PWI Alan Barham Maintenance Award 2020

Sydney Trains City South Territory

City South Team (all disciplines)

Transport Sydney Trains

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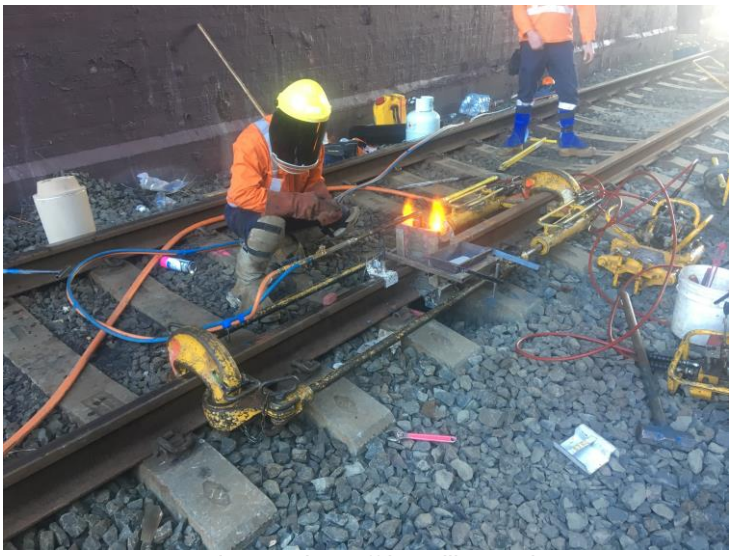


City South Staff installing a closure

Introduction

The Sydney Trains City South Team is located across two depots one at the multi-discipline Sydenham Network Base situated 5.5 kilometres south of Central Station. Sutherland multi-discipline Satellite Network Base is located at 24 kilometres south of Central Station.

City South Territory in purple (excluding Green Square to Wolli Creek Airport line)

City South Territory has a total of 131km of mainline track consisting:

- Illawarra Main line from Erskineville to Waterfall
- East Hills line Wolli Creek to Turrella/Bexley North
- Sutherland to Cronulla Branch line
- Sydenham to Marrickville Bankstown Line
- Metropolitan Freight Line from Tempe to Marrickville

City South Territory is also home to the XPT Maintenance Centre and Mortdale Maintenance Centre, as well as Waterfall and Cronulla Stabling Yards, coming to overall approximately 156km of track. City South's territory also includes 13 diamonds, 171 turnouts, 16 catchpoints and 7 cuttings.

Team Profile

The City South Civil team has a structure of 24 team members with 10 vacancies made up of the following:

- 1 Team Manager
- 2 Team Leaders
- 2 Acting Team Leaders
- 3 Work Group Leaders
- 3 Acting Work Group Leaders
- 13 Infrastructure Workers

The City South Civil team is made up of a wide range of competencies coming from a diverse group of staff. Knowledge ranges from new staff to staff with over 35 years' experience in Civil.

With a diverse group, the senior staff provides strong leadership, mentoring and coaching to the new employees. This ensures that the intellectual property is passed on through to the next generation of civil workers. To achieve our great year, our staff have collectively worked over 6000 hours of overtime.

Team Skills, Training and New starters

City South has added 6 new starters since July 2019, with all 6 currently trained in the national competencies to get to AVP2.3:

ASS384 - Introduction to track,
ASS385 - Install and Maintain Track
ASS386 - Apply fatigue management procedures
ASS371 - Visually inspect track
ASS380 - Process workplace documentation
ASS373 - Carry out measurements and calculations
ASS374 - Examine track Infrastructure
ASS375 - Apply quality systems
PW78 - Hand signalling Level 1

Ongoing Protection Officer, welding, track inspection and ultrasonic testing recertification's are managed through an Outlook calendar which gives 1 months' notice to a recertification date.

Our Civil team currently possess the following skills:

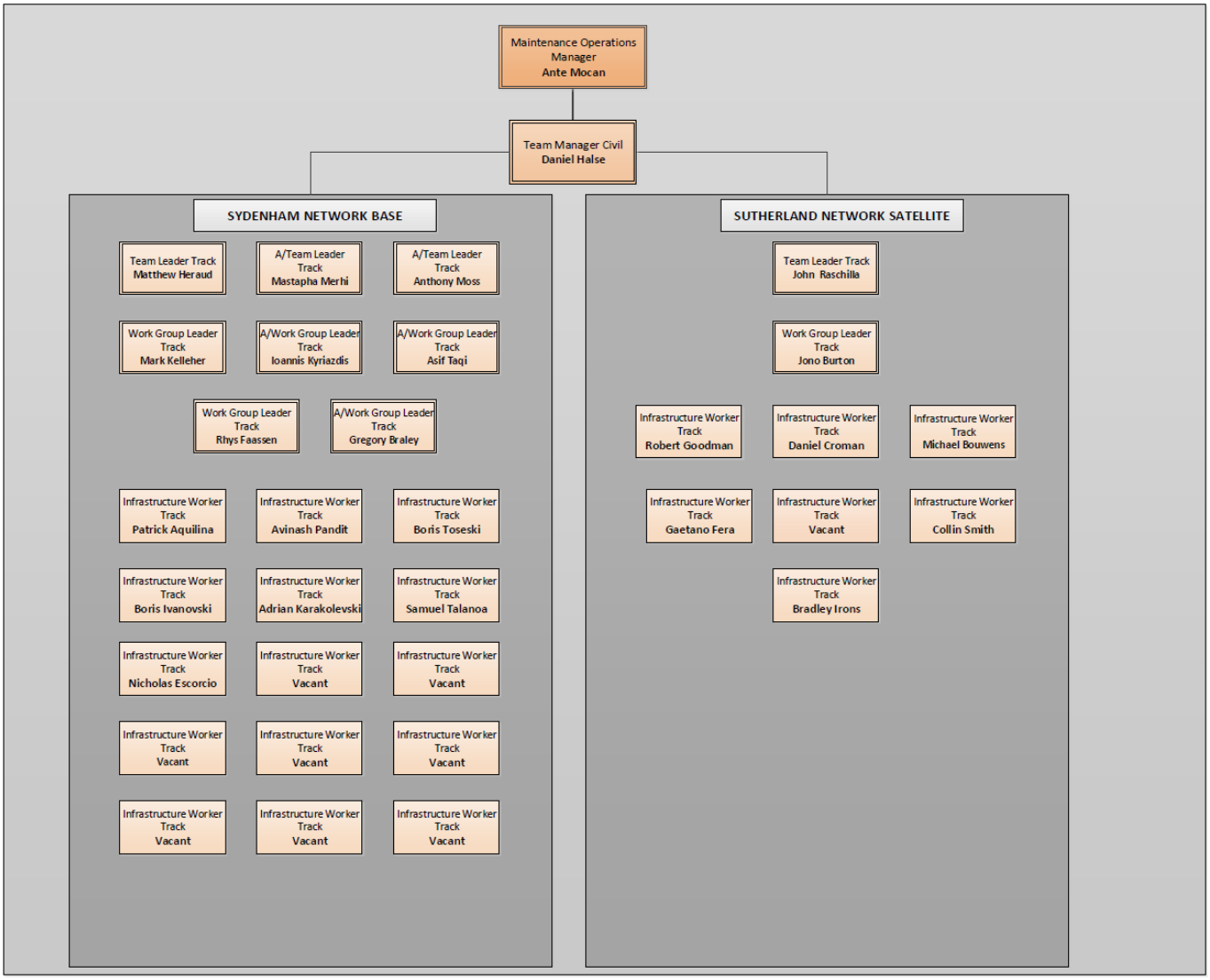
- 9 Safety Protection Officers (PO)
  - 1 x PO4
  - 1 x PO3
  - 4x PO2
  - 3x PO1
- 9 Hand Signaller *Level 1*
- 4 Hand Signaller *Level 2*
- 8 Ultrasonic Operators (KK)
- 20 Visual Track Inspection
- 15 Record and Analyse

- 15 Maintain Track Geometry
- 6 Aluminothermite Welders
- 1 Wirefeed Welders
- 6 Rough Cutting
- 10 Maintain points and crossings

Team members also hold competencies such as:

- First Aid and CPR
- Dogging Ticket
- Confined Spaces
- Chainsaws
- Forklift
- Chemcerts
- Heavy Rigid (HR) Vehicle Licence
- Medium Rigid (MR) Vehicle Licence

Organisation Chart



Time Management

As part of Sydney Trains' ongoing efforts to put the customer front of mind, reducing disruptions to services and train running key to ensuring a positive customer experience. Every division in Sydney Trains has had to rethink its business operations to put the customer front of mind. At City South territory this has required a large change in the way we do business, especially at our Sydenham Depot where trains can run as often as every 3 to 5 minutes in the peak period and every 7 to 10 minutes in the midday off-peak. City South introduced a nightshift roster, whereby 1 crew of 3 people are allocated to a permanent 4 night shift roster, with 4 other crews rotating on to nights for one week of their 4 week roster period. This allows us to complete all their inspections and has significantly increased our defect removal.

Team Environment and Pride in our work

The City South team environment is very supportive and understanding of our workers. New workers are fostered and taught through leadership by doing hands on inspection and defect removal. The Sydenham Civil team works cohesively and collaboratively to ensure they deliver a safe and reliable network. The team prides itself on a high quality standard.

Due to the nature of the work and strong comradery between the team members, they look out for each other and have a strong belief in the target zero principles in ensuring they all go home in the same condition that they arrived at work in.

Reliability of the track is gained through robust planning processes. The competency of our civil team ensures that planning is executed in a timely manner to a high standard.

Our Civil leadership team provides good mentoring, coaching and support to the wider team which allows for knowledge to be passed on.

All of these factors result in a strong team who has pride in their work and is demonstrated through the results they consistently produce.

Team Leader teaching new starters how to measure wing rail wear

When COVID-19 hit, two members were granted special leave as they deemed especially vulnerable given that they were of retirement age.

At City South we take great pride in every aspect of our work. In May, we had a joint covered concrete slab fail in Mortdale Maintenance Centre. This joint required concrete to be cut out and then batched on site. We were commended by not only the maintenance centre staff, but by the train drivers for ensuring that the site was kept safe and clean to allow the maintenance centre to operate as normal while the closure was installed and the concrete was placed.

Concrete Slab at the end of the pour

City South Incident Response ute with inverter and battery charger on the left

City South 19/20 Year in Review

Compliance

City South Territory achieved 100% compliance across all inspections in the financial year 19/20, carrying out 12,497 inspections in total.

Inspection Type	Inspections Planned	Inspections Complete	Compliance as a percentage
Safety Critical	7742	7742	100%
Safety Significant	3942	3942	100%
Safety Other	813	813	100%
Total	12497	12497	100%

WTSA – Broken Rails and misalignments

Over the 19/20 financial year City South had **no broken rails**. City South did have one misalignment at Turrella on the East Hills line on New Year's Eve. A speed restriction was put in place immediately, the misalignment was monitor and when the temperature cooled sleeper paddles were installed. The speed restriction was kept in place until a full possession was granted in order to undertake a spot tamp.

Misalignment Report

MN T 20211 Appendix C (Form MIS1)

District	City South	Date	31 December 2019
Basecode	12797	Track	East Hills Down Main
Kilometrage	9.380	Time Reported	15:14
Method of Detection	Driver Report	Reported To	ICON
Misalignment Length Length of misalignment in metres (Multiple of 5m)	5m (8m)	Misalignment Displacement Amount of displacement in mm (Multiple of 25mm)	50mm (48mm 15mm design for 33 variation form design).
Ambient Temperature Actual or Estimated	37C	Rail Temperature Actual or Estimated	49C approx.
Radius 0-400m, 400-800m, 800-1600m, over 1600m, Straight	400-800m	Rail Section	60kg
Length of Rail	CWR	Sleeper Type Timber, Steel, Concrete, Low Profile Concrete, Timber/Steel Interspersed, Timber/Concrete Interspersed	Concrete
Fastening Type	Pandrol	Sleeper Condition Good for 5 years or more, Split, Broken or Rotten, Other	Good
Fastenings Effective	Yes	Anchors Effective	Average, Crush biscuits
Ballast Deficient Shoulder and/or Crib Deficiency	1/2 shoulder 1/2 Crib	Track Disturbance Fettling, Manual Resleepering, Surfacing, Tie and Surfacing, Ballast Cleaning	None (pumping)
Rail Creep Primary Analysis	+37mm | +46mm	Alignment Primary Analysis	-11mm @ 9.398
Rail Adjustment Primary Analysis	0%	Adverse Condition(s) Primary Analysis	10% BR 10% TCI
Primary Analysis	15%	Calculated WTSA at time of misalignment	49% (with 1/2shoulder and 1/2 crib calculated).
Apparent Causes	Ballast deficiency, Bad top with pumping ballast.		
Corrective Action To Restore Traffic	CAN warn and 20km/hr TSR. After measurements TSR raised to 40km/hr.		
Planned Corrective Actions	Correct ballast condition and profile.		
Comments	505m Radius curve. Creep measurements consistant and stable from last 3 yrs. No rail welding in area recorded in smart weld. 18mm line defect reported from last TGMS run on 28/11/2019		

Incident/Emergency Response

City South Territory's has a robust incident response procedure with 5 people on call 24 hours a day for incident response. Each one of these utes is set up with a small number of; e-clips, fishbolts, fishplates, Robel Clamps, gauge board, depression pegs; light weight, battery powered hand grinder; new, light weight battery powered, hand held rattle guns, battery powered chainsaw and battery chargers built in that charge the equipment while driving. See full list in the appendix A. City South has also set up a "Response Truck", this is a small 3 tonne Isuzu truck carrying larger equipment such as welding equipment, tensors, rail saws, additional spare bolts and fishplates.. Should an incident such as a broken rail occur, the 3 tonne truck is set up to go straight away. This smaller truck is a better at navigating Sydney's smaller back streets where most of our access gates can be found. The smaller truck is also a lot easier to get into the corridor in an emergency than the 12 tonne welding truck that would usually be required for these larger incidents.

Network Reliability Initiatives

City South has implemented a number of network reliability initiatives to ensure that incident responses are not only timely, but fit for purpose.

- To improve network reliability, in the winter month's Civil team members attend track circuit failures with the Signal Electricians in case of broken rails.
- As part of Sydney Trains New Year's Celebration Readiness City South had 30 hours of standby emergency response coverage with rolling shifts over the New Year's celebrations to ensure that any emergencies were resolved promptly.
- As detailed above, City South has set up fit for purpose incident response vehicles as well as a response truck.
- Hand Grinder initiative – City South's night shift have made great use of their new hand grinders. When minor flow defects start to occur, the night shift team will grind the flow and replace the key with a type approved epoxy. This means that no signal failures over the 19/20 year have been attributed to GIJ's failing. Further to this, grinding of crossing nosed has markedly reduced crossing flow and RCF defects at known trouble spots. These small acts add up to ensure that network reliability has been improved in City South Territory.

Temporary Speed Restrictions

Total of 5 TSR's placed for 19/20.

TSR Location (including imposed date)	TSR Length	Normal Speed (Passenger)	TSR imposed speed	Length of time TSR in place
Sydenham 733 Diamond Concrete bearer failure (10/07/2019)	100m	80km/h	40km/h	11 Days
Sydenham 760A high rail switch/curve wear (14/07/2019)	50m	60km/h	20km/h	78 Days Due to steel work, special turnout on tight curve
Turrella misalignment found on highest patronage day of the year 31/12/20	200m	85km/h	40km/h	15 Days
Hurstville E2 geometry MTPV/geometry recording error – second occurrence TSR imposed as precaution (29/01/20)	300m	50km/h	40km/h	52 Days
Top Defect Sydenham Down Illawarra Local (15/05/20)	50m	70km/h	60km/h	3 days

TCI

TCI Data has been collected with Sydney Trains MTPV1. Due to Sydney Trains MTPV geometry system failure in early 2020 with replacement parts coming from Italy at the height of the COVID-19 outbreak, MTPV quarterly data is only available for quarters 1, 2 and 4. Geometry recordings were undertaken in late May as a catch up run with AK Car, however the TCI has not been made available to the territory.

Track	Jul-19	Oct-19	Jun-20
Down Illawarra Main	25	23.9	22.8
Up Illawarra Main	24	23.8	23.8
Down Illawarra Local	25.7	25.6	23.7
Up Illawarra Local	27.1	27.1	26.6
Down Cronulla	20.8	20.8	23.1
Up Cronulla	23.8	23.8	21
Down East Hills Main	23.7	23.7	22.1
Up East Hills Main	21.6	21.6	22.1
Down East Hills Local	30.3	30.3	31.2
Up East Hills Local	27.7	27.7	28.2
Down Bankstown	52	53.8	46
Up Bankstown	38	40.1	34
Weighted average TCI	24.8	24.4	23.8
Overall Year Average		24.3	

LTI and MTI data

City South had one LTI where a staff member rolled their ankle requiring time off work treatment and one MTI where a staff member attended hospital to have a large splinter that pierced their glove removed from their hand. The employee returned to work to finish the shift.

Audits

Throughout 19/20 City South had 2 Sydney Trains internal asset assurance audits from Engineering and System Integrity team. Both of these audits commended City's South's efforts and for with the worst finding from the first report ponding due to a TfNSW project in the area establishing a site compound covering the drainage pit at Waterfall yard, and the second identifying no non-compliances and no risks above a "Medium".

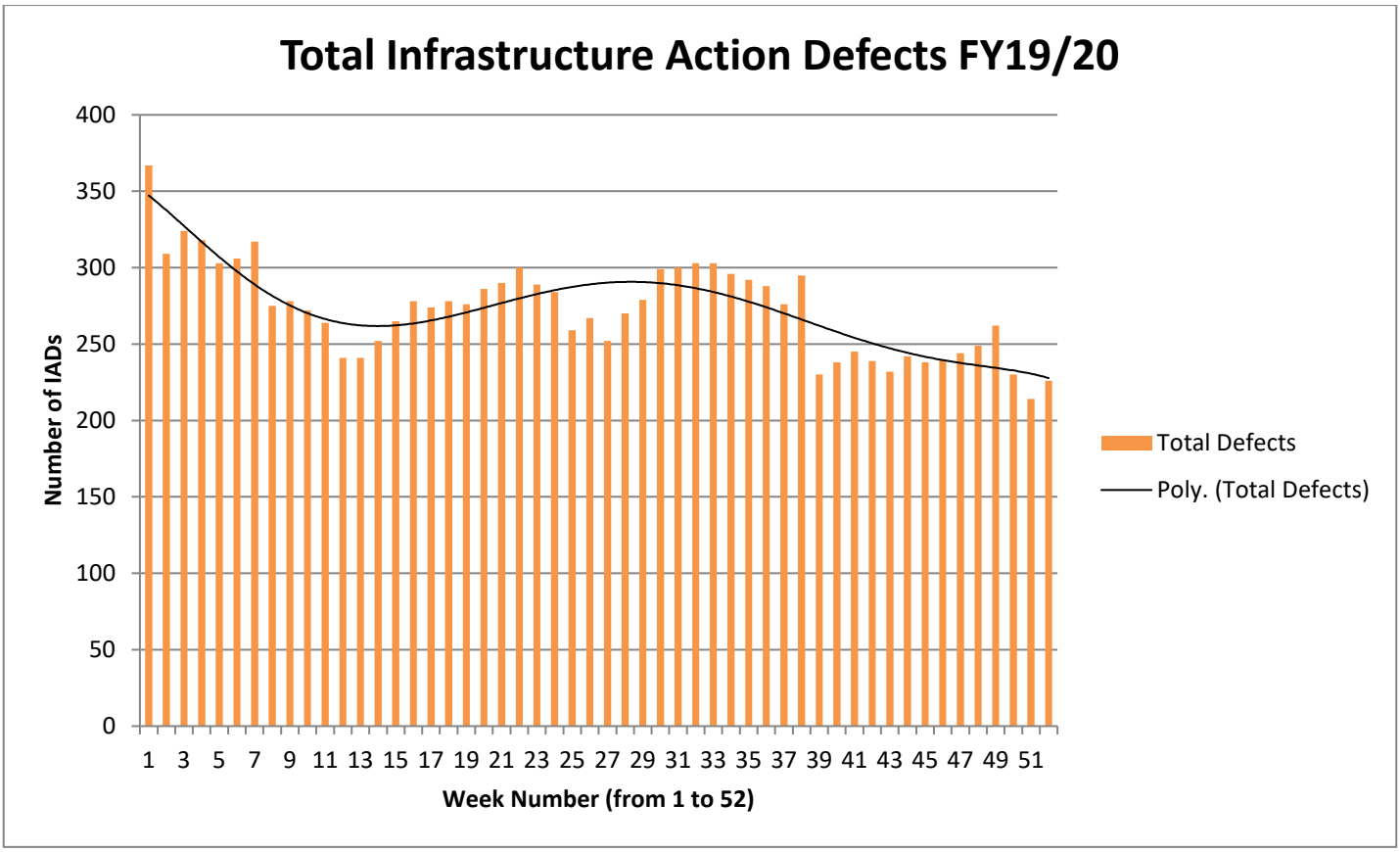
Track Access, Sydney Trains' Customer focus and Defect Removal

As previously stated, Sydney Trains has had a broader push to keep the customer front of mind and City South has risen to this challenge creating a night shift to enable maintenance access for inspections and defect removal. Over the 19/20 period City South has undertaken an aggressive defect removal program. This is our greatest achievement over the last year, not just the result, but the processwe have created in order to not just remove defect but to continue to reduce our defect numbers. This has included, ensuring MPM scope aligns to defect location, taking advantage of night windows for defect removal, stepping up defect removal in possessions with a focus on only difficult or hard to get to or detailed walk inspection done during possessions and taking on larger rerailing scopes for multiple or critical rail defects. City South has also tried to find efficiency in removing bulk critical defects in these weekend possessions and targeting critical individual high priority defect in night windows.

By minimising inspections during weekend possessions and redirecting effort towards defect repair and removal, this has increased network reliability and meant that City South has removed more defect that any other Sydney Trains territory. See the table on the next page for high priority (30 days or above response time). This has significantly reduced the risk to the network and reduced the team's workload for defect Revised Compliance (REVCOM) inspections dropping high priority defect numbers from 367 in July 2019 to 226 in June 2020, a reduction of 141 defects, 38.4% of the July 2019 number. As the territory has many vacancies, there have been many challenges in sustaining these numbers and driving defects down without adversely impacting the customer and the team at City South has risen to the challenge.

Over the last year City South has completed the following work:

- 17 V and K crossing replacements
- 80 Sleepers replaced on mainlines
- 181 Sleepers replaced across yards and sidings
- 270m of rerailing
- 18 Bog Hole repairs
- Replaced 46 GIJ's
- Installed 200 Closures
- Replaced 15 Stock and switches



High Priority Defects (Action within 30 days or less) over 19/20 across Sydney Trains

City South		
Month	Found	Removed
19/20 Jul	24	97
19/20 Aug	39	65
19/20 Sep	59	53
19/20 Oct	46	36
19/20 Nov	33	27
19/20 Dec	28	64
19/20 Jan	38	24
19/20 Feb	32	21
19/20 Mar	39	118
19/20 Apr	28	23
19/20 Jun	24	29
19/20 Jul	62	89
Total	**452**	**646**

City East		
Month	Found	Removed
19/20 Jul	38	50
19/20 Aug	50	40
19/20 Sep	44	34
19/20 Oct	22	22
19/20 Nov	35	53
19/20 Dec	36	49
19/20 Jan	34	18
19/20 Feb	41	53
19/20 Mar	42	42
19/20 Apr	46	90
19/20 Jun	47	82
19/20 Jul	27	63
Total	**462**	**596**

City West		
Month	Found	Removed
19/20 Jul	42	27
19/20 Aug	62	49
19/20 Sep	29	13
19/20 Oct	45	61
19/20 Nov	61	43
19/20 Dec	32	41
19/20 Jan	32	33
19/20 Feb	19	21
19/20 Mar	36	55
19/20 Apr	43	45
19/20 Jun	69	37
19/20 Jul	40	99
Total	**510**	**524**

City North		
Month	Found	Removed
19/20 Jul	23	15
19/20 Aug	20	8
19/20 Sep	59	5
19/20 Oct	26	22
19/20 Nov	32	28
19/20 Dec	20	10
19/20 Jan	38	40

Central Coast		
Month	Found	Removed
19/20 Jul	17	13
19/20 Aug	11	10
19/20 Sep	13	12
19/20 Oct	20	6
19/20 Nov	19	15
19/20 Dec	10	5
19/20 Jan	53	9

Western		
Month	Found	Removed
19/20 Jul	15	7
19/20 Aug	13	19
19/20 Sep	22	19
19/20 Oct	32	19
19/20 Nov	16	23
19/20 Dec	21	18
19/20 Jan	34	27

19/20 Feb	23	22
19/20 Mar	48	30
19/20 Apr	27	12
19/20 Jun	12	91
19/20 Jul	9	49
Total	**337**	**332**

19/20 Feb	15	26
19/20 Mar	23	25
19/20 Apr	86	15
19/20 Jun	39	48
19/20 Jul	54	39
Total	**360**	**223**

19/20 Feb	10	13
19/20 Mar	21	15
19/20 Apr	24	30
19/20 Jun	21	50
19/20 Jul	15	21
Total	**244**	**261**

South Coast		
Month	Found	Removed
19/20 Jul	7	18
19/20 Aug	18	18
19/20 Sep	17	6
19/20 Oct	18	33
19/20 Nov	34	5
19/20 Dec	30	31
19/20 Jan	26	21
19/20 Feb	13	24
19/20 Mar	9	13
19/20 Apr	21	7
19/20 Jun	24	18
19/20 Jul	11	24
Total	**228**	**218**

South West		
Month	Found	Removed
19/20 Jul	8	7
19/20 Aug	4	1
19/20 Sep	7	7
19/20 Oct	16	2
19/20 Nov	12	7
19/20 Dec	9	4
19/20 Jan	46	5
19/20 Feb	11	24
19/20 Mar	17	11
19/20 Apr	78	4
19/20 Jun	27	33
19/20 Jul	50	17
Total	**285**	**122**

Total		
Month	Found	Removed
19/20 Jul	174	234
19/20 Aug	217	210
19/20 Sep	250	149
19/20 Oct	225	201
19/20 Nov	242	201
19/20 Dec	186	222
19/20 Jan	301	177
19/20 Feb	164	204
19/20 Mar	235	309
19/20 Apr	353	226
19/20 Jun	263	388
19/20 Jul	268	401
Total	**2878**	**2922**

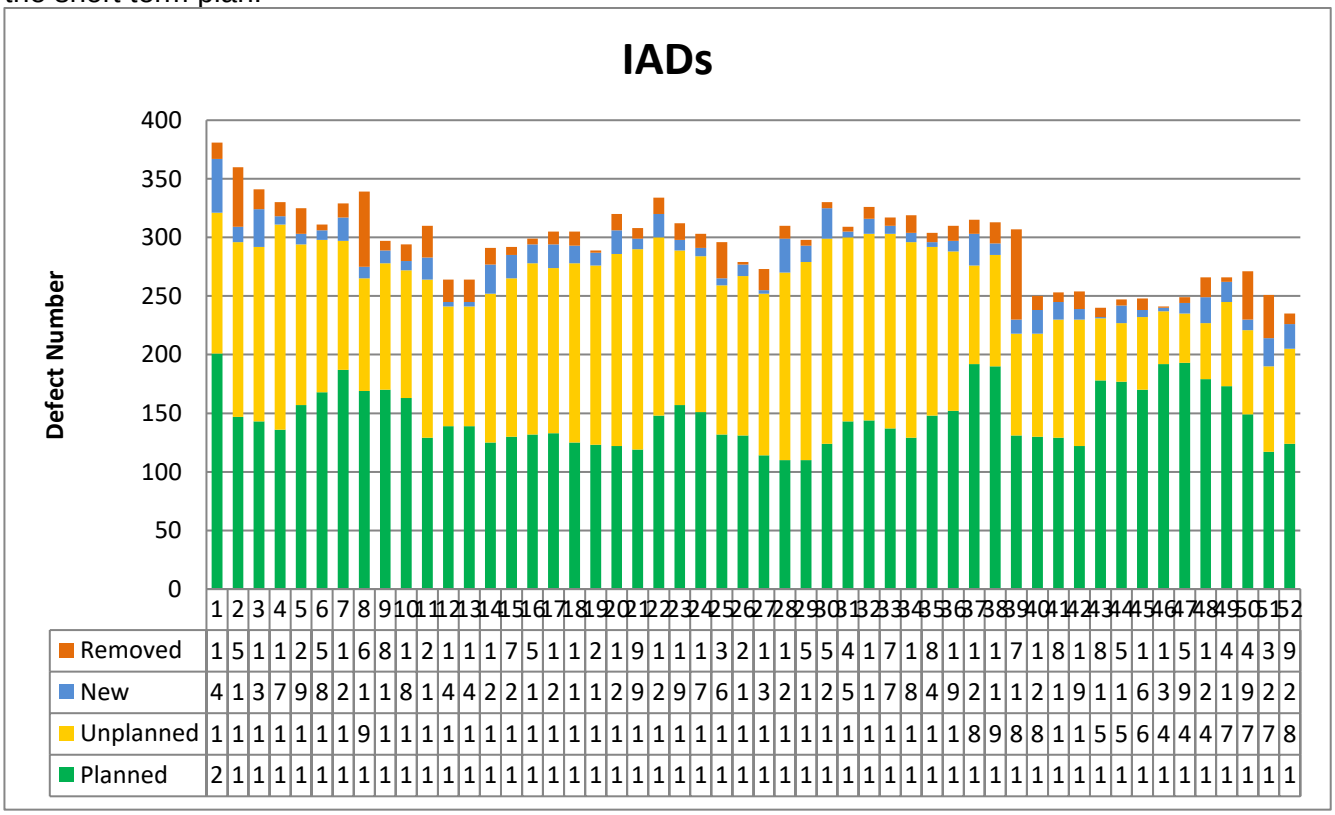
Innovation – Slab-Lok System

City South has introduced the Slab-Lok process to Sydney Trains. This process involves coring concrete sleeper ferrules to allow for regauging or replacing of snapped screws in the ferrule of concrete bearers in turnouts. In years gone by with timber bearer turnouts, reboring timber sleepers was a well-practiced art. With the widespread introduction of concrete bearers, when designs have not performed as planned and screw spikes have snapped in the ferrules this has reduced the safety of the track and has led to sleeper replacements on otherwise fit for purpose and non-defective sleepers. By coring round the screw, into the envelope that the ferrule occupies and removing a small amount of concrete to ensure that the epoxy has good concrete to mate with, the existing broken screw can be replaced and the bearer does not need to be replaced. By coring the envelope of the ferrule, this ensure that no reinforcement is damaged or destressed, meaning that the concrete bearer has not lost any strength through the process.

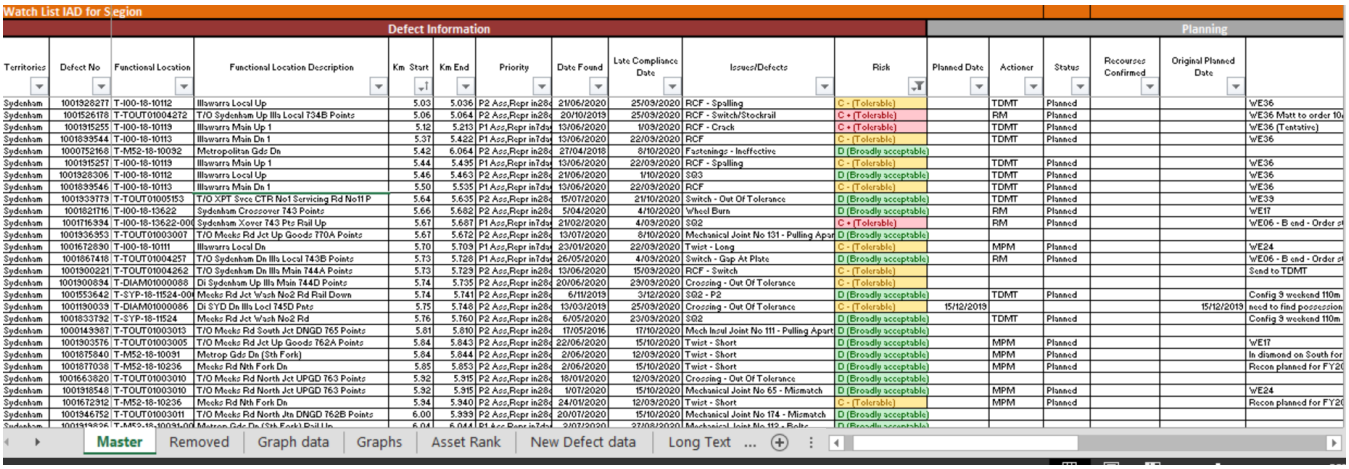
Step	Instruction	Illustration	
1	Remove plastic ferrule from concrete using a Hilti 40mm masonry bit and a Hilti TE70 Combihammer or equivalent. If a broken screw is hit which is remaining in the hole switch over to a 42mm diamond core drill to finish ferrule and screw removal. Drill to a depth of 160mm.		Comments: Make sure hole is Drilled/Cored vertical.
2	Flush & clean the cored hole with water, then dry the hole using a heat gun or similar. It is essential that the hole is clean, dry and free of debris for the ultimate adhesion of ES-50 to the cored hole.		
3	Fill the cored hole with Spike Fast ES-50 and wait at least 30 minutes for the ES-50 to set. Ambient temperatures can affect setting times.		Supplied by: Imtram Refer to the MSDS for the safe use of this product.
4	Replace track plates, set gauge. To ensure optimum fit, use the 22mm/19mm Stepped Drill with Collar, (Figure A), to drill the full depth in the center of the plate hole into the Spike Fast ES-50 (160mm). Stepped drill bits are supplied by Cold Forge. After drilling, ensure all drilling swarf is removed and all surfaces are clean and free of dirt and debris.	 *Figure A: 22/19mm Stepped Drill Bit*	
5	Install GageLok-24 with the structural washer provided using a powered impact driver or a rattle gun with 21mm 4-point drive socket.		GageLok-24 and the 21mm 4-point socket are Supplied by Cold Forge
6	Finish the installation using a torque wrench and torque the GageLok 24 Screw to 350 Nm.		

Organisation and Leadership

City South and the local engineering team have developed an Infrastructure Action Defect (IAD) tool to assist in the planning, prioritisation and removal of defects. Each Monday the IAD spreadsheet is sent out by the engineering team with data pulled directly from Sydney Trains' defect management system SAP. Every second Tuesday there is an IAD planning meeting to ensure scope has been met and plans are still valid. The IAD tool is used to direct all planning for the next year and beyond with planned weekend possessions included in the excel spreadsheet. Data is fed from SAP into the sheet and is organised into "new", "removed", "planned" or "unplanned" categories. Defects assessed the REVCOM process and this data is entered into SAP. The risk rating of these defects is also brought into the defect planning stage, where higher risk defect are planned first. Since March of 2019, City South has not had an unplanned "C+" risk or higher defect with these defects being planned immediately (scale from A to D where A is high risk and D is low risk). If a defect's priority has been changed this is identified at this meeting and the defect may move from the minor works program into the short term plan.



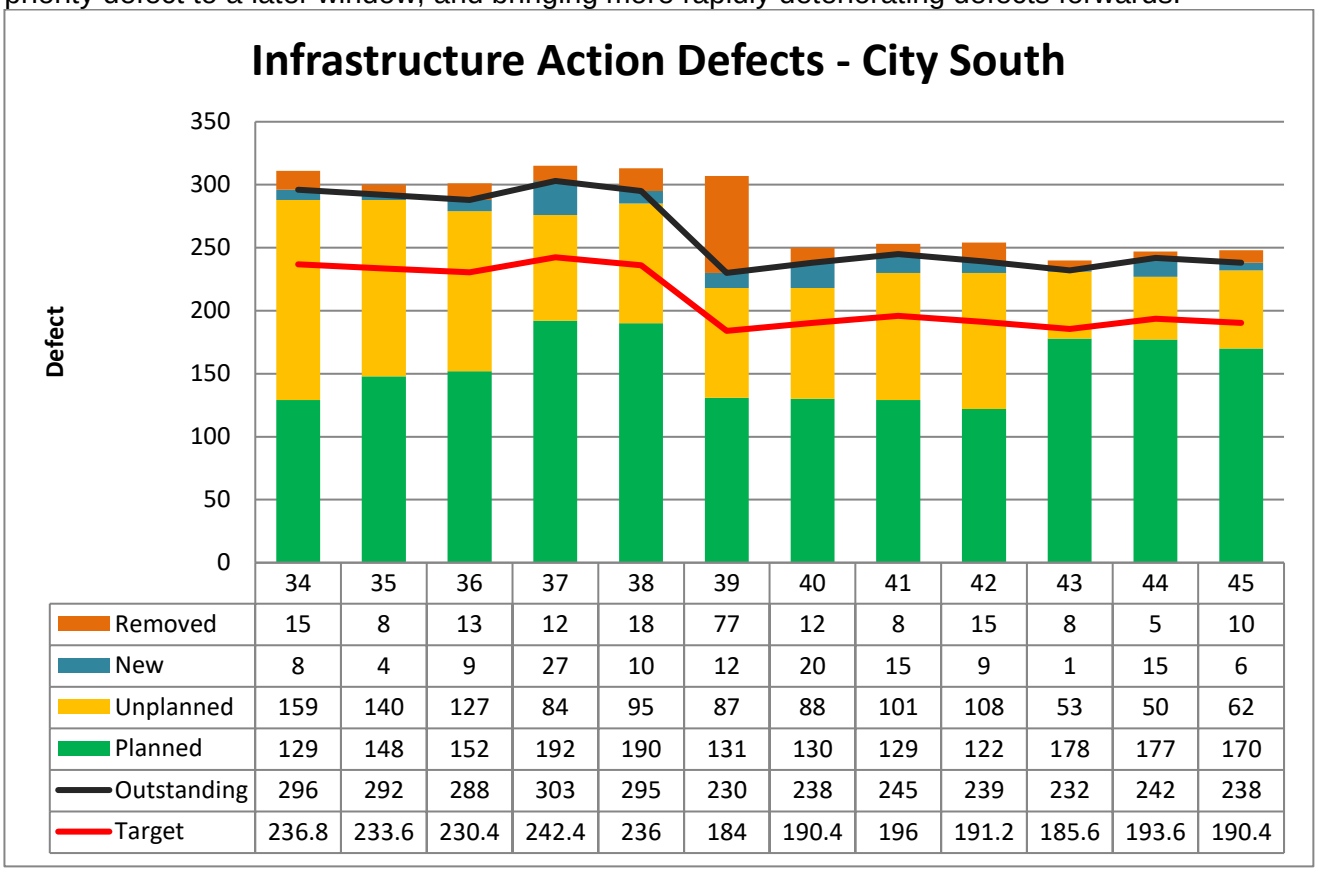
19/20 IAD sheet for the full year in review illustrating the change and in the last quarter how the planned defect outweighed the unplanned as the territory brought its defects under control.



A screen shot of the IAD sheet where risk ranks are shown, planned status and actioner are shown and the planned weekend possession is shown in the far right column (partially out of view)

Short Term Planning (Tier 1 Maintenance)

Short term planning is generally developed between 8 to 12 weeks out from a possession window. This is covered off at the fortnightly IAD planning meetings. If any defects are missed in the previous possession window they are replanned within that 8 to 12 week window, this is to allow for adequate signal support as restrictions around cutting track and signal support have become very stringent over the last year. If a defect's priority or risk is increased, this is also discussed and a plan is developed to either leave this defect in track safely until its planned removal date, or to bring its planned removal date forward. Once the 8 to 12 week planning is complete, we look ahead to the longer term, generally 12 to 16 weeks to identify likely scopes, however these plans are not locked in as generally detailed walking patrols will increase defect priority and change a defect's planned date, pushing out lower priority defect to a later window, and bringing more rapidly deteriorating defects forwards.

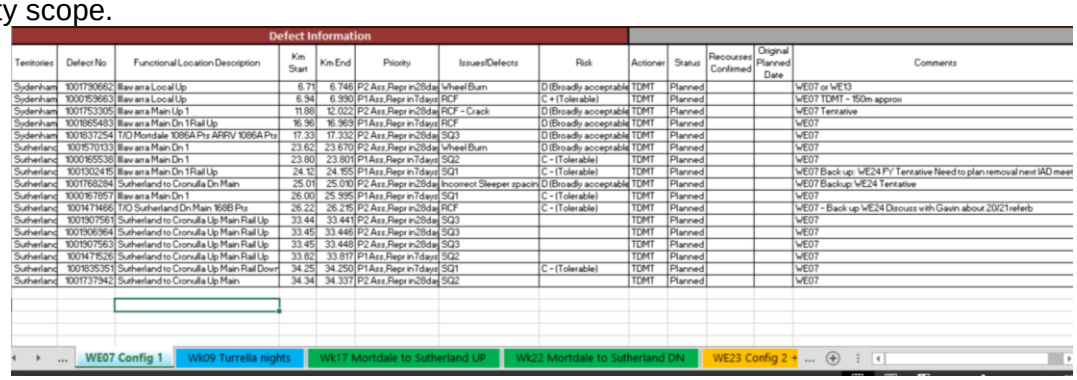


	34	35	36	37	38	39	40	41	42	43	44	45
Removed	15	8	13	12	18	77	12	8	15	8	5	10
New	8	4	9	27	10	12	20	15	9	1	15	6
Unplanned	159	140	127	84	95	87	88	101	108	53	50	62
Planned	129	148	152	192	190	131	130	129	122	178	177	170
Outstanding	296	292	288	303	295	230	238	245	239	232	242	238
Target	236.8	233.6	230.4	242.4	236	184	190.4	196	191.2	185.6	193.6	190.4

An example of a weekly graph distributed showing 12 weeks of planning (Week 45 from May 2020)

Annual Plan (Tier 2 Maintenance)

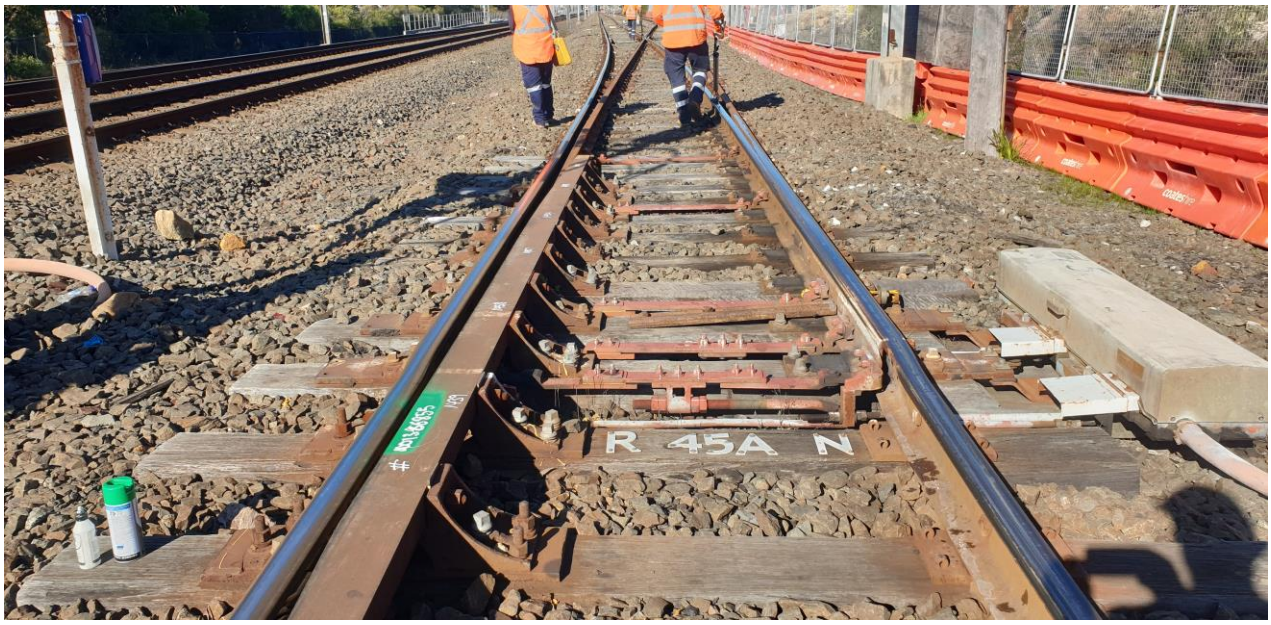
In the second half of the financial year Sydney Trains introduced a Track Defect Management Team who would use contract labour to supplement local track defect removal efforts. In order to ensure best use of this resource was City South developed a minor works program to show ensure that there were no planning double ups, and to ensure that the best "bang for buck" for the business was achieved by directing the TDMT workforce towards bulk high priority defect locations, leaving isolated locations for maintenance staff to target on night shifts. This plan copies the format of the IAD sheet, however packages the works up into their planned date and allows for TDMT to make comments and identify high priority scope.



Screen shot of an example of the AWP Spreadsheet

Long Term Plan (Tier 3 Maintenance)

Long Term maintenance is generally handled by the Asset Management Division (AMD) of Sydney Trains with buy-in from the territory. City South will plan larger rerail scopes for the MPM program and has worked with AMD to develop a program for MPM to remove 53kg housed switches, replacing them to 60kg switches. This allows for our signalling team to be able to better access their infrastructure, but more importantly a lot of knowledge and skills have been leaving Sydney Trains. While all points and crossing staff are qualified to inspection and repair these turnouts, special knowledge (such as a built in 20mm wide gauge) and how to shim, repair and replace the switch and stock rails are waning in the business as these aspects are not covered in the current courses offered by TfNSW or other training bodies. Where possible this knowledge is sought, however moving forward these assets are no longer being installed. Being proactive and replacing these assets in the medium to long term until the Turnout Renewal Program catches up is a safer long term solution.



Resource Management

Contracts are managed through Sydney Trains Contracts management team. Through the Contracts management team, City South has set up a “Long Term Hire” program for plant and a Track Access Program for protection officers. The long term hire (LTH) guarantees plant availability and has an on call process with plant required to be on site within 1 hour of the call.

Small plant is managed through the plant register spreadsheet. This spreadsheet also includes a register of plant not yet disposed but out of calibration. All small plant and equipment has a plant number, be it a combination board, or battery powered hand grinder. See our plant register below.

Civil P&E - Sydenham & Suther

Appendix A

RESPONSE UTE INTERIOR AND EQUIPMENT

Category	Description	Quantity
Consumables	Batteries - Torch	2
Consumables	Biscuits/Half Biscuits	6 each
Consumables	Bow Plates 53	1 set
Consumables	Bow Plates 60	1 set
Consumables	Cable Ties/Various Sizes	1 set each
Consumables	Check Rail Bolts	6
Consumables	Clips - Blue/Brown	4 each
Consumables	Coach Screw & Washers	6
Consumables	Concrete Screw Spikles & Washers	6
Consumables	Cutting Discs 4"	6
Consumables	Crossing Bolts (various sizes)	2 each
Consumables	E-Clip	6
Consumables	Fencing Wire	1 roll
Consumables	Fish Plates 53	1 set
Consumables	Fish Plates 60	1 set
Consumables	GIJ Epoxy Resin & Applicator	1 each
Consumables	Grinding Discs 4"	6
Consumables	Lubricant - WD 40	1
Consumables	Nut - Fish bolt (41mm x 200mm)	12
Consumables	Shims (various sizes)	2 each
Consumables	Spike Fast	1 box
Consumables	Timber Screw Spikes & Washers	6
Consumables	White/ Green/Blue Paint	4
Tools & Equipment	Bannister Brush	1
Tools & Equipment	Chain Saw with Charger/Battery	1 ea.
Tools & Equipment	Certifying Bag (Stringline, rule, text pens, Double-sided tape, measuring tape 30m, etc.)	1
Tools & Equipment	Depression Pegs	8
Tools & Equipment	Detonator Box	1
Tools & Equipment	Draw Wedges/Wedges	2 each
Tools & Equipment	E-Clip Applicator	1
Tools & Equipment	Fencing Pliers	1 pair
Tools & Equipment	Hand Held Torch	1
Tools & Equipment	Laser	1
Tools & Equipment	Lump Hammer (small)	1
Tools & Equipment	MEG Xing Spray	1
Tools & Equipment	Milwaukee Battery Charger/Battery	1 ea.

Tools & Equipment	Milwaukee Drill (or Ryobi)	1
Tools & Equipment	Milwaukee Grinder 4"	1
Tools & Equipment	Pinch Bar	1
Tools & Equipment	Pelican Pick	1
Tools & Equipment	Pliers/Wire Cutter	1
Tools & Equipment	Robel Clamps (large and small)	2
Tools & Equipment	Screw Driver Set	1
Tools & Equipment	Shifter 200mm	1
Tools & Equipment	Shovel	1
Tools & Equipment	Sledge Hammer	1
Tools & Equipment	Socket Set	1 kit
Tools & Equipment	Spanner - Shifter 250mm	1
Tools & Equipment	Spanner - Shifter 300mm	1
Tools & Equipment	Spanner Open Ended (41mm)	1
Tools & Equipment	Spike Fast Gun	1
Tools & Equipment	Stanley Knife	1
Tools & Equipment	Straight Edge	1
Tools & Equipment	Super Board	1
Tools & Equipment	Tape Measure	1
Tools & Equipment	Tool Bag	1
Safety	Blue & White Flashing Beacons	2
Safety	Detonators	24
Safety	Disposable gloves	1 box
Safety	Dust Mask	5
Safety	Earplugs	20
Safety	Face Shield	1
Safety	Fire Extinguisher	1
Safety	First Aid Kit	1
Safety	Flags - Red (4)/ Green (2)	6
Safety	Insect & Wasp Sprays	1
Safety	Lock & Chains	2
Safety	Lookout Sleeves	2
Safety	Point Clips with locks (Tangential and Standard)	4
Safety	P2 Face Masks	1 box
Safety	Red & Green Torch	1
Safety	Safety Lamp	2
Safety	Snake Bite Kit	1
Safety	Sunscreen	1
Safety	Whistle/horn/ Siren	1
Paperwork	PO/ Briefing forms (loose or book form)	15
Paperwork	Protection paper work/ forms	12