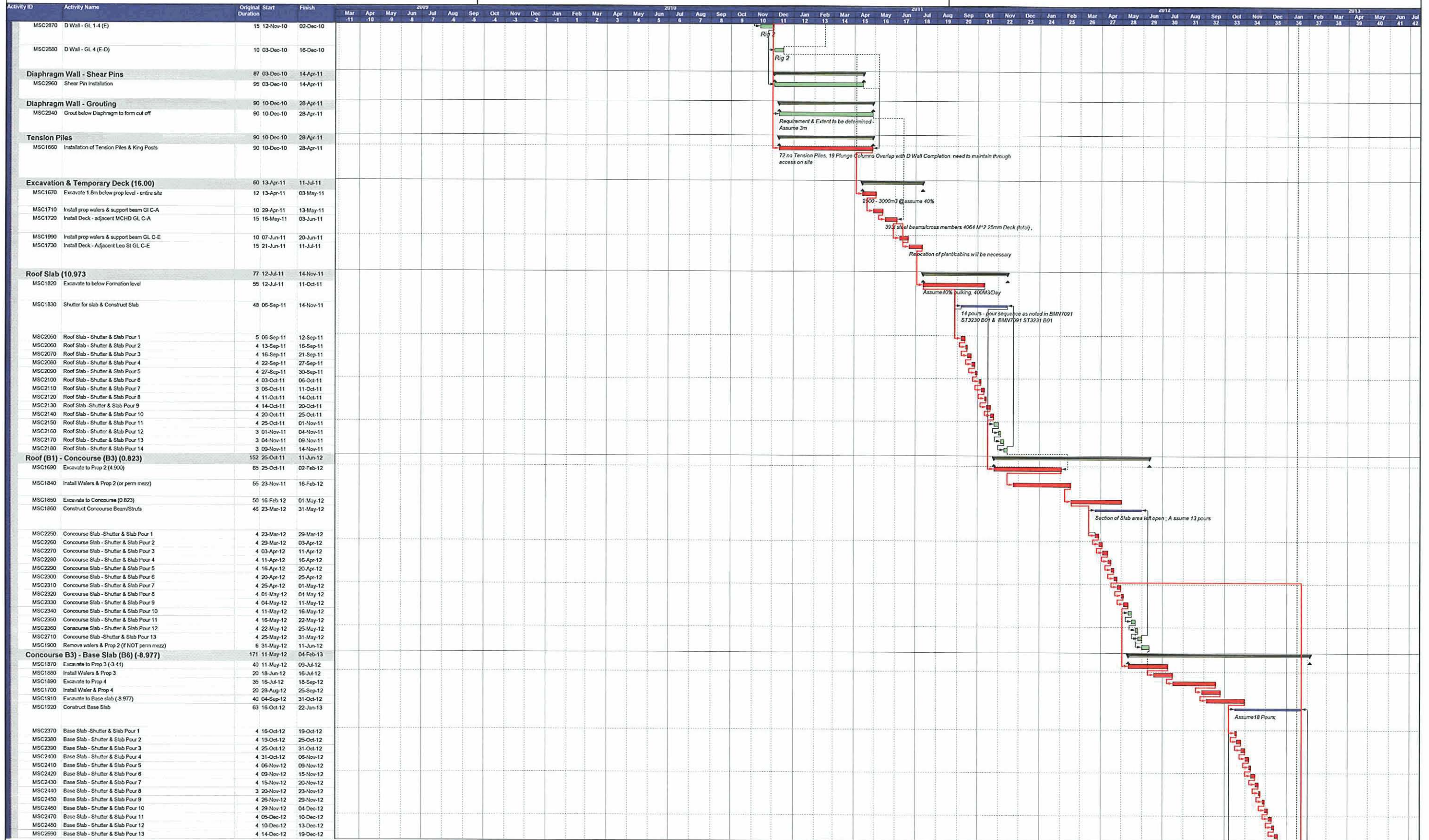
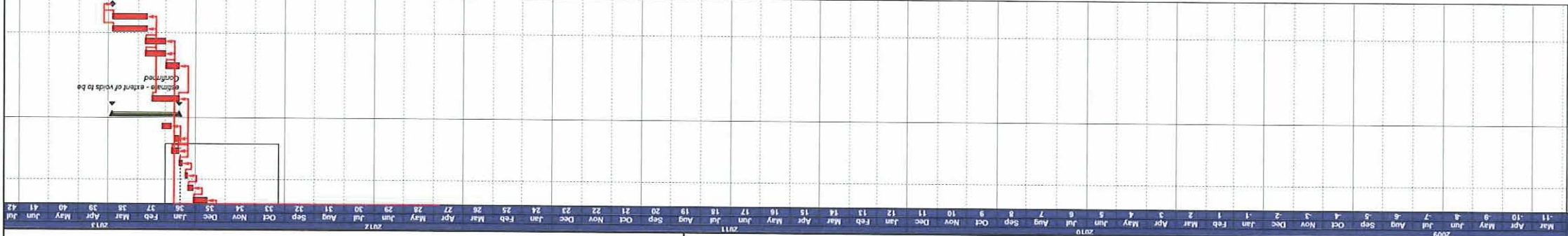


**METRO NORTH
ORAL HEARING
SD2.6D Rev A Final as
Issued_Part14**

STAGE 2 : Scheme DESIGN



Activity ID	Activity Name	Original Start	Finish
MSC2650	Base Slab - Shutter & Slab Pour 14	4 19-Dec-12	02-Jan-13
MSC2650	Base Slab - Shutter & Slab Pour 15	4 03-Jan-13	08-Jan-13
MSC2650	Base Slab - Shutter & Slab Pour 16	4 08-Jan-13	11-Jan-13
MSC2650	Base Slab - Shutter & Slab Pour 17	4 14-Jan-13	17-Jan-13
MSC1930	Remove Prop 4 & waters	6 17-Jan-13	25-Jan-13
MSC2650	Base Slab - Shutter & Slab Pour 18	4 17-Jan-13	22-Jan-13
MSC1940	Remove Prop 3 & Waters	6 25-Jan-13	04-Feb-13
Complete Above Ground Works & handback to MCHD			
MSC1950	fill voids left in roof slab	48 17-Jan-13	27-Mar-13
MSC1950	fill voids left in roof slab	20 17-Jan-13	14-Feb-13
MSC2950	Remove Catwalk, Clear Site etc	10 17-Jan-13	31-Jan-13
MSC1960	Remove temp Deck & waters	15 31-Jan-13	21-Feb-13
MSC1970	Old Dep'tem wall to 2m below final Grid Level	15 31-Jan-13	21-Feb-13
MSC1980	Install roof waterproof & protective layer	25 19-Feb-13	27-Mar-13
MSC2200	Construct WaterStops adjacent shafts & Entrance	25 19-Feb-13	27-Mar-13
MSC2210	Handback Site to MCHD	0 27-Mar-13	27-Mar-13



█ Remaining Level of Effort
█ Actual Level of Effort
█ Critical Remaining Work
◆ Milestone
◆ Milestone
▶ Summary

Appendix F Risk Register

SD-2.6D Construction Report

Appendix F Construction Risks

Reference	Activity	Potential Hazard	Mitigation Measure
1	Site Clearance & Demolition	Dust, allergens & contaminants (e.g. aspergillus and other airborne bacteria)	Carry out additional ground investigation to determine site-specific contaminants. Additional Geotechnical Investigation completed in December 2009. Records of contamination recorded in Geotechnical Reports (SD2.6). Potential environmental risk to human beings considered in Environmental Description (SD2.3)
2	Site Clearance & Demolition	Noise	None
3	Site Clearance & Demolition	Damage to adjacent properties during demolition of 24-26 Leo Street and 398 to 400 North Circular Road	None
4	Site Clearance & Demolition	Asbestos encountered during demolition of buildings.	Asbestos surveys required prior to demolition. RPA have procured an Asbestos Survey. Results of survey expected mid / end March 2009.
5	D-wall Construction	Damage to sensitive equipment in Mater Hospital and Mater Private Hospital.	Undertake vibration analysis to assess levels generated during construction. Vibration constraints to be included in Particular Specification of D&B Tender Documentation
6	D-wall Construction	Damage to foundations of adjacent buildings during construction of D-wall.	1.5m clearance allowed for between D-wall outer face and gable ends Leo Street Nos. 1 & 23. Research building and foundation records of Leo Street houses. Assess risk of damage. Request for trial pits made to RPA (mid March 2009) to verify (or otherwise) design assumptions.
7	D-wall Construction	Over excavation leading to structural failure or movement in excess of allowable tolerances	Allow for 0.5m accidental over excavation in design calculations at each excavation level (as per industry design standards and guidance.) Movement of D-wall during construction to be monitored against trigger levels.
8	Excavation	Contaminated land / groundwater encountered during excavation	Obtain and review relevant ground data. Supplement as necessary with additional ground investigation. Additional Ground Investigation completed in December 2008. Refer content of Geotechnical Reports (SD2.6) and Environmental Description (SD2.3). No significant contamination recorded.
9	Excavation	Artificial obstructions (excluding utilities - covered under Utilities Tab) encountered during excavation.	Search records of previous construction in vicinity of Mater Stop site and examine Ground Penetrating Radar surveys undertaken by the MCHD.
10	Excavation	Unexploded ordnance encountered during excavation	Search records of bomb drops on Dublin and Garda records of arms caches. Assess if construction site likely to be affected. Note that a Preliminary Unexploded Ordnance assessment has been completed - No significant risk identified.
11	Excavation	Deep excavation / confined space (e.g. lack of oxygen, excessive dust and fumes)	Design of temporary construction deck, roof and concourse to allow Contractor to provide temporary openings, to maximise air flow.
12	Excavation	Strut Failure	Provide redundancy in temporary propping. Design for temporary propping has allowed for progressive collapse (one strut failure). Stiffness of propping system assumed in design to be stated on drawings. Temporary propping is Temporary Works and will be designed by the D&B Contractor.
13	Excavation	Flooding of excavation (from run-off at street / temporary deck level)	Management of stormwater run-off during construction will require a temporary works solution. No provision for temporary drainage has been allowed for in design of permanent works. Contractor will have the option of on-site attenuation (e.g. on roof deck). 150mm high kickers or specific bund walls on all penetrations through roof slab, incorporated into Scheme Design, to capture runoff from temporary deck.
14	All Construction Activities	Falls from height	No design action. Top-down construction reduces frequencies of working at height.
15	Scabbling & Break Out	Hand arm vibration syndrome	Minimise area of scabbling or breakout between D-wall and slabs
16	D-wall Construction	Large and / or heavy component sizes.	Consider options to reduce size / weight of large / heavy components
17	Excavation	Noise and vibration due to increased excavation in rock following review of Additional Ground Investigation	Use of chemicals to break down rock not blasting techniques to reduce levels of noise and vibration.
18	Excavation	Ingress of groundwater	Permeability testing including packer tests and rising/falling head tests were undertaken during the additional ground investigation. A range of probable groundwater ingress has been estimated (similar range to that estimated during Stage 1) although the range / span of values is relatively large. May be unable to discharge all of water into DCC sewers. May need to tanker away. Further liaison with DCC required to establish allowable discharge to their assets. Specify pumping in Particular Specification, following construction of D-walls to provide an early indication of actual quantities that will require discharge.
19	Excavation	Excessive settlement due to box excavation resulting in damage to adjacent properties, structures & Underground assets	Carry out settlement analysis including potential damage assessment of adjacent buildings. Define ground movement monitoring to provide early warning of movements exceeding trigger levels.
20	Settlement damage to known services	Damage to utilities serving adjacent structures (e.g. damaged resulting from settlement caused by box excavation)	Obtain relevant utility information. Undertake settlement assessment and assess potential damage to utilities. Provide protection measures to utilities where required. Liaise with relevant utility companies. RPA has commissioned CCTV and Slit Trench surveys to assist with improving understanding of buried services.
21	Contact with buried services	Injury from live conductors, escape of gas leading to fire/explosion, ingress of water under pressure, ingress of foul water leading to disease.	Desk stop investigation to be undertaken to identify location of existing assets. RPA has commissioned CCTV and Slit Trench surveys to assist with improving understanding of buried services. Results of surveys to be reviewed and (if necessary), drawings of existing services to be revised to suit.
22	Contact with unforeseen services	Striking existing (unforeseen) services	Desk stop investigation to be undertaken to identify location of existing assets. RPA has commissioned CCTV and Slit Trench surveys to assist with improving understanding of buried services. Results of surveys to be reviewed and (if necessary), drawings of existing services to be revised to suit.
23	Working adjacent to live roads	Struck by highway and construction traffic	None
24	Diversions & Excavations	Collapse of excavations or personnel falling in. Material/ objects falling onto personnel below.	None
25	Diversions & Excavations	Leptospirosis - Exposure to infected rat urine	None
26	Public Rights of Way - Access & Egress	Diaphragm wall works in close proximity to public highways / footpath	Consider closure of footpath on North Circular Road and Leo Street during construction period. Draft Traffic Management measures to be discussed with DCC. Current proposal is to not close footpaths, but to provide covered walkway adjacent to site. Agreement with DCC documented in Interface Requirements Report (SD2.1).

Railway Procurement Agency
Ghníomhaireacht um Fháil Iamróid
Parkgate Business Centre,
Parkgate Street, Dublin 8, Ireland
Phone +353 1 646 3400
Fax +353 1 646 3401
www.rpa.ie

Responsible for

LUAS METRO

Integrated
Ticketing
System

With funding and
support from

transport21
progress in motion

