

Stakeholder communications: Best practice defect management reporting

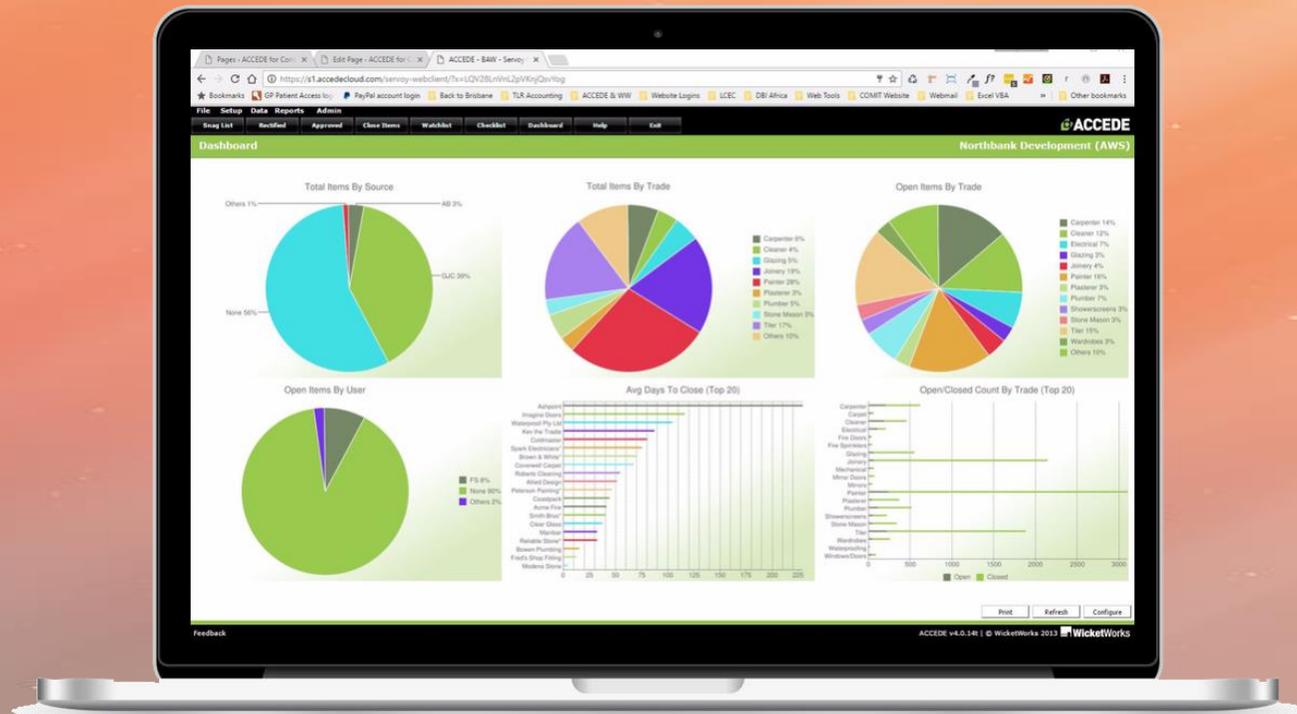


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1. Introduction

Managing quality on construction projects is critical to project and business success for all construction companies. Reputations built over many years can be eroded, sometimes irreparably, by a single job where quality is below par.

Paul Netscher* (construction management consultant and author) in a recent blog, [“The true cost of poor quality construction”](#), identified the consequences of poor quality construction as follows:

- Costs money
- Loses customers
- Causes accidents
- Can lead to employee unhappiness
- Teaches bad habits
- Negatively impacts other projects
- Delays projects
- Disrupts cash flow
- Harms the environment
- Can make recruiting good people difficult
- Leads to problems later

* See <http://www.pn-projectmanagement.com/paul-netscher.html>

1. Introduction (continued)

Whilst some of these consequences can be quantified in monetary terms, most are intangible and much harder to recover from.

Consequently, the construction industry views quality control as a critical business function often evidenced by volumes of policy, procedure and forms/templates. These are applied in all operational aspects of the construction process, from design and procurement through to handover.

This white paper focuses on inspections performed on site, largely during the latter stages of a construction project. These inspections give rise to punch lists or snag lists (depending on where you are located).

We use the terms interchangeably and the Glossary on our website defines a Punch list / Snag list as:

A list of events or items that must be followed up and, at some stage, noted as being completed or closed. Typically they are created in the field or on-site and allocated to a responsible party (employee or subcontractor). At a later time the item will be rectified by the responsible party and upon inspection of their work the item will be closed indicating satisfactory completion of follow up task or event.

1. Introduction (continued)

A typical example of a punch list / snag list is recording incomplete works or defects in construction projects, with field users inspecting the work of employees or subcontractors during the construction phase of the project. These defects must be addressed and rectified by the responsible party and closed to the satisfaction of the field user prior to project completion and building handover.

Generating a Punch/Snag list is a time consuming but critical quality process. There are many mobile/tablet based systems or apps available these days that automate the generation of Punch/Snag lists, however, many head contractors continue to use traditional/manual systems that incorporate Excel spreadsheets. Traditional/manual systems are extremely cumbersome and inefficient on large projects.

We often refer to research led by Professor Marton Marosszeky at the Australian Centre for Construction Innovation (University of NSW) who identified the following in respect of the impact of defects:

- On average, the total cost of defect rectification ranges between 4% and 6% of construction expenditure.

1. Introduction (continued)

- The rectification process is highly management intensive due to the requirement for checking, recording, coordinating, reporting and signing-off reworked activities. The indirect management costs are as much as direct rectification costs. The administrative cost is substantially borne by head contractors while the subcontractors bear the direct cost of rework.

In summary, average cost of defect rectification using traditional/manual methods is 5% with half of this (2.5%) borne by the head contractor in administrative burden.

Consider a \$20M construction project; total cost of defect rectification is (on average) \$1M with the head contractor's cost being (on average) \$0.5M. This is a significant cost but one that is rarely costed in the closing stages of a project leading to project handover and completion.

In another of our white papers, we created a “Simple Excel Punch List Template” complete with instructions for use ([click here to download](#)). In this white paper, we concluded:

1. Introduction (continued)

Recording the defect and creating the Punch List using this spreadsheet template is a great first step in making a manual system more efficient but Excel spreadsheets will rarely be the optimal solution, other than on small projects. The reality is that real efficiencies only arise by simplifying, encouraging and automating collaboration with project stakeholders and especially responsible parties and subcontractors.

Having previously considered how the Punch/Snag list is generated let's move on to the next critical feature of your defect management processes. That is, ***what can you do to encourage collaboration with project stakeholders?***

We believe the solution starts with best practice defect management reporting.

Regardless of the accuracy and completeness of information collected during quality inspections, ineffectual reporting of defect data to responsible parties and subcontractors will severely limit rectification efficiencies.

But this is only the start of the best practice defect management reporting journey.

1. Introduction (continued)

Armed with the defect information already collected for policy compliance, how can this be used to make better management decisions, say to save time/money on the current or future projects?

This white paper considers best practice defect management reporting by project stakeholders identifying the information critical for communicating defect data that will encourage collaboration between stakeholders. These best practice reporting principles are applicable to all defect management systems process irrespective of them being traditional/manual or automated. Notwithstanding, example reports will be based on those available to **ACCEDE** users.

We will also highlight some of the reporting automation features available in the **ACCEDE Defect Management System** that permit set-and-forget reporting at regular intervals and ad-hoc reports for management on project status and project performance analysis.

2. Subcontractor

Subcontractors, or any responsible parties who must follow up on a punch list defect item, need clear, concise information. We consider the following to be critical information that must be communicated to the responsible party regarding defect items:

- location of the defect
- unique identifier/reference
- description
- additional notes
- key dates (due, created etc)
- originator
- identifying photo/image, if appropriate

This critical defect item information should be provided to the responsible party in three forms:

2. Subcontractor (continued)

A. New/Amended Defect Items Listing

Consider this – you spend a few hours walking the site collecting defect information including both text and photos. At the end of that exercise, what do you do with the collected data? The obvious answer is for you to send that information to the relevant subcontractors to inform them of any new defect items they have been given responsibility for rectifying.

An incremental listing, one that only shows new items since the last report, will aid the subcontractor to efficiently manage their rectification activities.

As well as newly created defects, this listing should also include any items that have been updated since the previous report was issued. For example, extra descriptive text may have been added, or a due date changed.

The most suitable frequency for such a report will vary with the volume of defects you are collecting. Typically, it makes sense to send a New/Amended Defect Items listing to subcontractors daily as it provides a great working document for the subcontractor who can simply pass on to his team accompanied with “Here’s yesterday’s new/amended defects - go to it!”

2. Subcontractor (continued)

A. New/Amended Defect Items Listing (example report)

A daily report such as this could look like this ...

BPC Limited
 ABN: 49 123 123 123
 Level 18
 345 Queen St
 Brisbane QLD 4000

Northbank Development (AWS)
 123 High St
 Highvale QLD 4444



New/Updated Item Notification Alert
 Coastpack - New and updated items since 20/01/2017 12:08

Twr / Flr / Unit	Reference	Location	Room / Trd / Type / Source	Description	Due	Created	Created By	Status	Rectified	Approved
Tower 1 / 02 / Function 2	020475		Formal Dining / Carpenter // Architect	reset access hatch join	21/05/16	18/05/16		Updated	Yes	
Tower 1 / 02 / Function prep store	020493		Formal Dining / Carpenter // Architect	vermin proof to fire hose reel	21/05/16	18/05/16		Updated		
Tower 1 / 03 / Amenities	021217		All Unit / Carpenter //	cavity slider track bumpy	15/06/16	08/06/16	FS	Updated		Yes
Tower 1 / 03 / Female Toilets	020302		Bath 1 / Carpenter // AB	gap shadow at door	18/05/16	15/05/16		Updated		
Tower 1 / 06 / 0601	021274		Bed 2 / Plasterer / Defect / AB	clean hinges on top	10/06/16	03/06/16	FS	Updated		



-1-



-2-

Tower 1 / 06 / 0601	021275		Bed 2 / Plasterer / Defect / Acme	clean hinges right	10/06/16	03/06/16	FS	Updated		
Tower 1 / 08 / 0801	021246		Bath 1 / Carpenter / Defect / Acme	cavity slider doesnt lock	23/06/16	16/06/16	FS	Updated		
Tower 1 / 08 / 0801	021257		All Unit / Carpenter //	change hinges	01/09/16	25/08/16	FS	Updated		

Total Records 8

2. Subcontractor (continued)

B. Listing of All Open Defect Items

The daily report, above, is incremental by nature – it only shows new items created since yesterday. While this makes for a great working document, we must remember that an item will only ever be listed on one report – it doesn't appear again on the next day's report as it is no longer "new".

What happens if a daily incremental report goes missing? Claims of "the dog ate my daily report" will mean a day's worth of newly-created items could disappear into the ether.

To guard against this, we consider it best practice to send the subcontractor a complete list of all open items allocated to him. This list will obviously be larger than the daily lists and would typically be sent once per week. This list also serves as a great reference for weekly status meetings.

A weekly report such as this could look like this ...

2. Subcontractor (continued)

B. Listing of All Open Defect Items (example report)

BPC Limited ABN: 49 123 123 123 Level 18 345 Queen St Brisbane QLD 4000		Northbank Development (AWS) 123 High St Highvale QLD 4444					
Current Open Item Notification Alert Peterson Painting* - Open Items							
Twr / Flr / Unit	Reference	Location	Room / Trd / Type / Source	Description	Due	Created	Created By
Tower 1 / 03 / Gym 2	020887		South End / Painter // AB	.repaint where marked	26/05/11	23/05/11	
Tower 1 / 03 / Gym 2	020888		South End / Painter // AB	prep and paint skirting	26/05/11	23/05/11	
Tower 1 / 03 / Gym 2	020889		South End / Painter // AB	grit in paint	26/05/11	23/05/11	
Tower 1 / 03 / Gym 2	020893		South End / Painter // AB	paint on frames	26/05/11	23/05/11	
Tower 1 / 03 / Lap Pool	020795		Pool Area / Painter // AB	check around lights	26/05/11	23/05/11	
Tower 1 / 03 / Lap Pool	020805		Pool Area / Painter // AB	brush marks to all light boxes	26/05/11	23/05/11	
Tower 1 / 03 / Lap Pool	020815		Pool Area / Painter // AB	touch up wall ceiling joints	26/05/11	23/05/11	
Tower 1 / 03 / Lap Pool	020828		Pool Area / Painter // AB	.repaint where marked	26/05/11	23/05/11	
Tower 1 / 03 / Male Toilets	020324		Powder room / Painter // AB	finish coat frames and doors	18/05/11	15/05/11	
Tower 1 / 03 / Male Toilets	020334		Powder room / Painter // AB	paint on closer	18/05/11	15/05/11	
Tower 1 / 03 / Male Toilets	020340		Bath 1 / Painter // AB	cut paint to access hatch	18/05/11	15/05/11	
Tower 1 / 03 / Male Toilets	020341		Powder room / Painter // AB	.repaint where marked	18/05/11	15/05/11	
Tower 1 / 03 / Spa	020837		Pool Area / Painter // AB	paint to steam cupboard	26/05/11	23/05/11	
Tower 1 / 05 / 0501	021084		Bed 1 / Painter / Defect /	fix crack in ceiling where marked	08/05/13	01/05/13	FS
 <p>-1-</p>							
Tower 1 / 05 / 0502	021276		Bed 1 / Painter / Defect /	fix crack in ceiling where marked	08/05/13	01/05/13	FS
Tower 1 / 06 / 0602	021284		Bath 2 / Painter / Defect / AB	clean off paint on aluminium	15/06/16	08/06/16	FS
 <p>-1-</p>							
Tower 1 / 11 / 1101	021092		Bath 1 / Painter //	repaint where marked	22/05/13	15/05/13	FS

2. Subcontractor (continued)

C. Overdue Defect Items Listing

Ideally, defect items will be attended to by subcontractors on or before the due dates specified by the originator. On occasions, some defect items may be inadvertently overlooked, requiring a gentle reminder to the subcontractor.

An overdue item is defined as one that is still open and the due date (allocated at defect capture) is in the past.

An Overdue Defect Items Listing is another of our best practice recommendations. It will bring attention to outstanding defect items and further aid in the timely close out of your project. We advise reporting overdue defect items to the subcontractor on a **weekly** basis.

A weekly report such as this could look like this ...

2. Subcontractor (continued)

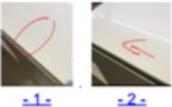
C. Overdue Defect Items Listing (example report)

BPC Limited
 ABN: 49 123 123 123
 Level 18
 345 Queen St
 Brisbane QLD 4000

Northbank Development (AWS)
 123 High St
 Highvale QLD 4444



Overdue Item Notification Alert
 Reliable Stone* - Overdue

Twr / Flr / Unit	Reference	Location	Room / Trd / Type / Source	Description	Due	Created	Created By
Tower 1 / 03 / Female Toilets	020293		Powder room / Stone Mason // AB	repair scratches where marked	18/05/11	15/05/11	
Tower 1 / 03 / Female Toilets	020303		Powder room / Stone Mason // AB	cork bench top	18/05/11	15/05/11	
Tower 1 / 03 / Lap Pool	020826		Pool Area / Stone Mason // AB	brocken at drain	26/05/11	23/05/11	
Tower 1 / 03 / Male Toilets	020328		Powder room / Stone Mason // AB	cork bench top	18/05/11	15/05/11	
Tower 1 / 03 / Male Toilets	020329		Powder room / Stone Mason // AB	repair scratches where marked	18/05/11	15/05/11	
Tower 1 / 14 / 1404	021306		Kitchen / Stone Mason / Defect / MSC*	hairline crack in stone bench top	08/12/16	03/12/16	BAW
							
Tower 1 / 15 / 1504	021301		Kitchen / Stone Mason / Defect / MSC*	hairline crack in stone bench top	08/12/16	03/12/16	BAW
							
Tower 1 / 30 / 3001	010698		Kitchen / Stone Mason // GJC	repair scratches where marked	20/02/11	17/02/11	
Tower 1 / 30 / 3001	010731		Ensuite / Stone Mason // GJC	repair scratches where marked	20/02/11	17/02/11	
Tower 1 / 30 / 3002	010800		Kitchen / Stone Mason // GJC	repair scratches where marked	20/02/11	17/02/11	
Tower 1 / 30 / 3003	010829		Kitchen / Stone Mason // GJC	repair scratches where marked	20/02/11	17/02/11	
Tower 1 / 30 / 3004	010867		Kitchen / Stone Mason // GJC	repair scratches where marked	20/02/11	17/02/11	
Tower 1 / 30 / 3004	010947		Kitchen / Stone Mason // GJC	repair scratches where marked	23/02/11	20/02/11	
Tower 1 / 30 / 3005	010882		Kitchen / Stone Mason // GJC	repair scratches where marked	20/02/11	17/02/11	
Tower 1 / 31 / 3103	011071		Kitchen / Stone Mason // GJC	repair scratches where marked	27/02/11	24/02/11	
Tower 1 / 31 / 3105	011149		Kitchen / Stone Mason // GJC	repair scratches where marked	02/03/11	27/02/11	
Tower 1 / 32 / 3202	011266		Kitchen / Stone Mason // GJC	repair scratches where marked	04/03/11	01/03/11	
Tower 1 / 39 / 3903	020856		Bath 1 / Stone Mason // GJC	chipped bench top	26/05/11	23/05/11	
Tower 3 / 24 / 2402	019854		Kitchen / Stone Mason //	polish DW kick stone	17/05/11	10/05/11	

ACCEDE
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27/01/2017 15:55

2. Subcontractor (continued)

We've discussed three ways to communicate current defect status with your subcontractors. Don't be daunted by the prospect of having to manually compile and distribute these reports – your defect management system should do it for you automatically. We'll look at that later.

3. Defects Inspector

Once defect data has been collected and distributed to responsible parties, what does the defects inspector (let's use another term - the Originator) need to know from the system?

In short, best practice is to keep him up-to-date in two areas.

A. Rectified Item Listing

Subsequent to the subcontractor addressing a defect item, the subcontractor will mark that item as “rectified”. Remember, in this context, rectified means the subcontractor believes the issue has been addressed. Rectified does not mean the item is closed – that's up to the originator.

It follows then that the originator should be supplied with a list of the newly rectified items – typically since yesterday. This list serves as a prompt to return to site and inspect, and hopefully close, the newly rectified defects.

Best practice is to supply this list to the originator in an incremental form on a daily basis.

3. Defects Inspector (continued)

A. Rectified Item Listing (example report)

BPC Limited
 ABN: 49 123 123 123
 Level 18
 345 Queen St
 Brisbane QLD 4000

Northbank Development (AWS)
 123 High St
 Highvale QLD 4444



Rectified Alert to Originator
 Rectified updated since 26/01/2017 16:18

Twr / Flr / Unit	Reference	Location	Room / Trd / Type / Source	Description	Responsible	Rectified	By	On
Tower 1 / 05 / 0501	021036		Bath 1 / Electrical / Defect /	replace gpo coverplate.	Spark Electricians*	Yes	BM	27/01/2017 16:17
Tower 1 / 05 / 0501	021084		Bed 1 / Painter / Defect /	fix crack in ceiling where marked	Peterson Painting*	Yes	BM	27/01/2017 16:17
Tower 1 / 05 / 0501	021179		Bath 1 / Plumber / Incomplete Works /	unblock floor waste	Brown & White*	Yes	BM	27/01/2017 16:17
Tower 1 / 05 / 0501	021241		Bed 3 / Electrical / /	fix scratch on balcony light.	Spark Electricians*	Yes	BM	27/01/2017 16:17
Tower 1 / 05 / 0501	021293		Bath 1 / Plumber / Defect / AB	unblock waste	Brown & White*	Yes	BM	27/01/2017 16:17
Tower 1 / 05 / 0501	021294		Bath 1 / Plumber / Defect / AB	caulk toilet	Brown & White*	Yes	BM	27/01/2017 16:17
Tower 1 / 05 / 0502	021044		Bath 1 / Plumber / /	basin chrome overflow not fixed	Brown & White*	Yes	BM	27/01/2017 16:17
Tower 1 / 05 / 0502	021276		Bed 1 / Painter / Defect /	fix crack in ceiling where marked	Peterson Painting*	Yes	BM	27/01/2017 16:17
Tower 1 / 05 / 0503	021085		Bath 1 / Plumber / Incomplete Works /	unblock waste	Brown & White*	Yes	BM	27/01/2017 16:17
Tower 1 / 06 / 0601	021087		Bed 1 / Electrical / Variation /	Move GPO where marked	Jupiter	Yes	BM	27/01/2017 16:17
Tower 1 / 06 / 0601	021273		Bed 2 / Mechanical / Defect / Acme	install cap to cover pipe hole	Coldmaster	Yes	BM	27/01/2017 16:17
Tower 1 / 06 / 0601	021274		Bed 2 / Plasterer / Defect / AB	clean hinges on top	Coastpack	Yes	BM	27/01/2017 16:17
Tower 1 / 06 / 0601	021275		Bed 2 / Plasterer / Defect / Acme	clean hinges right	Coastpack	Yes	BM	27/01/2017 16:17
Tower 1 / 06 / 0602	021282		Bath 2 / Plumber / Defect / AB	grate under wall in shower west	Brown & White*	Yes	BM	27/01/2017 16:17
Tower 1 / 06 / 0602	021283		Bath 2 / Plumber / Defect / AB	caulk toilet	Brown & White*	Yes	BM	27/01/2017 16:17

3. Defects Inspector (continued)

B. Overdue Defect Items Listing

The originator needs to keep a finger firmly on the pulse of items created by the originator. The originator needs to know as soon as a defect remains open after the due date nominated.

What does the originator do with this information? The originator follows up the subcontractor in a timely fashion to determine the reason why the defect remains open. Perhaps the subcontractor needs further information and hasn't asked. Perhaps the due date was unreasonable. Or perhaps the subcontractor simply needs a gentle prod.

In any of these cases, best practice would be to notify the originator of any overdue items on at least a weekly basis.

3. Defects Inspector (continued)

B. Overdue Defect Items Listing (example report)

BPC Limited
 ABN: 49 123 123 123
 Level 18
 345 Queen St
 Brisbane QLD 4000

Northbank Development (AWS)
 123 High St
 Highvale QLD 4444



Overdue Item Notification Alert
 Coastpack - Overdue

Twr / Flr / Unit	Reference	Location	Room / Trd / Type / Source	Description	Due	Created	Created By
Tower 1 / 03 / Gym 1	020872		South End / Carpenter // AB	patch corner high at glass wal	26/05/11	23/05/11	
Tower 1 / 03 / Gym 2	020886		South End / Carpenter // AB	margin to skirting under mirror	26/05/11	23/05/11	
Tower 1 / 03 / Lap Pool	020802		Pool Area / Carpenter // AB	seal around steel posts	26/05/11	23/05/11	
Tower 1 / 03 / Lap Pool	020811		Pool Area / Carpenter // AB	gap ej at amenities	26/05/11	23/05/11	
Tower 1 / 03 / Lap Pool	020821		Pool Area / Carpenter // AB	patch light boxes where marked	26/05/11	23/05/11	
Tower 1 / 03 / Lap Pool	020823		Pool Area / Carpenter // AB	stucco incomplete at entry	26/05/11	23/05/11	
Tower 1 / 03 / Male Toilets	020330		Powder room / Carpenter // AB	no soap dispencer	18/05/11	15/05/11	
Tower 1 / 03 / Male Toilets	020331		Powder room / Carpenter // AB	gap shadow	18/05/11	15/05/11	
Tower 1 / 03 / Male Toilets	020344		Bath 1 / Carpenter // AB	hole in p50 toilet	18/05/11	15/05/11	
Tower 1 / 03 / Steam	020853		Pool Area / Carpenter // AB	patch near shower entry	26/05/11	23/05/11	
Tower 1 / 06 / 0601	021274		Bed 2 / Plasterer / Defect / AB	clean hinges on top	10/05/16	03/05/16	FS
<div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;">-1- -2-</p>							
Tower 1 / 06 / 0601	021275		Bed 2 / Plasterer / Defect / Acme	clean hinges right	10/05/16	03/05/16	FS
Tower 1 / 08 / 0801	021246		Bath 1 / Carpenter / Defect / Acme	cavity slider doesnt lock	23/06/15	16/06/15	FS
Tower 1 / 08 / 0801	021257		All Unit / Carpenter //	change hinges	01/09/15	25/08/15	FS
Tower 1 / 12 / 1201	021236		Bath 1 / Carpenter //	cavity slider doesnt lock ?	27/02/16	20/02/16	DT

4. Project Manager

The project manager does not need to be involved in the nitty-gritty of individual defect management – there are plenty of other priorities needing attention.

Provided the troops are doing their job on the day-to-day activities of defect management, the project manager needs high level, summary information regarding the status of the defect management process as a whole.

A. How many defects have been captured and remain open?

A simple one-pager that shows total defect count, both open and closed, will do the job here. The listing should be able to be provided subtalled according to the project manager's preference – perhaps by location or by subcontractor.

Here is an example subtalled by subcontractor...

4. Project Manager (continued)

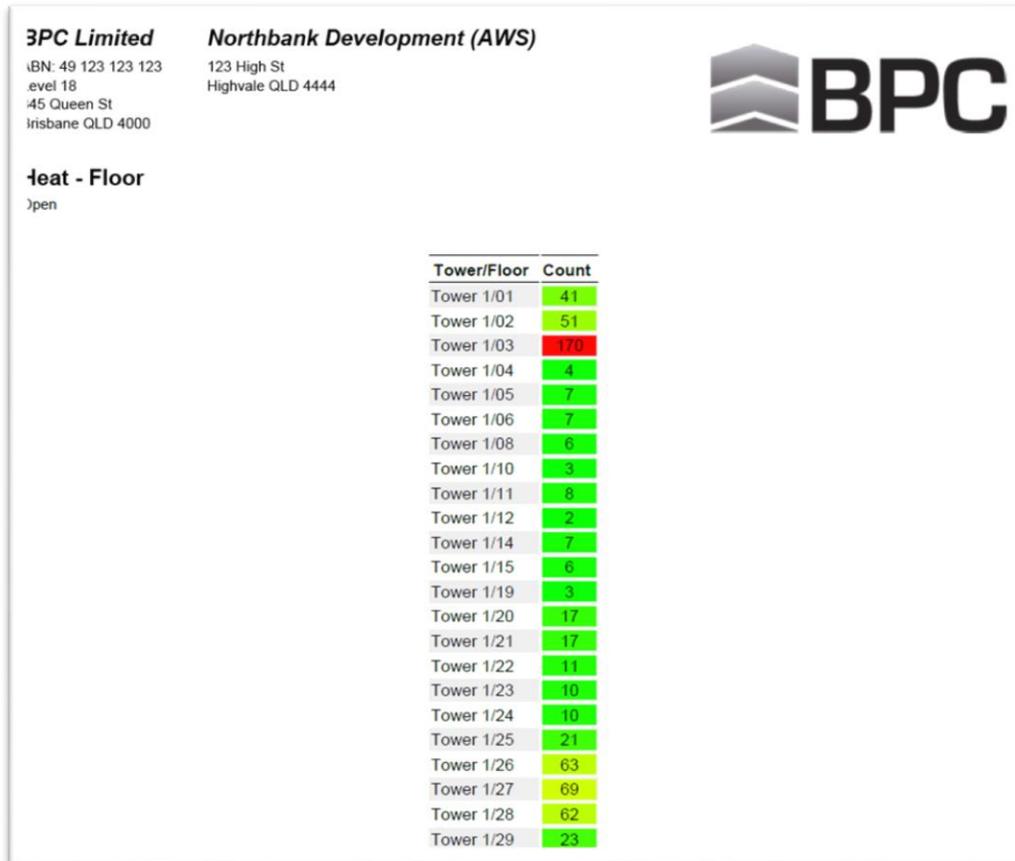
A. How many defects have been captured and remain open? (example report)

BPC Limited ABN: 49 123 123 123 Level 18 345 Queen St Brisbane QLD 4000		Northbank Development (AWS) 123 High St Highvale QLD 4444			
Statistics by Responsible All					
	Rectified	Not Rectified	Closed	Open	Total
Acme Fire	0	45	34	11	45
Allied Design	2	57	17	42	59
Ashpoint	217	1,858	2,062	13	2,075
Black Tiling	0	7	0	7	7
Bowen Plumbing	11	4	13	2	15
Brown & White*	27	459	384	102	486
Clear Glass	0	621	547	74	621
Coastpack	18	917	725	210	935
Coldmaster	2	57	43	16	59
Coverwell Carpet	0	62	30	32	62
Crystal Pools	0	7	0	7	7
EasyFab	0	1	0	1	1
Fred's Shop Fitting	0	51	18	33	51
Greenway	0	1	0	1	1

4. Project Manager (continued)

B. At-a-glance status

The same sort of information may be presented in the form of a heat chart. This example allows the project manager to spot at a glance the concentration of open items by location...



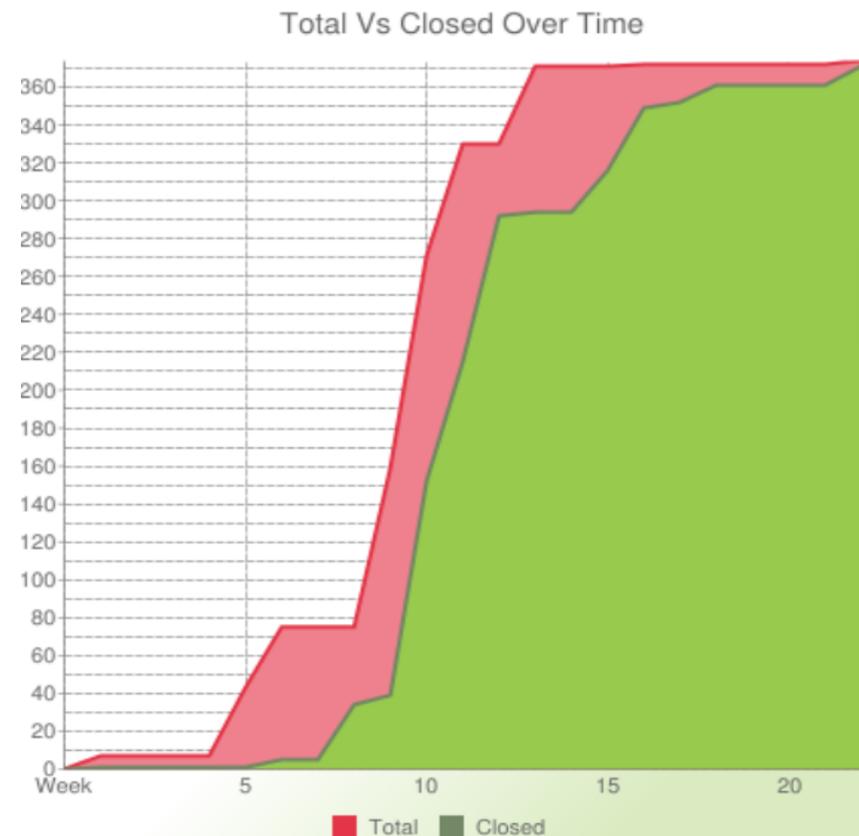
4. Project Manager (continued)

C. How is defecting progressing in general?

A typical project will see little defect capture activity during the early phases, rapid collection during the middle and then taper off toward the end. If all is going well, defect closure activity should follow this trend closely.

We consider it best practice to present this key information to the project manager in chart form so it's easy to spot at a glance if there is a gap between defect capture and closure activity.

This chart demonstrates a typical profile...



4. Project Manager (continued)

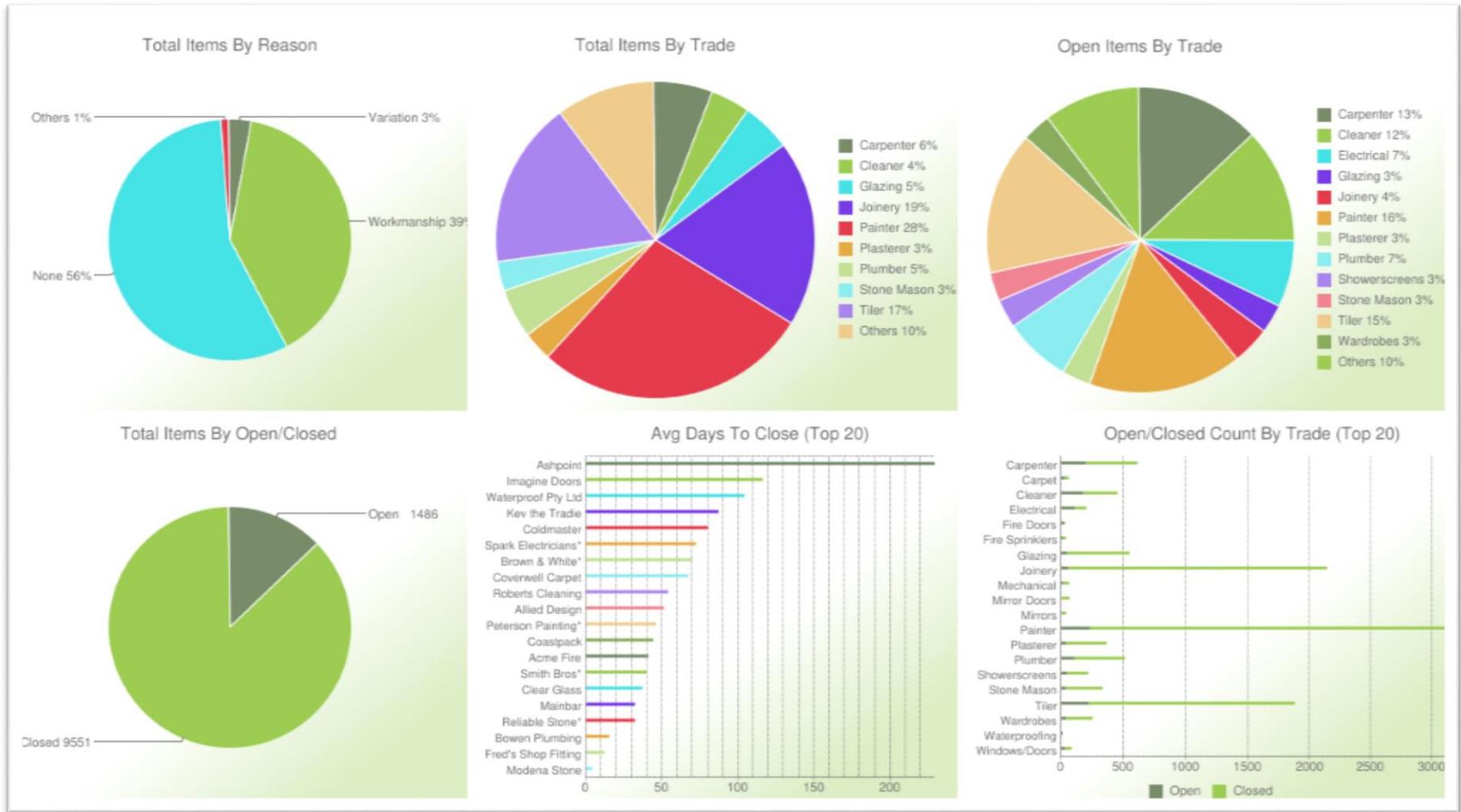
D. Dashboarding

Charts like the above convey snapshot status information at a glance. A best practice defect information system must allow the project manager to receive such information on a timely and regular basis. The content of the dashboard should be configurable so the project manager sees only that in which he is interested and is not bombarded by verbose lists.

Here is an example of a dashboard showing six sample metrics...

4. Project Manager (continued)

D. Dashboarding (example report)



5. Quality Manager

The quality manager has a foot in both camps. While possibly involved in the day-to-day management of a particular project's defect process, a view of the bigger picture is mandatory. Of interest to the quality manager are the more analytical listings for at least two purposes.

A. Subcontractor evaluation

A heat chart cross tabulating subcontractor by defect reason provides, at a glance, insight into subcontractor performance...

BPC Limited
 ABN: 49 123 123 123
 Level 18
 345 Queen St
 Brisbane QLD 4000

Northbank Development (AWS)
 123 High St
 Highvale QLD 4444



Heat - Responsible by Reason

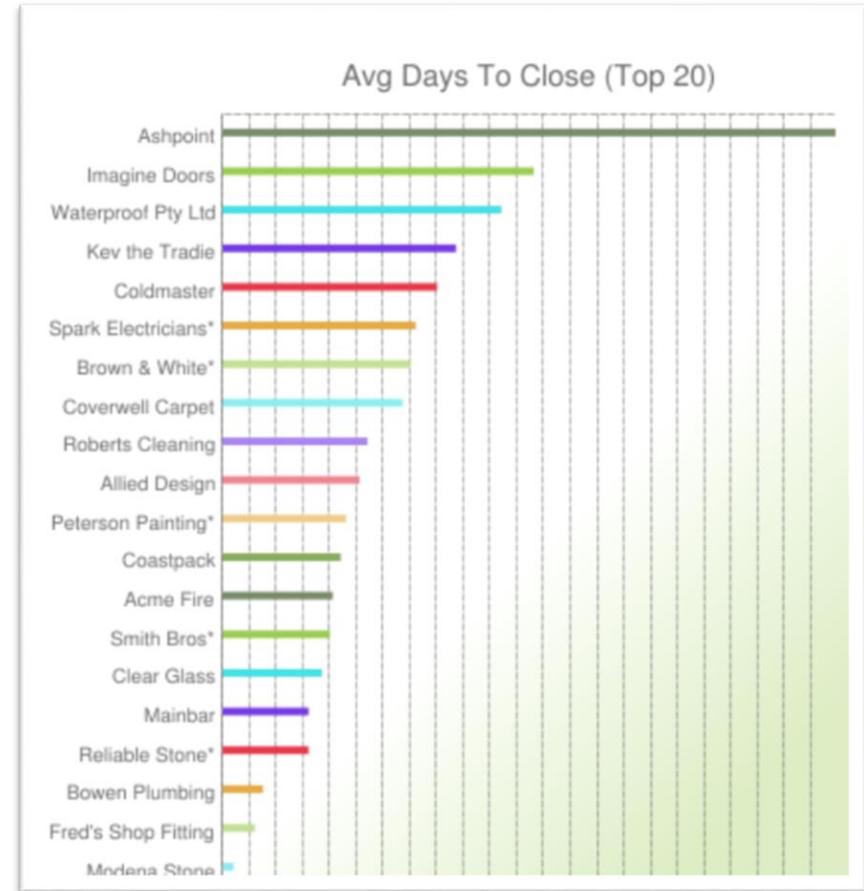
All

Responsible	Reason							
	Client	Design	Material	Other	Supply	Variation	Workmanship	<None>
Acme Fire	0	2	0	0	0	0	30	13
Allied Design	0	0	0	1	1	0	1	56
Ashpoint	0	19	1	3	2	3	1082	965
Black Tiling	0	0	0	0	0	7	0	0
Bowen Plumbing	0	0	5	0	0	1	0	9
Brown & White*	1	0	2	0	6	14	162	301
Clear Glass	0	0	2	1	0	0	205	413
Coastpack	0	11	3	1	2	53	406	459
Coldmaster	0	1	1	0	0	7	29	21
Coverwell Carpet	0	8	0	0	0	6	17	31
Crystal Pools	0	0	0	0	0	7	0	0
EasyFab	0	0	0	0	0	1	0	0
Fred's Shop Fitting	0	21	1	0	0	20	6	3
Greenway	0	0	0	0	0	0	0	1
Imagine Doors	0	8	0	0	0	6	1	9
IntelliSign	0	0	0	0	0	0	1	0
Intrepid Lockers	0	0	0	0	0	3	0	0
Jupiter	0	0	0	0	0	0	1	1
Kev the Tradie	0	0	0	0	1	0	2	0
Lofty Lifts	0	0	0	0	0	2	5	0
Mainbar	0	0	0	2	0	5	191	359
Matildi Plumbing	0	0	0	0	0	0	0	1
McMaster Industries	0	0	0	0	0	7	0	0
Modena Stone	0	7	0	0	0	0	2	2
Peterson Painting*	10	35	2	2	0	74	1113	1888
Plumbwell Plumbers	0	1	0	0	0	0	0	0
Reliable Stone*	4	0	0	0	0	5	161	156
Roberts Cleaning	0	0	0	2	3	32	47	315
Rocky Landscapes	0	0	0	0	0	2	0	0
Rogers Roofing	0	0	0	0	0	1	0	0
Smith Bros*	5	7	0	4	0	55	758	1081
Spark Electricians*	5	36	1	0	5	18	59	60
Waterproof Pty Ltd	0	0	0	0	0	7	1	0

5. Quality Manager (continued)

A. Subcontractor evaluation (continued)

Combining the above, with intelligence regarding how long it takes a subcontractor to address defects, will enable the quality manager to make informed decisions regarding subcontractor selection.



5. Quality Manager (continued)

B. Defect cause

Powerful ad-hoc report filtering is the go-to tool for the quality manager when searching for trends in repetitive defect occurrence. After identifying a possible trend, the quality manager should be able to narrow down his search target by any number of criteria based upon the data collected.

For example, this report lists all defects in three fire-related trades where the reason for the defect is “Workmanship”...

BPC Limited
 ABN: 49 123 123 123
 Level 18
 345 Queen St
 Brisbane QLD 4000

Northbank Development (AWS)
 123 High St
 Highvale QLD 4444



Statistics by Responsible
 Fire Doors, Fire speakers, Fire Sprinklers; Workmanship

	Rectified	Not Rectified	Closed	Open	Total
Acme Fire	0	30	25	5	30
Imagine Doors	0	1	0	1	1
Report Total	0	31	25	6	31

6. Management Team

While the project manager and quality manager are on top of the defecting process at the individual project level, the management team needs to know what's happening across all projects – both current and past.

Classifying projects according to attributes of interest to the enterprise, for example state, sector, division, and the reporting across those projects and attributes gives the management team valuable information regarding defect trends across the enterprise.

Here is a heat chart showing cross-project defect count by State and Trade...

Heat - Trade by State - Count

All

Trade	State (Count)			Total
	QLD	WA	<None>	
FURNISHINGS	4	119	3	126
GLAZING ALUMINIUM	.	.	2	2
GLAZING PARTS/SCRNS	.	16	.	16
HARDWARE	20	199	.	219
Hydraulic	43	.	.	43
HYDRAULIC SERVICES	85	398	3	486
INSULATION BASEMENT	.	13	.	13
IRRIGATION	.	8	.	8
Joinery	33	.	.	33
JOINERY	.	98	.	98
JOINTING	4	6	.	10
KERBS	.	4	.	4
Landscaping	27	.	.	27
LANDSCAPING	23	33	.	56
Lift Services	1	.	.	1
LIFTS HOISTS ESCALAT	5	395	.	400
Mechanical	10	.	.	10
MECHANICAL SERVICES	72	711	22	805
METAL CLADDING	3	13	.	16
Metalwork	4	.	.	4
METALWORK	26	22	5	53
OPERABLE DOORS	.	.	1	1
OPERABLE WALLS	.	8	.	8
Other	2	.	.	2
Painters	73	.	.	73
PAINTING	330	1595	57	1982
PARTITIONS CEILINGS	528	1758	40	2326
PAVING	.	40	.	40

6. Management Team (continued)

A cross-project summary report provides key indicators of how the defect process is progressing across active projects.

BPC Limited
 ABN: 49 123 123 123
 Level 18
 345 Queen St
 Brisbane QLD 4000

Cross Project Summary
 Period 01/06/2016 09:05 - 20/02/2017 14:44



Project	Total	Open				Period New	Period Closed	Last New	Last Closed	Avg Days To Close	Open Items	Avg Age
Highvale Towers	4	4	Rectified: 2	Arch OK: 0	Client OK: 0	0	0	27/08/15			824	
Northbank Development (AWS)	11041	1489	Rectified: 334			40	17	08/12/16	08/12/16	89	2008	
Total Records												2

7. Project & Business Analysis

Reporting defect information to the previously identified stakeholders is a great way to enhance your project close out and will save a significant amount of time, enabling a faster and smoother path to handover and project completion. We believe it should be the minimal information available to every project manager and CEO and necessary for the efficient and profitable operations of a construction company.

One thing you may have noticed about the best practice reports we've identified above is they are more compliance and operation focused, used to communicate the status and progress of a construction project, and to facilitate collaboration between stakeholders with responsibility for project quality.

Over time though, one project finishes and another starts, a cycle that will be ongoing for best practice head contractors. The defect information amassed over concurrent and consecutive projects in 1-2 years, even for a mid-tier head contractor, will be significant. But can this information be used to make better decisions regarding future projects?

7. Project & Business Analysis (continued)

We believe this information can be used to analyse project and business performance, guiding management to a deeper understanding of project success or failure factors, incorporating benchmark statistics into employee and subcontractor key performance indicators and finally, aiding subcontractor qualifying measures for future projects.

A. Project Analysis

Many head contractors will incorporate some type of project close out meeting with key internal members of the project team to identify what went right and what didn't go so right with the project on demobilisation from site. Unfortunately, most of the focus of these meetings is on the things that didn't go right in the hope that lessons learned are not repeated in future projects.

Defect information provides a great insight into subcontractor performance, identifying problem trades and even subcontractors whose individual performance is below par. Statistics such as the following are example indicators:

7. Project & Business Analysis (continued)

A. Project Analysis (continued)

- Average days to close
- % of defects overdue
- % of defects not approved at first re-inspection
- % of defects by type
- % of defects by reason
- Defects giving rise to subsidiary defects
- Defects captured per inspection hour

Comparison by subcontractor, trade, project and where applicable inspector / originator is advisable.

Heat maps, a graphical representation of data where the individual values contained in a matrix are represented as colours, are another good way to quickly identify areas worthy of further investigation. For example,

7. Project & Business Analysis (continued)

A. Project Analysis (continued)

- Defects per floor
- Defects per floor by type
- Responsible subcontractor by reason
- Area by trade

B. Key Performance Indicators

Cross-project reports can be used to compare defecting statistics between projects or against company-wide performance. Consider selecting 3-5 of the most relevant statistics for your business as key performance indicators (KPIs). Set KPI benchmarks or targets using:

7. Project & Business Analysis (continued)

B. Key Performance Indicators (continued)

- i) best outcomes from your overall project portfolio i.e. the best outcome per KPI from each completed project,
- ii) company-wide averages i.e. aggregate of all projects,
- iii) best outcomes from a single project,
- iv) industry standards,
- v) professional judgement,
- vi) combination of all the above.

Review recently completed projects against KPI targets and investigate variances, both favourable and unfavourable, say greater than 10%. Review and revise KPI targets at least annually or upon the implementation of new equipment, technology, and/or significant changes to operating practices on site.

To improve staff engagement, consider incorporating into employee annual bonus calculations/schemes, whilst safeguarding against potential unintended consequences.

7. Project & Business Analysis (continued)

C. Subcontractor Engagement & Qualification

As your project nears completion, you may want to consider making subcontractor performance, as judged by a few carefully selected KPIs, public information. Rather than highlight the poor performers, we suggest you identify and congratulate the top five subcontractors based on a weighted average of weekly and project-to-date KPIs. Display the “Subcontractor League Table” just after the head subcontractor site entry point and update weekly. Also provide an overview of the factors what have the greatest influence on rising up the table rankings or the name and mobile number of who to contact for further information and/or feedback on their performance.

We suggest you regularly make available relevant subcontractor statistics to your Procurement/Commercial teams. This data can be used in subcontractor qualification processes to:

- i) exclude poorly performed subcontractors from tender invitations,
- ii) amend commercial terms and conditions.

8. ACCEDE Reporting Tool

The reports and listings described above fall in to two camps – automated tasks that run on a predefined schedule and ad-hoc reporting.

The challenge in designing an ad-hoc reporting tool is to balance both flexibility and usability. At one extreme, a reporting tool that is able to produce any report known to man, but is impossibly difficult to operate is next to useless. At the other end of the spectrum, a reporting tool that is “one-click” simple probably will not be flexible enough to produce the sort of reports you require.

A best practice ad-hoc reporting tool should require you to specify only three things...

What defects to include in the report?

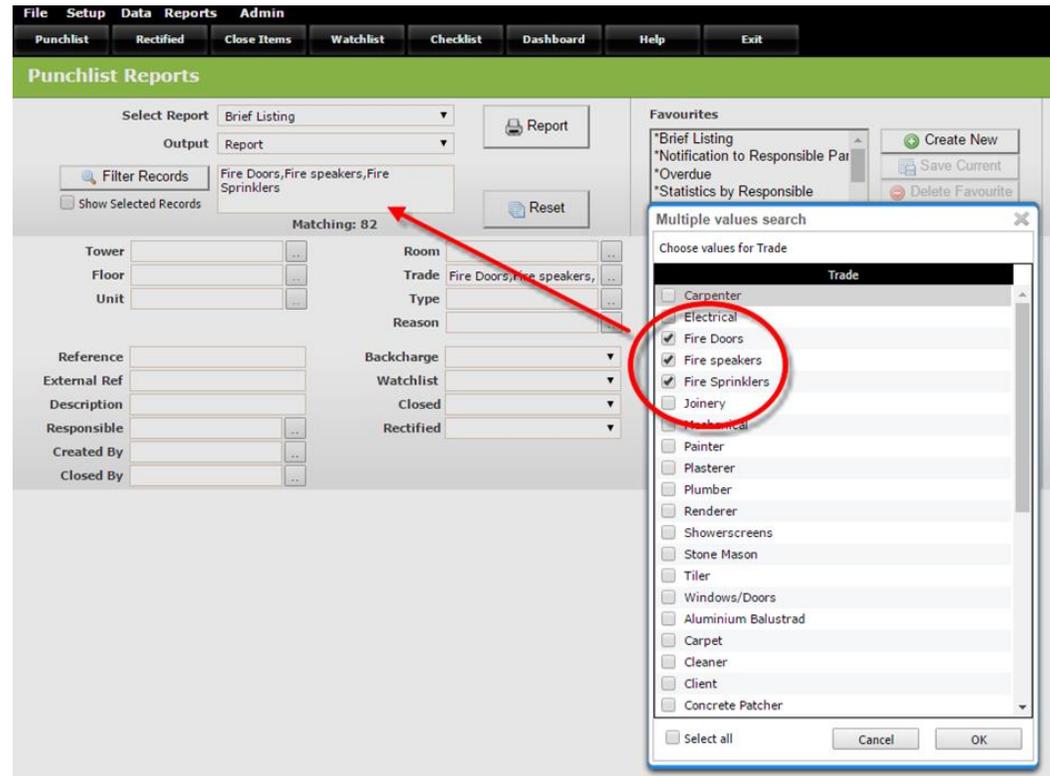
What should be the layout of the resulting report?

Where to send the report?

8. ACCEDE Reporting Tool (continued)

A. What defects to include in the report?

The reporting tool must make it easy to select, or filter, your desired result set from the great bucket of defect data you have collected. Typically, this selection is made by filling in controls like text boxes or drop downs. Drop down selections are appropriate for predefined lists, such as which trades to include, or which buildings or levels. Further, it makes sense for these controls to allow for multiple selection. For example, I may want to select three trades – Fire Doors, Fire Sprinklers and Fire Speakers.



8. ACCEDE Reporting Tool (continued)

A. What defects to include in the report? (continued)

Text boxes are great when searching descriptive text for keywords. For example, only include defects where “floor waste” appears in the description.

The screenshot displays the ACCEDE Reporting Tool interface. At the top, there is a navigation bar with menus: File, Setup, Data, Reports, and Admin. Below this is a secondary navigation bar with buttons: Punchlist, Rectified, Close Items, Watchlist, Checklist, Dashboard, Help, and Exit. The main section is titled "Punchlist Reports".

On the left side, there are search and filter options:

- Select Report:** Brief Listing (dropdown)
- Output:** Report (dropdown)
- Filter Records:** A search box containing "floor waste".
- Show Selected Records:** An unchecked checkbox.
- Matching:** 51

On the right side, there are "Favourites" and "History" sections:

- Favourites:** A list of saved reports including "*Brief Listing", "*Notification to Responsible Par...", "*Overdue", "*Statistics by Responsible", "Address Book", and "Fire open twr 1".
- History:** A search box for history records.

Below the search filters, there are various filter fields for the report results:

- Tower, Floor, Unit (dropdowns)
- Room, Trade, Type, Reason (dropdowns)
- Backcharge, Watchlist, Closed, Rectified (dropdowns)
- Reference, External Ref, Description, Responsible, Created By, Closed By (text boxes)

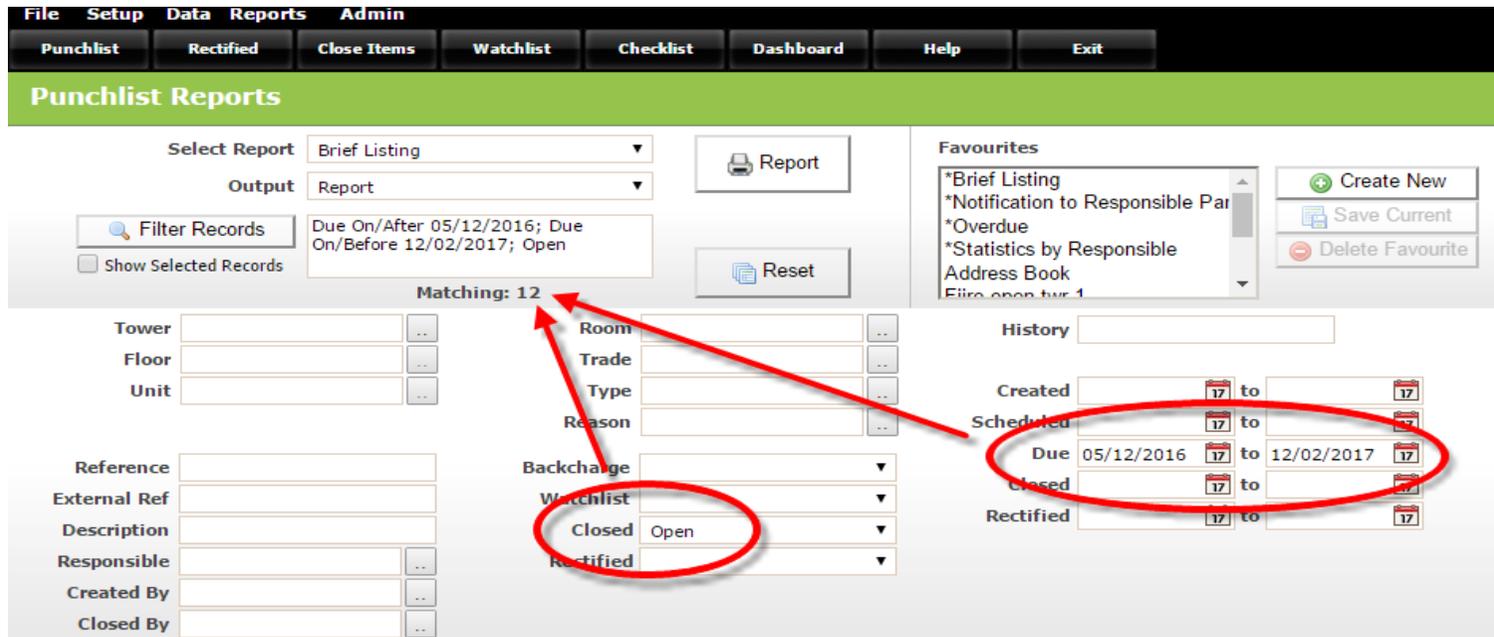
The "Description" field is highlighted with a red circle, and a red arrow points to it from the "Matching: 51" text. The text "floor waste" is entered in the Description field.

At the bottom right, there are date range selectors for "Created", "Scheduled", "Due", "Closed", and "Rectified", each with a "to" field and a calendar icon.

8. ACCEDE Reporting Tool (continued)

A. What defects to include in the report? (continued)

Similarly, date range selection is important when applied to all date attributes – open date, closed date, due date, etc. Flexible date filtering opens the door to analysis like “show me all open defects due next week”.



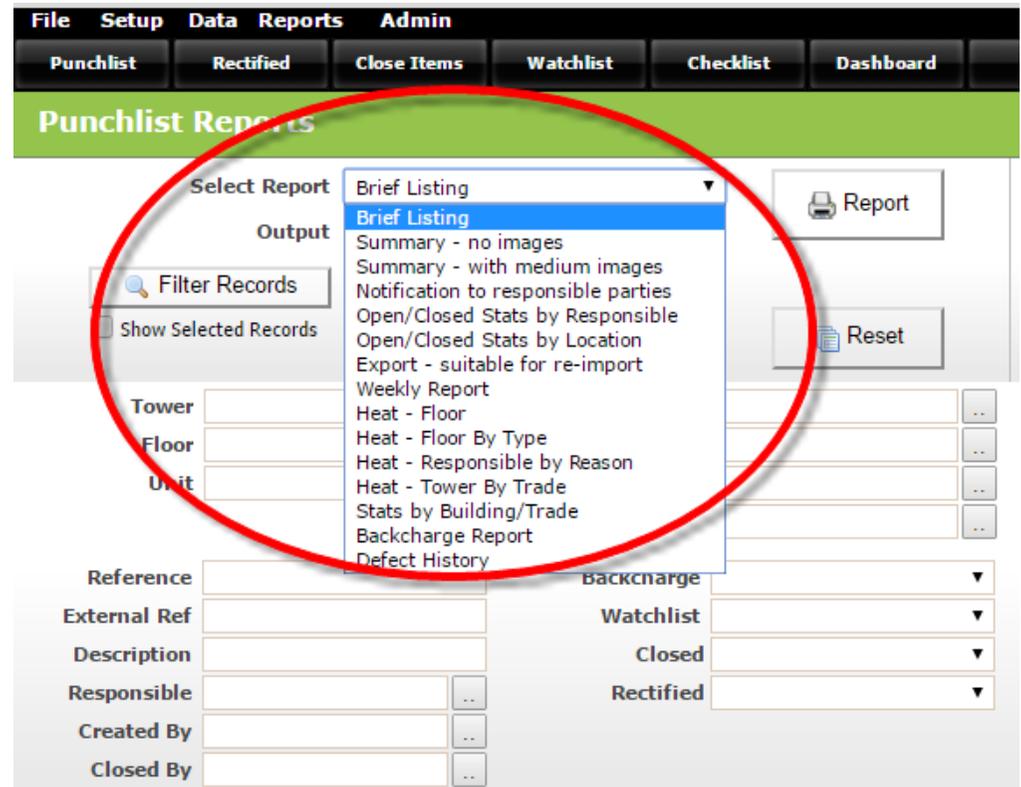
Once you have decided on your defect filtering criteria, you now produce the report. Hopefully, your defect reporting tool allows you to choose the layout of the report.

8. ACCEDE Reporting Tool (continued)

B. What should be the layout of the resulting report?

Layout of the report will vary depending upon the ultimate use of the report. If the report is to provide detailed information on the defect to the subcontractor, then the report should include as many defect attributes as possible.

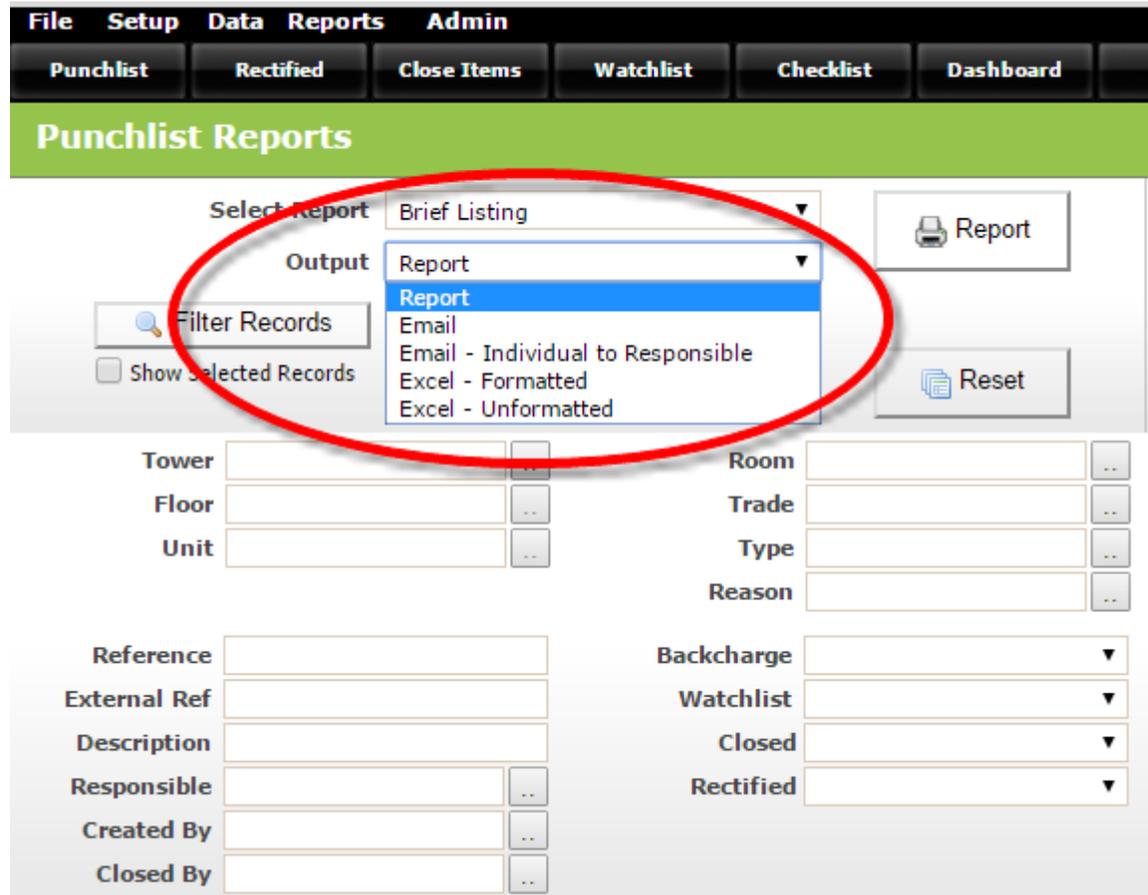
On the other hand, a brief summary report is all that's needed if you wish to answer a question like "In which apartments are all the open floor waste defects?"



8. ACCEDE Reporting Tool (continued)

C. Where to send the report?

Once you have decided what defects appear in the report and what the report is to look like, your reporting tool should allow you to send the resulting report to a variety of destinations, such as screen preview, PDF file, spreadsheet file or straight to email.



9. ACCEDE Report Layouts

We discussed the importance of being able to select from a variety of suitable report layouts depending upon the purpose of the resulting report.

A best practice defect management system should allow you to define and tailor these layouts as you see fit. The tool provided to perform this definition will, by nature, be a little more complex than the standard day-to-day reporting tool, however must still be relatively simple to use.

Layout: Brief Listing Type: Listing

Page Title: Brief Listing

Group 1 Header: [Dropdown] New Page Print Coveragepage on Group Change

Group 2 Header: [Dropdown] New Page

Detail Columns: Tower/f | Referen | Room | Trade | Descrip | Respon | Closed

Group 2 Footer: Show Record Count

Group 1 Footer: Show Record Count

Report Footer: Show Record Count

Orientation: Landscape Show Images Prompt for Cover Page

Order By: Tower/Floor | Reference | [Dropdown]

9. ACCEDE Report Layouts (continued)

Further, if you don't have the need or desire to embark upon your own report designing, your defect management system should provide a standard list of reports in a report library "out of the box" so you can get started straight away.

ACCEDE provides these report layouts as a starter

1. Brief Listing
2. Summary – no images
3. Summary – medium images
4. Notification to responsible parties
5. Statistics by Location
6. Statistics by Responsible
7. Export – suitable for re-import

10. ACCEDE Report Automation

Now that we have decided the above reports, charts and listings constitute a good suite of regular reports destined for the stakeholders, how much effort do we need to put into generating this communication?

The answer is “None”!

Hopefully, your defect management system provides the ability to define these reports once and then, set-and-forget.

ACCEDE’s Scheduled Task function allows you to set up reports such as the above and decide the frequency (weekly, daily, even hourly) and the time of day (8am on Monday, 6pm every day, etc). You can also set up individual email body text for each task. For example, you may choose to quote specific contractual obligations in the overdue notification email. Automated emails can also be copied to any individual you choose. You could CC yourself should you really want to keep your finger on the pulse of all outgoing subcontractor communication.

10. ACCEDE Report Automation (continued)

Task	Email originator list of new and updated open items	Image Size	Medium
Description	New/Updated Item Notification Alert to Originator		
Suspended	<input type="checkbox"/>	Notes	
Interval	Daily	Run Once Now	
Start	29/10/2016 09:15	Last Run	20/01/2017 09:15
Recipients	will be determined when this task runs	CC	
	Select	Select	
	<input type="checkbox"/> Don't send to recipients - Only send CC		
Email Subject	Defect notification from Northbank Development		
Email Body	Please find attached a listing of new defects created/updated since last notification. If you have any queries, contact the defect originator, or Fred Smith on 0412 345 678 BPC		

ACCEDE provides the following choice of tasks available for automation ...

1. Email dashboard charts
2. Email responsible list of all open items
3. Email responsible list of all new items
4. Email responsible list of all new and updated open items

10. ACCEDE Report Automation (continued)

ACCEDE provides the following choice of tasks available for automation ... (continued)

5. Email responsible list of all overdue items
6. Email responsible list of all recently closed items
7. Email originator list of all open items
8. Email originator list of all new open items
9. Email originator list of all new and updated open items
10. Email originator list of all overdue items
11. Email originator recent updates to Rectified
12. Email list of all items – no images
13. Email list of all open items – no images
14. Email list of all items – with images
15. Email list of all open items – with images
16. Email list of all closed items – with images
17. Email recently created items
18. Email recent updates to Rectified
19. Email Cross-project Summary

10. ACCEDE Report Automation (continued)

To recap, regular communication should not be a difficult, daunting task comprising recording, noting, transcribing, cutting, pasting, printing, splitting, emailing. It should be a simple matter of doing what you do best – collecting defect information – and then letting the system do the routine report generation and dissemination while you get on with something more productive.

11. Conclusion

Defect management using traditional/manual methods gives rise to an administrative burden of approximately 2.5% of the project value, which is borne by the head contractor. On many projects this is greater than the profit margin, so it is a significant project cost that needs to be proactively managed. Sadly, in the rush to complete a project and meet contracted handover dates, this significant administrative cost is often overlooked.

Tablet-based defect management systems can reduce this burden, especially in respect of creating Punch/Snag Lists and automating their distribution to key project stakeholders, mostly the subcontractors responsible for rectifying substandard or incomplete work.

However, the defect data generated by the head contractor can give rise to greater efficiencies and better decision making simply by how it is reported and analysed. In this white paper, we have considered best practice defect reporting by project stakeholder, and demonstrated with examples how best to communicate defect data with the aim of maximising efficiencies, reducing administrative burden and ensuring your project meets your company's quality standards without the usual frantic rush in the final weeks before handover.

11. Conclusion (continued)

In addition, we have demonstrated how to analyse the defect data collected over time to make better decisions regarding future projects and how, with KPIs, you can engage employees and subcontractors in your quality culture.

Finally, we've identified the reporting and automation features of our **ACCEDE Defect Management System**. We invite you to [contact us regarding a free trial](#).

We hope you have found the information presented useful and given you the motivation to make the most out of your Punch/Snag List data and further enhance the reputation and profitability of your construction business.

For more information ...

[Request Free Trial](#)

[Visit ACCEDE Website](#)

[Download Brochures](#)

[Help](#)

Thanks for taking the time to download and read this white paper.

Disclaimer

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