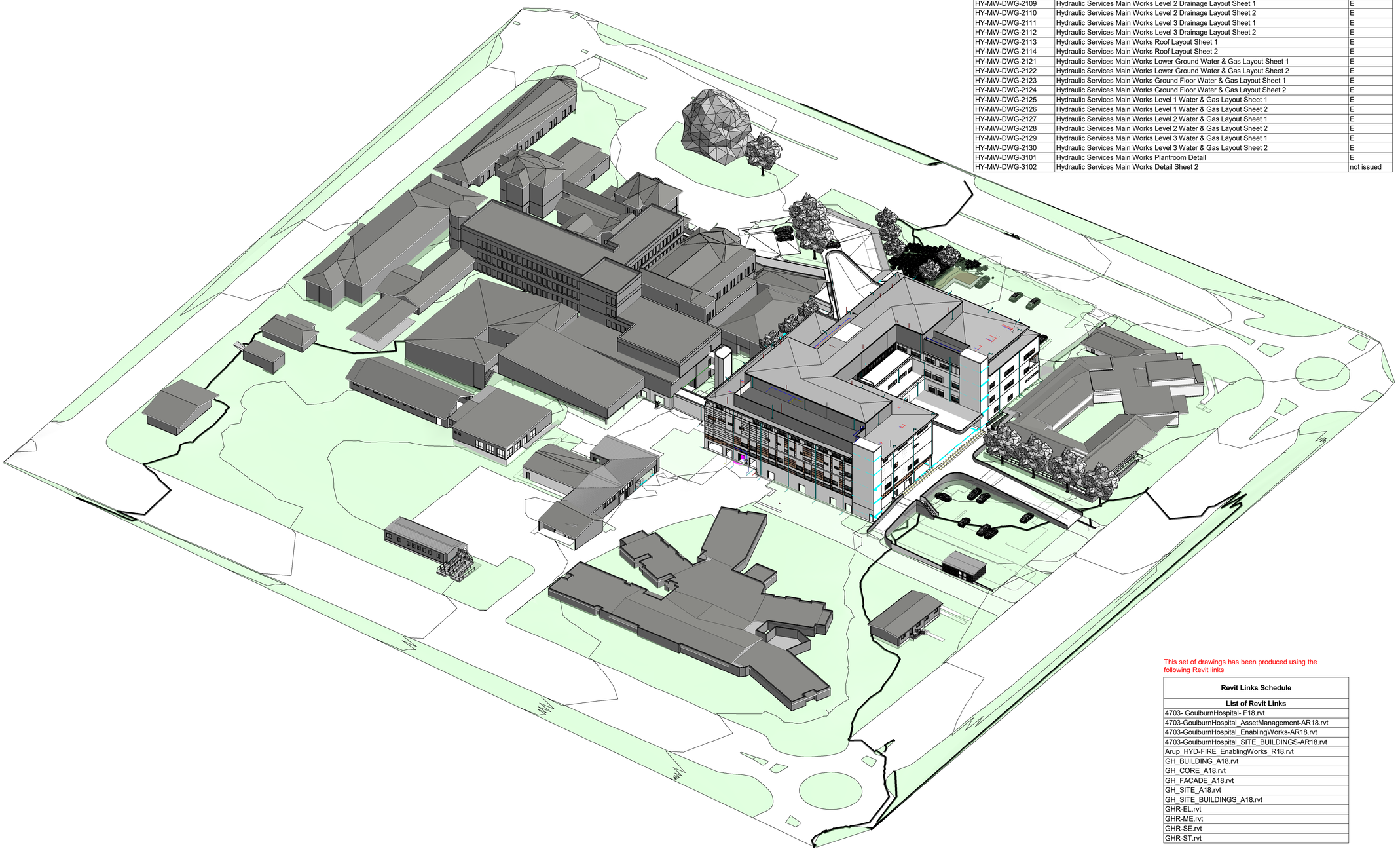
Yours sincerely

Max Hough
Senior Engineer

Goulburn Hospital and Health Service Redevelopment

Hydraulic Services

Drawing Number	Drawing Name	Revision
HY-MW-DWG-0110	Hydraulic Services Main Works Drawing List	E
HY-MW-DWG-0120	Hydraulic Services Main Works Legend and General Notes	E
HY-MW-DWG-0130	Hydraulic Services Design Criteria & Schedules	E
HY-MW-DWG-1101	Hydraulic Services Main Works Cold Water, Hot Water & Gas Schematic Diagram Sheet 1	E
HY-MW-DWG-1102	Hydraulic Services Main Works Cold Water, Hot Water & Gas Schematic Diagram Sheet 2	E
HY-MW-DWG-1103	Hydraulic Services Main Works Fire Hydrant & Hose Reel Schematic Diagram	E
HY-MW-DWG-1105	Hydraulic Services Main Works Drainage Schematic Diagram Sheet 1	E
HY-MW-DWG-1106	Hydraulic Services Main Works Drainage Schematic Diagram Sheet 2	E
HY-MW-DWG-2001	Hydraulic Services Main Works Site Plan Overall	E
HY-MW-DWG-2002	Hydraulic Services Main Works Site Plan North	E
HY-MW-DWG-2101	Hydraulic Services Main Works Lower Ground In Ground Layout Sheet 1	E
HY-MW-DWG-2102	Hydraulic Services Main Works Lower Ground In Ground Layout Sheet 2	E
HY-MW-DWG-2103	Hydraulic Services Main Works Lower Ground Drainage Layout Sheet 1	E
HY-MW-DWG-2104	Hydraulic Services Main Works Lower Ground Drainage Layout Sheet 2	E
HY-MW-DWG-2105	Hydraulic Services Main Works Ground Floor Drainage Layout Sheet 1	E
HY-MW-DWG-2106	Hydraulic Services Main Works Ground Floor Drainage Layout Sheet 2	E
HY-MW-DWG-2107	Hydraulic Services Main Works Level 1 Drainage Layout Sheet 1	E
HY-MW-DWG-2108	Hydraulic Services Main Works Level 1 Drainage Layout Sheet 2	E
HY-MW-DWG-2109	Hydraulic Services Main Works Level 2 Drainage Layout Sheet 1	E
HY-MW-DWG-2110	Hydraulic Services Main Works Level 2 Drainage Layout Sheet 2	E
HY-MW-DWG-2111	Hydraulic Services Main Works Level 3 Drainage Layout Sheet 1	E
HY-MW-DWG-2112	Hydraulic Services Main Works Level 3 Drainage Layout Sheet 2	E
HY-MW-DWG-2113	Hydraulic Services Main Works Roof Layout Sheet 1	E
HY-MW-DWG-2114	Hydraulic Services Main Works Roof Layout Sheet 2	E
HY-MW-DWG-2121	Hydraulic Services Main Works Lower Ground Water & Gas Layout Sheet 1	E
HY-MW-DWG-2122	Hydraulic Services Main Works Lower Ground Water & Gas Layout Sheet 2	E
HY-MW-DWG-2123	Hydraulic Services Main Works Ground Floor Water & Gas Layout Sheet 1	E
HY-MW-DWG-2124	Hydraulic Services Main Works Ground Floor Water & Gas Layout Sheet 2	E
HY-MW-DWG-2125	Hydraulic Services Main Works Level 1 Water & Gas Layout Sheet 1	E
HY-MW-DWG-2126	Hydraulic Services Main Works Level 1 Water & Gas Layout Sheet 2	E
HY-MW-DWG-2127	Hydraulic Services Main Works Level 2 Water & Gas Layout Sheet 1	E
HY-MW-DWG-2128	Hydraulic Services Main Works Level 2 Water & Gas Layout Sheet 2	E
HY-MW-DWG-2129	Hydraulic Services Main Works Level 3 Water & Gas Layout Sheet 1	E
HY-MW-DWG-2130	Hydraulic Services Main Works Level 3 Water & Gas Layout Sheet 2	E
HY-MW-DWG-3101	Hydraulic Services Main Works Plantroom Detail	E
HY-MW-DWG-3102	Hydraulic Services Main Works Detail Sheet 2	not issued



This set of drawings has been produced using the following Revit links

Revit Links Schedule
List of Revit Links
4703- GoulburnHospital- F18.rvt
4703-GoulburnHospital_AssetManagement-AR18.rvt
4703-GoulburnHospital_EnablingWorks-AR18.rvt
4703-GoulburnHospital_SITE_BUILDINGS-AR18.rvt
Arup_HYD-FIRE_EnablingWorks_R18.rvt
GH_BUILDING_A18.rvt
GH_CORE_A18.rvt
GH_FACADE_A18.rvt
GH_SITE_A18.rvt
GH_SITE_BUILDINGS_A18.rvt
GHR-EL.rvt
GHR-ME.rvt
GHR-SE.rvt
GHR-ST.rvt

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Hydraulic and Fire Services ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Drawing List

Scale at A1

Role
Hydraulic Services

Suitability

Arup Job No
260684

Rev
E

Name
HY-MW-DWG-0110

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Pipework Schematic Legend

- Sewer drainage
- Vent pipe
- Rainwater
- Grease waste
- Grease vent
- Cold water
- Hot water flow
- Hot water return
- Tempered water
- Reverse Osmosis flow
- Natural gas
- Fire hydrant
- Fire hose reel

Pipework Layout Legend

- Ø100 S — Sewer drainage
- Ø100 VP — Vent pipe
- Ø100 RWP — Rainwater
- Ø100 GW — Grease waste
- Ø100 GWV — Grease vent
- Ø100 DCW — Cold water
- Ø100 HWF — Hot water flow
- Ø100 HWR — Hot water return
- Ø100 WW — Tempered water
- Ø100 TRW — Treated recycled water
- Ø100 NG — Natural gas

Wall Types

- 120/120/120 Fire wall
- Smoke wall

Pipework Existing from WAE (Work As Executed)

- Sewer existing
- Cold Water existing
- Fire Hydrant existing
- Fire Sprinkler existing
- Natural Gas existing

Valves and Fittings

- Isolating valve
- Balance valve
- Reflux valve
- Drain valve
- Check valve
- Pressure reducing valve
- Float valve
- Pressure relief valve
- Monitored valve
- Solenoid valve
- Strainer
- RPZD
- Pump
- Jockey pump
- Capped valve
- Gas regulator
- WM — Water meter
- GM — Gas meter
- DCV — Dual check valve
- AAV — Air admittance valve
- Pressure gauge
- Penetration

Drainage

- Clear out
- Rainwater outlet
- Siphonic rainwater outlet
- Boundary trap
- Gully overflow
- External gully
- Floor waste
- Basket trap floor waste
- Tundish
- Manhole
- Generic pit
- Grated pit
- Gutter
- Trench

Domestic Hot and Cold Water

- Hose tap
- Mixing valve
- Shower
- T — Thermostatic mixing valve
- PS — Pressure switch
- FS — Flow switch

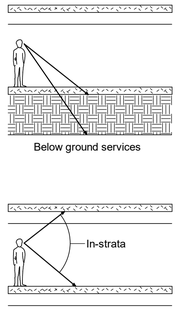
Hydrant & hose reel

- Fire hydrant
- Fire hose reel

Guidance Notes

1. This set of drawings shall be read in conjunction with the hydraulic services specification, civil, electrical, mechanical, structural and architectural documentation and other relevant trades and services drawings.
2. All works to comply with HI Engineering Design Guidelines and Southern Local Health District requirements, Architectural documentation, RDS and FF&E Schedules.
3. Any service disconnections, removal or relocation must be submitted for review and approval by LHD to ensure that hospital remains operational during Main Works.
4. For details of materials and workmanship refer to the hydraulic services specification.
5. This set of drawings is diagrammatic only. The contractor shall coordinate with other trades and set out all works to suit actual on site conditions.
6. Allow to investigate, verify and confirm all existing hydraulic and fire prior to commencing any works on site.
7. This set of drawings is issued for tender status for the works which does not constitute as the installation drawings. The contractor shall develop the information contained on this set of drawings into a complete set of fully detailed installation drawings for construction.
8. Technical submission including shop drawings, material / equipment schedules with technical information, hydraulic calculations and samples shall be submitted for review prior to installation.
9. Check all dimensions on site and coordinate with other trades prior to purchase of equipment or installation of the hydraulic and fire services.
10. No claims will be considered regarding items which cannot be installed due to error resulting from failure to check dimensions or coordinate with other trades.
11. Determine exact sizes and locations of structural penetrations on site in accordance with the structural requirements. Obtain approval from structural engineer prior to drilling any core holes and penetrating structure. All penetrations shall be fired rated to the approval of structural engineer and authorities with approved materials.
12. Locate, coordinate and confirm locations, mounting levels, routing, setting-out, sizes, dimensions of all the hydraulic and fire services with other trades prior to installation.
13. Refer to Room Data Sheet for the final equipment selection, final number of fixtures and fittings.
14. Provide control valves so that individual fixture groups may be shut down without affecting the wider system. Male, female and access amenities to be individually isolated.
15. Provide standard isolating valves on supply to each cistern, sink, basin and speciality equipment.
16. Provide control valves so that individual fixture groups may be shut down without affecting the wider system. Male, female and access amenities to be individually isolated as well as specliaty rooms.
17. All hot water and warm water pipework to be insulated to minimise heat loss.
18. Warm water will be provided with thermostatic mixing valves housed in recessed s/s wall boxes located between 300mm and 1500mm AFFL. Refer to Architectural drawings for set out and final location.
19. Tundishes to be installed with HepWorth Waterless trap and in-wall tundish. Provide access panel directly at waterless trap.
20. Allow to provide a removable metallic access plate on each WC.

Layout View Range



Nomenclature

@	At
AAV	Air Admittance Valve
A/S	Above slab
AP	Access Panel
B	Hand basin
BFW	Basket floor waste
BPS	Bed pan sanitiser
BS	Bar sink
BT	Boundary trap
Bth	Bath
BWU	Boiling water unit
CA	Compressed air
CI	Cast iron
CO	Clear out
COND	Condensate drain
CS	Cleaner's sink
Cu	Copper pipe
CV	Chamber vent
CW	Cold water
CWM	Clothes washing machine
CWU	Chilled water unit
DB	Disabled basin
DCV	Double check valve
DCW	Domestic cold water
DF	Drinking fountain
DG	Disconnector gully
DHWF	Domestic hot water flow
DHWR	Domestic hot water return
DICL	Ductile iron cement line
DP	Down pipe
DT	Dilution tank
DW	Dishwasher
ES	Emergency shower
ES+EW or ES/EW	Emergency shower & eye wash station
FA	From above
FB	From below
FC	Fume cupboard
FH	Fire hydrant
FHBC	Fire hydrant booster connection
FHR	Fire hose reel
FW	Floor waste
FU	Fixture unit
GA	Grease arrestor
GO	Gutter outlet
GST	Grease stack
GT	Gully trap
GVP	Grease vent pipe
GW	Grease waste
GWM	Glass washing machine
HT	Hose tap
H/L	High level
HWF	Hot water flow
HWR	Hot water return
IL	Invert level
IO	Inspection opening
IPMF	Induct pipe mica flap
IS	Inspection shaft
kPa	Kilo Pascal
KS	Kitchen sink
L/L	Low level
LS	Laboratory sink
LT	Laundry trough
MG	Medical gas
MGP	Medical gas panel
MGV	Medical gas valve
MH	Manhole
NG	Natural gas
NP	Non-potable
NRV	Non-return valve
NTS	Not to scale
ORG	Overflow relief gully
PA	Plaster arrestor
PD	Planter drain outlet
PE	Polyethylene pipe
PP	Polypropylene pipe
PTRV	Pressure and temperature relief valve
PV	Pressure vessel
RCP	Reinforced concrete pipe
RFB	Rise from below
RFS	Rim flushing sink
RPZD	Reduced pressure zone device
RTA	Rise to above
RV	Reflux valve
RWO	Rainwater outlet
RWP	Rainwater pipe
SD	Sewer drainage
SDP	Syphonic downpipe
SFW	Sealed floorwaste
SGT	Single gas turret
SHR	Shower
SK	Sink
SOF	Syphonic overflow
SRM	Sewer rising main
SSD	Subsoil drainage
SST	Soil stack
SV	Stop valve
SWP	Stormwater pit
TA	To above
TB	To below
TD	Tundish
TW	Trade waste
TWP	Trade waste pumpout
TMV	Thermostatic mixing valve
TS	Tea sink
TTD	Trapped tundish
UR	Urinal
UPVC	Unplasticised poly vinyl chloride pipe
U/S	Under slab
UW	Utensil washer
VCP	Vitreous clay pipe
VP	Vent pipe
WC	Water closet
WST	Water stack
WW	Warm water

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Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Legend and General Notes

Scale at A1: 1 : 100

Role: Hydraulic Services

Suitability

Arup Job No: 260684

Rev: E

Name: HY-MW-DWG-0120

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Load Type / Parameter	Design Criteria	Adopted Value / System	Comment
Proposed Building	New building fixture units	983 cold FU's 725 hot FU's	Fixture count obtained from architectural plans. Loadings as per AS 3500.1-2015 Table 3.2.1
	Effective height	< 25 m	
Water flow and pressure	Flow velocity	≤ 1.5 m/s	Based on acoustically sensitive flow velocity through pipes
	Minimum fixture outlet pressure	200 kPa	HI Engineering Service Guidelines
	Maximum pressure within buildings	500 kPa	As per AS 3500.1-2015 section 3.3.4
Hot water system	Pipe configuration	Flow and return reticulation through central riser, with branch loops at each level. Branch lines from circulating system will service fixure groups	Hot water dead leg volume to not exceed 2L of water Max. temperature drop through reticulation system = 5°C
	Hot water demand	Central hot water system must provide a min. of 8,250 Litres of hot water raised by 50 °C over the two hour peak period Central hot water system must include a min. of 860 Litres hot water storage capacity	Central hot water plant to be gas fired
	Delivery temperatures	Hot water distribution: 60°C - 65°C Water Temperature at Fixture: Patient use • Personal hygiene and hand washing utensils, cups, etc.: 38 - 40.5 deg. with 43.5 deg. thermal shutoff for children, 40.5 - 45 deg. with 46 deg. thermal shutoff for adults. • Beverage preparation: boiling Non-patient use (staff use only) • Beverage preparation: boiling • Sinks for manual dishwashing: 77 deg. min • Cleaner's sink/laundry tub: 60 deg. min • Automatic dishwasher: 60 - 70 deg. at inlet • Automatic washer/disinfector for healthcare: 60 deg. min at inlet • Automatic clothes washer: 70 - 85 deg. at inlet Personal hygiene: 50 deg. max	As per 'Water - Requirements for the Provision of Cold and Heated Water' by Health Infrastructure, HI Engineering Services Guidelines and AS3500.4-2015
Domestic cold water system	Pipe configuration	Main reticulation through central riser with branch lines at each level. Branch lines to each level to separate to supply each half of the building separately	
	Water softening plant	Dual pressure vessels with high-quality resin media, dual salt brine tanks and a 40mm backwash filter	Based on water quality data and ESPF
Fire hydrant system	Pipe configuration	Dedicated fire hydrant system, with risers located in the two fire stairs	Fire hydrant system to connect into pipework installed during Enabling Works
	Type	Attack Hydrants	
	Flow when boosted by on-site pumps	2 x hose stream @ 5 L/s each	As per AS 2419.1-2005 Table 2.1 & 2.3
	Flow when boosted by fire brigade pumps	2 x hose stream @ 10 L/s each	As per AS 2419.1-2005 Table 2.1 & 2.2
	Residual Pressure at Hydrant outlets	700 – 1200 kPa	As per AS 2419.1-2005 Table 2.2 & 2.3
Fire hose reel system	Pipe configuration	Dedicated fire hose reel system, with risers reticulating up through FHR cupboards	Fire hose reel system to connect to DCW system
	Flow	2 x hose streams @ 0.33 L/s each at 220 +- 10 kPa inlet pressure	As per AS 2441-2005 Table 6.1
Sanitary drainage system	Pipe configuration	Elevated drainage	Minimum pipe diameter is 65mm No branch line connections on the vertical
Stormwater drainage	Rainfall intensity	154 mm/hr - 5min 1:100 year event	BOM 2016 Rainfall IFD Data System using latitude and longitude of -34.747785 and 149.713148, respectively
	Rainwater drainage	Eaves gutters and external down pipes off sloped roofs and rain water outlets from terraces	

1 Hydraulic Services Design Criteria

Item	Type	Location	Remarks
Domestic Cold Water Pump	Triplex Variable Speed Pressure System	DCW pump house in Engineering Services Compound	3 x main pumps (each capable of 50% flow) & 1 x jacking pump Duty: Jacking pump - 0.5 L/s @ 55m/head, Main (each pump) - 7.5 L/s @ 50m/head Installed during enabling works
Primary Filtration System	4 x DN65 automatic back wash filters (2 x c/w 100 micron S/S screens, 2 x c/w 30 micron S/S screens)	DCW pump house in Engineering Services Compound	Installed during enabling works
Pressure Reduction Valves	Dual 80mm Pressure Reduction Valves with 20mm Pressure Reduction Valves for low-flow bypass	DCW pump house in Engineering Services Compound	Installed on existing DCW service to ensure system is not over-pressurised Installed during enabling works
Fire Hydrant Pump	1 x Diesel fire hydrant pump with water cooled engine 1 x 240V single phase vertical multistage jacking pump	Dedicated fire pump house in Engineering Services Compound	Duty: 10L/s @ 660 kPa Installed during enabling works

3 Hydraulic Services Enabling Works Equipment Schedule

Refer to Architectural documentation and room data sheets for list of sanitary fixture and fittings

TMVs Schedule

Level	Count	Comments
LEVEL 2	19	North
LEVEL 2	37	South
LEVEL 1	42	North
LEVEL LOWER GROUND	19	South
LEVEL G	45	North
EXISTING LEVEL LG - ONCOLOGY	43	South
EXISTING LEVEL LG - ONCOLOGY	31	North
	17	South

Fixture Schedule

Plumbing Fixture	Count
B	325
Bth	3
Shr	91
Sk	52
WC	136

Total: 607

Fire Hose Reels

Level	Item	Coverage	Count
LEVEL LG	FHR	Coverage 36m+4m Spray	11
LEVEL G	FHR	Coverage 36m+4m Spray	7
LEVEL 1	FHR	Coverage 36m+4m Spray	7
LEVEL 2	FHR	Coverage 36m+4m Spray	6
LEVEL 3	FHR	Coverage 36m+4m Spray	5

Fire Hydrants

Level	Item	Coverage	Count
LEVEL LG	FH	Internal: Coverage 30m+10m Spray	10
LEVEL G	FH	Internal: Coverage 30m+10m Spray	9
LEVEL 1	FH	Internal: Coverage 30m+10m Spray	7
LEVEL 2	FH	Internal: Coverage 30m+10m Spray	6
LEVEL 3	FH	Internal: Coverage 30m+10m Spray	5

Level	Plumb Fixture	Count	Comments
LEVEL 2			
LEVEL 2	B	28	North
LEVEL 2	B	55	South
LEVEL 2	Shr	6	North
LEVEL 2	Shr	22	South
LEVEL 2	Sk	3	North
LEVEL 2	Sk	5	South
LEVEL 2	WC	9	North
LEVEL 2	WC	25	South
LEVEL 1			
LEVEL 1	B	51	North
LEVEL 1	B	29	South
LEVEL 1	Shr	19	North
LEVEL 1	Shr	3	South
LEVEL 1	Sk	5	North
LEVEL 1	Sk	5	South
LEVEL 1	WC	22	North
LEVEL 1	WC	8	South
LEVEL G			
LEVEL G	B	50	North
LEVEL G	B	57	South
LEVEL G	Bth	3	North
LEVEL G	Shr	12	North
LEVEL G	Shr	21	South
LEVEL G	Sk	14	North
LEVEL G	Sk	6	South
LEVEL G	WC	22	North
LEVEL G	WC	26	South
LEVEL LG			
LEVEL LG	B	37	North
LEVEL LG	B	18	South
LEVEL LG	Shr	6	North
LEVEL LG	Shr	2	South
LEVEL LG	Sk	8	North
LEVEL LG	Sk	8	South
LEVEL LG	WC	16	North
LEVEL LG	WC	8	South

Note: Quantities reflect the elements in the model at the time of issue and are scheduled for information only. They do not necessarily reflect the quantities required

Item	Type	Location	Remarks
Water softening plant	Southland D-30-WS dual water softening plant or equivalent	LG water plant room	Dual pressure vessels with high-quality resin media, dual salt brine tanks and a 40mm backwash filter
Water meter	Pipe diameter: 80mm Litres per pulse: 10L	LG water plant room	
Leak detection system	Early warning leak detection system equal to STULZ LDS, comprising of sensing cables installed in drip trays and wall mounted control panels. Detection of a leak is to activate an audible alarm at the control panel and send an alarm signal to the BMS	Drip trays below pipework in ceilings above operating theatres and other sensitive areas	Wall mounted control panel locations to be coordinated with Architect
Hot water plant	Rheem Tankpak Series 2 model TPI05N*D/1430 or approved equivalent	Level 3 plant room	5 x continuous flow internal water heaters, 2 x storage cyclinders, dual circulation pumps & a digital controller
RPZDs	80mm dual RPZD assembly	LG water plant room	Complete with Y-strainers and isolation valves
	32mm single RPZD assembly	LG water plant room, upstream of FHR service	Complete with Y-strainer and isolation valves
	20mm hot and cold RPZD	Dirty utility and cleaner rooms	Located in recessed stainless steel wall box with tundish drain. Refer to floor plans for locations
TMVs	Enware Aquablend ir approved equivalent	Upstream of each fixture group Refer to floor plans for general locations. Final location to be coordinated with architect	
TMV wall box	Enware Aquablend recessed stainless steel box with removable lid	Refer to floor plans for general locations. Final location to be coordinated with architect	
TMV monitoring hubs	Enware	Locations to be coordinated with architect	
External Fire Hydrants	100mm dual pillar hydrant with Storz Couplings	Refer to site plan for locations	
Internal Fire Hydrants	100mm landing valve with Storz Coupling	Refer to floor plans for locations	
Fire Hose Reels	36m hose with 25mm connections	Refer to floor plans for locations	
Clear Outs	To terminate at FFL with access cover. Refer to Architectural documentation for access cover specification		
Rainwater outlets	260mm diameter grate with 100mm outlet equal to SPS Truflo 100mm RWO	Roof terraces	

2 Hydraulic Services Main Works Equipment Schedule

Service	Location	Material
Sewer Drainage	In ground	Class DWV U.P.V.C
Sewer Drainage	Above ground	Class DWV U.P.V.C with 5 Kg/m² acoustic barrier bonded to 25mm thick convoluted foam
Sewer Drainage	Above operating theatres and other sensitive areas	HDPE with electrofusion welded sleeve couplings
Rainwater drainage	In ground	Class DWV U.P.V.C
Rainwater drainage	Above ground internal	Class DWV U.P.V.C with 5 Kg/m² acoustic barrier bonded to 25mm thick convoluted foam
Rainwater drainage	Above ground external	Refer to Architectural documentation
Cold Water Service	In ground	Type B copper or PN12 PE
Cold Water Service	Above ground main runs	Type B copper, Brazed
Cold Water Service	Rough-ins within wet areas	Type B copper, Brazed or Rehau cross linked polyethylene (PE-X) with compression joints
Hot Water Service	Main runs	Type B copper, Brazed
Hot Water Service	Rough-ins within wet areas	Type B copper, Brazed or Rehau cross linked polyethylene (PE-X) with compression joints Insulated with Thermotec 4 Zero (or approved equal) Exposed external to be 0.5mm Zinc anneal metal sheath wrapped.
Natural Gas Service	In ground	Type B copper
Natural Gas Service	Above ground	Type B copper, Brazed
Fire Hydrant Service	In ground	PN16 PE
Fire Hydrant Service	Above ground	Galvanised Mild Steel min 3.5mm
Fire Sprinkler Service	Above ground	Galvanised Mild Steel min 3.5mm
Fire Sprinkler Service	In ground	PN16 PE

4 Hydraulic Services Pipe Schedule

Standard Drainage Pipe Sizing Calculations (from AS3500.2-2015)			
Pipe Size (mm)	1:40	1:60	1:80
65	25 FU	X	X
80	10 FU	61 FU	(42 FU)
100	255 FU	165 FU	(120 FU)
150	1790 FU	1310 FU	1040 FU
225	8060 FU	6370 FU	5360 FU
Note: X indicates combination not accepatble. Figures in brackets are the maximum FU for drains laid at reduced grades			

All in-ground pipes to be 100mm

All pipe sizes to be in accordance with AS3500.2 Appendix C.

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E	12/06/19	AC	MH	MH
100% DD				
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PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
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T +61 2 9276 1400

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Role
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Suitability

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HY-MW-DWG-0130

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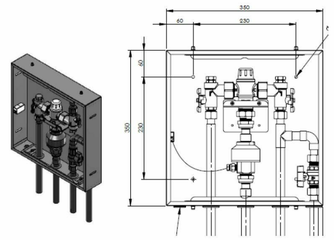


TMV detail.
Typically located at 1400mm by finished floor level. TMVs to be orientated as shown above

TMV Monitoring Hub locations to be coordinated. Max 30m of cable to the served TMVs.

TMVs Schedule		
Level	Count	Comments
LEVEL 2	19	North
LEVEL 2	37	South
LEVEL 1	42	North
LEVEL 1	19	South
LEVEL G	45	North
LEVEL G	43	South
LEVEL LOWER GROUND	31	North
LEVEL LOWER GROUND	17	South

Fixture Schedule	
Plumbing Fixture	Count
B	325
Bth	3
Shr	91
Sk	52
WC	136

Total: 607

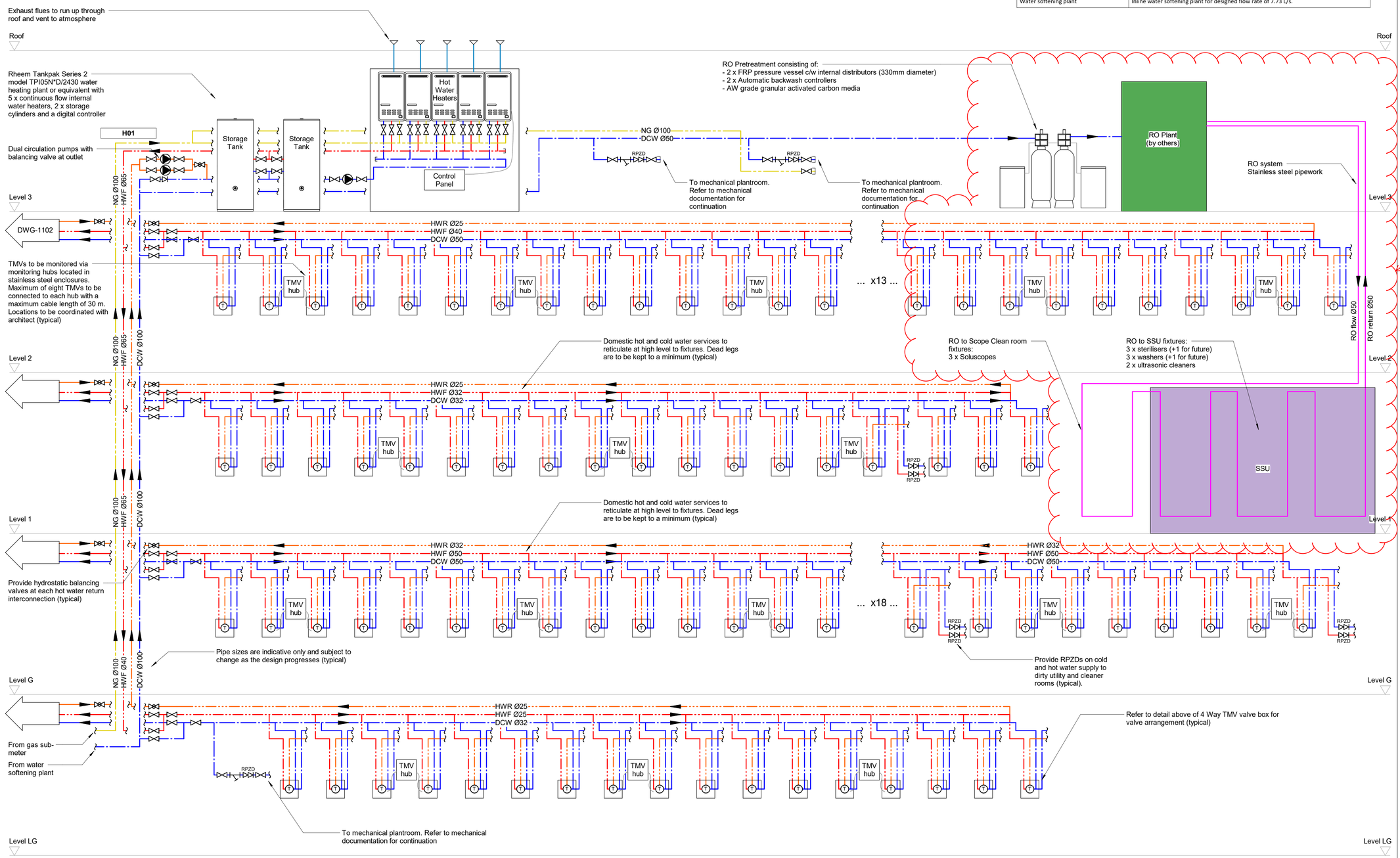
Refer to floor plan layouts for number and location of TMVs

Cold & Hot Water Fixture Units Break-down

Section	Fixture Units	ESPF (L/s)	Level	Fixture Units	ESPF (L/s)	Building	Fixture Units	ESPF (L/s)
LG North	117c 85h	1.15c 0.90h	LG	177c 129h	1.57c 1.24h	New Hospital	1118c 846h	4.86c 4.22h
LG South	60c 44h	0.70c 0.56h						
G North	187c 143h	1.64c 1.34h	G	398c 302h	2.78c 2.31h			
G South	211c 159h	1.79c 1.45h						
1 North	186c 142h	1.63c 1.33h	1	256c 196h	2.06c 1.70h			
1 South	70c 54h	0.78c 0.65h						
2 North	79c 61h	0.85c 0.70h	2	287c 219h	2.23c 1.84h			
2 South	208c 158h	1.77c 1.44h						

Domestic Cold Water & Domestic Hot Water Design Criteria

Item	Parameter
Supply water fixture units in new hospital building	967 cold water FUs & 707 hot water, based on proposed architectural plans. Loadings as per AS 3500.1-2015 Table 3.2.1.
Domestic Hot Water delivery Temperature	Hot water distribution: 60°C - 65°C Male/Female/Disabled toilet fixtures: 43°C Maximum Kitchen / Laundry: 60°C - 65°C Sinks used for manual dishwashing: 77°C Cleaner's Room: 60°C - 65°C The above temperatures comply to Heath Infrastructure 'Water – Requirements for the Provision of Cold and Heated Water'.
Working velocities in water services pipes	Max 1.5 m/s due to noise sensitivity for domestic cold water and 0.6 to 1.0 m/s for domestic hot water, based on HI Engineering Services Guidelines.
Maximum operational water pressure	500 kPa, in compliance with HI Engineering Services Guidelines
Minimum operational water pressure	250 kPa, in compliance with HI Engineering Services Guidelines
Cold water average supply temperature	10°C
Water softening plant	Inline water softening plant for designed flow rate of 7.73 L/s.



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12. Provide standard isolating valves on supply to each cistern, sink, basin and speciality equipment.

Rev	Date	By	Chkd	Appd
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D	31.05.19	AC	MH	MH
100% DD				
C	10.05.19	AC	MH	MH
100% DD				
B	03.05.19	AC	MH	MH
80% DD				
A	26.03.19	AC	MH	MH
50% DD				

Hydraulic and Fire Services
ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Cold Water, Hot Water & Gas Schematic Diagram Sheet 1

Scale at A1: N.T.S.

Role: Hydraulic Services

Suitability

Arup Job No: 260684

Rev: E

Name: HY-MW-DWG-1101

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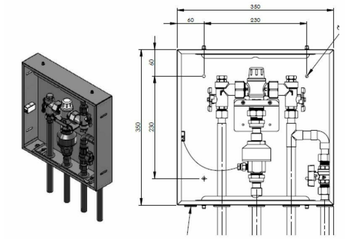

TMV detail.
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4 Way TMV valve box

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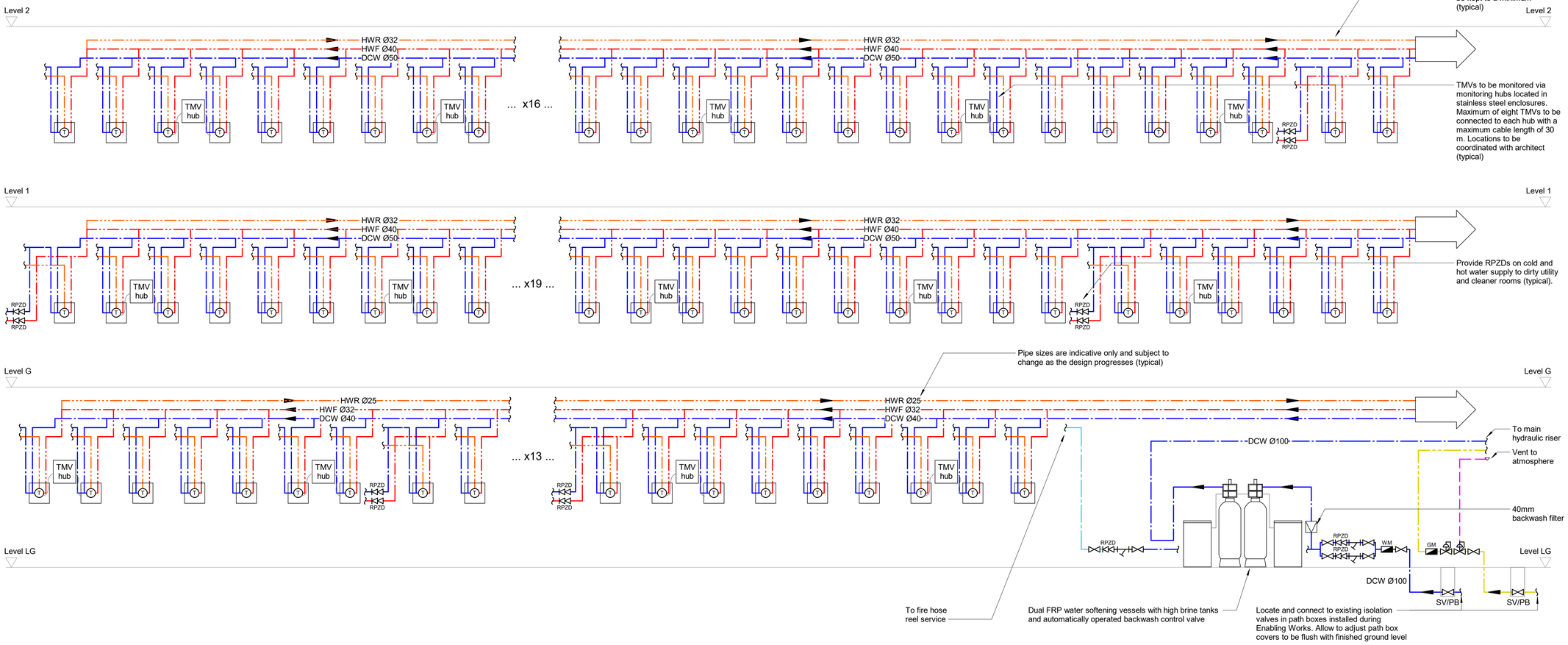

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Hydraulic and Fire Services ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Cold Water, Hot Water & Gas Schematic Diagram Sheet 2

Scale at A1: N.T.S.

Role: Hydraulic Services

Suitability

Arup Job No: 260684

Rev: E

Name: HY-MW-DWG-1102

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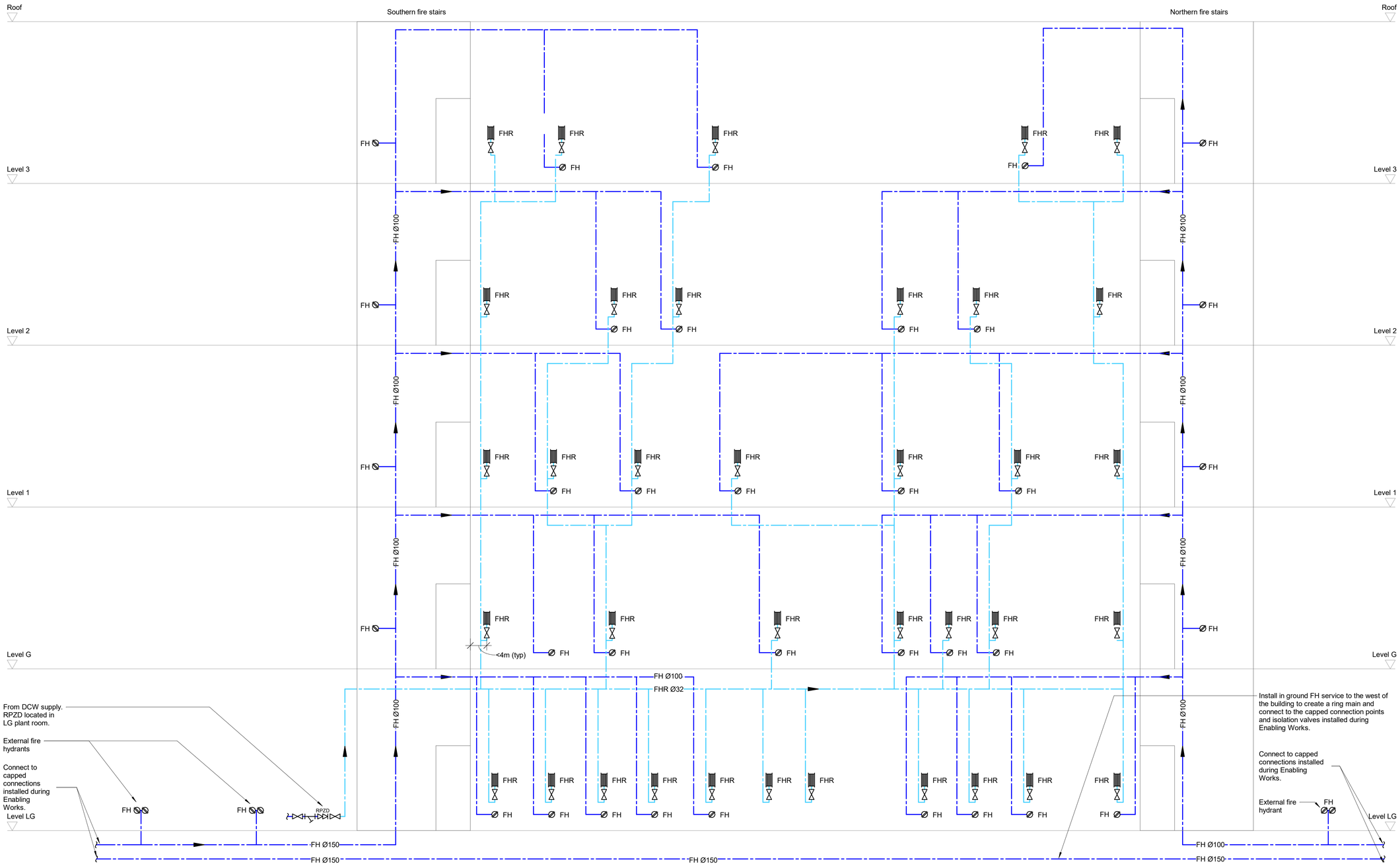
Do not scale

Fire Hydrants & Hose Reels Design Criteria

Item	Parameter
Building effective height	< 25 m
Largest Fire Compartment	> 500 m^2 < 10 000 m^2
Fire Hose Reels	0.33 L/s @ 230 kPa minimum, located throughout building to provide full coverage (approximately 32 x fire hose reels) in compliance with AS 2441-2005
Fire hydrants type	Attack Hydrants
Fire hydrants flow rate	2 x hose streams @ 5 L/s each when boosted by on-site pumps 2 x hose streams @ 10 L/s each when boosted by fire brigade pumps (As per AS 2419.1-2005)
Quantity of fire hydrants	Number of operational hydrants as per AS 2419.1-2005 coverage requirements depending on fire compartment sizes (approximately 3 x external fire hydrants & 21 x internal fire hydrants).
Fire hydrants flow velocity through pipes	≤ 4 m/s in compliance with AS 2419.1-2005
Residual Pressure at Hydrant outlets	700 – 1200 kPa, in compliance with AS 2419.1-2005.

Fire Hose Reels			
Level	Item	Coverage	Count
LEVEL LG	FHR	Coverage 36m+4m Spray	11
LEVEL G	FHR	Coverage 36m+4m Spray	7
LEVEL 1	FHR	Coverage 36m+4m Spray	7
LEVEL 2	FHR	Coverage 36m+4m Spray	6
LEVEL 3	FHR	Coverage 36m+4m Spray	5

Fire Hydrants			
Level	Item	Coverage	Count
LEVEL LG	FH	Internal: Coverage 30m+10m Spray	12
LEVEL G	FH	Internal: Coverage 30m+10m Spray	9
LEVEL 1	FH	Internal: Coverage 30m+10m Spray	7
LEVEL 2	FH	Internal: Coverage 30m+10m Spray	6
LEVEL 3	FH	Internal: Coverage 30m+10m Spray	5



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Hydraulic and Fire Services ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
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T +61 2 9276 1400
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SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Fire Hydrant & Hose Reel Schematic Diagram

Scale at A1: N.T.S.

Role: Hydraulic Services

Suitability

Arup Job No: 260684

Rev: E

Name: HY-MW-DWG-1103

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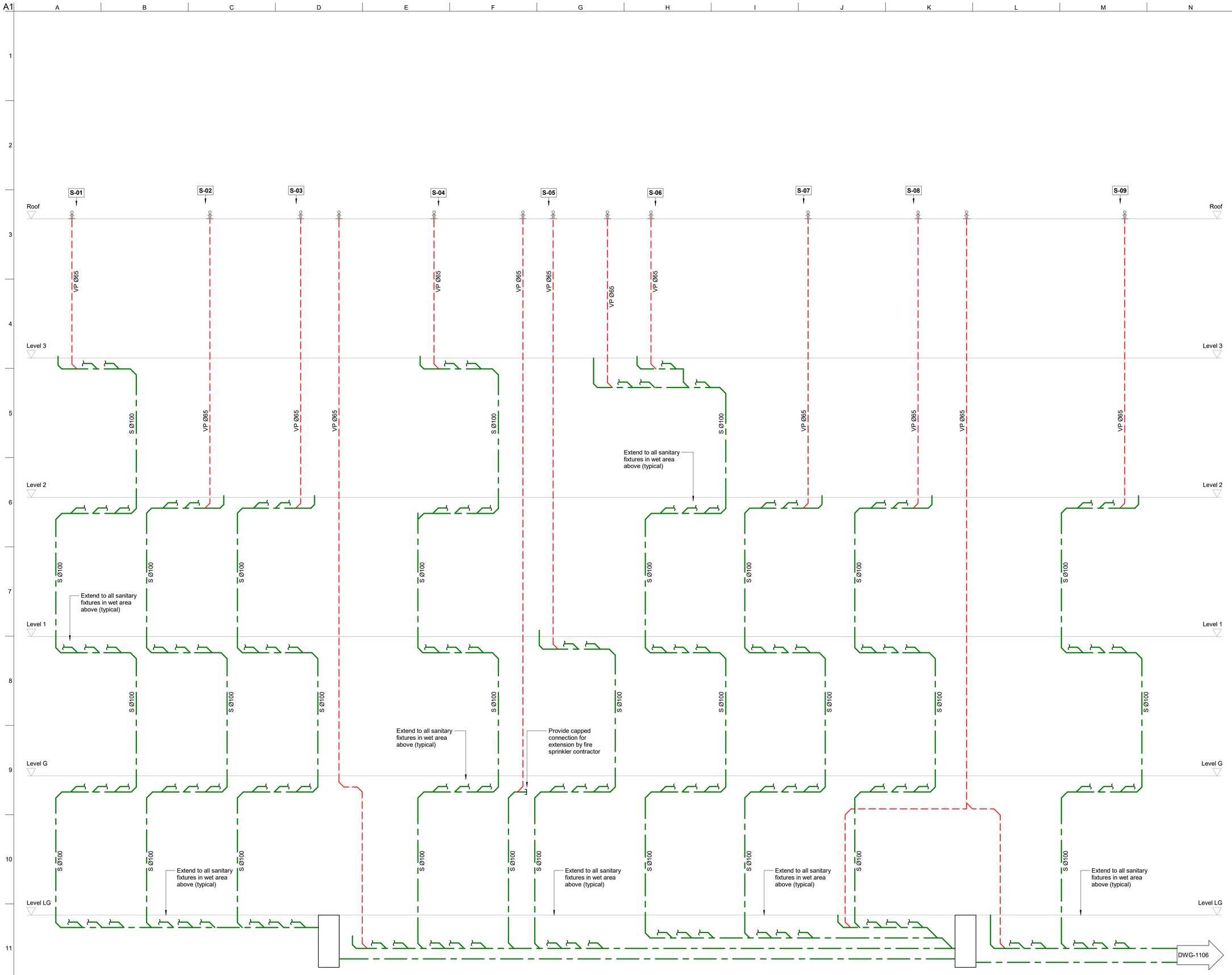

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12. Provide Internal mains, risers with 25% additional service capacity for future expansion.

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D	31.05.19	AC	MH	MH
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TSA MANAGEMENT
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SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Drainage Schematic Diagram Sheet 1

Scale at A1: N.T.S.

Role: Hydraulic Services

Suitability

Arup Job No: **260684**

Rev: **E**

Name
HY-MW-DWG-1105

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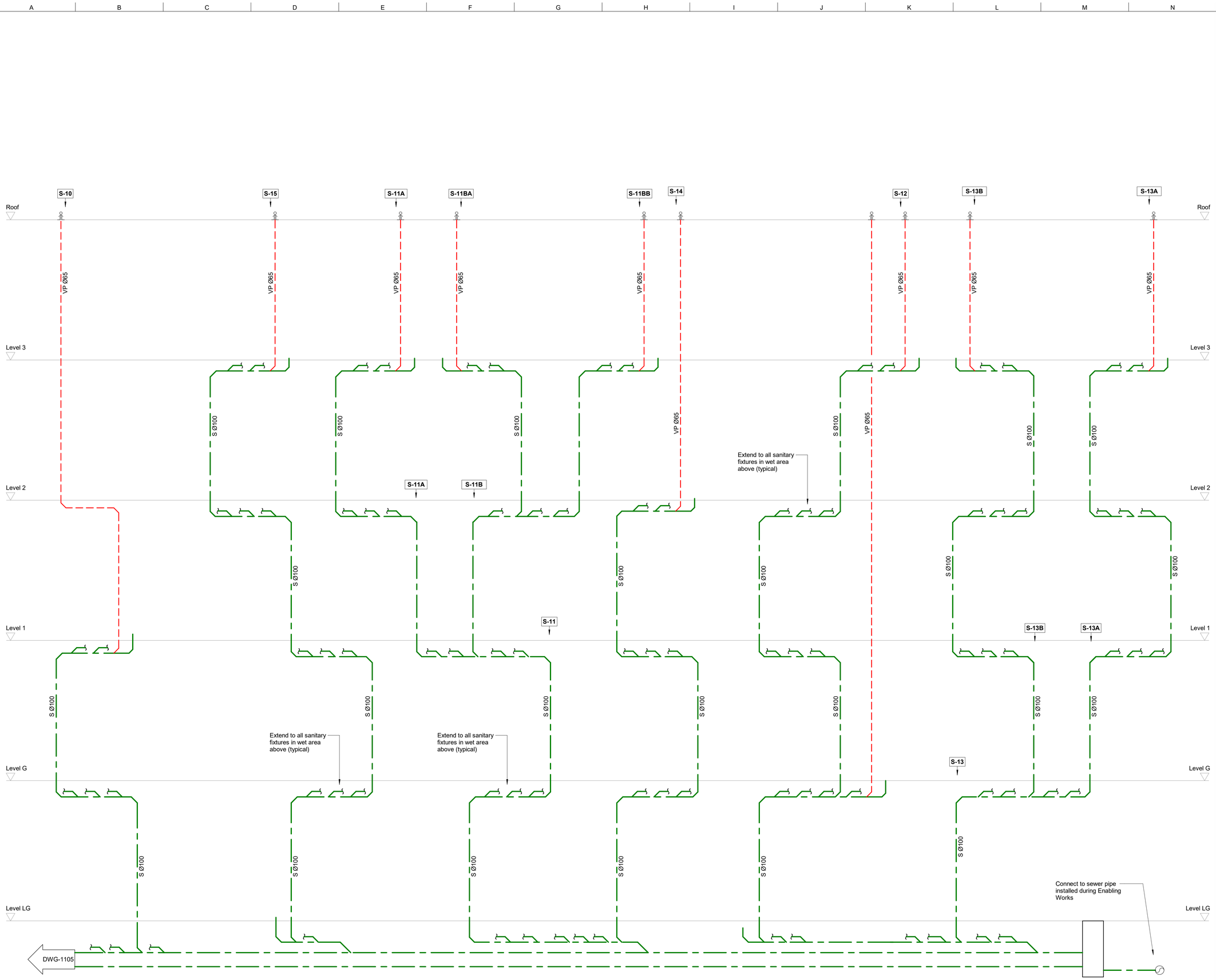

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SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Drainage Schematic Diagram Sheet 2

Scale at A1 N.T.S.

Role Hydraulic Services

Suitability

Arup Job No 260684

Rev E

Name HY-MW-DWG-1106

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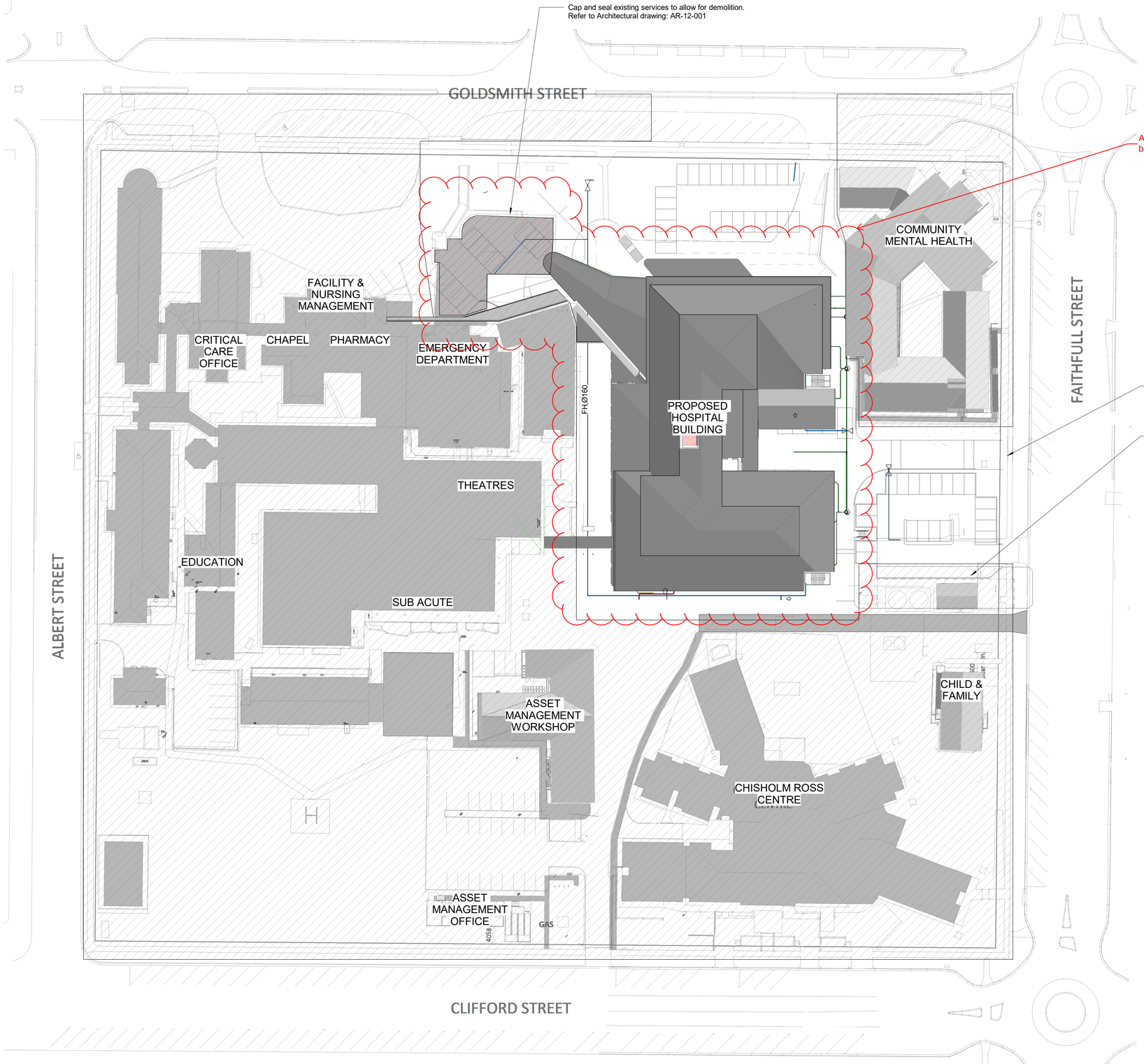

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NORTH

Hydraulic and Fire Services ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
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SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Site Plan Overall

Scale at A1 1 : 500

Role Hydraulic Services

Suitability

Arup Job No 260684

Rev E

Name HY-MW-DWG-2001

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A1

Services relocations documented to allow for new building links

Locate and connect to capped FH service installed during Enabling Works and extend to create a ring main as shown.

Lower existing services installed during enaibling works to 750mm below cut level

Extend a branch line and provide an external FH min.10m away from the building. Final location to be coordinated with car park layout

Allow to relocate vent pipe and 2 downpipes serving adjacent building at connection to new building.

Depths and setout of trench for fire hydrant ring main to be coordinated with Structures.

Allow to relocate existing gas meter outside the link's footprint to allow construction of the link

Locate NG valve and relocate outside link's footprint to allow constrution of the link. NG service to be kept operational.

Locate DCC valve and relocate outside link's footprint to allow constrution of the link. DCW service to be kept operational.

Proposed location of the relocated gas meter assembly to be coordinated with architect. Allow to provide bollard in front of the enclosure

150mm S Main
IL 651.285 (From Enabling Works "WAE" plans)

Change from 150 to 225mm S Main
IL 650.925 (From Enabling Works "WAE" plans)

225mm S Main
IL 649.250 (From Enabling Works "WAE" plans)

IL 654.840 (From Enabling Works "WAE" plans)

eFH
eFS

FH

Relocate existing FH

Ø100 FH

Ø160 FH

FH Ø160

New NG Valve

Ø150

Ø225

Refer to ARUP-HY-DWG-2101 for continuation

Refer to ARUP-HY-DWG-2101 for continuation

Refer to ARUP-HY-DWG-2102 for continuation

Refer to ARUP-HY-DWG-2102 for continuation

Ø160 FS
Ø160 FH

CO

SMS

IL 649.797

Ø150 S 1.00%

IL 649.676

Ø160 FH

Ø150 S 1.00%

Ø160 FH

Ø100 S 1.65%

IL 651.333

CO

IL 649.435

CO

Ø225 S 1.00%

IL 649.311

Ø100 FH

CO

Ø100 S 1.65%

CO

FH

e SMS
IL 649.075 (From Enabling Works "WAE" plans)

IL 648.940 (From Enabling Works "WAE" plans)

Ø160 FH

Ø160 FH

eDCW Ø100
eDCW Ø150
eFH Ø160
eS Ø225
eFS Ø160

eNG

Locate and connect to capped pipework installed during Enabling Works.

Locate and connect to capped pipework installed during Enabling Works.

Extend a branch line and provide an external FH min.10m away from the building. Final location to be coordinated with car park layout

Locate and connect to existing sanitary drainage installed during Enabling Works and extend as shown

225mm S Main
IL 648.910 (From Enabling Works "WAE" plans)

Locate and connect to capped pipework installed during Enabling Works. Refer to Enabling Works "WAE" documentation for set out

Pipework Existing from WAE (Work As Executed)

- Sewer existing
- Cold Water existing
- Fire Hydrant existing
- Fire Sprinkler existing
- Natural Gas existing

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100% DD				
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80% DD				

0 2.5 5 7.5 10 12.5 m

NORTH

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TSA MANAGEMENT
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CLIENT
NSW HI
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SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Site Plan North

Scale at A1: As indicated

Role: Hydraulic Services

Suitability

Arup Job No: 260684

Rev: E

Name: HY-MW-DWG-2002

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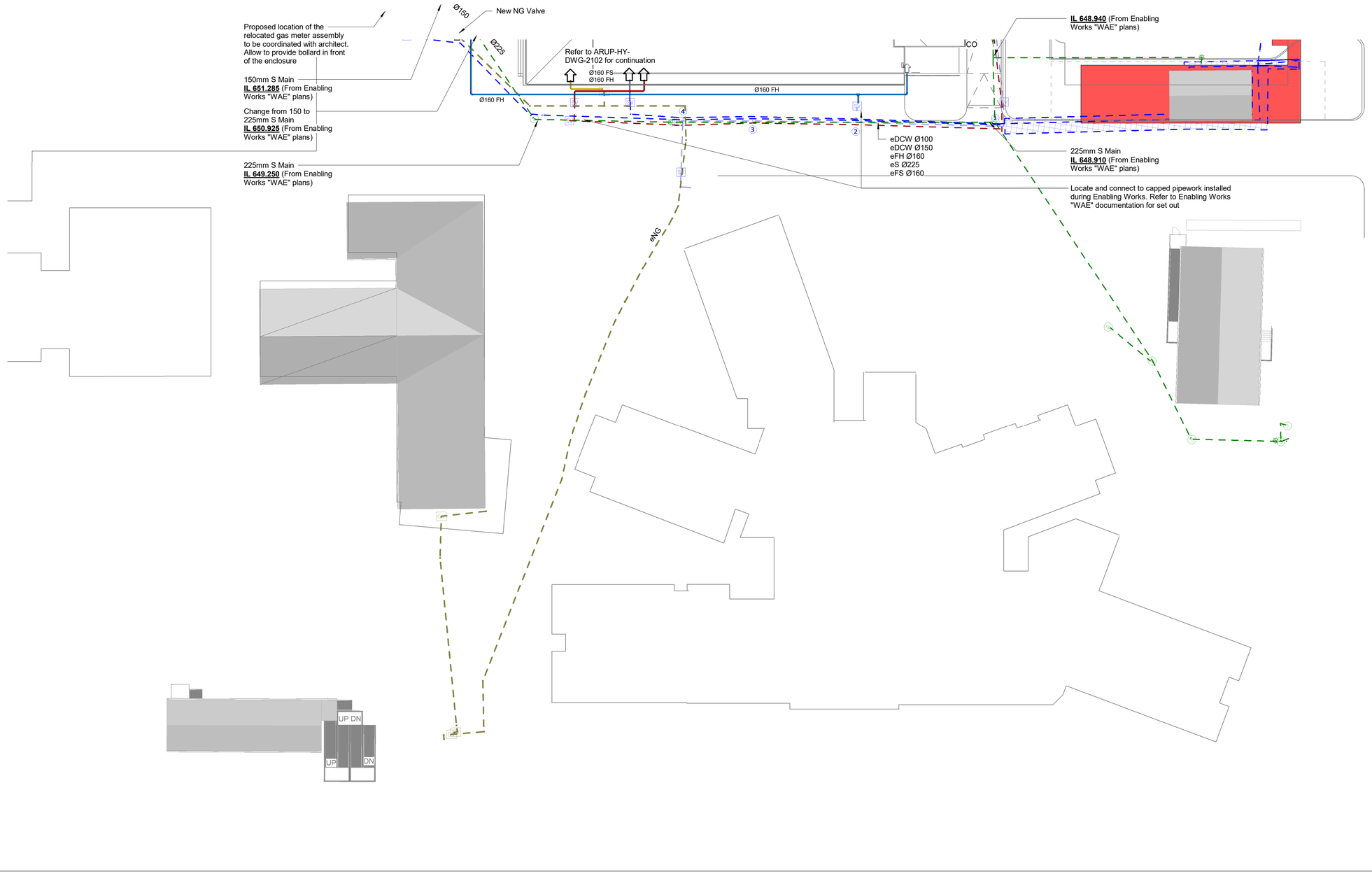

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NORTH

Hydraulic and Fire Services

ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER

TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT

NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title

Goulburn Hospital and Health Service Redevelopment

Drawing Title

Hydraulic Services Main Works Site Plan South

Scale at A1 1 : 250

Role Hydraulic Services

Suitability

Arup Job No **260684**

Rev **E**

Name **HY-MW-DWG-2003**

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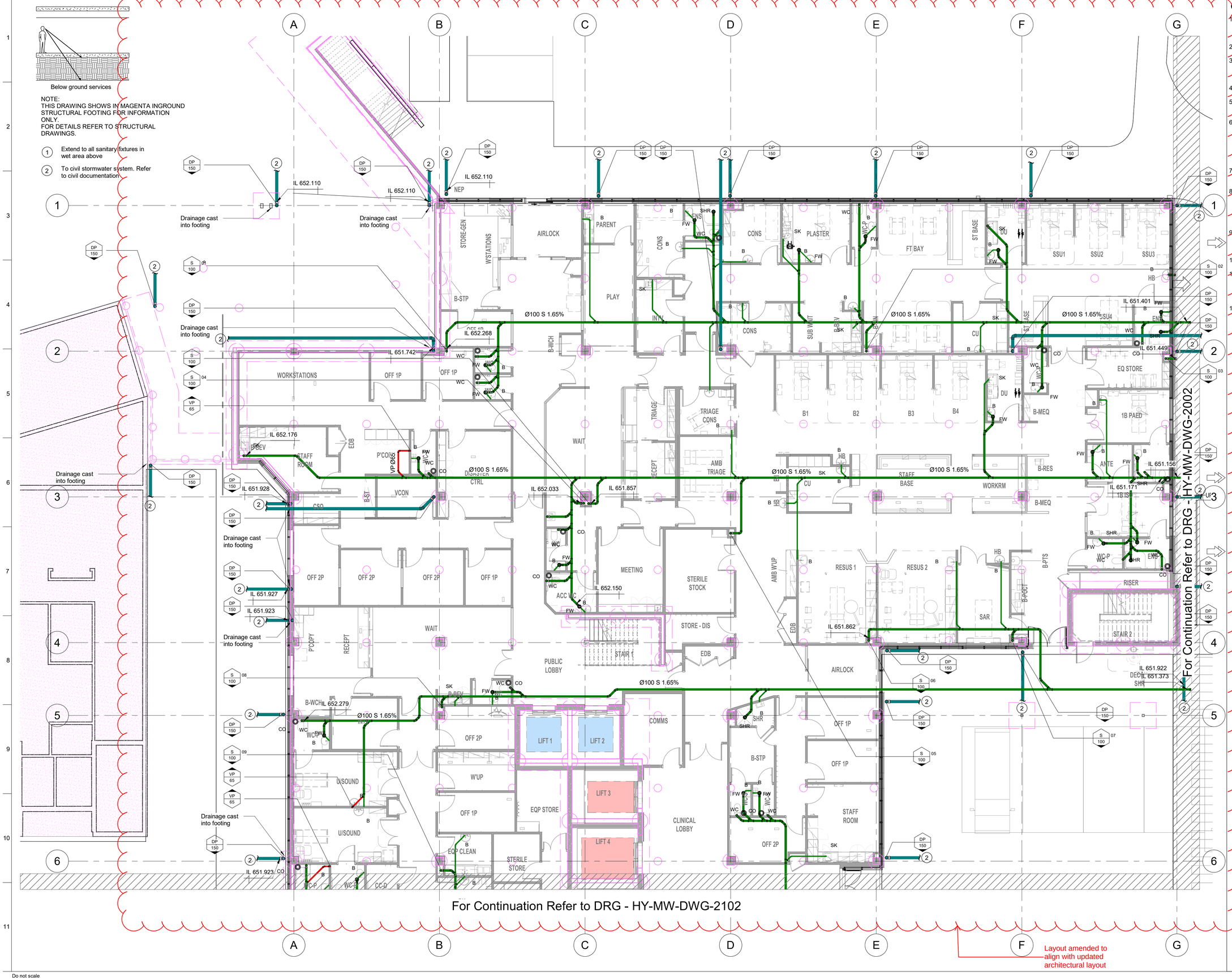

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C	10.05.19	AC	MH	MH
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B	03.05.19	AC	MH	MH
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A	26.03.19	AC	MH	MH
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Hydraulic and Fire Services

ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Lower Ground In Ground Layout Sheet 1

Scale at A1: 1 : 100

Role: Hydraulic Services

Suitability

Arup Job No: 260684

Rev: E

Name: HY-MW-DWG-2101

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Do not scale

A1

Below ground services

NOTE:
THIS DRAWING SHOWS IN MAGENTA INGROUND STRUCTURAL FOOTING FOR INFORMATION ONLY.
FOR DETAILS REFER TO STRUCTURAL DRAWINGS.

1. Extend to all sanitary fixtures in wet area above
2. To civil stormwater system. Refer to civil documentation.

Drainage cast into footing

Provide 600mm x 600mm bunded pit to alarm valve room with Ø225 outlet

Provide Trapped tundish drains to RPZD's above

Layout amended to align with updated architectural layout

For Continuation Refer to ARUP-HY-DWG-2101 for continuation

For Continuation Refer to DRG - HY-MW-DWG-2002

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B	03.05.19	AC	MH	MH
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A	26.03.19	AC	MH	MH
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NORTH

Hydraulic and Fire Services

ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Lower Ground In Ground Layout Sheet 2

Scale at A1
1 : 100

Role
Hydraulic Services

Suitability

Arup Job No
260684

Rev
E

Name
HY-MW-DWG-2102

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A1

In-strata

1. Extend to all sanitary fixtures in wet area above
2. To civil stormwater system. Refer to civil documentation

Provide plaster trap in rooms where operations involving plaster are to be perfomed, as per Goulburn Mulwaree Council "Liquid Trade Waste Policy" . (Typical)

Provide capped connection for extention by fire sprinkler contractor

For Continuation Refer to DRG - HY-MW-DWG-2102

Layout amended to align with updated architectural layout

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Hydraulic and Fire Services

ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

TSA MANAGEMENT

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

NSW GOVERNMENT Health Infrastructure

STH
SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Lower Ground Drainage Layout Sheet 1

Scale at A1 1 : 100

Role Hydraulic Services

Suitability

Arup Job No 260684

Rev E

Name HY-MW-DWG-2103

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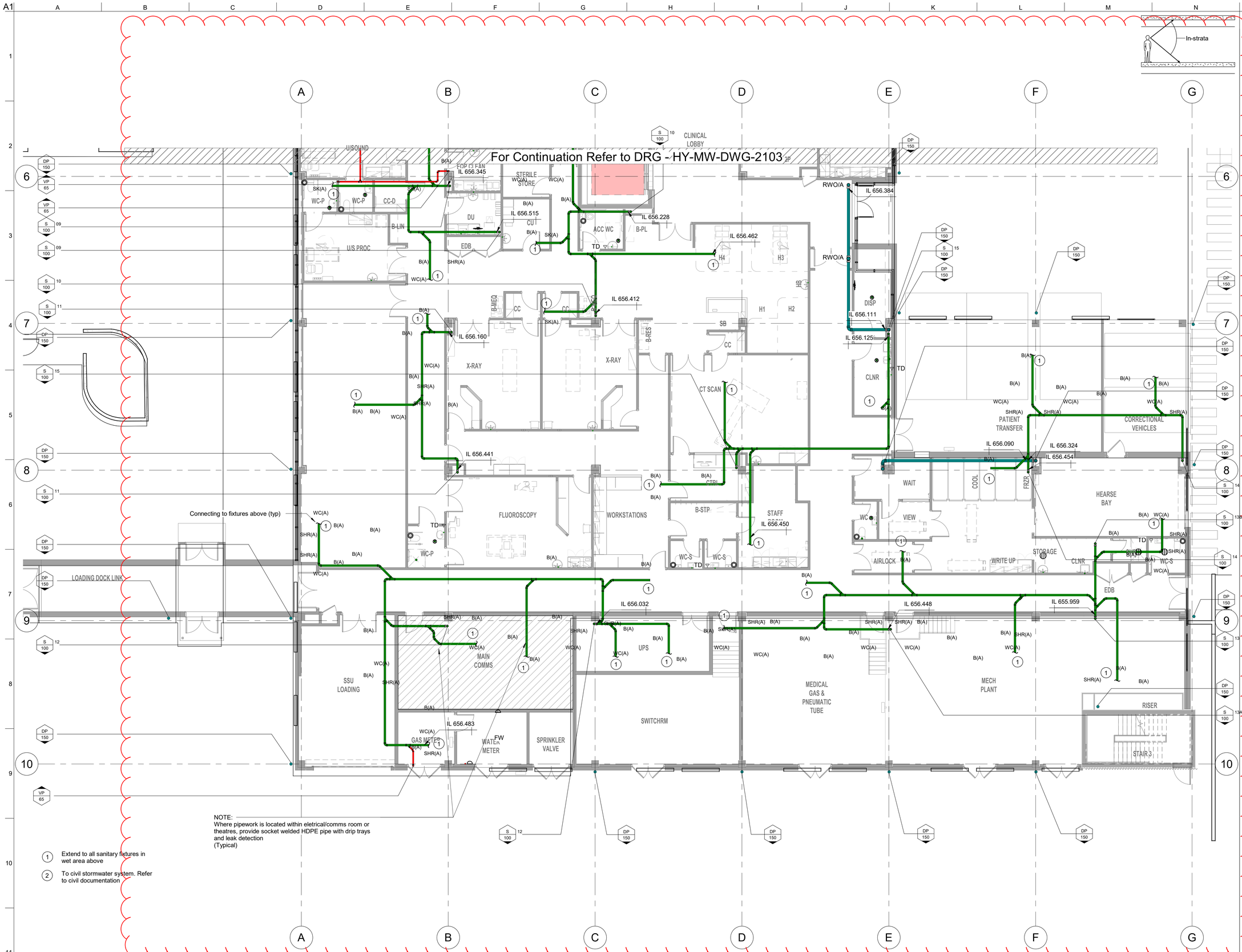

NOTE:
Where pipework is located within eletrical/comms room or theatres, provide socket welded HDPE pipe with drip trays and leak detection
(Typical)

1. Extend to all sanitary fixtures in wet area above
2. To civil stormwater system. Refer to civil documentation

Layout amended to align with updated architectural layout

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Hydraulic and Fire Services

ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

STH
SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Lower Ground Drainage Layout Sheet 2

Scale at A1
1 : 100

Role
Hydraulic Services

Suitability

Arup Job No
260684

Rev
E

Name
HY-MW-DWG-2104

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Do not scale

A1

Extend to all sanitary fixtures in wet area above

To civil stormwater system. Refer to civil documentation

In-strata

Ø40 Overflow

For Continuation Refer to DRG - HY-MW-DWG-2106

Layout amended to align with updated architectural layout

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A	26.03.19	AC	MH	MH
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NORTH

Hydraulic and Fire Services
ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
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www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Ground Floor Drainage Layout Sheet 1

Scale at A1: 1 : 100

Role: Hydraulic Services

Suitability

Arup Job No	Rev
260684	E

Name
HY-MW-DWG-2105

12/06/2019 5:47:14 PM

Do not scale

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2. To civil stormwater system. Refer to civil documentation

Layout amended to align with updated architectural layout

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www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Ground Floor Drainage Layout Sheet 2

Scale at A1
1 : 100

Role
Hydraulic Services

Suitability

Arup Job No
260684

Rev
E

Name
HY-MW-DWG-2106

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A1

1 Extend to all sanitary fixtures in wet area above

2 To civil stormwater system. Refer to civil documentation

Minimum effective cross sectional area of gutter = 12 800 mm² (typical)

In-strata

General Notes

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CLIENT
NSW HI
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www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Level 1 Drainage Layout Sheet 1

Scale at A1 1 : 100

Role Hydraulic Services

Suitability

Arup Job No 260684

Rev E

Name HY-MW-DWG-2107

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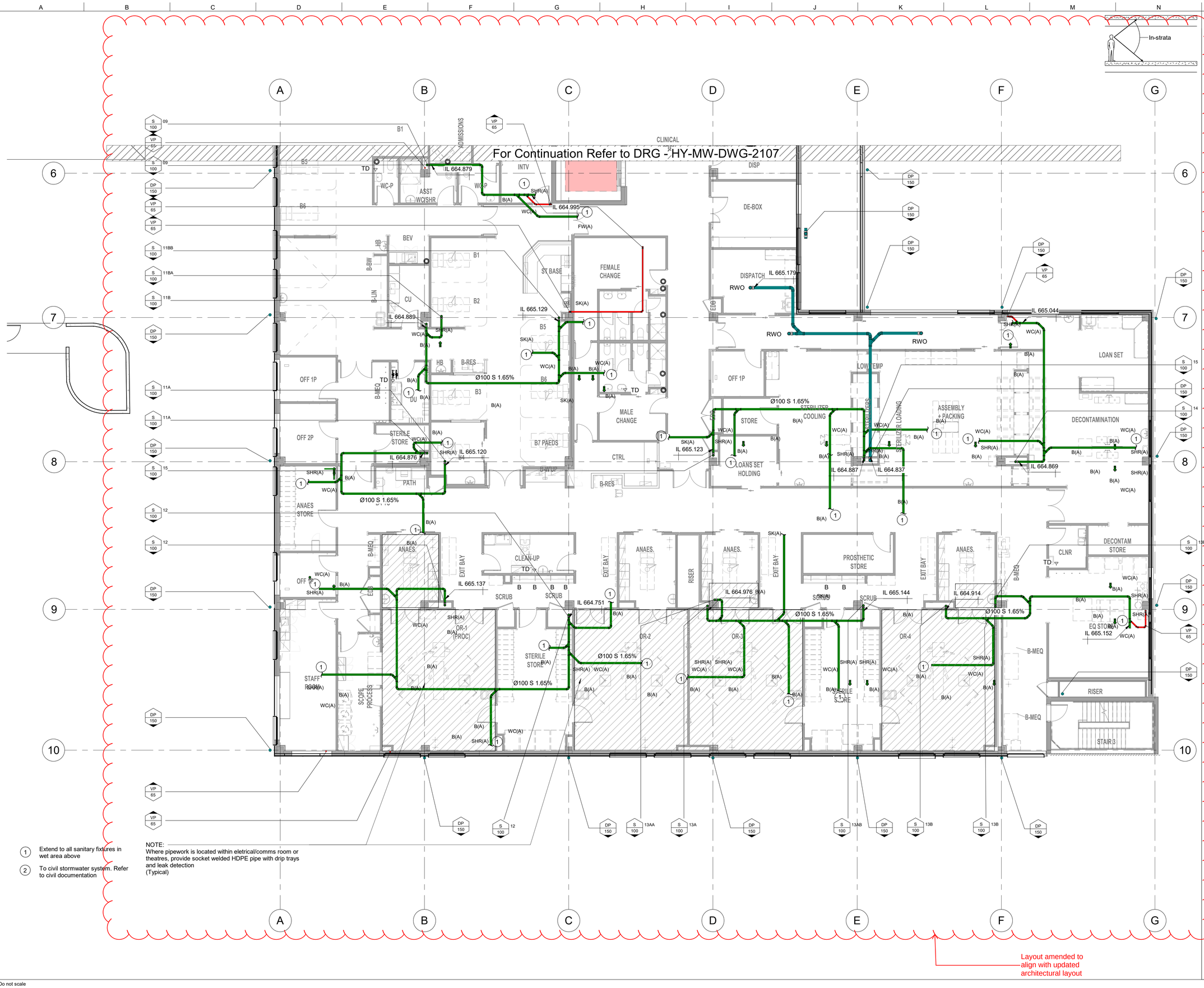
For Continuation Refer to DRG - HY-MW-DWG-2108

Layout amended to align with updated architectural layout

Do not scale



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A	26.03.19	AC	MH	MH
50% DD				

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NORTH

Hydraulic and Fire Services
ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
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SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Level 1 Drainage Layout Sheet 2

Scale at A1: 1 : 100

Role: Hydraulic Services

Suitability

Arup Job No: 260684

Rev: E

Name: HY-MW-DWG-2108

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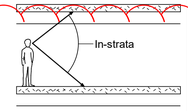
A1

1 Extend to all sanitary fixtures in wet area above

2 To civil stormwater system. Refer to civil documentation



Spreader to discharge on roof below (typical)

Minimum effective cross sectional area of gutter = 12 800 mm² (typical)

Ø40 Overflow

T01
482.42 m²

CNE OFF 2P
STAFF RM
TERRACE
O/F
RWO
NUM OFF 1P
B-STP
DIR OFF 1P
WC
SHR
BATH
EQ STORE
MEETING
669.413
669.499
BEV
CLNR
DE-BOX
EDB
WAIT
INTV
COPY
B-LIN
WC
RISER
STAIR 1
PUBLIC LOBBY
LIFT 1
LIFT 2
LIFT 3
LIFT 4
COMMS
INTV
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ACC WC
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B(A)
FW(A)
AH
IL 669.305
IL 669.448
IL 669.218
IL 669.369
IL 669.372
FW/A
HB
TD
RISER
CU
STERILE STORE
STAFF
CLINICAL WROOM
B-MEQ
B-BW
B-RES
B-SS
B-PTS
ICU-10
ICU-9
ICU-8
ICU-7
ICU-6 (BAR)
ANTE
ENS
ICU-5 (ISO)
PAT ENS
ICU-1
ICU-2
ICU-3
ICU-4
DU
RISER
STAIR 2
DP 150
VP 65
S 100 01
S 100 06
S 100 04

For Continuation Refer to DRG - HY-MW-DWG-2110

Layout amended to align with updated architectural layout

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A	26.03.19	AC	MH	MH
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NORTH

Hydraulic and Fire Services
ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
L4/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Level 2 Drainage Layout Sheet 1

Scale at A1 1 : 100

Role Hydraulic Services

Suitability

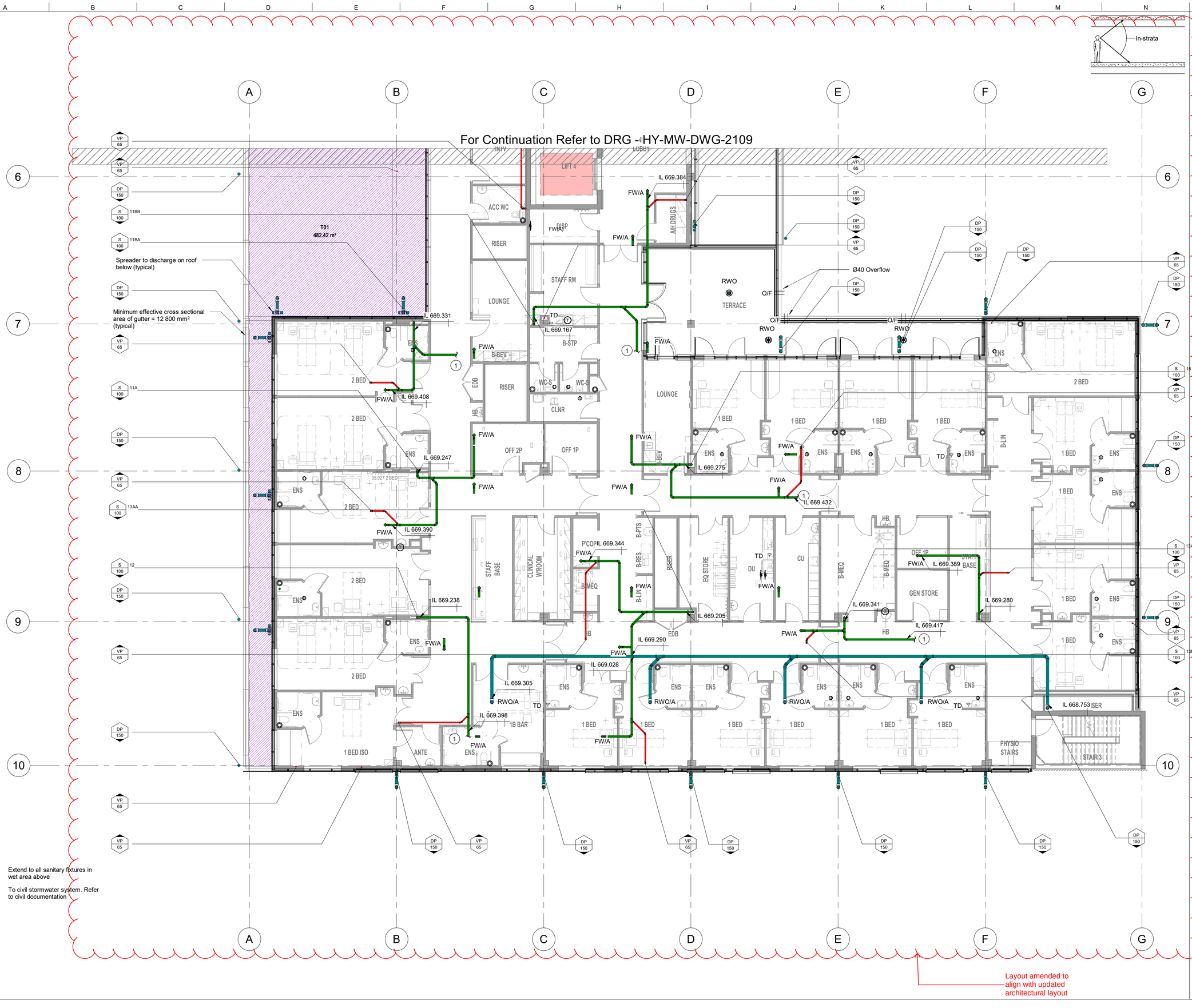
Arup Job No 260684

Rev E

Name HY-MW-DWG-2109

12/06/2019 5:47:19 PM

Do not scale



1. Extend to all sanitary fixtures in wet area above
2. To civil stormwater system. Refer to civil documentation

Layout amended to align with updated architectural layout

General Notes

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12. Provide Internal mains, risers with 25% additional service capacity for future expansion.

Rev	Date	By	Chkd	Appd
E	12/06/19	AC	MH	MH
100% DD				
D	31.05.19	AC	MH	MH
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C	10.05.19	AC	MH	MH
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80% DD				
A	26.03.19	AC	MH	MH
50% DD				

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NSW GOVERNMENT Health Infrastructure

STH
SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Level 2 Drainage Layout Sheet 2

Scale at A1 1 : 100

Role Hydraulic Services

Suitability

Arup Job No **260684**

Rev **E**

Name **HY-MW-DWG-2110**

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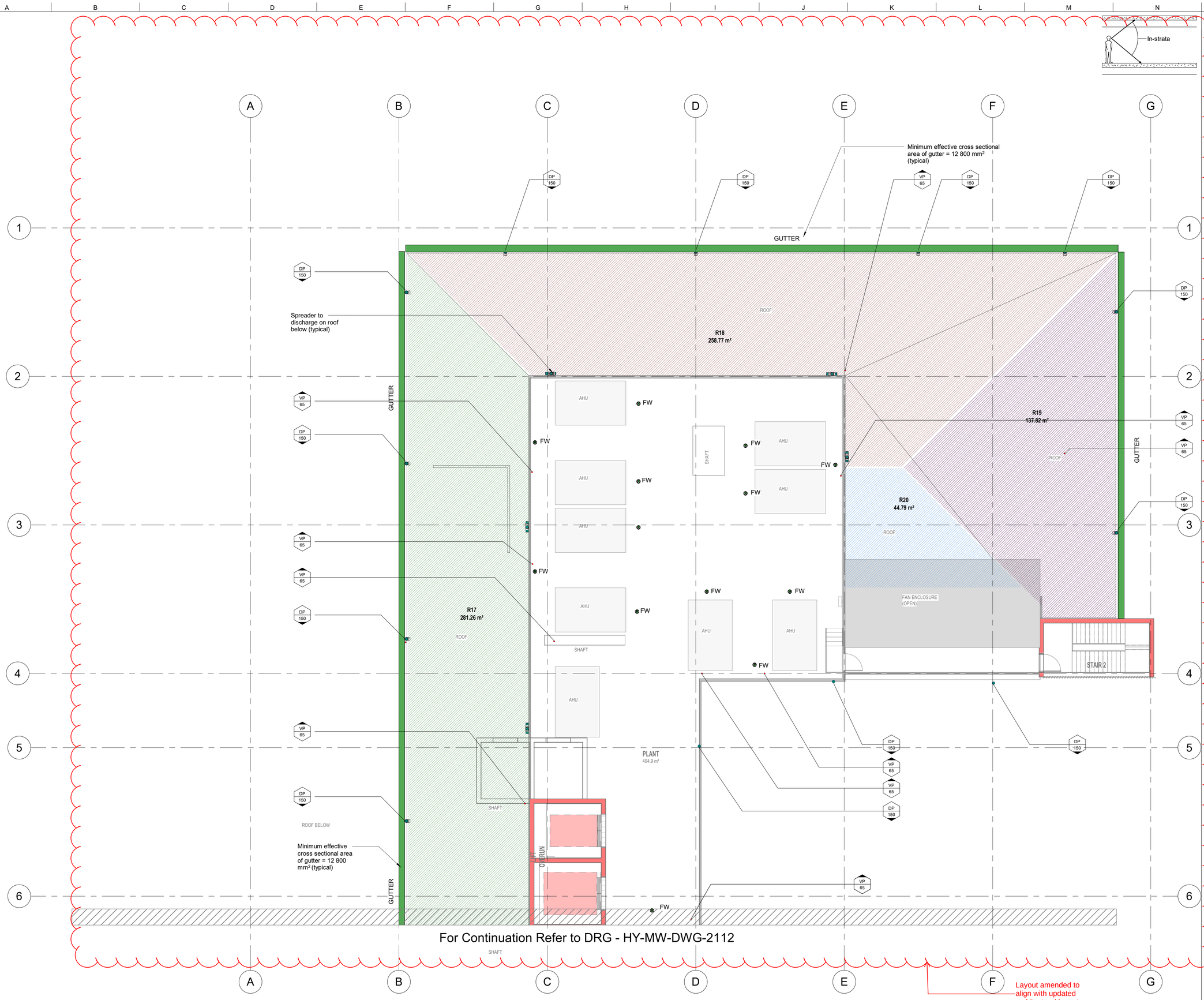

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TSA MANAGEMENT
Level 15, 207 Kent Street
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CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Level 3 Drainage Layout Sheet 1

Scale at A1
1 : 100

Role
Hydraulic Services

Suitability

Arup Job No
260684

Rev
E

Name
HY-MW-DWG-2111

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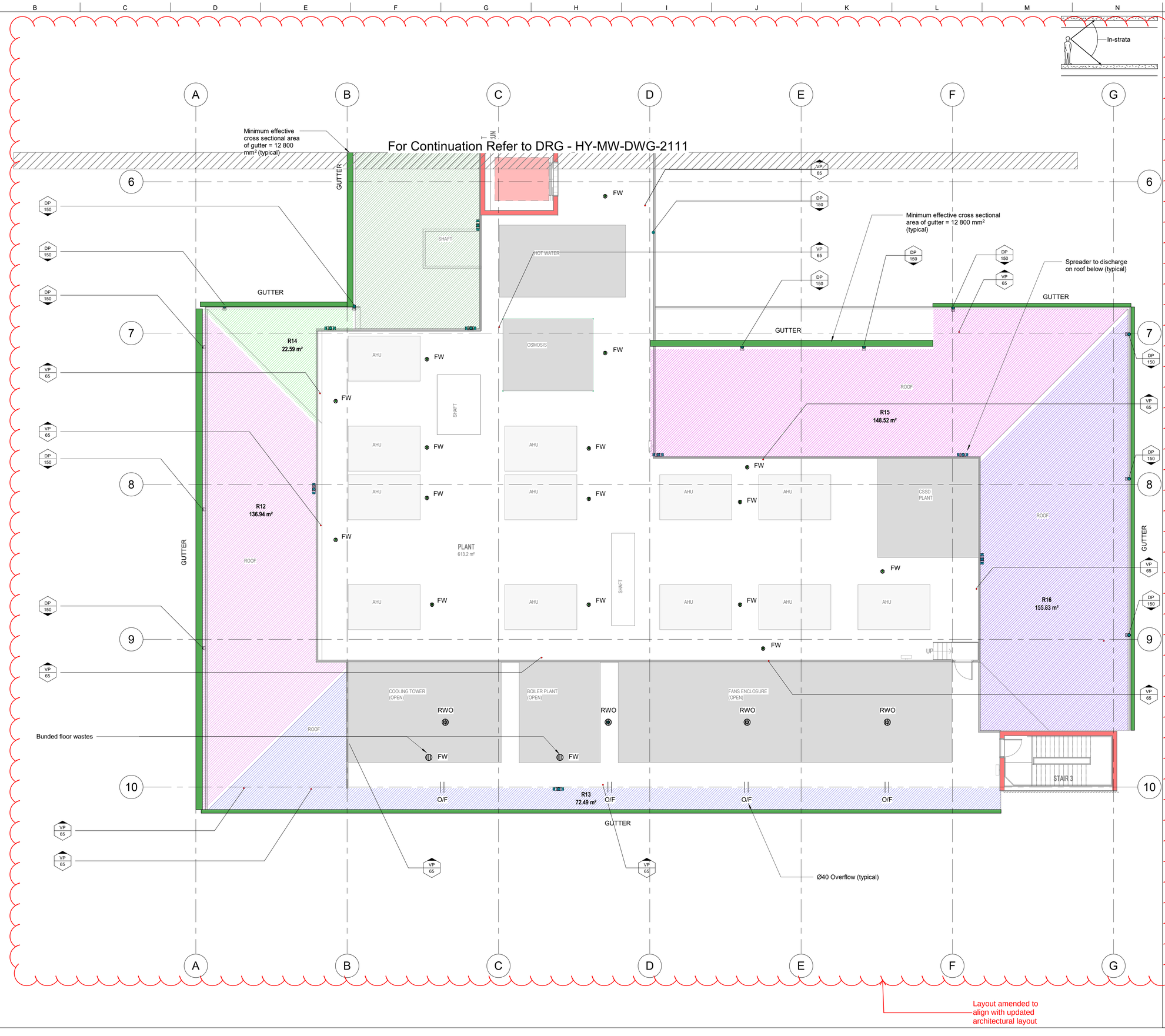

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80% DD				
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50% DD				

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Hydraulic and Fire Services

ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Level 3 Drainage Layout Sheet 2

Scale at A1
1 : 100

Role
Hydraulic Services

Suitability

Arup Job No
260684

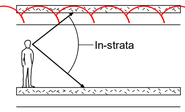
Rev
E

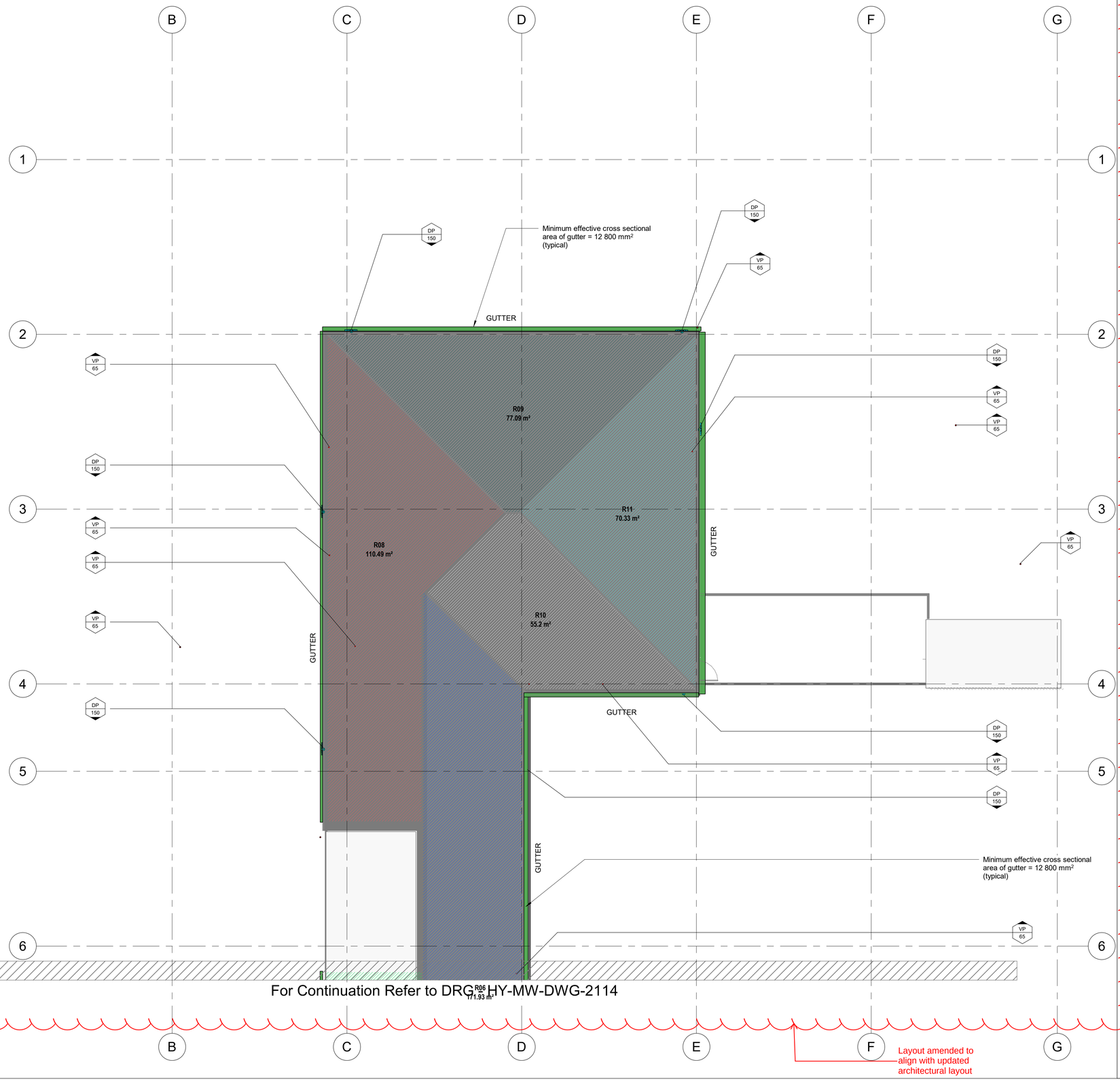
Name
HY-MW-DWG-2112

12/06/2019 5:47:21 PM

Do not scale

HYD - Calcs - Stormwater Catchment Area					
Level	Number	Name	Area	Perimeter	Flow (l/s)
LEVEL 2	T01	Terrace	482.42 m²	279758	36.181653
LEVEL 3	R12	Roof	136.94 m²	62890	10.270183
LEVEL 3	R13	Roof	72.49 m²	98786	5.436951
LEVEL 3	R14	Roof	22.59 m²	25697	1.694476
LEVEL 3	R15	Roof	148.52 m²	64621	11.138683
LEVEL 3	R16	Roof	155.83 m²	57814	11.686884
LEVEL 3	R17	Roof	281.26 m²	98519	21.0945
LEVEL 3	R18	Roof	258.77 m²	93048	19.407969
LEVEL 3	R19	Roof	137.82 m²	53335	10.336147
LEVEL 3	R20	Roof	44.79 m²	29566	3.358969
ROOF	R01	Roof	82.67 m²	43902	6.200517
ROOF	R02	Roof	189.06 m²	81061	14.179538
ROOF	R03	Roof	32.49 m²	27522	2.43675
ROOF	R04	Roof	103.59 m²	52472	7.769211
ROOF	R05	Roof	63.36 m²	35226	4.751764
ROOF	R06	Roof	171.93 m²	83299	12.894619
ROOF	R07	Roof	42.29 m²	29500	3.17203
ROOF	R08	Roof	110.49 m²	56284	8.286989
ROOF	R09	Roof	77.09 m²	42171	5.781838
ROOF	R10	Roof	55.2 m²	32767	4.139975
ROOF	R11	Roof	70.33 m²	40493	5.274735





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80% DD				
A	26.03.19	AC	MH	MH
50% DD				

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NORTH

Hydraulic and Fire Services ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Roof Layout Sheet 1

Scale at A1: 1 : 100

Role: Hydraulic Services

Suitability

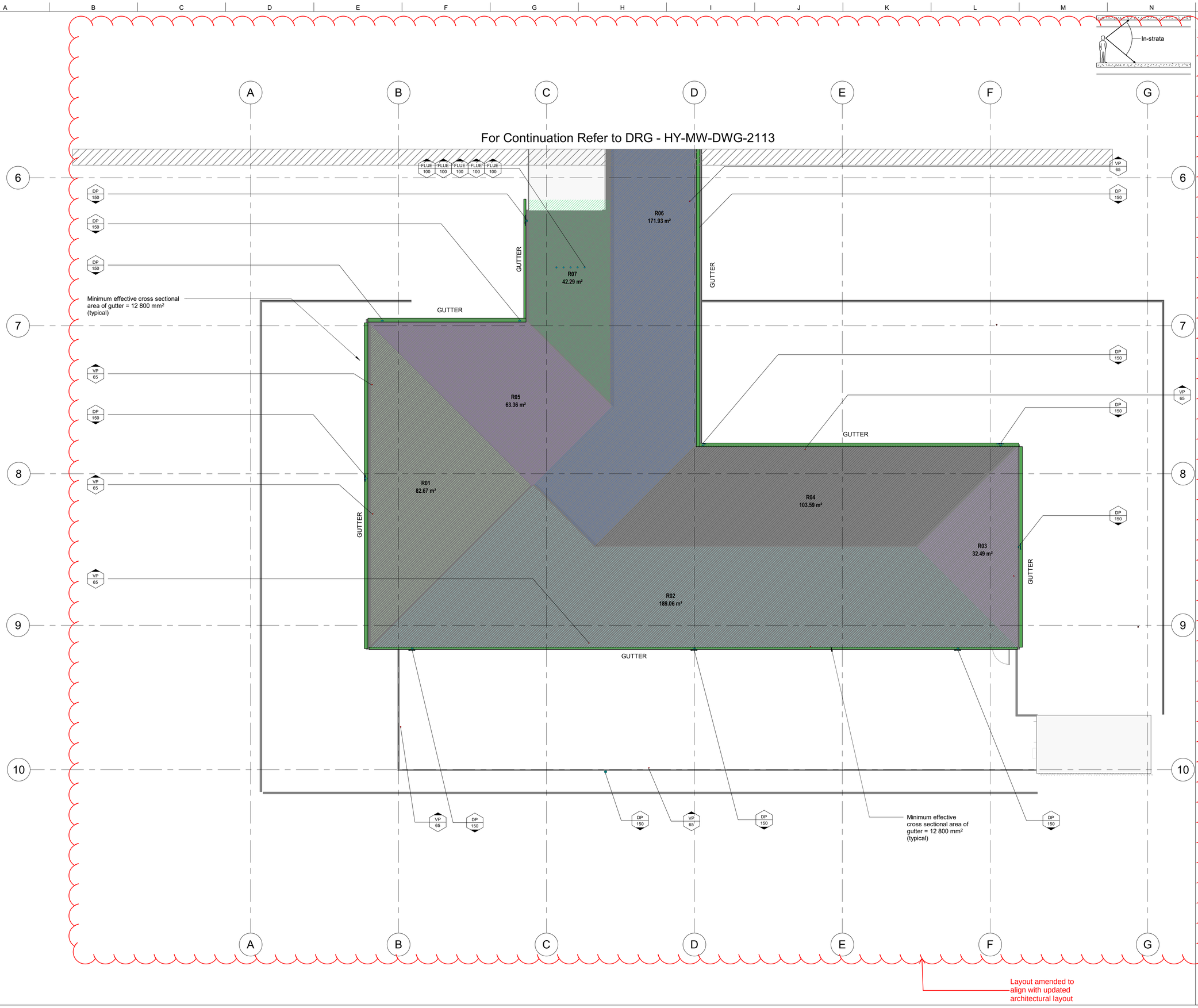
Arup Job No: 260684

Rev: E

Name: HY-MW-DWG-2113

12/06/2019 5:47:28 PM

Do not scale



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0 1 2 3 4 5 m

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SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Roof Layout Sheet 2

Scale at A1: 1 : 100

Role: Hydraulic Services

Suitability

Arup Job No: 260684

Rev: E

Name: HY-MW-DWG-2114

12/06/2019 5:47:35 PM

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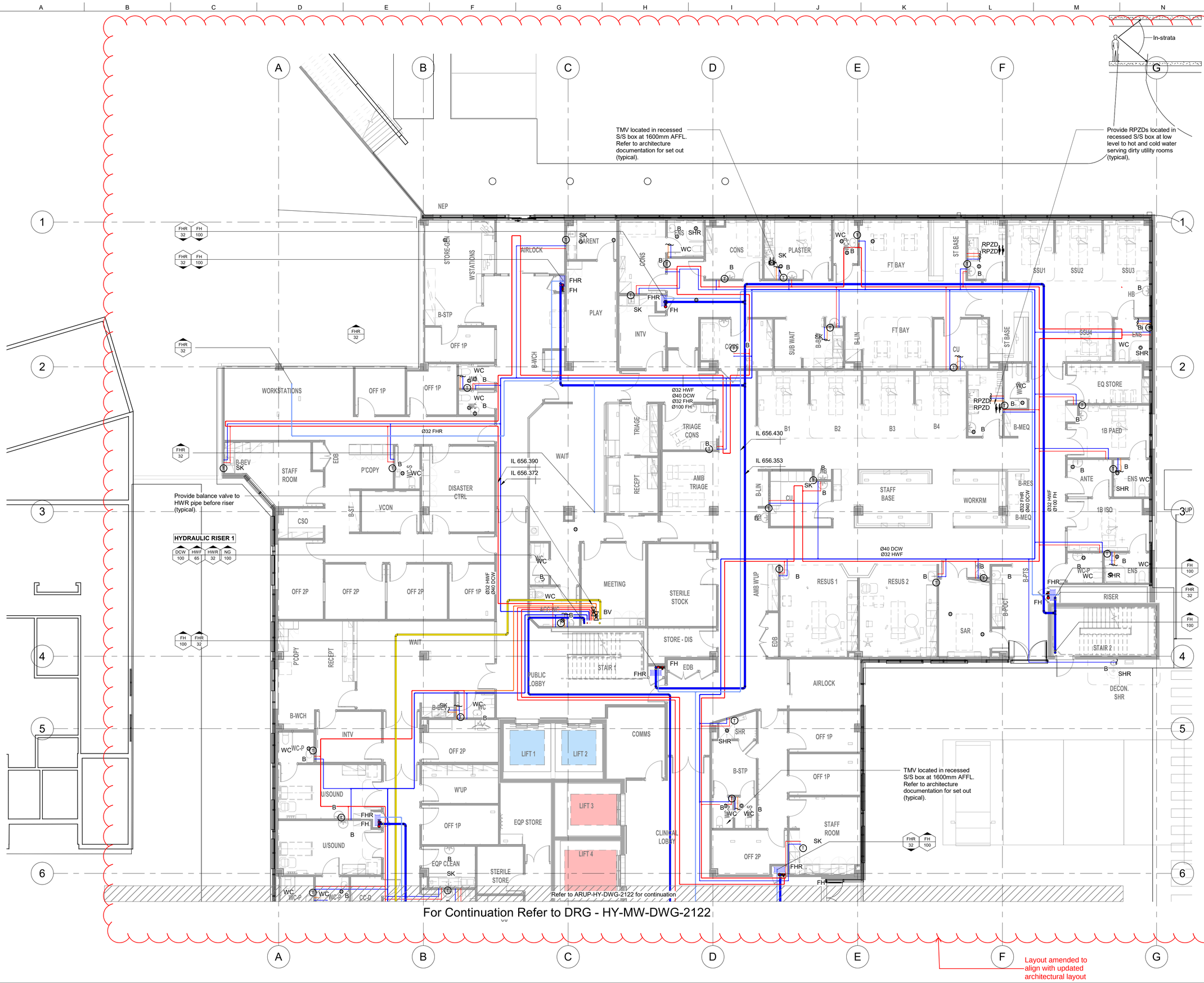

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11. Provide control valves so that individual fixture groups may be shut down without affecting the wider system. Male, female and access amenities to be individually isolated.
12. Provide standard isolating valves on supply to each cistern, sink, basin and speciality equipment.
13. Refer to schematics for pipe sizing.

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SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Lower Ground Water & Gas Layout Sheet 1

Scale at A1: 1 : 100

Role: Hydraulic Services

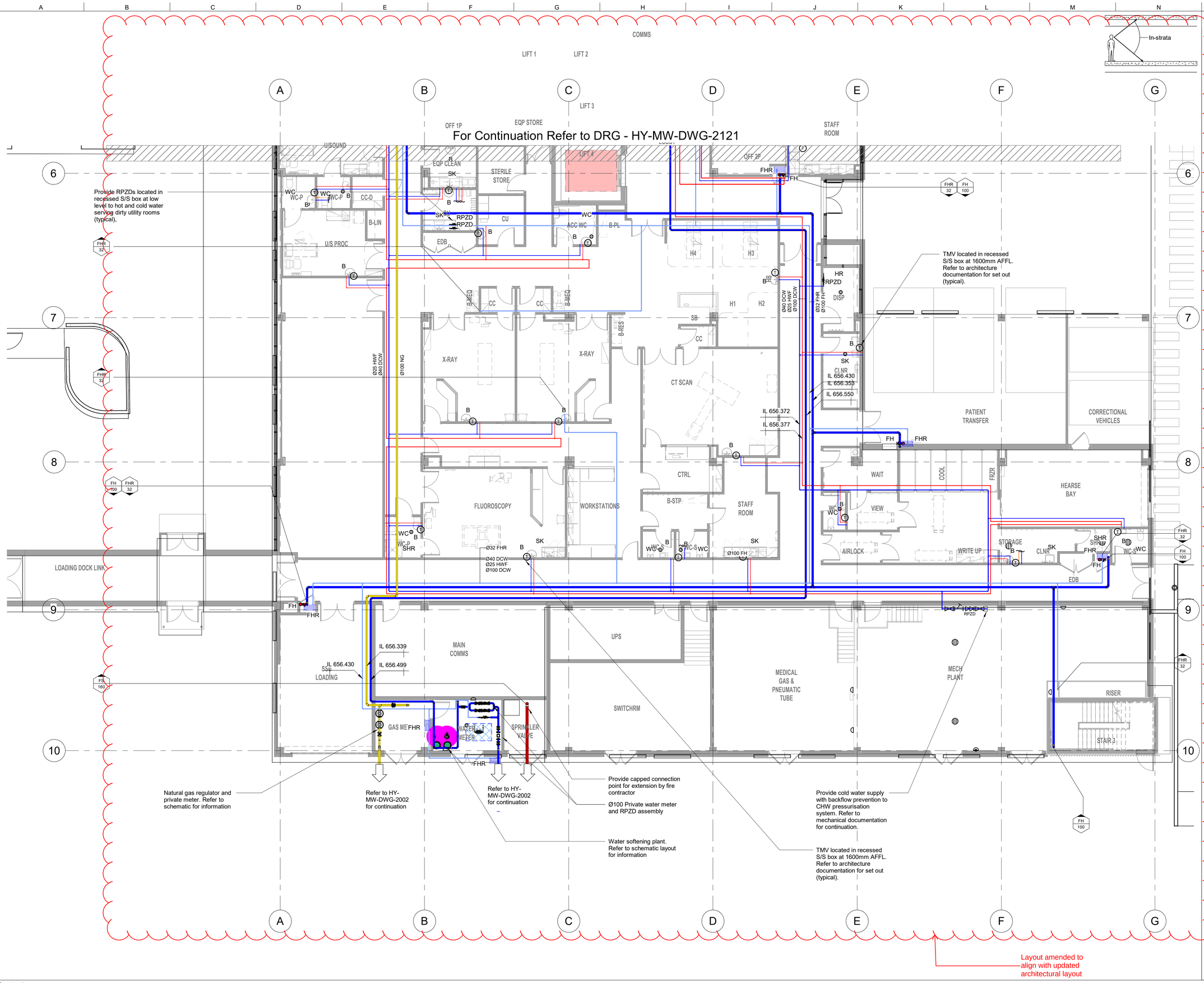
Suitability

Arup Job No: 260684

Rev: E

Name: HY-MW-DWG-2121

12/06/2019 5:47:37 PM



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SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Lower Ground Water & Gas Layout Sheet 2

Scale at A1 1 : 100

Role Hydraulic Services

Suitability

Arup Job No 260684

Rev E

Name HY-MW-DWG-2122

12/06/2019 5:47:39 PM

Do not scale

A1

TMV located in recessed S/S box at 1600mm AFFL. Refer to architecture documentation for set out (typical).

Provide RPZDs located in recessed S/S box at low level to hot and cold water serving dirty utility rooms (typical),

In-strata

Provide balance valve to HWR pipe before riser (typical).

HYDRAULIC RISER 1

DCW	HWF	HWR	NG
100	65	32	100

Ø50 DCW

Ø40 HWF
Ø50 DCW

IL 660.731

IL 660.725

TMV located in recessed S/S box at 1600mm AFFL. Refer to architecture documentation for set out (typical).

Layout amended to align with updated architectural layout

For Continuation Refer to DRG - HY-MW-DWG-2124

General Notes

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CLIENT
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NSW GOVERNMENT Health Infrastructure

STH
SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Ground Floor Water & Gas Layout Sheet 1

Scale at A1 1 : 100

Role Hydraulic Services

Suitability

Arup Job No 260684

Rev E

Name HY-MW-DWG-2123

12/06/2019 5:47:40 PM

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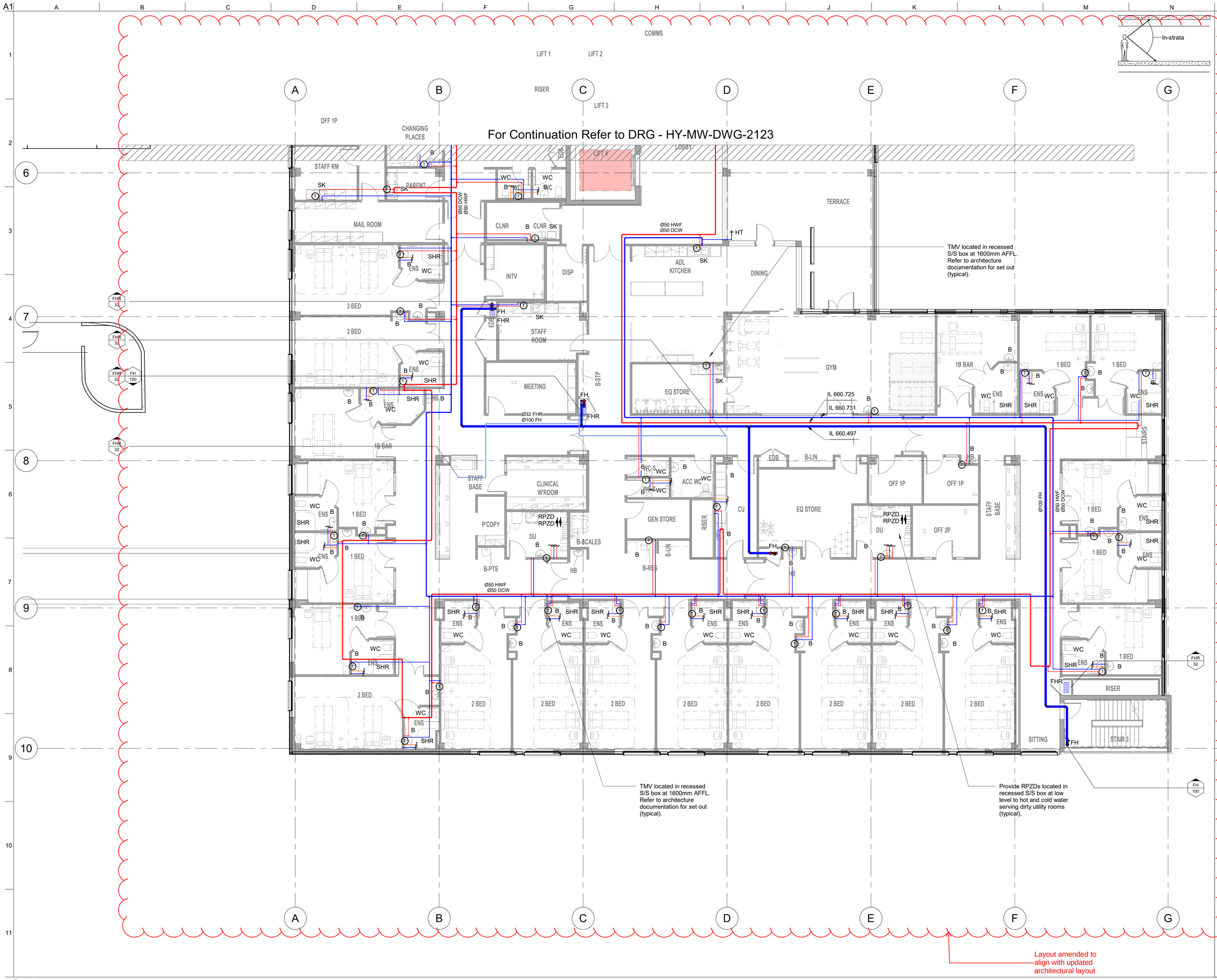

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A	26.03.19	AC	MH	MH
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NORTH

Hydraulic and Fire Services

ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Ground Floor Water & Gas Layout Sheet 2

Scale at A1: 1 : 100

Role: Hydraulic Services

Suitability

Arup Job No: 260684

Rev: E

Name: HY-MW-DWG-2124

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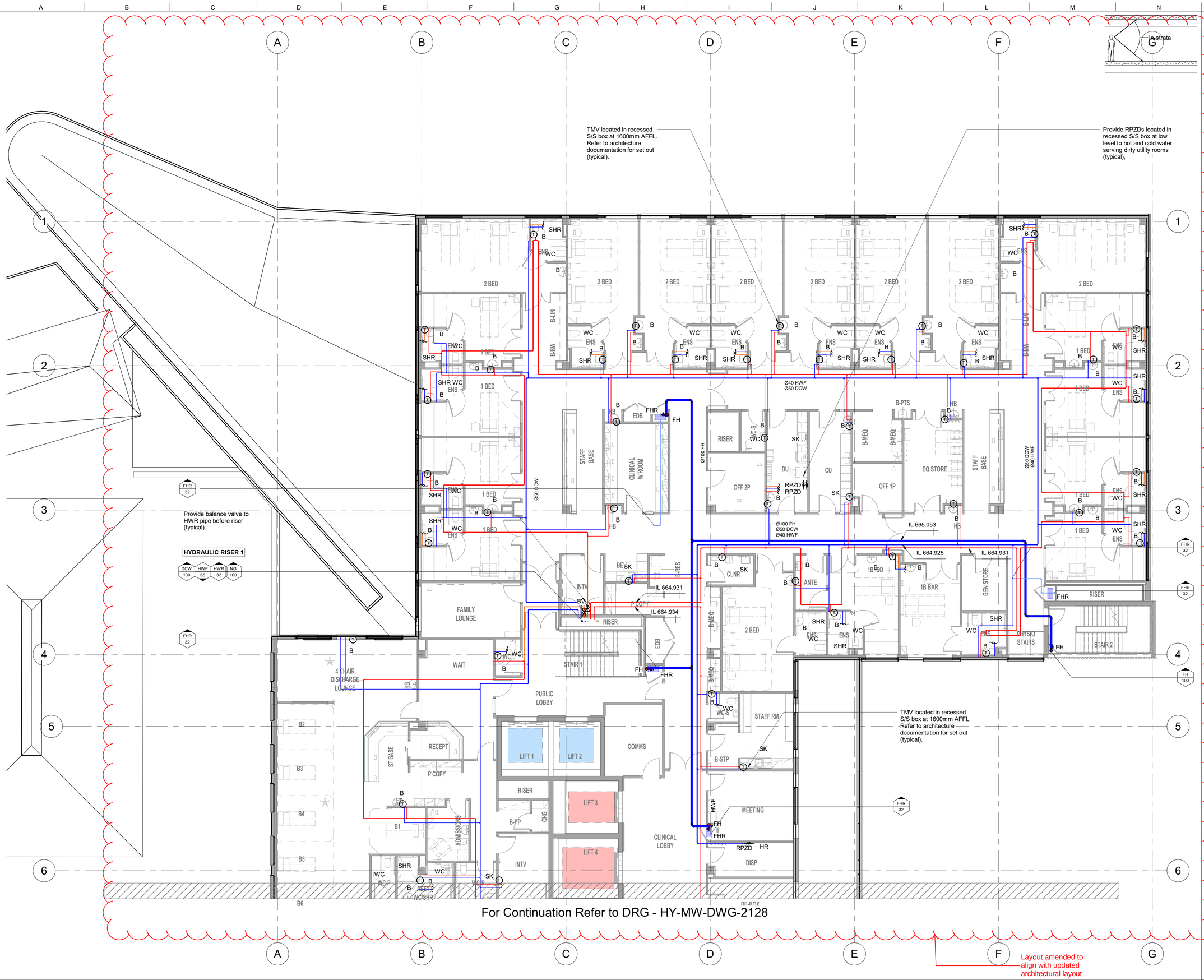

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Hydraulic and Fire Services
ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
1/477 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Level 1 Water & Gas Layout Sheet 1

Scale at A1: 1 : 100

Role: Hydraulic Services

Suitability

Arup Job No: 260684

Rev: E

Name: HY-MW-DWG-2125

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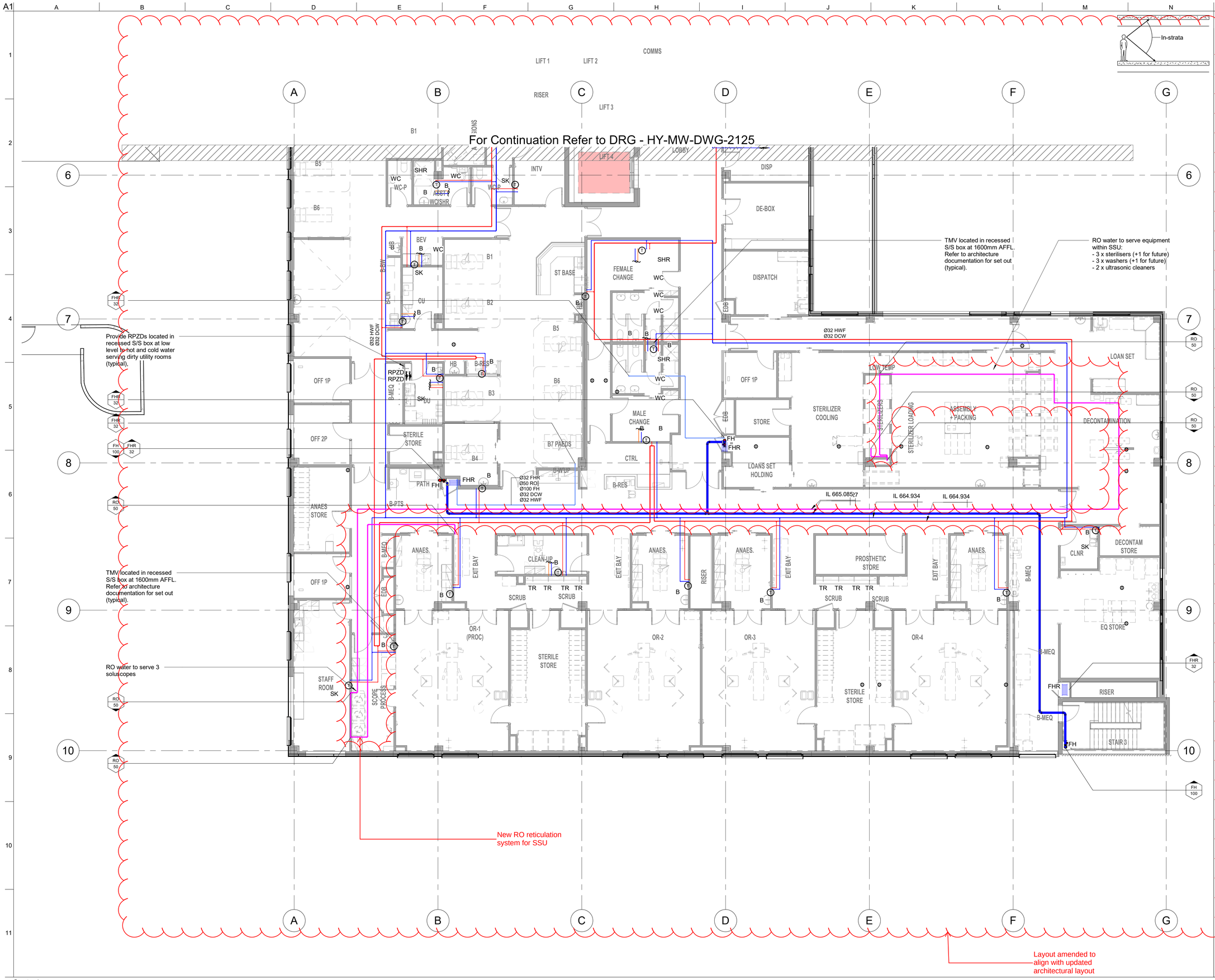

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NORTH

Hydraulic and Fire Services
ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 397 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Level 1 Water & Gas Layout Sheet 2

Scale at A1
1 : 100

Role
Hydraulic Services

Suitability

Arup Job No
260684

Rev
E

Name
HY-MW-DWG-2126

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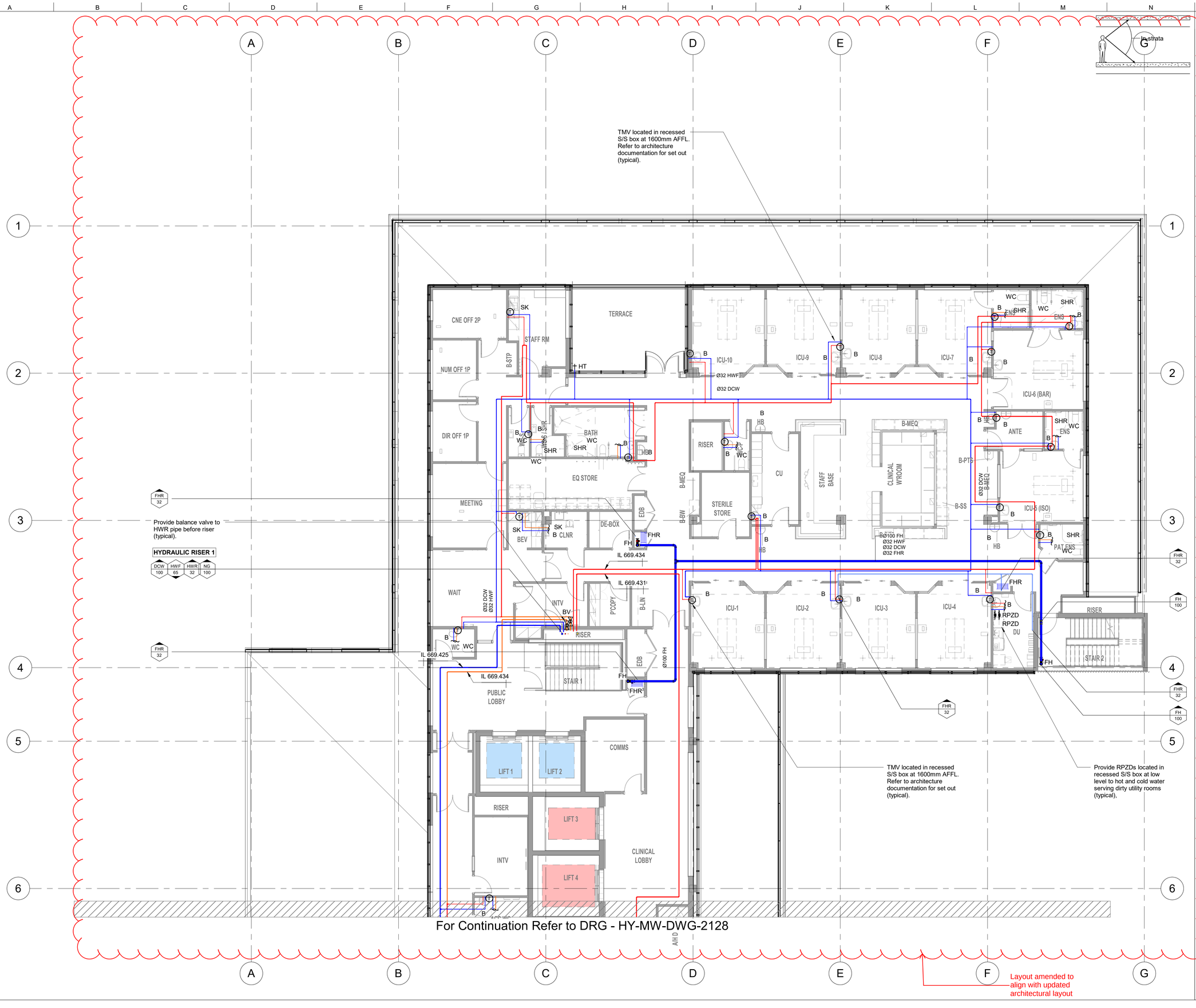

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Hydraulic and Fire Services
ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
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CLIENT
NSW HI
14/77 Pacific Hwy
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T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Level 2 Water & Gas Layout Sheet 1

Scale at A1 1 : 100

Role
Hydraulic Services

Suitability

Arup Job No
260684

Rev
E

Name
HY-MW-DWG-2127

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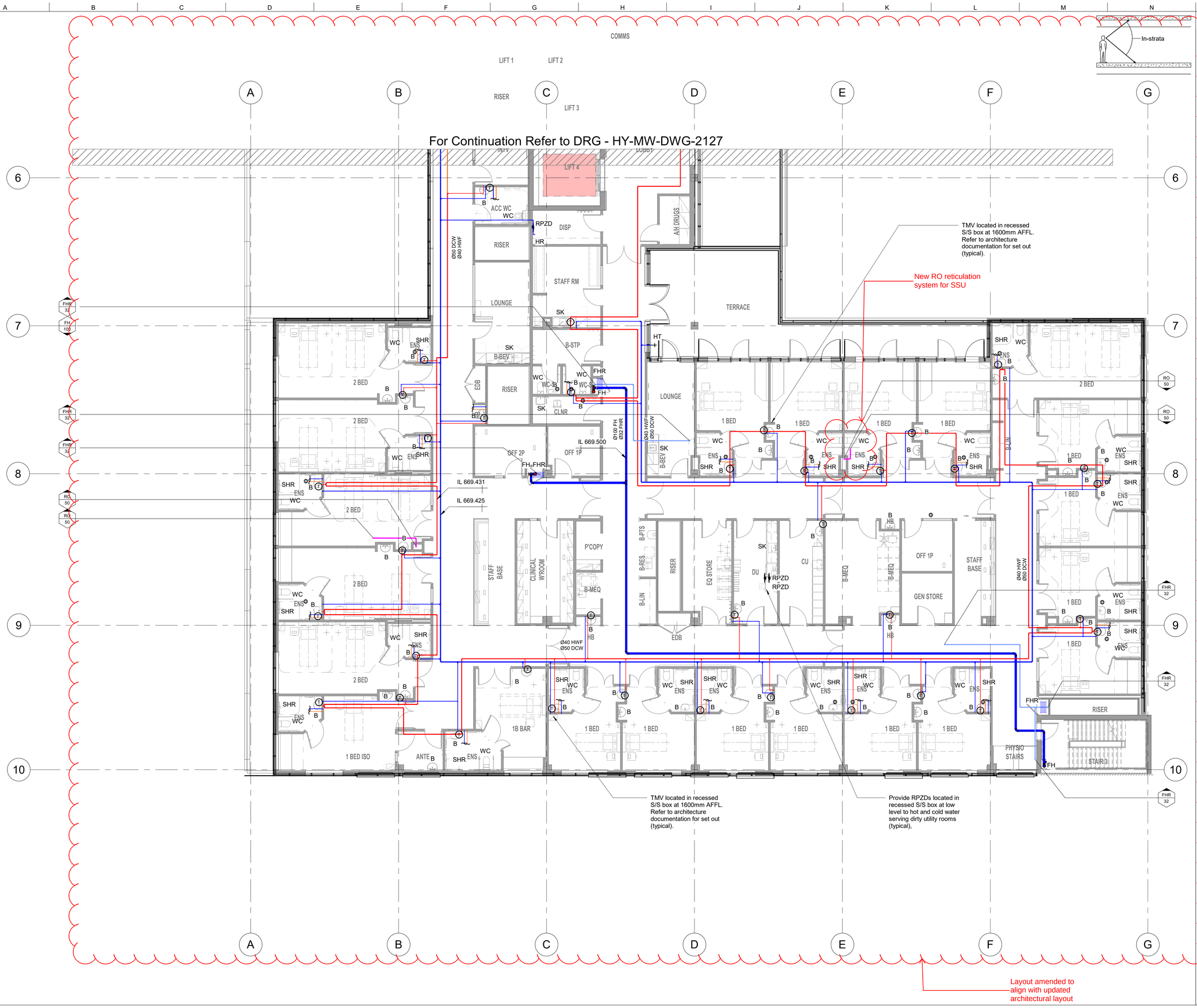

In-strata

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SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Level 2 Water & Gas Layout Sheet 2

Scale at A1
1 : 100

Role
Hydraulic Services

Suitability

Arup Job No
260684

Rev
E

Name
HY-MW-DWG-2128

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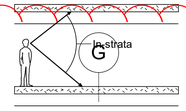

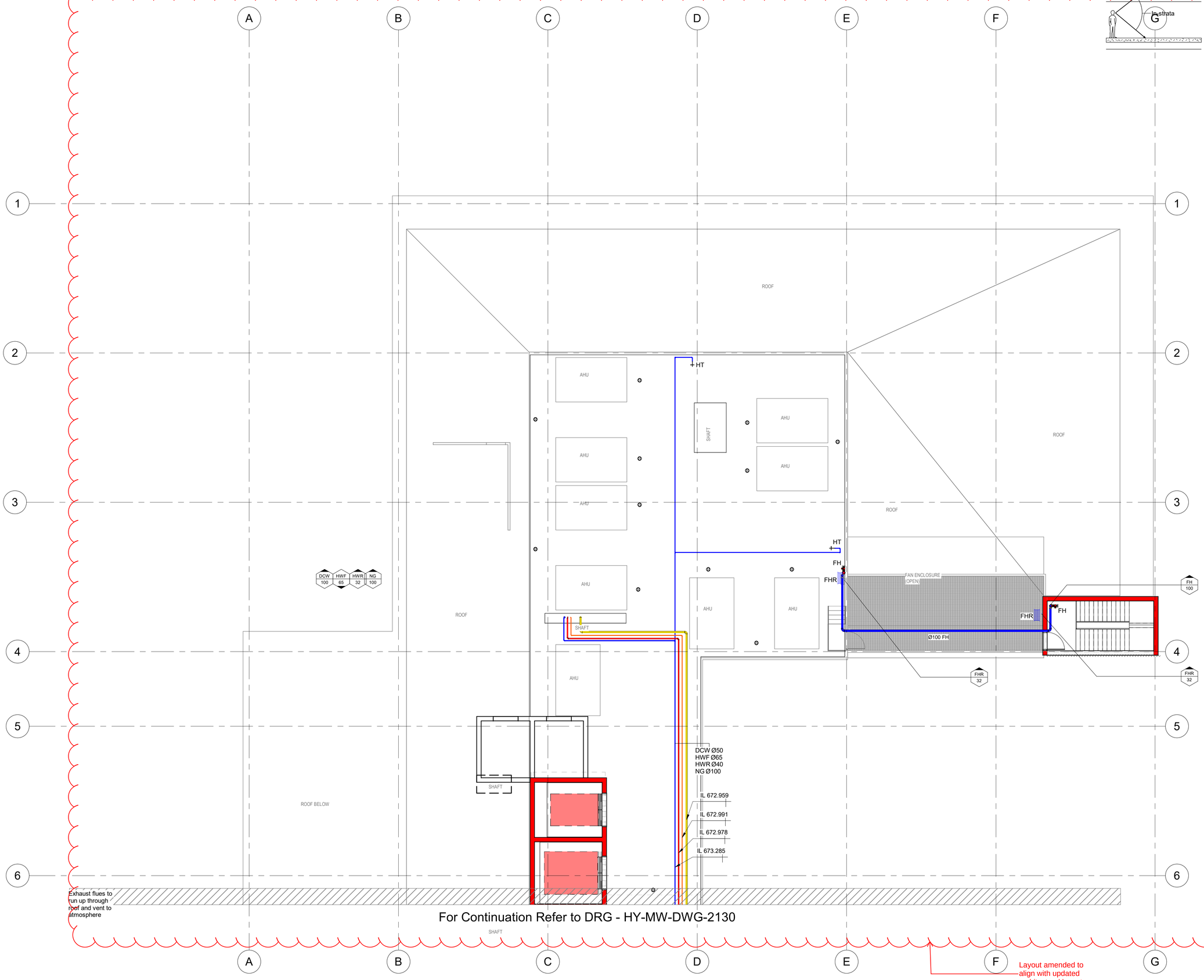

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NORTH

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ARUP
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PROJECT MANAGER
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NSW HI
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SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Level 3 Water & Gas Layout Sheet 1

Scale at A1 1 : 100

Role Hydraulic Services

Suitability

Arup Job No 260684

Rev E

Name HY-MW-DWG-2129

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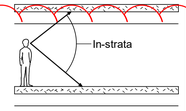
For Continuation Refer to DRG - HY-MW-DWG-2129



Exhaust flues to run up through roof and vent to atmosphere

FLUE 100 | FLUE 100 | FLUE 100 | FLUE 100 | FLUE 100

Domestic hot water plant (Refer to schematic for details)

RO Pretreatment consisting of:
- 2 x FRP pressure vessel c/w internal distributors (330mm diameter)
- 2 x Automatic backwash controllers
- AW grade granular activated carbon media

Reverse osmosis plant (by others)

DCW Ø50
HWF Ø65
HWR Ø40
NG Ø100

SHAFT

HOT WATER

DOMESTIC HOT WATER PLANTROOM

OSMOSIS

REVERSE OSMOSIS PLANTROOM (by others)

AHU

SHAFT

New RO reticulation system for SSU

ROOF

FHR 32

RO 50

FHR

FH

IL 672.959

IL 673.053

IL 673.310

IL 673.291

HT

Ø100 FH
Ø40 DCW

CSSD PLANT

FHR 32

FH
FHR UP

FH 100

FHR

FH

FHR 32

COOLING TOWER (OPEN)

BOILER PLANT (OPEN)

FANS ENCLOSURE (OPEN)

RPZD

RPZD

Provide cold water supply with backflow prevention for make-up water to cooling towers. Refer to mechanical documentation for continuation.

Provide cold water supply with backflow prevention to boiler room for mechanicl pressurisation equipment. Refer to mechanical documentation for continuation.

Provide natural gas supply with isolation valve to boiler. Total boiler consumption is 4340MJ/hr @ 2.75 kPa. Refer to mechanical documentation for continuation.

Layout amended to align with updated architectural layout

General Notes

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NORTH

Hydraulic and Fire Services ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
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Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
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SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Level 3 Water & Gas Layout Sheet 2

Scale at A1 1 : 100

Role Hydraulic Services

Suitability

Arup Job No 260684

Rev E

Name HY-MW-DWG-2130

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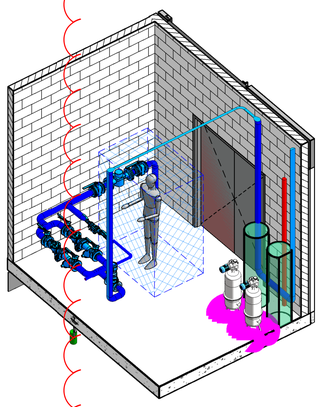
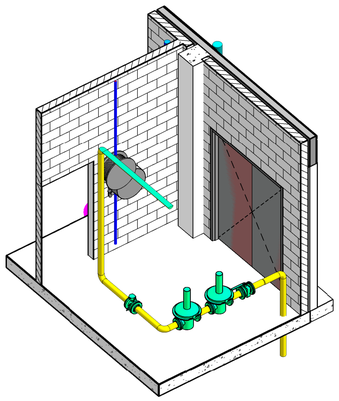
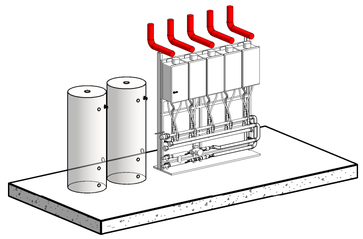


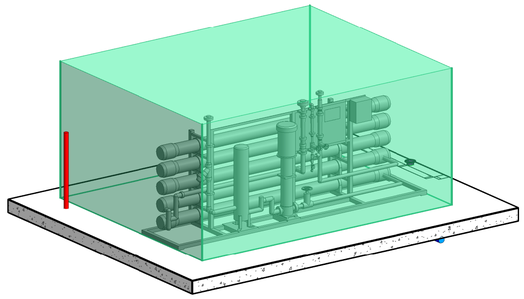
1 DCW meter room



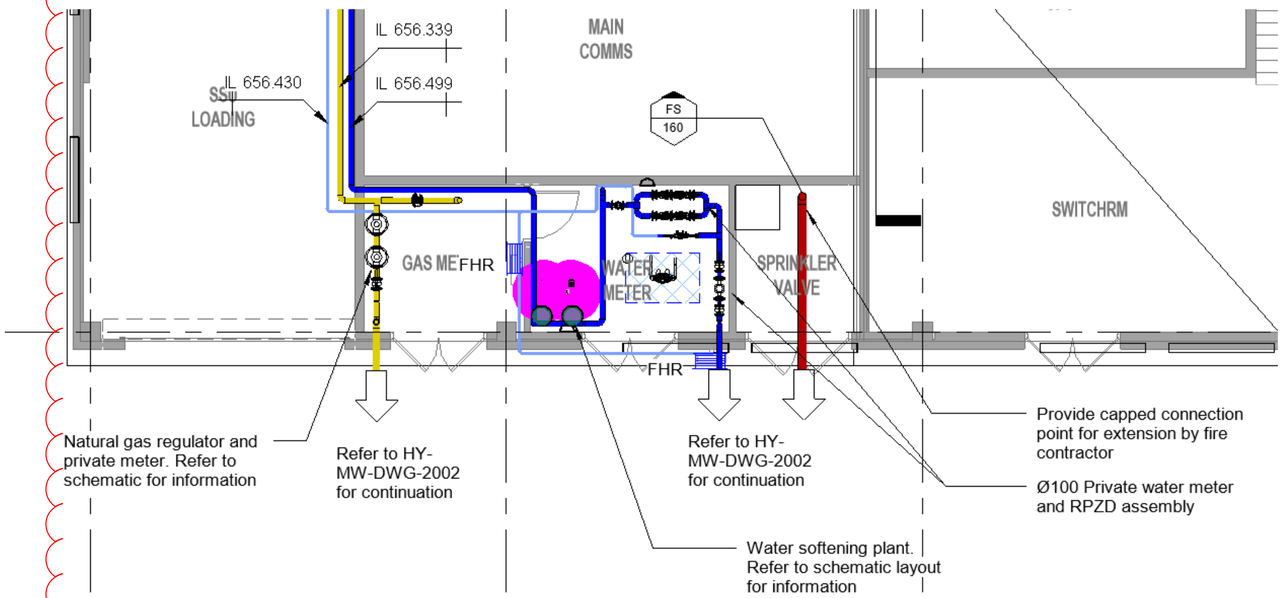
2 NG meter room



3 DHW plantroom



4 RO plantroom- TBC



Gas meter, water meter and sprinkler valve room layout.
Refer drawing MW-DWG-2122 for services coordination

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North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Hydraulic Services Main Works Plantroom Detail

Scale at A1

Role
Hydraulic Services

Suitability

Arup Job No
260684

Rev
E

Name
HY-MW-DWG-3101

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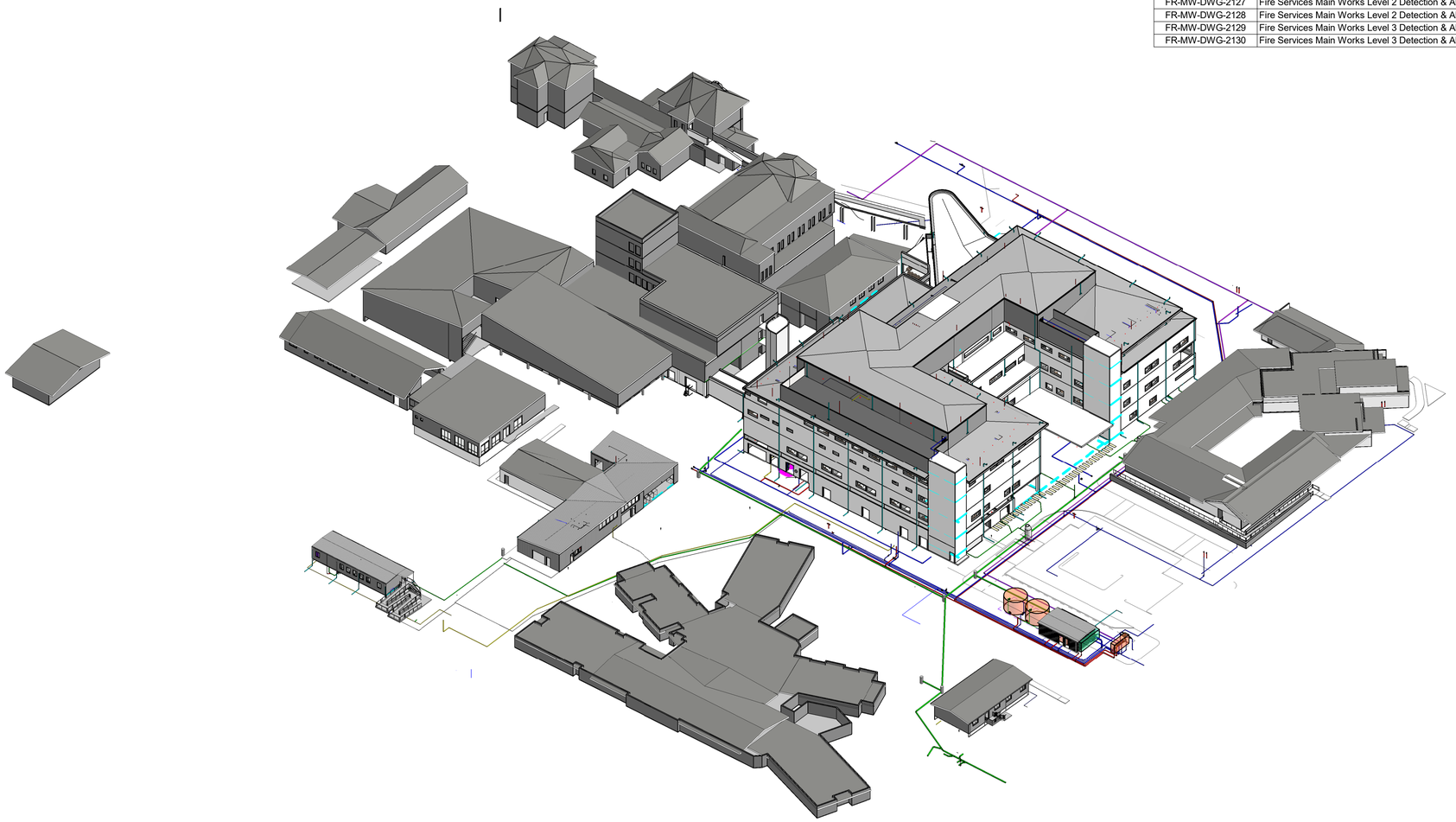
A1

Goulburn Hospital and Health Service Redevelopment

Fire Services

Drawing Number	Drawing Name	Revision
FR-MW-DWG-0110	Fire Services Main Works Drawing List	E
FR-MW-DWG-0120	Fire Services Main Works Legend and General Notes	E
FR-MW-DWG-0130	Fire Services Design Criteria & Schedules	E
FR-MW-DWG-1101	Fire Services Main Works Fire Sprinkler Schematic Diagram	E
FR-MW-DWG-1102	Fire Services Main Works Fire Detection and Alarm Schematic Diagram	E
FR-MW-DWG-2001	Fire Services Main Works Site Plan	E
FR-MW-DWG-2101	Fire Services Main Works Lower Ground Sprinkler Layout Sheet 1	E
FR-MW-DWG-2102	Fire Services Main Works Lower Ground Sprinkler Layout Sheet 2	E
FR-MW-DWG-2103	Fire Services Main Works Ground Floor Sprinkler Layout Sheet 1	E
FR-MW-DWG-2104	Fire Services Main Works Ground Floor Sprinkler Layout Sheet 2	E
FR-MW-DWG-2105	Fire Services Main Works Level 1 Sprinkler Layout Sheet 1	E
FR-MW-DWG-2106	Fire Services Main Works Level 1 Sprinkler Layout Sheet 2	E
FR-MW-DWG-2107	Fire Services Main Works Level 2 Sprinkler Layout Sheet 1	E
FR-MW-DWG-2108	Fire Services Main Works Level 2 Sprinkler Layout Sheet 2	E
FR-MW-DWG-2109	Fire Services Main Works Level 3 Sprinkler Layout Sheet 1	E
FR-MW-DWG-2110	Fire Services Main Works Level 3 Sprinkler Layout Sheet 2	E
FR-MW-DWG-2121	Fire Services Main Works Lower Ground Detection & Alarm Sheet 1	E
FR-MW-DWG-2122	Fire Services Main Works Lower Ground Detection & Alarm Layout Sheet 2	E
FR-MW-DWG-2123	Fire Services Main Works Ground Floor Detection & Alarm Layout Sheet 1	E
FR-MW-DWG-2124	Fire Services Main Works Ground Floor Detection & Alarm Layout Sheet 2	E
FR-MW-DWG-2125	Fire Services Main Works Level 1 Detection & Alarm Layout Sheet 1	E
FR-MW-DWG-2126	Fire Services Main Works Level 1 Detection & Alarm Layout Sheet 2	E
FR-MW-DWG-2127	Fire Services Main Works Level 2 Detection & Alarm Layout Sheet 1	E
FR-MW-DWG-2128	Fire Services Main Works Level 2 Detection & Alarm Layout Sheet 2	E
FR-MW-DWG-2129	Fire Services Main Works Level 3 Detection & Alarm Layout Sheet 1	E
FR-MW-DWG-2130	Fire Services Main Works Level 3 Detection & Alarm Layout Sheet 2	E



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Hydraulic and Fire Services ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

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Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Drawing List

Scale at A1

Role
Fire Services

Suitability
100% DD

Arup Job No
260684

Rev
E

Name
FR-MW-DWG-0110

Do not scale

Pipework Schematic

- Fire sprinkler main
- Fire sprinkler main (Dry)
- Fire sprinkler booster
- Range
- Fire hydrant
- Fire hydrant booster
- Fire drain
- Fire Detection Network Cabling
- MS

Pipework Layout

- Ø100 FS — Fire sprinkler main
- Ø100 FSB — Fire sprinkler booster
- Ø100 R — Range
- Ø100 FH — Fire hydrant
- Ø100 FHB — Fire hydrant booster
- Ø100 FD — Fire drain
- Ø100 FSL — Fire suction line
- Ø100 MS — MS

Wall Types

- 120/120/120 Fire wall
- Smoke wall

Valves and Fittings

- Isolating valve
- Butterfly valve
- Check valve
- Drain valve
- Pressure reducing valve
- Alarm valve
- Float valve
- Solenoid valve
- Monitored valve
- Flexible connection
- Pressure gauge
- Test and drain
- Annubar
- Penetration
- Flow switch
- Pressure switch
- Zone device check

Sprinklers

- Semi-recessed pendant
- Exposed pendant sprinkler
- Exposed pendant sprinkler with guard
- Exposed pendant sprinkler of higher temperature
- Wall wetting sprinkler
- Flush ceiling sprinkler
- Concealed space sprinkler
- Concealed space upright sprinkler
- Sprinkler inside duct
- Horizontal sidewall sprinkler
- Vertical sidewall sprinkler
- Multi-jet control
- Open sprinkler
- Dry head MJC
- Exposed sprinkler with baffle plate over
- Sprinkler with deflector

Detectors

- Smoke detector
- Smoke detector in concealed space
- Smoke alarm
- Smoke detector within air duct
- Smoke detector with probe
- Remote visual indicator
- Heat detector
- Heat detector in concealed space
- Heat alarm
- Heat detector within air duct

Alarm Systems

- Fire alarm bell
- Alarm gong
- Electric strike
- Electromagnetic door holder
- FIP — Fire indicator panel
- DNE — Do not enter
- MP — Mimic panel
- SIP — Sub indicator panel
- FFCP — Fire fans control panel
- ASE — Alarm signalling equipment
- MASDS — Multipoint aspirating smoke detection system
- MECP — Master emergency control panel
- SECP — Sub-evacuation control panel
- BAT — Batteries
- ELD — End of line device
- EPS — Essential power supply
- GSV — Gas supply solenoid valve
- MDF — Main distribution framework
- Surface mounted speaker
- Recessed speaker
- Horn speaker
- Visual warning device
- Warden intercom point
- Manual call point
- Strobe light
- Strobe light (amber/red)

Hydrant, hose reel & fire extinguishers

- Fire hydrant
- Fire hose reel
- Gas nozzle - four way
- Pump
DE - diesel
EL - electric
J - jacking
- Fire extinguisher - water
- Fire extinguisher - foam
- Fire extinguisher - wet chemical
- Fire extinguisher - powder
- Fire extinguisher - carbon dioxide
- Fire blanket

Nomenclature

@	At
AFFL	Above finished floor level
AHU	Air handling unit
CS	Ceiling space
DR	Drain
FA	From above
FB	From below
FH	Fire hydrant
FHR	Fire hose reel
FR	Fast response
FS	Fire sprinkler
FSB	Fire sprinkler booster
FSL	Fire suction line
HYD	Hydrant
L	Lockable
LO	Locked open
LS	Locked shut
NC	Normally closed
NO	Normally open
OS +YM	Outside screw and yoke monitored
OS + Y	Outside screw and yoke
RA	Return air
SA	Supply air
SG	Sight glass
TA	To above
TB	To below

Guidance Notes

1. This set of drawings shall be read in conjunction with the fire services specification, documentation of all relevant trades and services drawings.
2. For details of materials and workmanship, refer to the fire services specification.
3. This set of drawings is diagrammatic only. The contractor shall coordinate with other trades and set out all works to suit actual on site conditions.
4. This set of drawings is issued for tender status for the works which does not constitute as the installation drawings. The contractor shall develop the information contained on this set of drawings into a complete set of fully detailed installation drawings for construction.
5. Check all dimensions on site and coordinate with other trades prior to purchase of equipment or installation of fire services. No claims will be considered regarding items which cannot be installed due to error resulting from failure to check dimensions or coordinate with other trades.
6. Confirm locations, sizes and depths of structural beams, all other services, ceiling void and ceiling height prior to installation. Determine exact sizes and locations of structural penetrations on site in accordance with the structural requirements. Obtain approval from structural engineer prior to drilling any core holes and penetrating structure.
7. All penetrations shall be fired rated to the approval of structural engineer and authorities with approved materials.
8. Locate, coordinate and confirm locations, mounting levels, routing, setting-out, sizes, dimensions of all the fire services with other trades prior to installation.
9. All sprinkler works shall comply with AS 2118.1.
10. All fire detection and alarm system and SSISEP (or EWIS) works shall comply with AS 1670.
11. Refer sprinkler schedule in the specification for sprinkler types and details.
12. Refer fire engineering report for the fire services requirements.
13. Provide sprinkler heads, detectors and speakers to suit the final reflected ceiling plans and structural / architectural layouts and coordinate with other trades prior to installation.
14. Provide extra sprinkler heads to suit services layouts and underneath services exceeding 800mm in width.
15. Provide 141°C sprinkler heads in lift shafts with stout metal guards.
16. Provide sprinkler guards for sprinklers against mechanical damage.
17. Locations of fire services installations such as sprinklers, detectors, sound speakers, warden intercom points, manual call points, visual warning devices and portable fire extinguishers as shown on the drawings are indicative, confirm all details and coordinate with other trades prior to installation.
18. Submit detailed hydraulic calculations (Hyena) with isometric diagrams for the sprinkler systems for review prior to installation.
19. Technical submission including shop drawings, material / equipment schedules with technical information, hydraulic calculations and samples shall be submitted for review prior to installation.
20. All fire services to be coordinated with final RCP. Final fire services in ceilings to be reviewed once RCPs completed.
21. Pipework generally 150mm C.L. below slabs.
22. Concealed space sprinklers upright U.N.O.
23. Exposed pipework finish painted to arch spec.
24. Minimum connection to sprinkler head to be 25mm pipework

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Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Legend and General Notes

Scale at A1: N.T.S.

Role: Fire Services

Suitability: 100% DD

Arup Job No: **260684**

Rev: **E**

Name: **FR-MW-DWG-0120**

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Load Type / Parameter	Design Criteria	Adopted Value	Comment
Fire sprinkler system	AS2118.1 - 2017	Throughout building	To be installed in accordance with AS 2118.1-2017
	Classification AS 2118.1-2017 Appendix A	Light Hazard OH1	Hospital Fire pump room and plant rooms
Sprinkler water demand	Light Hazard	Min. 70 kPa at each of the 6 most disadvantaged heads. K-Factor = 8 and flow = 67 L/min each resulting in a flow rate 402 L/min	As per AS 2118.1-2017 section 9
	OH1	60 L/min per sprinkler for worst case of 8 x sprinklers, resulting in flow rate of 480 L/min	As per AS 2118.1-2017 section 10
	Wall-wetting sprinklers	75 L/min per sprinkler for worst case of 18 x sprinklers, resulting in flow rate of 1350 L/min	As per AS 2118.1-2017 section 3
	Internal Drenchers	4 drenchers operating at 85 L/min each for 120 mins, resulting in a combined flow rate of 340 L/min	FEBQ and Tyco data sheets
Automatic Detection and Alarm System	AS1670.1-2015	Throughout building	
Emergency Warning and Intercom System	AS1670.4 - 2015	Throughout building	

1 Fire Services Design Criteria

Item	Type	Location	Remarks
Zone check devices	Fire Sense ZoneCheck - Automatic Flow Switch Tester or equivalent	Main fire riser	Provide 2 x zone check devices per level
FIPs	Open protocol, non-proprietary equal to Vigilant MX-1	Fire control centre in main entrance	
EWIS	Open protocol, non-proprietary equal to Vigilant QE-90	Fire control centre in main entrance	

2 Fire Services Main Works Equipment Schedule

Item	Type	Location	Remarks
Fire Sprinkler Pumps	1 x Diesel fire sprinkler pump with water cooled engine 1 x Electric fire sprinkler pump 1 x 240V single phase vertical multistage jacking pump	Dedicated fire pump house in Engineering Services Compound	Duty: 1350 L/min @ 1000 kPa Minimum 60% rated efficiency Installed during Enabling Works
Fire Sprinkler Tanks	2 x 55 kL tanks (110 kL total effective capacity) Diameter: 4.5m Height 3.59m	Engineering Services Compound adjacent to fire pump house	Installed during Enabling Works

3 Fire Services Enabling Works Equipment Schedule

Location	Sprinkler Hazard	Below Ceiling	Ceiling Space
General areas	Light Hazard (LH)	15 mm Semi-recessed sprinklers with fast response heads 68°C below false ceiling and 2 piece recessed escutcheon plant	Exposed fast response 79°C
Interconnecting stairwell: level 2 and below stairs	Light Hazard (LH)	15 mm Semi-recessed sprinklers with fast response heads 68°C below false ceiling and 2 piece recessed escutcheon plant	Exposed fast response 79°C
Interconnecting stairwell: lower ground level	Light Hazard (LH)	15 mm Semi-recessed sprinklers with fast response heads 68°C below false ceiling and 2 piece recessed escutcheon plant	
Operating theatres	Light Hazard (LH)	15mm UL listed flush concealed fast response 68°C with cover plate	Exposed fast response 79°C
Pressure controlled rooms	Light Hazard (LH)	UL listed flush concealed fast response 68°C with cover plate and rubber (EDPM) sealing gasket	Exposed fast response 79°C
Plant rooms	Ordinary Hazard 1 (OH1)	15mm Exposed upright / pendent 68°C with metal guard	N/A
Comms / electrical rooms	Ordinary Hazard 1 (OH1)	15mm Exposed upright / pendent 68°C with metal guard	Exposed 79°C
Façade glazing (refer to BCA report)	Exposure protection	Pendent spray 93°C	N/A

4 Fire Services Sprinkler Head Schedule

Service	Location	Material
Fire Sprinkler Service	Above ground	Galvanised Mild Steel min 3.5mm
Fire Sprinkler Service	In ground	PN16 PE

5 Fire Services Pipe Schedule

Note: Quantities reflect the elements in the model at the time of issue and are scheduled for information only. They do not necessarily reflect the quantities required and it is the sub-contractors respnsibility to provide a fully compliant system

Fire Alarm Device Schedule		
Level	Type	Count
LEVEL Lower Ground		
LEVEL Lower Ground	Electromagnetic Door Holder	6
LEVEL Lower Ground	Fire Alarm Bell	1
LEVEL Lower Ground	Fire Extinguisher - Carbon Dioxide	9
LEVEL Lower Ground	Heat Detector	27
LEVEL Lower Ground	Horn Speaker	10
LEVEL Lower Ground	Manual Call Point	5
LEVEL Lower Ground	Reccessed Speaker	175
LEVEL Lower Ground	Smoke Detector	175
LEVEL Lower Ground	Smoke Detector in Concealed Space	163
LEVEL Lower Ground	Strobe Light (Amber/Red)	11
LEVEL Lower Ground	Visual Warning Device	5
LEVEL G		
LEVEL G	Electromagnetic Door Holder	12
LEVEL G	Fire Extinguisher - Carbon Dioxide	8
LEVEL G	Heat Detector	50
LEVEL G	Horn Speaker	3
LEVEL G	Manual Call Point	5
LEVEL G	Reccessed Speaker	197
LEVEL G	Smoke Alarm Within Air Duct	3
LEVEL G	Smoke Detector	180
LEVEL G	Smoke Detector in Concealed Space	195
LEVEL G	Strobe Light (Amber/Red)	10
LEVEL G	Visual Warning Device	6
LEVEL 01		
LEVEL 01	Electromagnetic Door Holder	18
LEVEL 01	Fire Extinguisher - Carbon Dioxide	11
LEVEL 01	Heat Detector	27
LEVEL 01	Manual Call Point	3
LEVEL 01	Reccessed Speaker	168
LEVEL 01	Smoke Alarm Within Air Duct	6
LEVEL 01	Smoke Detector	154
LEVEL 01	Smoke Detector in Concealed Space	168
LEVEL 01	Strobe Light (Amber/Red)	8
LEVEL 01	Visual Warning Device	3
LEVEL 02		
LEVEL 02	Electromagnetic Door Holder	12
LEVEL 02	Fire Extinguisher - Carbon Dioxide	9
LEVEL 02	Heat Detector	35
LEVEL 02	Horn Speaker	4
LEVEL 02	Manual Call Point	4
LEVEL 02	Reccessed Speaker	142
LEVEL 02	Smoke Alarm Within Air Duct	7
LEVEL 02	Smoke Detector	127
LEVEL 02	Smoke Detector in Concealed Space	147
LEVEL 02	Strobe Light (Amber/Red)	12
LEVEL 02	Visual Warning Device	4
LEVEL 03		
LEVEL 03	Horn Speaker	21
LEVEL 03	Smoke Detector	36
LEVEL 03	Strobe Light	18

Sprinkler Heads Schedule		
Level	Type	Count
LEVEL Lower Ground		
LEVEL Lower Ground	Concealed Space	326
LEVEL Lower Ground	Exposed Pendant	35
LEVEL Lower Ground	Exposed Pendant Sprinkler with Gaurd	29
LEVEL Lower Ground	Semi-Recessed Pendant	326
LEVEL G		
LEVEL G	Concealed Space	341
LEVEL G	Exposed Pendant	3
LEVEL G	Exposed Upright	2
LEVEL G	Semi-Recessed Pendant	341
LEVEL 01		
LEVEL 01	Concealed Space	300
LEVEL 01	Exposed Pendant	3
LEVEL 01	Exposed Upright	4
LEVEL 01	Semi-Recessed Pendant	303
LEVEL 02		
LEVEL 02	Concealed Space	241
LEVEL 02	Exposed Pendant Sprinkler with Gaurd	1
LEVEL 02	Exposed Upright	6
LEVEL 02	Semi-Recessed Pendant	244
LEVEL 03		
LEVEL 03	Exposed Pendant Sprinkler with Gaurd	96
Grand total: 2601		

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Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
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Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Design Criteria & Schedules

Scale at A1

Role
Fire Services

Suitability
100% DD

Arup Job No
260684

Rev
E

Name
FR-MW-DWG-0130

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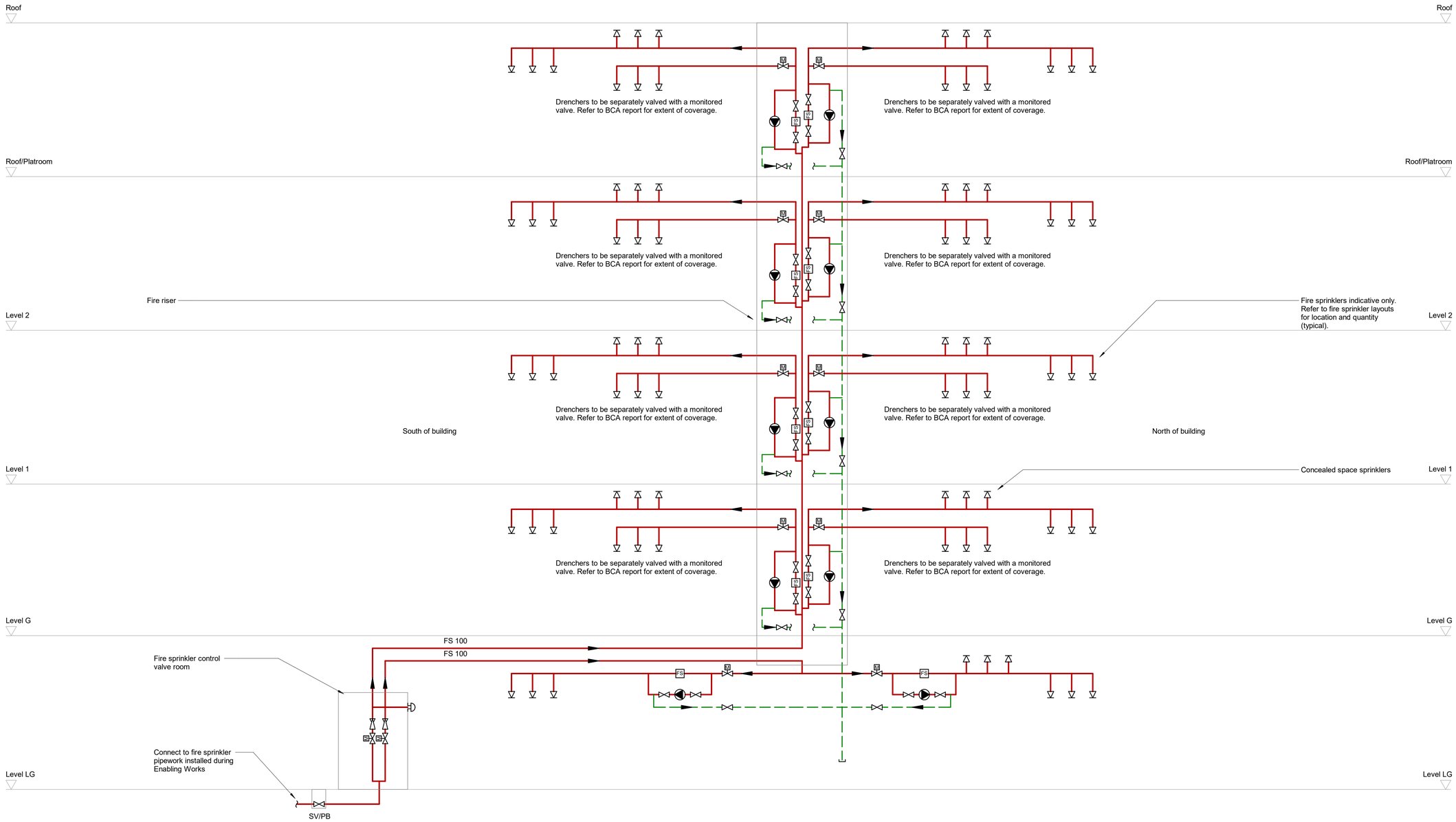

Fire Sprinkler Design Criteria

Item	Parameter
Building effective height	< 25 m
Largest Fire Compartment	> 500 m^2 < 10 000 m^2
Fire Sprinklers Hazard Classifications	Hospital – Light Hazard Plant rooms – OH1 (As per AS 2118.1-2017 Appendix A)
Fire Sprinkler spray densities	Light Hazard – 4.1 mm/min/m^2 for 4 x sprinklers covering 21 m^2 each, resulting in flow rate of 344.4 L/min. OH1 – 60 L/min per sprinkler for worst case of 8 x sprinklers, resulting in flow rate of 480 L/min. Wall-wetting sprinklers – 75 L/min per sprinkler for worst case of 18 x sprinklers, resulting in flow rate of 1350 L/min. (As per AS 2118.1-2017 sections 9, 10 & 3)

General Notes

1.This set of drawings shall be read in conjunction with the fire services specification, documentation of all relevant trades and services drawings.
3.This set of drawings is diagrammatic only. The contractor shall coordinate with other trades and set out all works to suit actual on site conditions.
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6.Confirm locations, sizes and depths of structural beams, all other services, ceiling void and ceiling height prior to installation. Determine exact sizes and locations of structural penetrations on site in accordance with the structural requirements. Obtain approval from structural engineer prior to drilling any core holes and penetrating structure.
7.All penetrations shall be fired rated to the approval of structural engineer and authorities with approved materials.
8.Locate, coordinate and confirm locations, mounting levels, routing, setting-out, sizes, dimensions of all the fire services with other trades prior to installation.
9.All sprinkler works shall comply with AS 2118.1-2017.
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19.All fire services to be coordinated with final RCP. Final fire services in ceilings to be reviewed once RCPs completed.
20.Pipework generally 150mm C.L. below slabs.
21.Exposed pipework finish painted to arch spec.
22.Ceiling void sprinklers will be provided to sprinkler protected buildings where the ceiling void space is greater than 200mm.

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Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

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Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Fire Sprinkler Schematic Diagram

Scale at A1: N.T.S.
Role: Fire Services
Suitability: 100% DD
Arup Job No: 260684
Rev: E
Name: FR-MW-DWG-1101

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A1

Roof

Roof/Platroom

Level 2

Level 1

Level G

Level LG

NORTH ELD
NORTH ELD
SOUTH ELD
SOUTH ELD

ELD NORTH
ELD SOUTH

NORTH ELD
NORTH ELD
SOUTH ELD
SOUTH ELD

ELD NORTH
ELD SOUTH

NORTH ELD
NORTH ELD
SOUTH ELD
SOUTH ELD

ELD NORTH
ELD SOUTH

MECP

FIP

Fire Control Centre

SARU
Community Mental Health

Red BGA (signal to brigade)

ASE

MP
MP

MP
MP

MP
MP
MP

MP
MP
MP

MS
FS
I/O

MXP
NORTH
SOUTH

2xMimic panels located in nurse stations on each level (typical)

2xFiretrip to be provided to mechanical switchboard for connection by mechanical contractor (typical)

I/O

Engineering Compound outside of main building

Enabling Works

Pumps

PIT

Inground

PIT

General Notes

1.This set of drawings shall be read in conjunction with the fire services specification, documentation of all relevant trades and services drawings.
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8.All penetrations shall be fired rated to the approval of structural engineer and authorities with approved materials.
9.Locate, coordinate and confirm locations, mounting levels, routing, setting-out, sizes, dimensions of all the fire services with other trades prior to installation.
10.All fire detection and alarm system and SSISEP (or EWIS) works shall comply with AS 1670-2015
11.Refer fire engineering report for the fire services requirements.
12.Provide detectors and speakers to suit the final reflected ceiling plans and structural / architectural layouts and coordinate with other trades prior to installation.
13.Locations of fire services installations such as detectors, sound speakers, warden intercom points, manual call points, visual warning devices and portable fire extinguishers as shown on the drawings are indicative, confirm all details and coordinate with other trades prior to installation.
14.Technical submission including shop drawings, material / equipment schedules with technical information and samples shall be submitted for review prior to installation.
15.All fire services to be coordinated with final RCP. Final fire services in ceilings to be reviewed once RCPs completed.
16.Smoke detectors in ward sleeping areas and in mental health shall be configured that the LED (light emitting diode) indicator does not flash during normal operations.

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Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
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Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Fire Detection and Alarm Schematic Diagram

Scale at A1 N.T.S.

Role Fire Services

Suitability 100% DD

Arup Job No 260684

Rev E

Name FR-MW-DWG-1102

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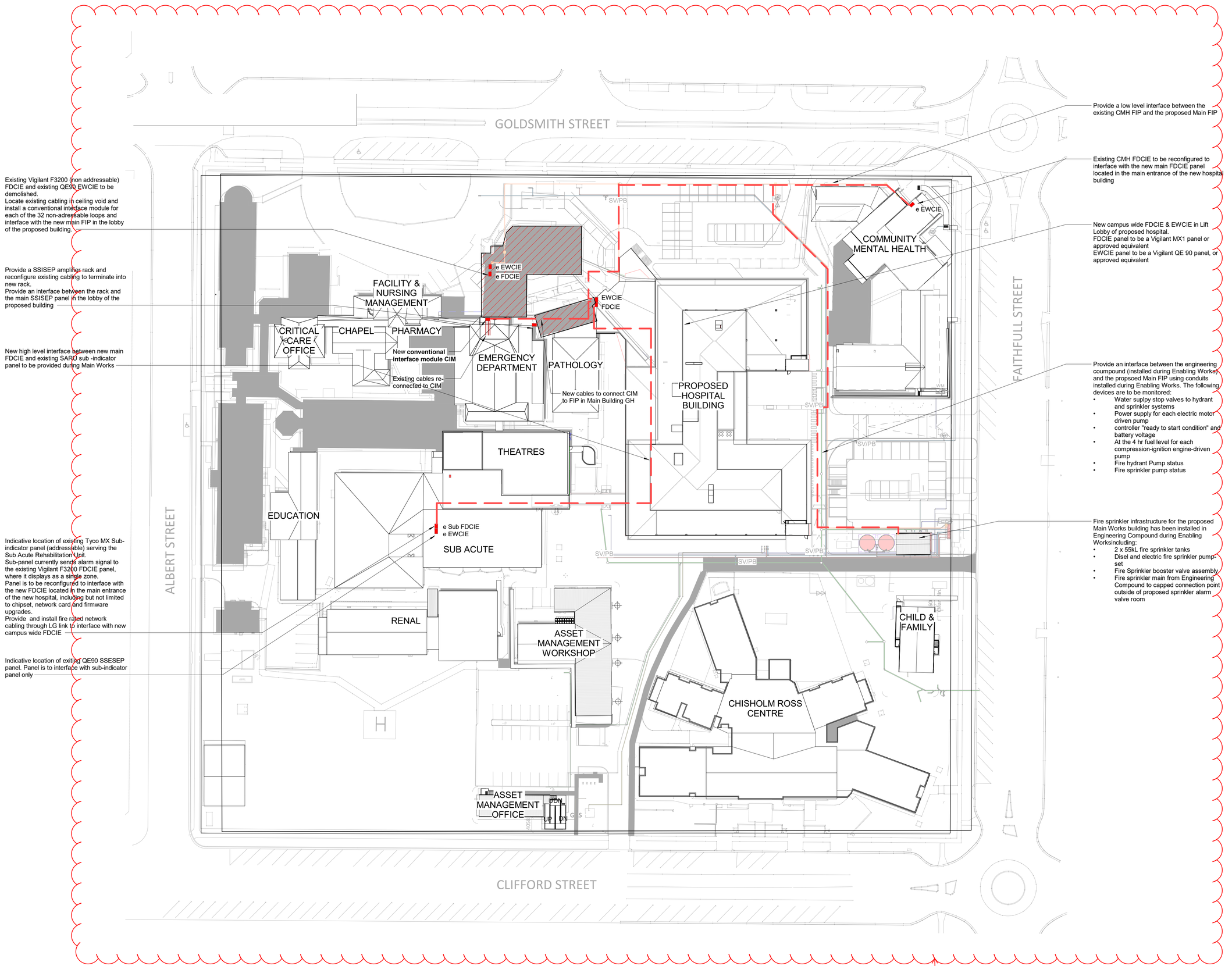

Rev	Date	By	Chkd	Appd
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D	31.05.19	AC	MH	MH
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C	10.05.19	AC	MH	MH
100% DD				
B	03.05.19	AC	MH	MH
80% DD				
A	26.03.19	AC	MH	MH
50% DD				

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NORTH

Hydraulic and Fire Services

ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER

TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

TSA MANAGEMENT

CLIENT

NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

NSW GOVERNMENT Health Infrastructure

STH
SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Site Plan

Scale at A1: 1 : 500

Role: Fire Services

Suitability: 100% DD

Arup Job No: 260684

Rev: E

Name: FR-MW-DWG-2001

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E	12/06/19	AC	MH	MH
100% DD				
D	31.05.19	AC	MH	MH
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C	10.05.19	AC	MH	MH
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B	03.05.19	AC	MH	MH
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A	26.03.19	AC	MH	MH
50% DD				

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NORTH

Hydraulic and Fire Services
ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Lower Ground Sprinkler Layout Sheet 1

Scale at A1 1 : 100

Role Fire Services

Suitability 100% DD

Arup Job No **260684**

Rev **E**

Name **FR-MW-DWG-2101**

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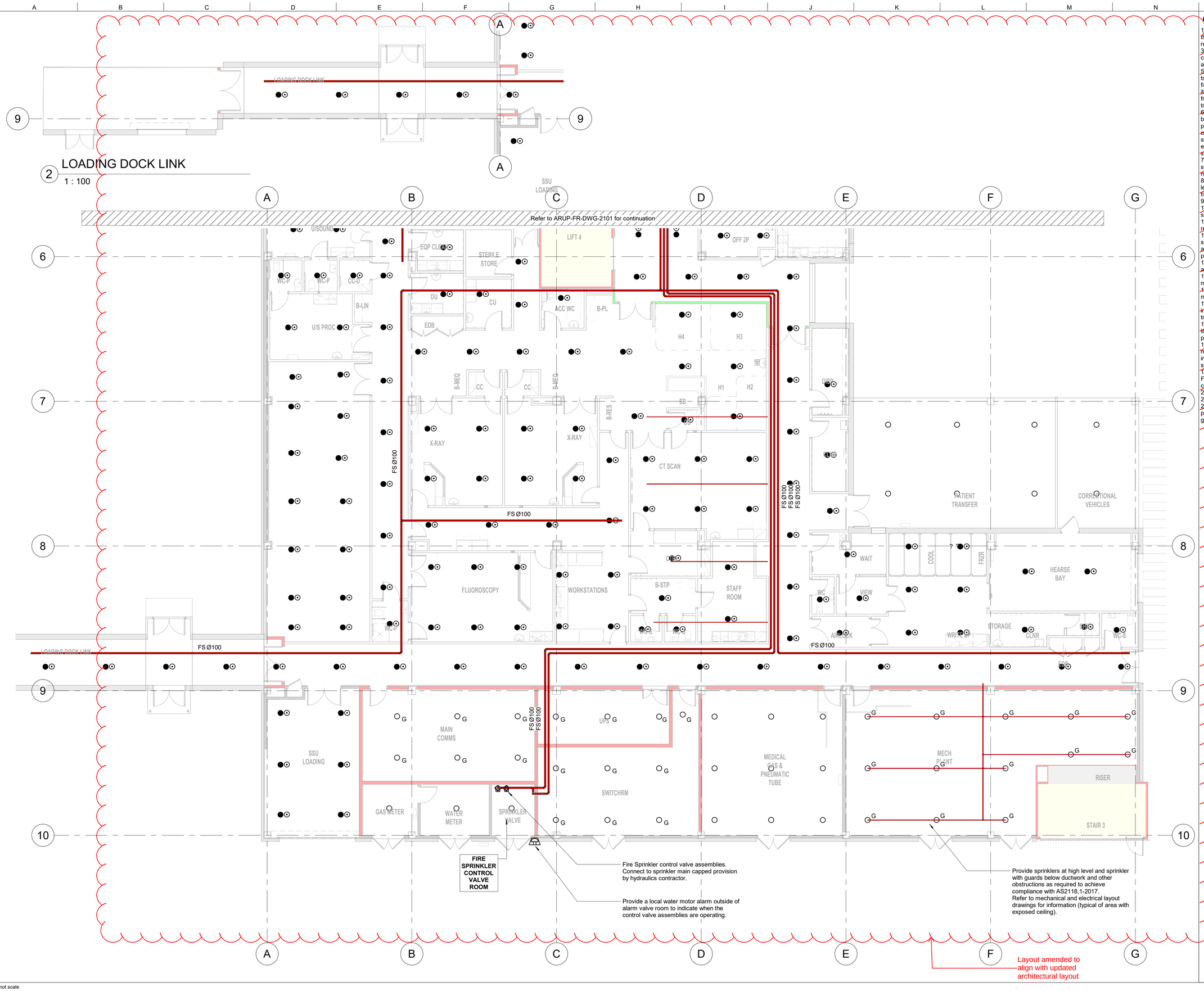

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C	10.05.19	AC	MH	MH
100% DD				
B	03.05.19	AC	MH	MH
80% DD				
A	26.03.19	AC	MH	MH
50% DD				

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NORTH

Hydraulic and Fire Services
ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Lower Ground Sprinkler Layout Sheet 2

Scale at A1: 1 : 100

Role: Fire Services

Suitability: 100% DD

Arup Job No: 260684

Rev: E

Name: FR-MW-DWG-2102

12/06/2019 6:01:13 PM

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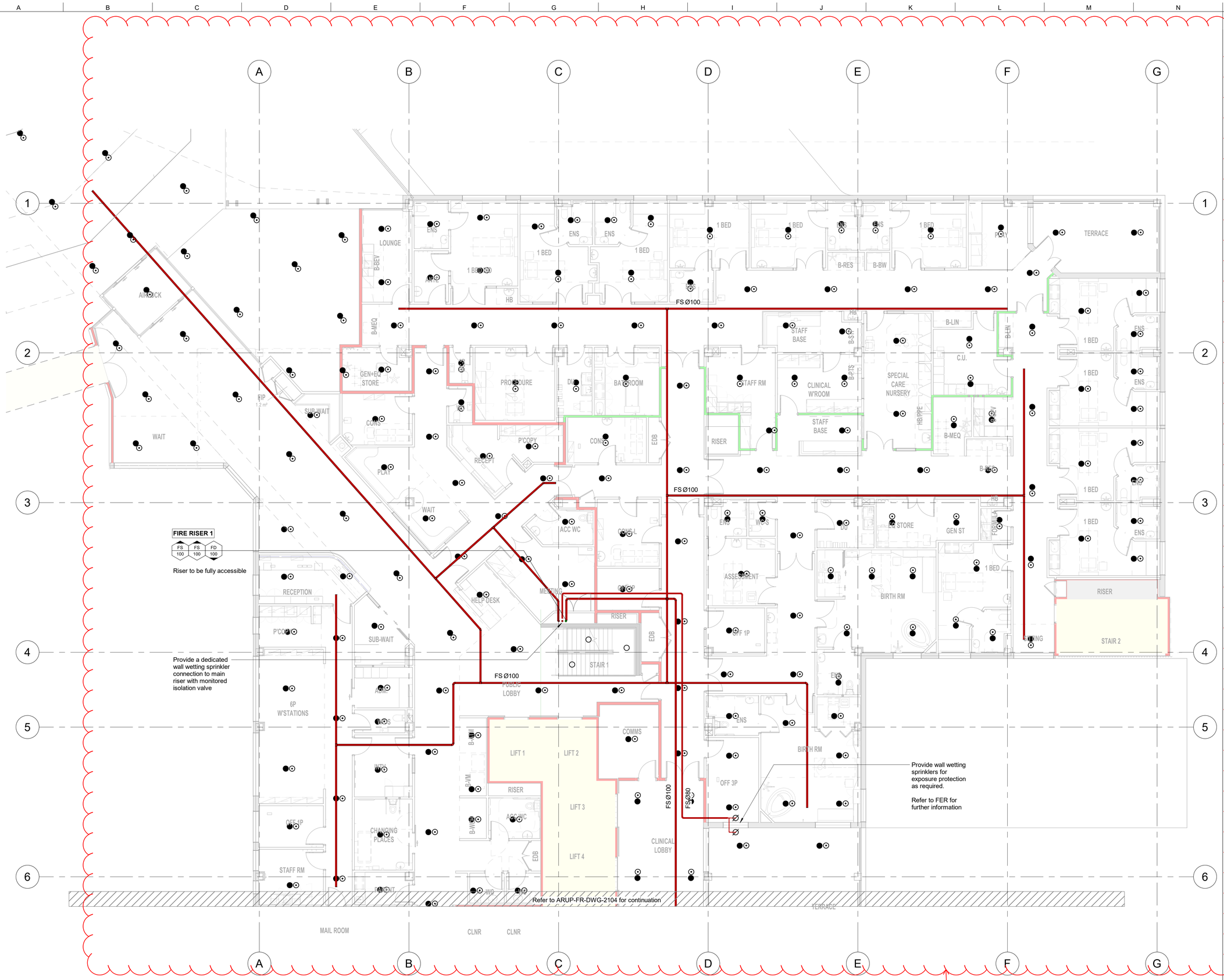

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E	12/06/19	AC	MH	MH
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D	31.05.19	AC	MH	MH
100% DD				
C	10.05.19	AC	MH	MH
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B	03.05.19	AC	MH	MH
80% DD				
A	26.03.19	AC	MH	MH
50% DD				

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NORTH

Hydraulic and Fire Services
ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Ground Floor Sprinkler Layout Sheet 1

Scale at A1: 1 : 100

Role: Fire Services

Suitability: 100% DD

Arup Job No: **260684**

Rev: **E**

Name: **FR-MW-DWG-2103**

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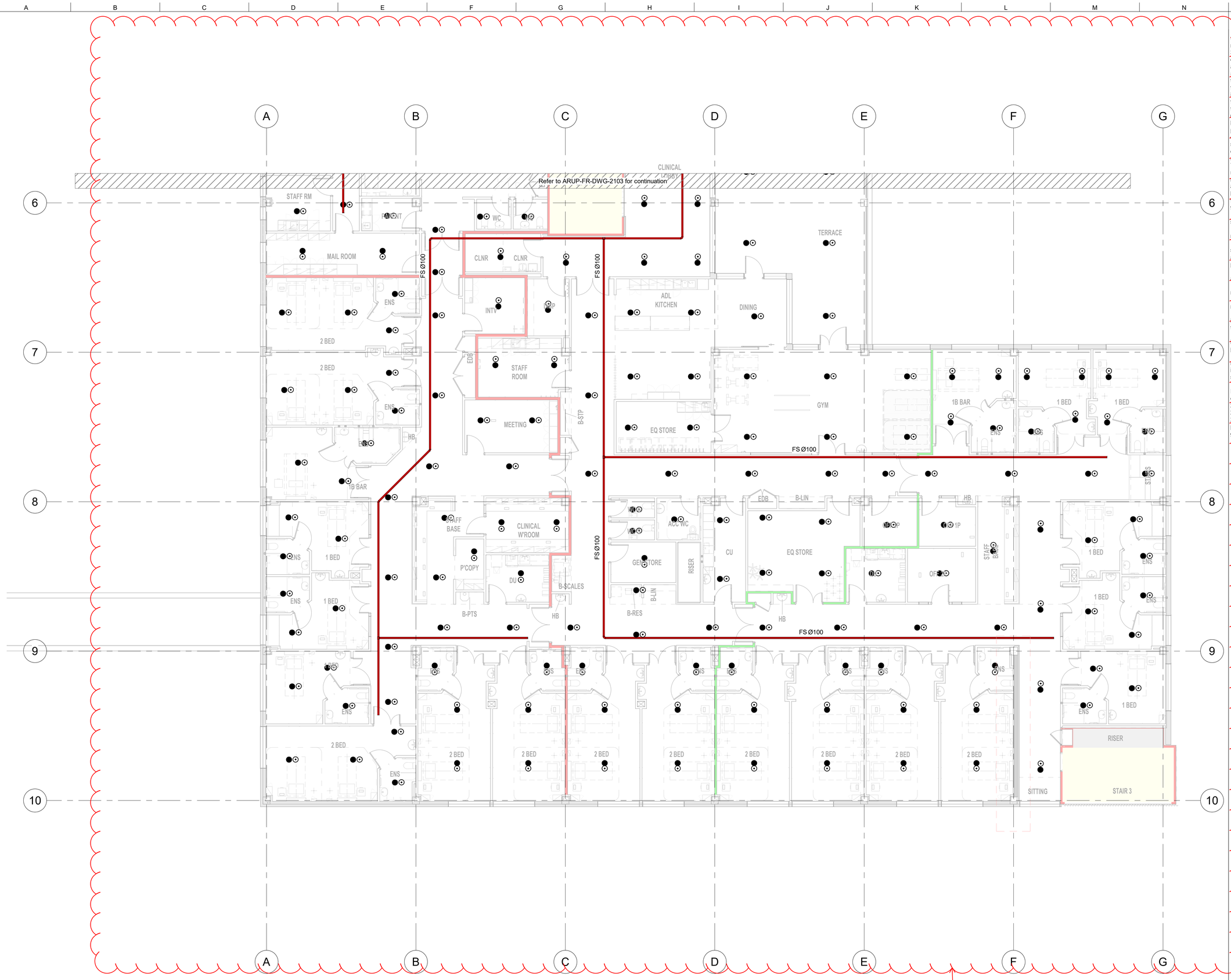

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D	31.05.19	AC	MH	MH
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C	10.05.19	AC	MH	MH
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B	03.05.19	AC	MH	MH
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A	26.03.19	AC	MH	MH
50% DD				

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NORTH

Hydraulic and Fire Services

ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

TSA MANAGEMENT

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

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STH
SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Ground Floor Sprinkler Layout Sheet 2

Scale at A1 1 : 100

Role Fire Services

Suitability 100% DD

Arup Job No **260684**

Rev **E**

Name **FR-MW-DWG-2104**

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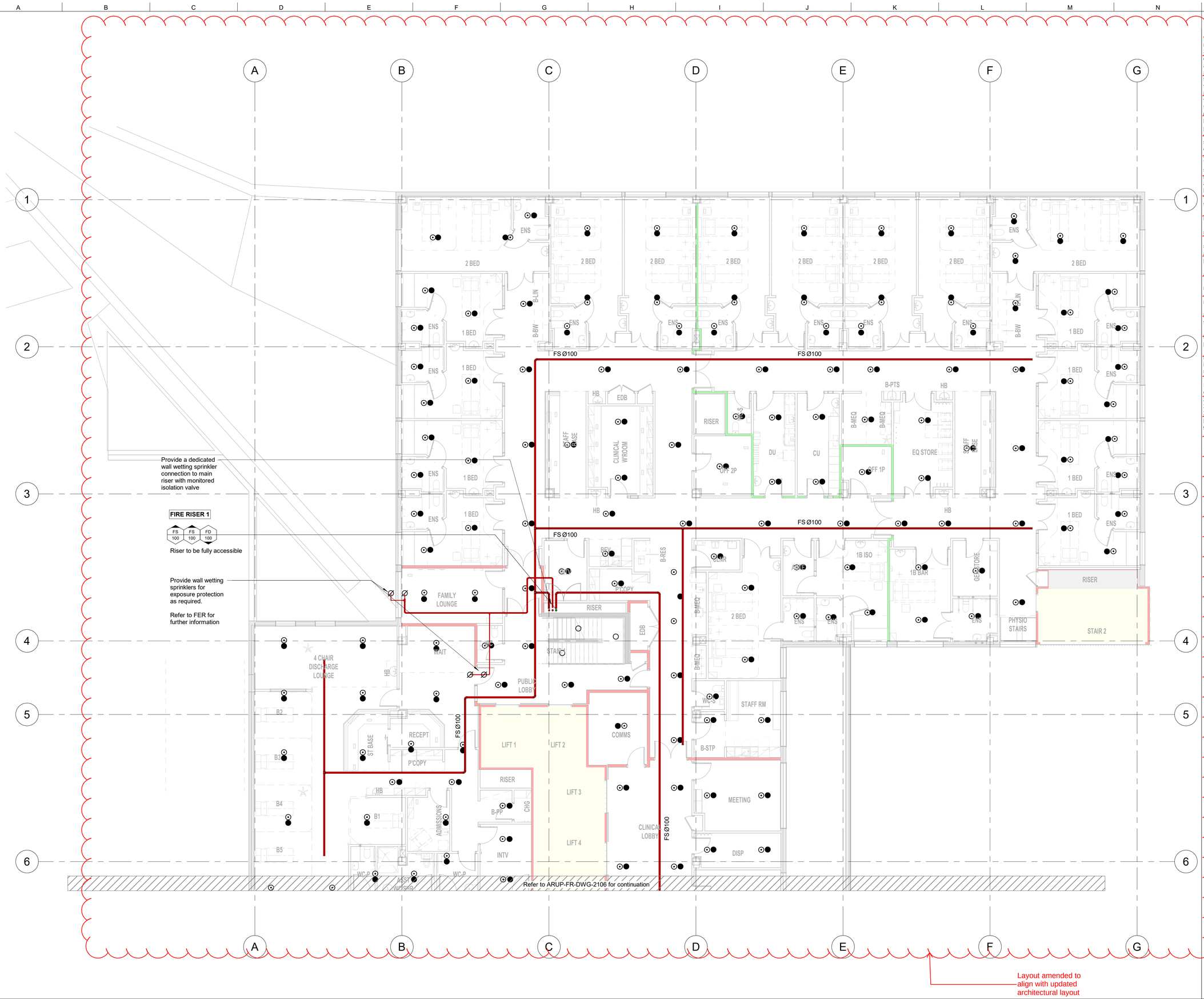

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NORTH

Hydraulic and Fire Services

ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

TSA MANAGEMENT

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

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STH
SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Level 1 Sprinkler Layout Sheet 1

Scale at A1 1 : 100

Role Fire Services

Suitability 100% DD

Arup Job No 260684

Rev E

Name FR-MW-DWG-2105

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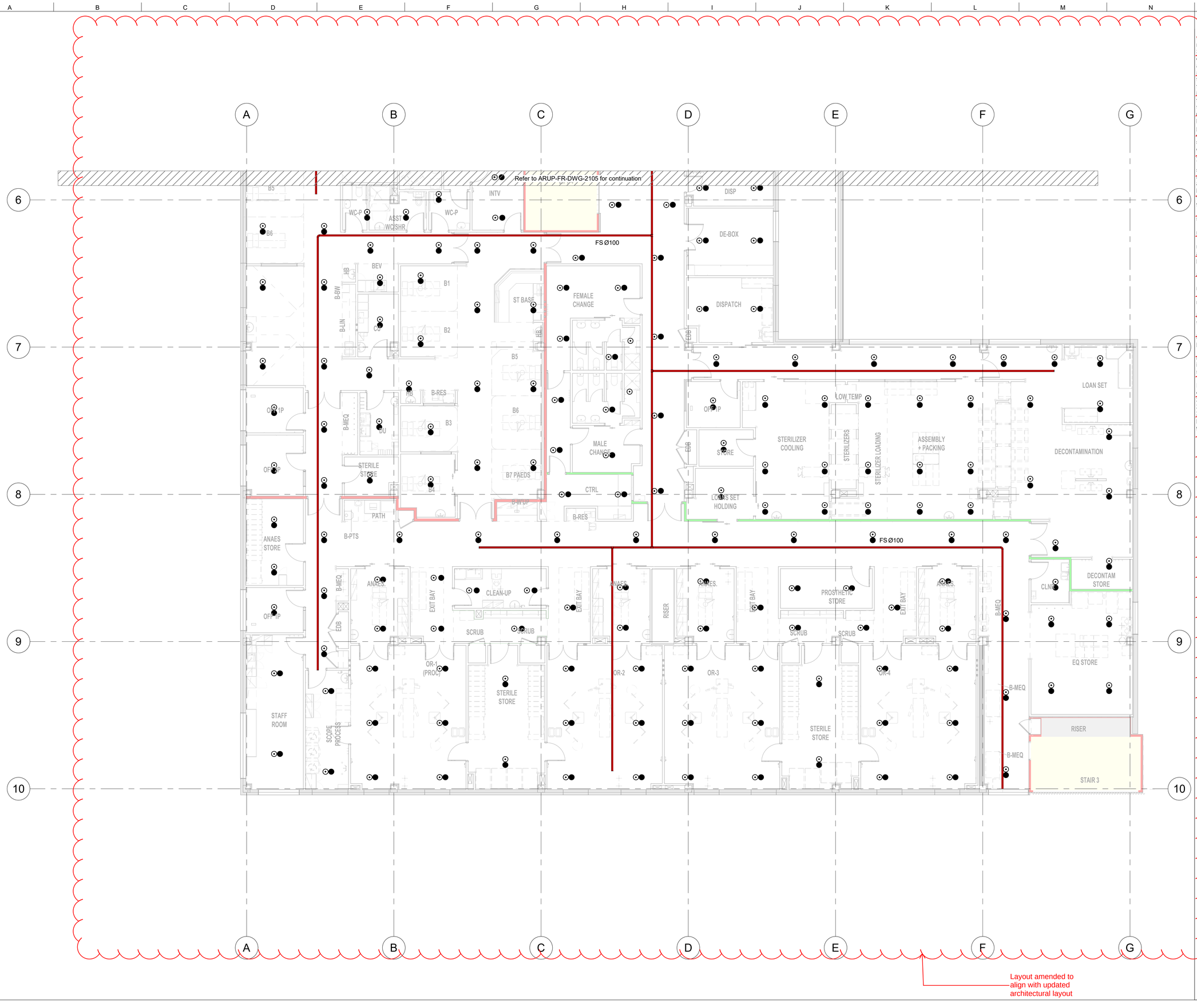

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NORTH

Hydraulic and Fire Services

ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

TSA MANAGEMENT

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
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STH
SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Level 1 Sprinkler Layout Sheet 2

Scale at A1 1 : 100

Role Fire Services

Suitability 100% DD

Arup Job No 260684

Rev E

Name FR-MW-DWG-2106

Layout amended to align with updated architectural layout

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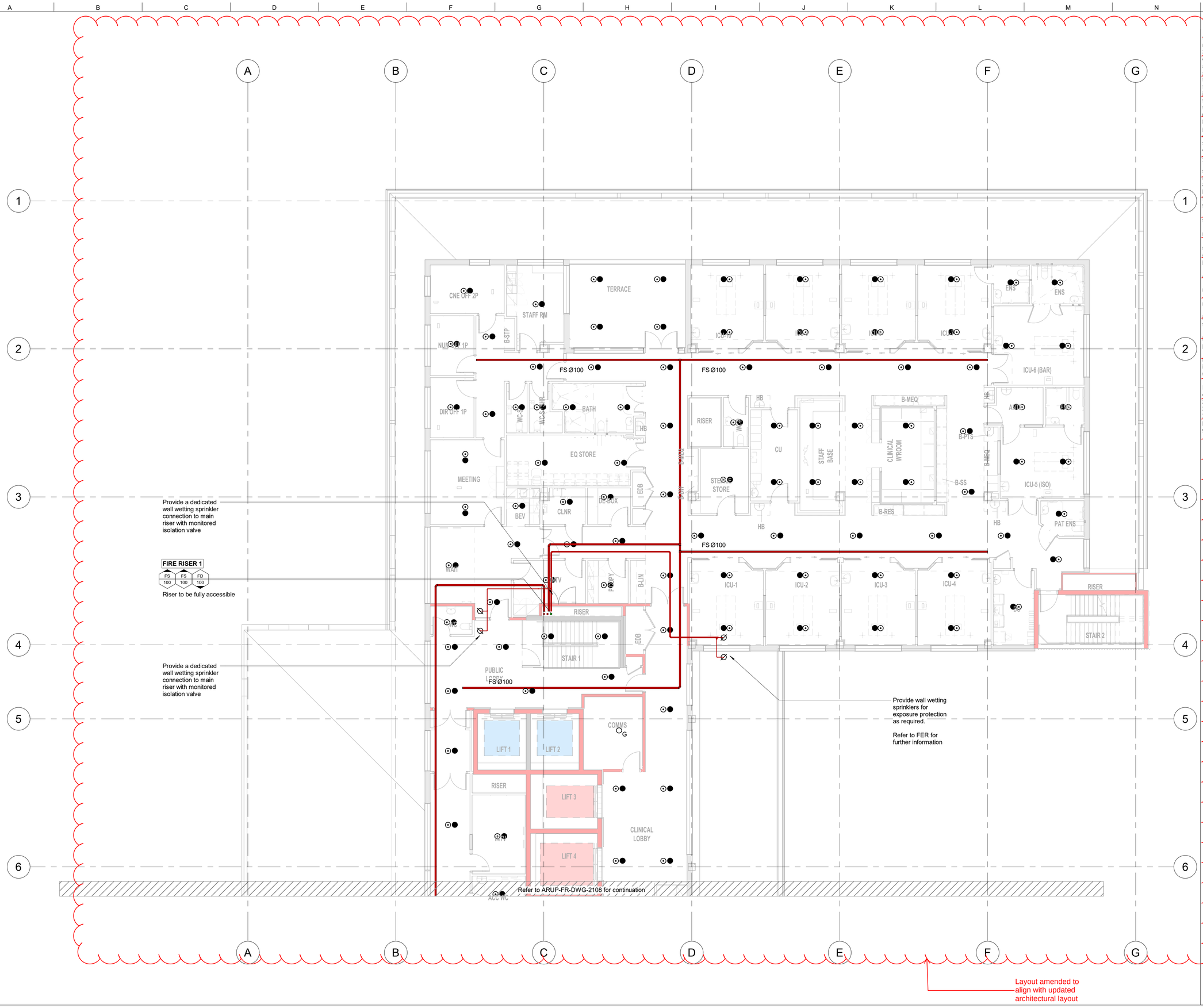

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50% DD				

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NORTH

Hydraulic and Fire Services
ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 397 Kent Street
Sydney NSW 2000
T +61 2 9276 1400
TSA MANAGEMENT

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au
NSW GOVERNMENT Health Infrastructure

STH
SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Level 2 Sprinkler Layout Sheet 1

Scale at A1: 1 : 100

Role: Fire Services

Suitability: 100% DD

Arup Job No: 260684

Rev: E

Name: FR-MW-DWG-2107

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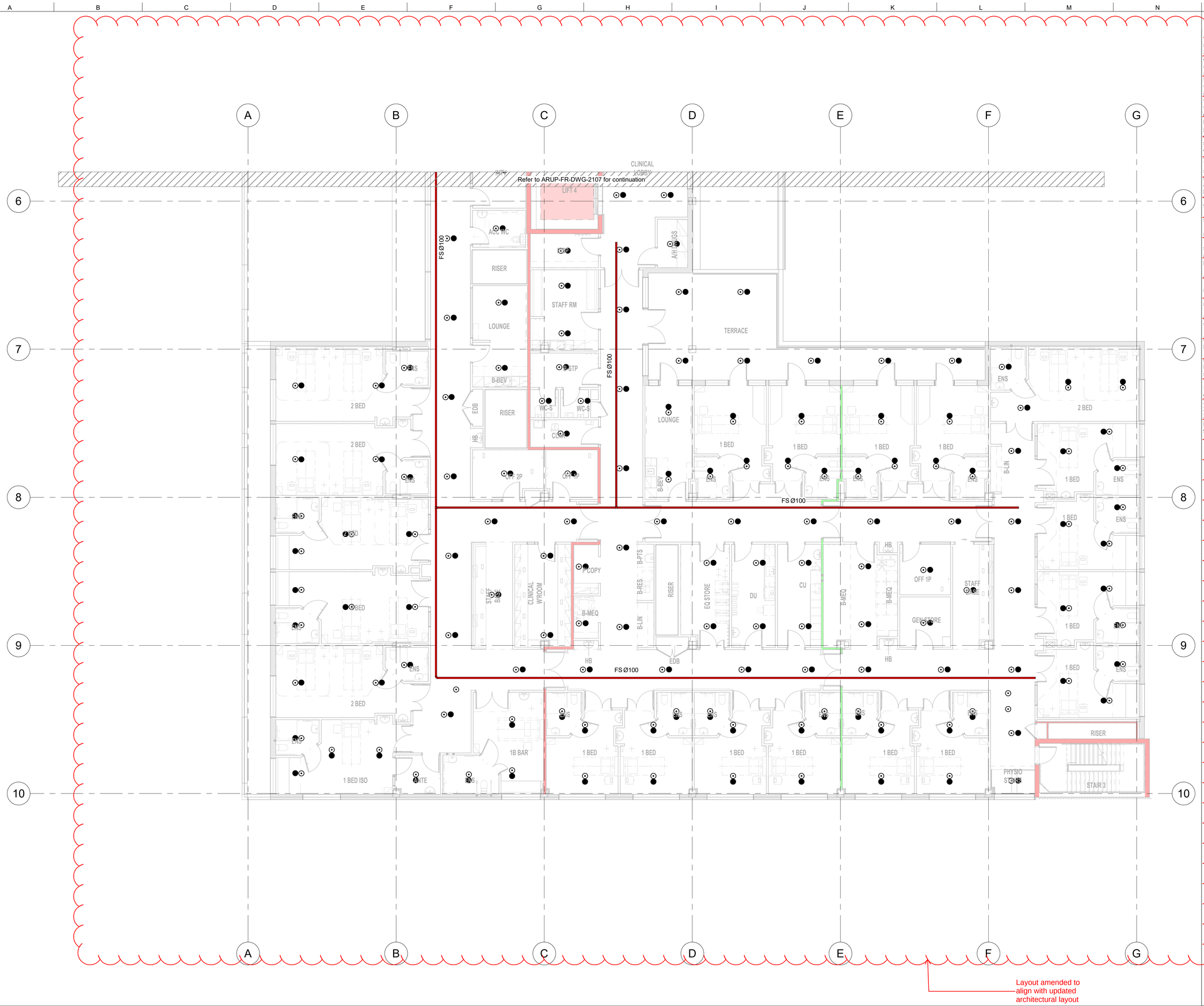

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7. All penetrations shall be fired rated to the approval of structural engineer and authorities with approved materials.
8. Locate, coordinate and confirm locations, mounting levels, routing, setting-out, sizes, dimensions of all the fire services with other trades prior to installation.
9. All sprinkler works shall comply with AS 2118.1-2017.
10. Refer sprinkler schedule in the specification for sprinkler types and details.
11. Refer fire engineering report for the fire services requirements.
12. Provide sprinkler heads, detectors and speakers to suit the final reflected ceiling plans and structural / architectural layouts and coordinate with other trades prior to installation.
13. Provide extra sprinkler heads to suit services layouts and underneath services exceeding 800mm in width.
14. Provide 141°C sprinkler heads in lift shafts with stout metal guards.
15. Provide sprinkler guards for sprinklers against mechanical damage.
16. Locations of sprinklers shown on the drawings are indicative, confirm all details and coordinate with other trades prior to installation.
17. Submit detailed hydraulic calculations (Hyena) with isometric diagrams for the sprinkler systems for review prior to installation.
18. Technical submission including shop drawings, material / equipment schedules with technical information, hydraulic calculations and samples shall be submitted for review prior to installation.
19. All fire services to be coordinated with final RCP. Final fire services in ceilings to be reviewed once RCPs completed.
20. Pipework generally 150mm C.L. below slabs.
21. Exposed pipework finish painted to arch spec.
22. Ceiling void sprinklers will be provided to sprinkler protected buildings where the ceiling void space is greater than 200mm.

Rev	Date	By	Chkd	Appd
E	12/06/19	AC	MH	MH
100% DD				
D	31.05.19	AC	MH	MH
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C	10.05.19	AC	MH	MH
100% DD				
B	03.05.19	AC	MH	MH
80% DD				
A	26.03.19	AC	MH	MH
50% DD				

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NORTH

Hydraulic and Fire Services

ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

TSA MANAGEMENT

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

NSW GOVERNMENT Health Infrastructure

STH
SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Level 2 Sprinkler Layout Sheet 2

Scale at A1 1 : 100

Role Fire Services

Suitability 100% DD

Arup Job No 260684

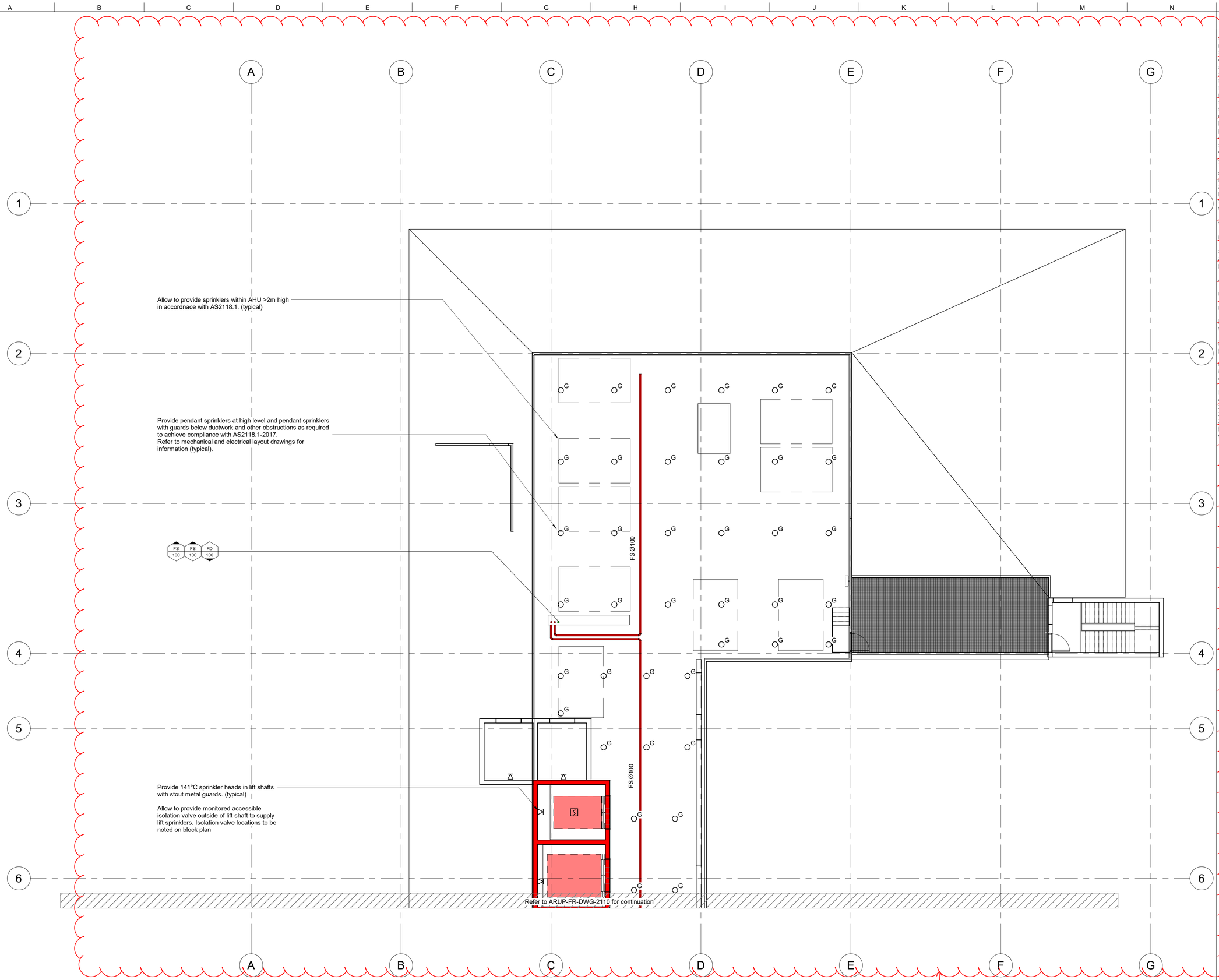
Rev E

Name FR-MW-DWG-2108

12/06/2019 6:01:26 PM

Layout amended to align with updated architectural layout

Do not scale



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100% DD				
C	10.05.19	AC	MH	MH
100% DD				
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80%DD				

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NORTH

Hydraulic and Fire Services
ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Level 3 Sprinkler Layout Sheet 1

Scale at A1: 1 : 100

Role: Fire Services

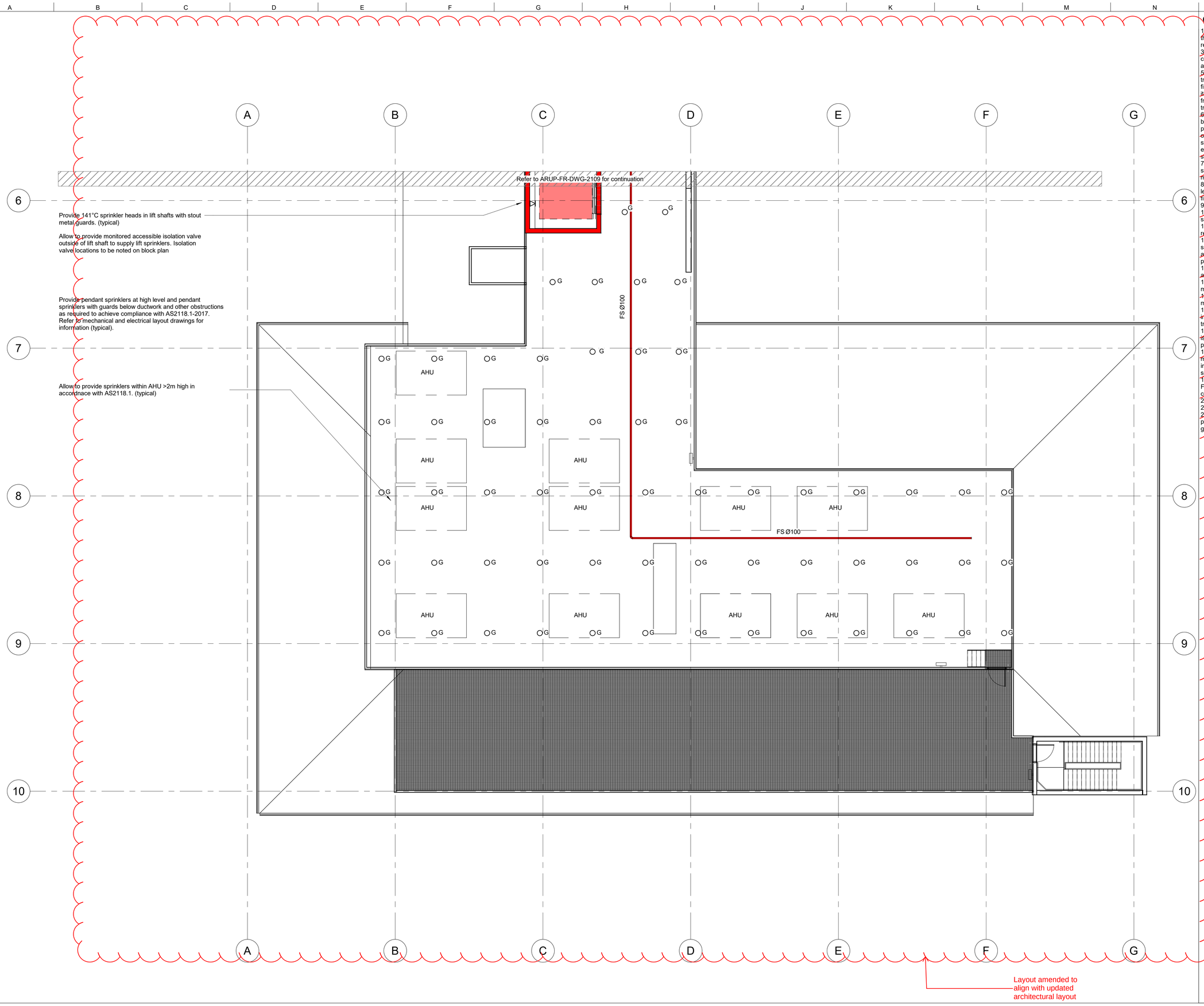
Suitability: 100% DD

Arup Job No: **260684**

Rev: **E**

Name: **FR-MW-DWG-2109**

12/06/2019 6:01:27 PM



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100% DD				
D	31.05.19	AC	MH	MH
100% DD				
C	10.05.19	AC	MH	MH
100% DD				
B	03.05.19	AC	MH	MH
80%DD				

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NORTH

Hydraulic and Fire Services ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Level 3 Sprinkler Layout Sheet 2

Scale at A1: 1 : 100

Role: Fire Services

Suitability: 100% DD

Arup Job No: 260684

Rev: E

Name: FR-MW-DWG-2110

12/06/2019 6:01:30 PM

Do not scale

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18. Sound systems and intercom systems for emergency purposes will be configured to minimise patient trauma in inpatient areas.

Rev	Date	By	Chkd	Appd
E	12/06/19	AC	MH	MH
100% DD				
D	31.05.19	AC	MH	MH
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C	10.05.19	AC	MH	MH
100% DD				
B	03.05.19	AC	MH	MH
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NORTH

Hydraulic and Fire Services

ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

TSA MANAGEMENT

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

NSW GOVERNMENT Health Infrastructure

STH
SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Lower Ground Detection & Alarm Sheet 1

Scale at A1 1 : 100

Role Fire Services

Suitability 100% DD

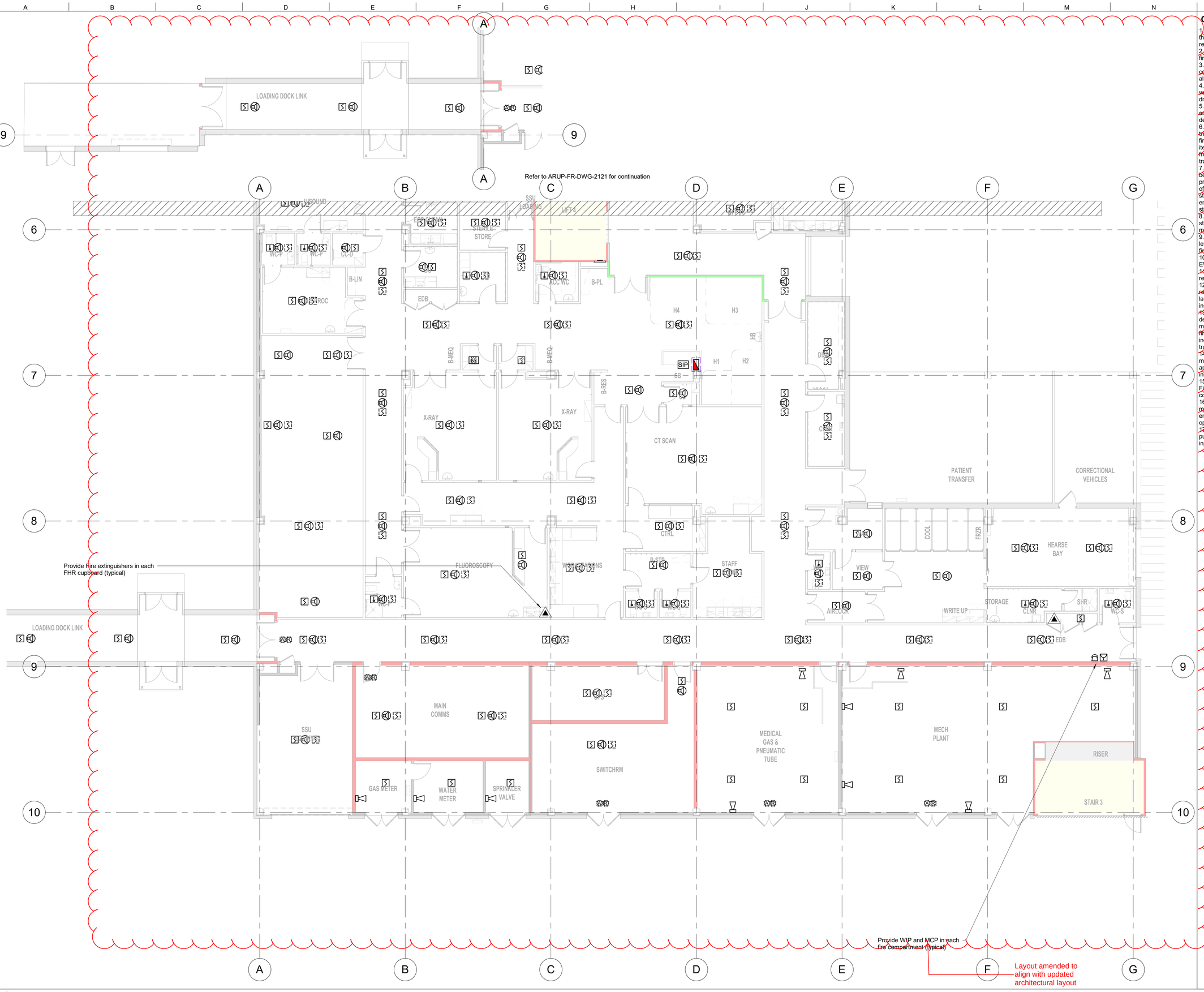
Arup Job No 260684

Rev E

Name FR-MW-DWG-2121

12/06/2019 6:01:34 PM

Do not scale



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E	12/06/19	AC	MH	MH
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D	31.05.19	AC	MH	MH
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C	10.05.19	AC	MH	MH
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B	03.05.19	AC	MH	MH
80%DD				

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NORTH

Hydraulic and Fire Services

ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
L4/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Lower Ground Detection & Alarm Layout Sheet 2

Scale at A1: 1 : 100

Role: Fire Services

Suitability: 100% DD

Arup Job No: 260684

Rev: E

Name: FR-MW-DWG-2122

12/06/2019 6:01:38 PM

Do not scale

A1

Smoke detectors to be installed 1.5m either side of fire doors (typical)

Provide Mimic Panel and CO2 fire extinguishers at Staff Bases (typical)

Provide Fire extinguishers in each FHR cupboard (typical)

Provide WIP and MCP in each fire compartment (typical)

Refer to ARUP-FR-DWG-2124 for continuation

Layout amended to align with updated architectural layout

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D	31.05.19	AC	MH	MH
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NORTH

Hydraulic and Fire Services
ARUP
Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Ground Floor Detection & Alarm Layout Sheet 1

Scale at A1 1 : 100

Role Fire Services

Suitability 100% DD

Arup Job No **260684**

Rev **E**

Name **FR-MW-DWG-2123**

12/06/2019 6:01:39 PM

Do not scale

Refer to ARUP-FR-DWG-2123 for continuation

Provide Fire extinguishers in each FHR cupboard (typical)

Smoke detectors to be installed 1.5m either side of fire doors (typical)

Provide Mimic panel and Co2 fire extinguisher at each Staff Base (typical)

Provide WIP and MCP in each fire compartment (typical)

Layout amended to align with updated architectural layout

General Notes

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NORTH

Hydraulic and Fire Services

ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

TSA MANAGEMENT

CLIENT
NSW HI
14/77 Pacific Hwy
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NSW GOVERNMENT Health Infrastructure

STH
SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Ground Floor Detection & Alarm Layout Sheet 2

Scale at A1 1 : 100

Role Fire Services

Suitability 100% DD

Arup Job No **260684**

Rev **E**

Name **FR-MW-DWG-2124**

12/06/2019 6:01:43 PM

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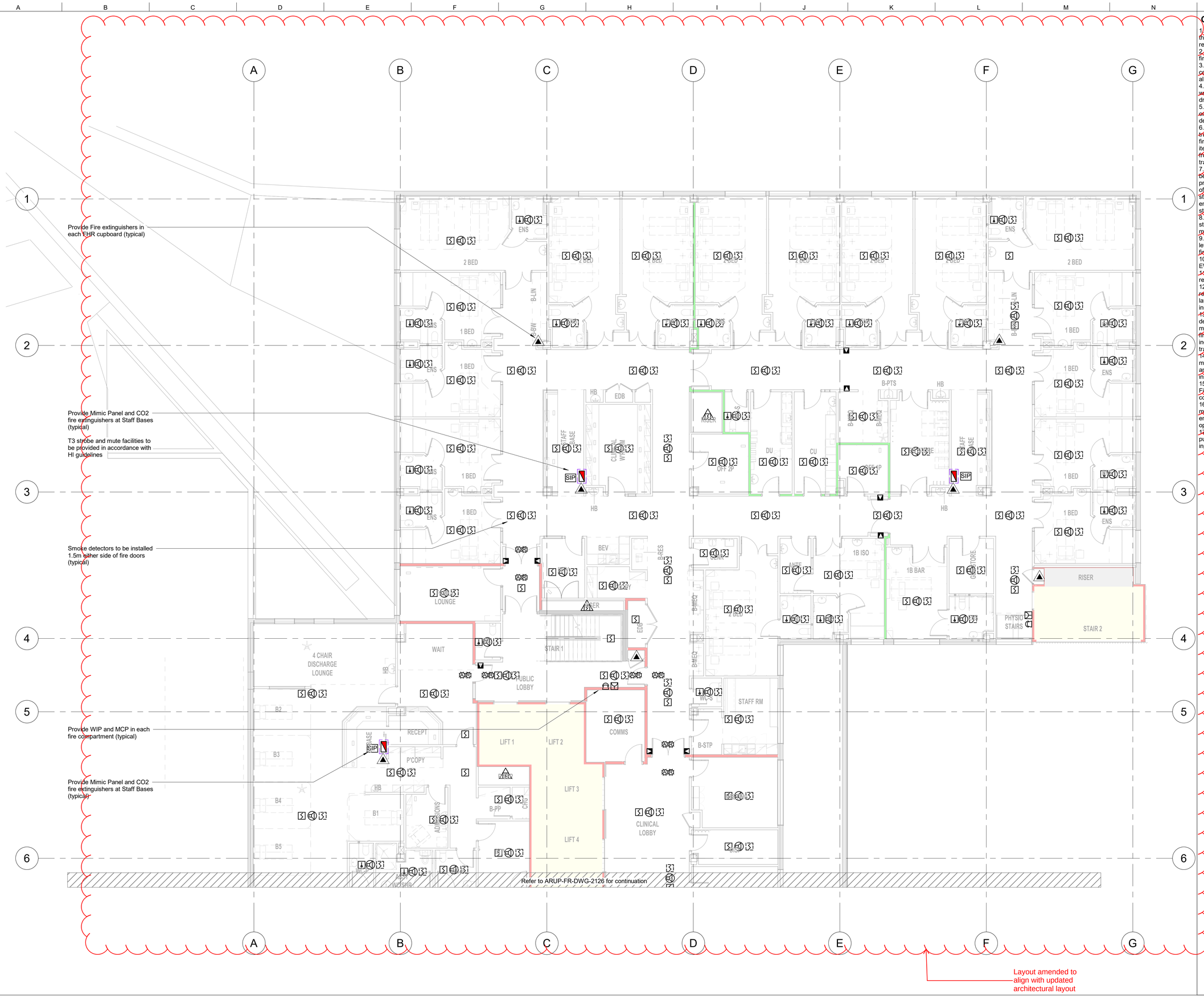

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NORTH

Hydraulic and Fire Services ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Level 1 Detection & Alarm Layout Sheet 1

Scale at A1: 1 : 100

Role: Fire Services

Suitability: 100% DD

Arup Job No: 260684

Rev: E

Name: FR-MW-DWG-2125

12/06/2019 6:01:43 PM

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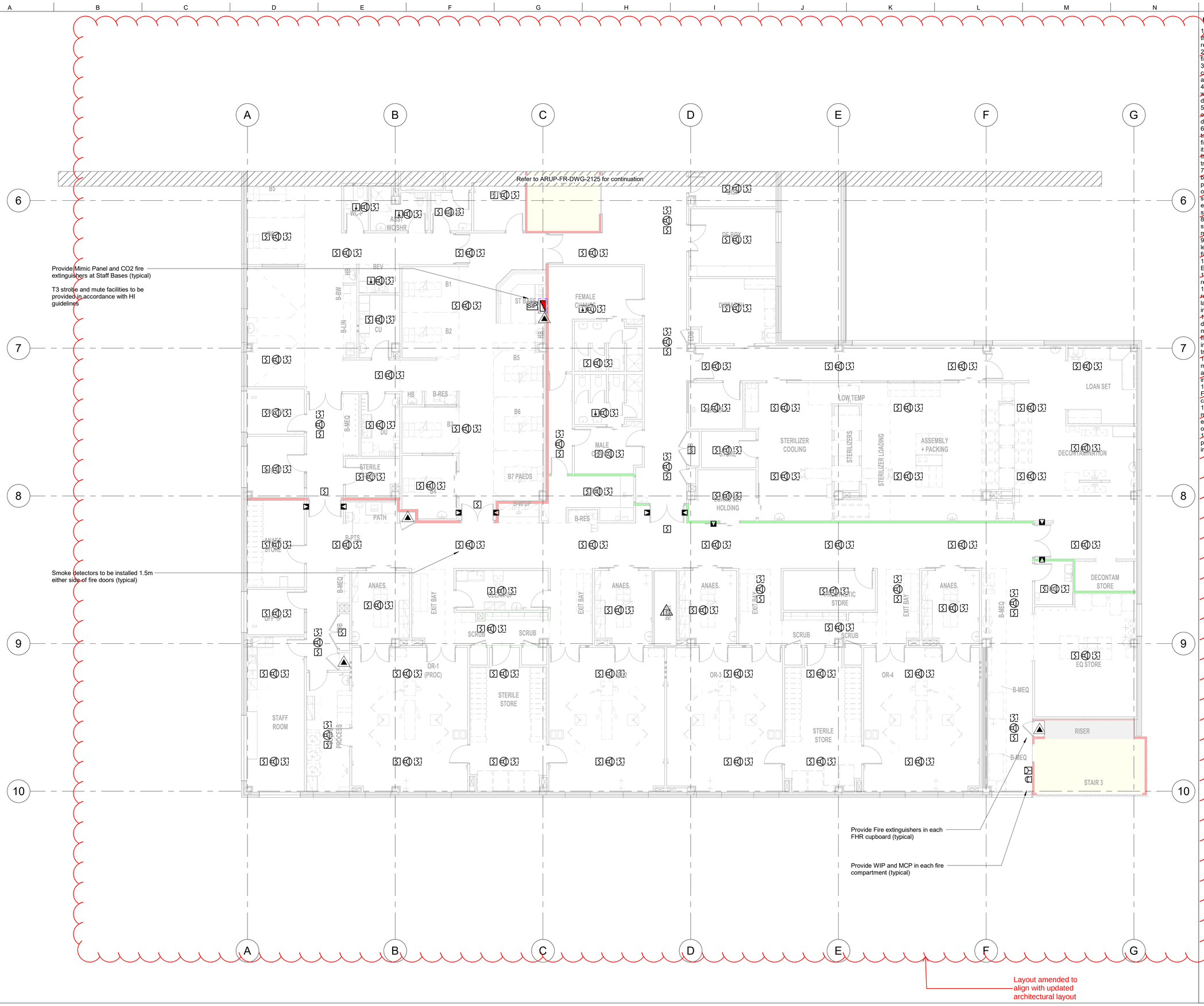

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100% DD				
C	10.05.19	AC	MH	MH
100% DD				
B	03.05.19	AC	MH	MH
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NORTH

Hydraulic and Fire Services

ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

TSA MANAGEMENT

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

NSW GOVERNMENT Health Infrastructure

STH
SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Level 1 Detection & Alarm Layout Sheet 2

Scale at A1 1 : 100

Role Fire Services

Suitability 100% DD

Arup Job No **260684** | Rev **E**

Name **FR-MW-DWG-2126**

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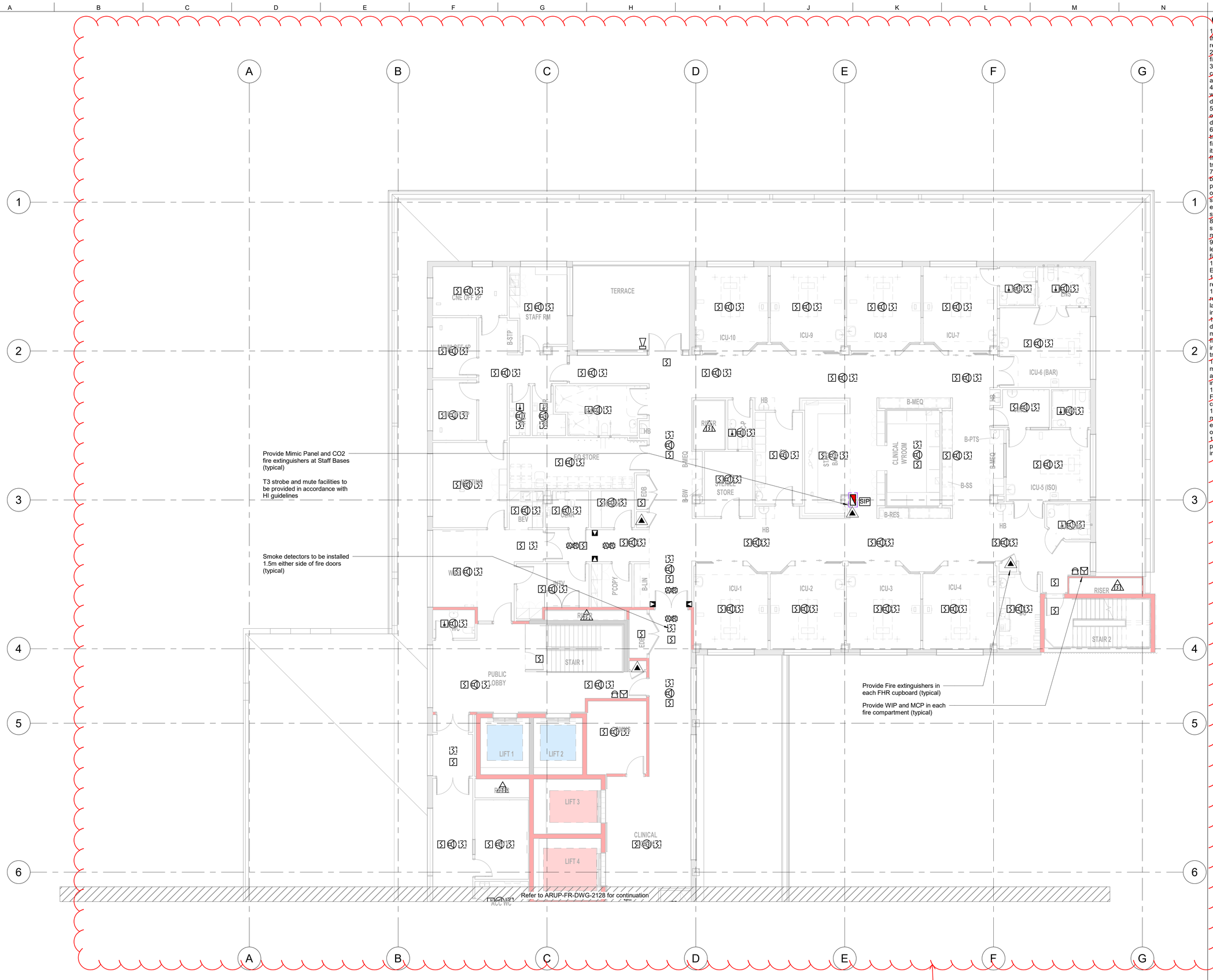

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NORTH

Hydraulic and Fire Services

ARUP

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Level 2 Detection & Alarm Layout Sheet 1

Scale at A1: 1 : 100
Role: Fire Services
Suitability: 100% DD
Arup Job No: 260684
Rev: E
Name: FR-MW-DWG-2127

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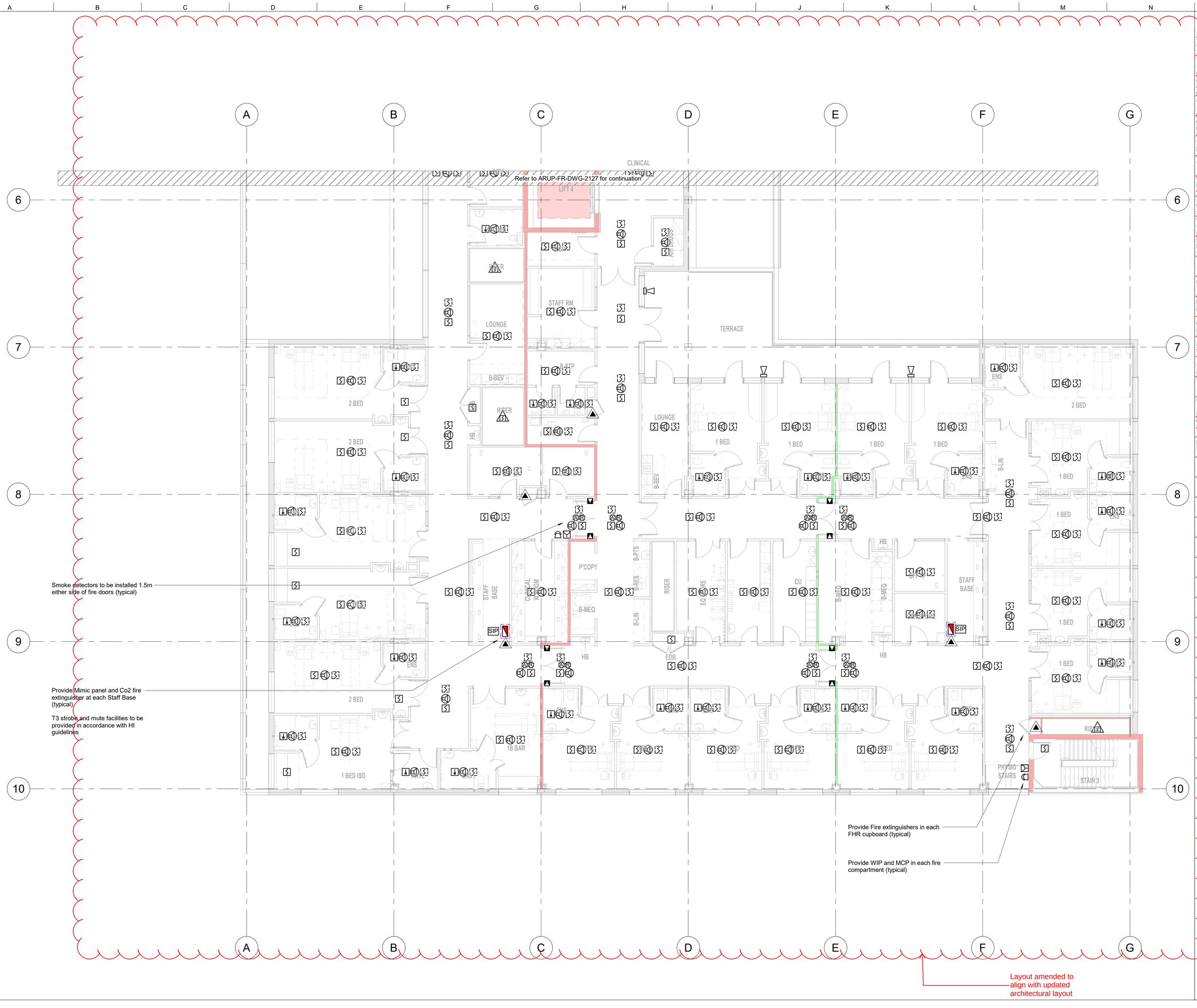

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80%DD				

Rev | Date | By | Chkd | Appd

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NORTH

Hydraulic and Fire Services **ARUP**

Barrack Place, 151 Clarence Street, Sydney 2000

PROJECT MANAGER
TSA MANAGEMENT
Level 15, 207 Kent Street
Sydney NSW 2000
T +61 2 9276 1400

CLIENT
NSW HI
14/77 Pacific Hwy
North Sydney NSW 2060
T +61 2 9276 1400
www.hinfra.health.nsw.gov.au

SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Level 2 Detection & Alarm Layout Sheet 2

Scale at A1 1 : 100

Role Fire Services

Suitability 100% DD

Arup Job No **260684** | Rev **E**

Name **FR-MW-DWG-2128**

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A1

AHU

AHU

AHU

AHU

AHU

AHU

AHU

AHU

Allow to provide detectors within AHUs in accordance with AS1670.1 requirements

Note: Mechanical Engineer to confirm requirements for induct smoke detectors.

Detectors to be provied at the top of all elevator shafts

Refer to ARUP-FR-DWG-2130 for continuation

Layout amended to align with updated architectural layout

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SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Level 3 Detection & Alarm Layout Sheet 1

Scale at A1 1 : 100

Role Fire Services

Suitability 100% DD

Arup Job No 260684

Rev E

Name FR-MW-DWG-2129

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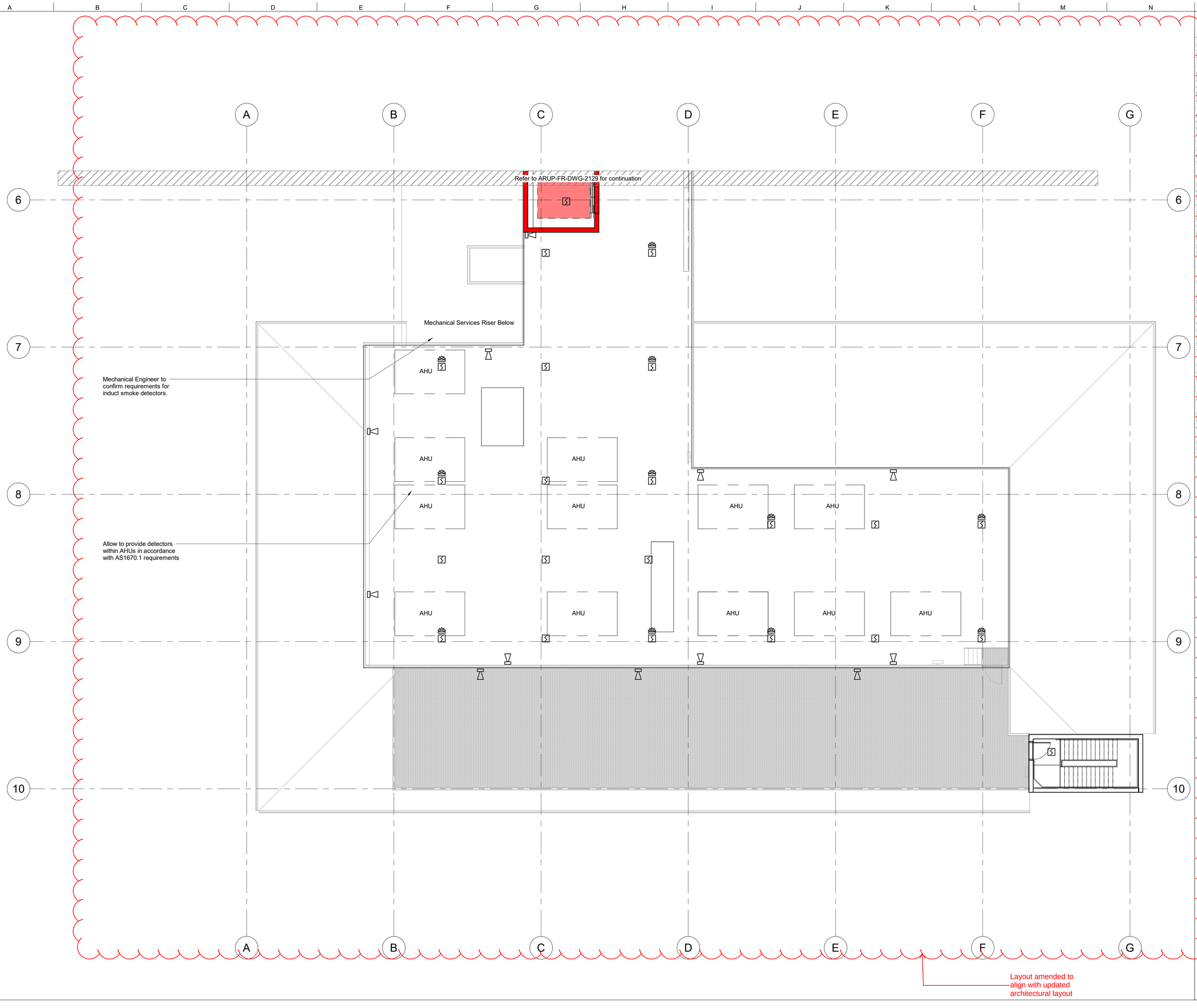

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SILVER THOMAS HANLEY

Project Title
Goulburn Hospital and Health Service Redevelopment

Drawing Title
Fire Services Main Works Level 3 Detection & Alarm Layout Sheet 2

Scale at A1: 1 : 100

Role: Fire Services

Suitability: 100% DD

Arup Job No: 260684

Rev: E

Name: FR-MW-DWG-2130

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