





A vertical decorative image on the left side of the page, showing a close-up of green plant stems and leaves against a dark teal background. 

# Kempsey District Hospital Redevelopment Stormwater Management Plan

Prepared for: **Health Infrastructure NSW**  
By: **Enstruct Group**  
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## 1.0 Introduction

Enstruct have been engaged by Health Infrastructure to complete the detailed civil engineering design works for the redevelopment of the Kempsey District Hospital. The works include construction of a new car park, a new service road and services compound and infrastructure associated with the new Hospital building.

This Stormwater Management Plan discusses the proposed stormwater drainage associated with the redevelopment including the on-site detention requirements and offsite disposal.

The report also discusses sediment and erosion control for the site during construction operations.

## 2.0 Development Description & Previous Reports

The proposed redevelopment has been divided into two packages – early works and main works.

The early works will entail decanting, demolition of existing buildings, earthworks, retaining walls, installation of new surface water drainage, mechanical, electrical and hydraulic services, new kerbs, roads, pavements, a services compound and parking.

The main contract works will principally entail construction of the new building and some smaller elements of externals works including modifications to the northern car park, building stormwater drainage and landscape regrading works.

The redevelopment works will require installation of new surface water drainage systems to service the new paved areas and discharge water offsite.

Previous reports and investigations have been utilised in the preparation of this report and these are listed below:

- Kempsey District Hospital – Schematic Design Report by enstruct dated 17/4/13
- Geotechnical investigation: Kempsey District Hospital by Coffey Geotechnics dated 8/3/13.
- Plan of Lots 1-8 SEC 20A DP759080, Lots 1 & 14 SEC 23A DP 759080 & Lot 20 DP 112084 River, Tozer & Polwood Streets, Kempsey by M.W.Rogers & Associates, dated February 2013.

### 3.0 Site Description & Pre & Post Development Analysis

The site discussed in this report is described as Lots 1-8 SEC 20A DP759080, Lots 1 & 14 SEC 23A DP 759080. The site is located to the North West of Kempsey Town Centre, NSW.

The site is bounded by Polwood Street to the North, River Street to the West, Tozer Street to the East and a graveyard to the South. The site generally slopes from the North West corner of the site to the South East. Levels fall from approximately 28.0m AHD to 11.0m AHD.

As a consequence of its elevated location with the Kempsey area, the site is at very low risk from flooding from both overland flows from neighbouring areas and the River Macleay which is some 8m lower and immediately to the west of the site.

The site has a total area of 4.1Ha and currently contains the existing hospital campus. The current campus consists of a number of buildings ranging in size and position, car parking areas, circulation roads, a helicopter pad and landscaping areas.

Investigation of the current site topography and existing site drainage infrastructure suggests that the site has been divided into six separate sub-catchment areas. These six sub-catchments are described and illustrated below. Rainfall falling within each sub-catchment is ultimately discharged into one of two receiving surface water systems: the River Macleay or a council owned drainage network located below Tozer Street.

The table below summarises the total contributing areas to each of the receiving drainage systems and the percentage of hard engineered impermeable surfacing for the pre and post-development sites.

#### Pre-Development Catchment Analysis

| Receiving drainage system | Catchment Area (ha) | Catchment Area Impermeable (ha) | Percentage Impermeable (%) |
|---------------------------|---------------------|---------------------------------|----------------------------|
| River Macleay             | 1.47                | 1.26                            | 85.7                       |
| Tozer Street              | 2.61                | 0.85                            | 32.6                       |
| <b>Total</b>              | <b>4.09</b>         | <b>2.12</b>                     |                            |

#### Post-Development Catchment Analysis

| Receiving drainage system | Catchment Area (ha) | Catchment Area Impermeable (ha) | Percentage Impermeable (%) |
|---------------------------|---------------------|---------------------------------|----------------------------|
| River Macleay             | 1.69                | 1.46                            | 86.4                       |
| Tozer Street              | 2.40                | 1.02                            | 42.5                       |
| <b>Total</b>              | <b>4.09</b>         | <b>2.49</b>                     |                            |

This analysis demonstrates that there is a net increase in impermeable area which will increase the rate at which water runs off the site.

The following sections describe each of the sub-catchments and their existing means of discharging water.



PRE-DEVELOPED CATCHMENT

| CATCHMENT  | AREA (m <sup>2</sup> ) | % OF TOTAL SITE AREA | OUTFALL       |
|------------|------------------------|----------------------|---------------|
| NORTH      | 6418                   | 15.7%                | TOZER ST      |
| EAST       | 9883                   | 24.2%                | TOZER ST      |
| SOUTH      | 8443                   | 20.6%                | TOZER ST      |
| WEST       | 1396                   | 3.4%                 | TOZER ST      |
| NORTH-WEST | 1504                   | 3.7%                 | RIVER MACLEAY |
| CENTRE     | 13246                  | 32.4%                | RIVER MACLEAY |
| TOTAL      | 40895                  |                      |               |

TOZER STREET TOTAL = 26140m<sup>3</sup>  
 RIVER MACLEAY TOTAL = 14750m<sup>3</sup>

### 3.1 North Stormwater Drainage

The north edge of the campus drains towards Polwood Street and consists of a mixture of in ground pipe works and overland flow discharging directly onto the street through either kerb connectors or direct connection to council stormwater drainage pits.

The maternity building at the North West corner of the site connects to council's drainage system underground while the buildings to the east discharge by a series of kerb connectors. Water then runs east down the kerb and gutter of Polwood Street to council's in ground drainage system located at the intersection with Tozer Street.

Rainfall runoff in excess of the design capacity of the drainage system will run as overland flow towards Polwood Street and the both east and west along Polwood Street to River Street and Tozer Street respectively.

## **3.2 North West Drainage**

The North West drainage catchment runoff is conveyed across the site underground and is then discharged under River Street in a north westerly direction. The discharge is understood to connect directly to the River Macleay.

## **3.3 East Stormwater Drainage**

In a similar scenario to the North, stormwater drainage areas to the east of the campus will drain east towards Tozer Street. These areas are not substantially developed and mainly consist of landscaped areas and the existing helipad.

No apparent in ground drainage exist within the campus and both minor and major design storm flow will run overland to discharge from the site.

Tozer Street has an existing in ground stormwater drainage system which will pick up the discharge flows from the site. Flows in excess of the capacity of this system will run overland south along council's road corridor towards the creek located between the hospital site and the cemetery.

## **3.4 Central Stormwater Drainage**

The buildings located to the west of the site circulation road and south of the northern boundary buildings currently drain towards the circulation road.

The minor drainage system consists of direct downpipe connections to the kerb and gutter along the main access road. The in-ground drainage running under the main access road falls with the road to the south of the site.

Discussion with the maintenance team on site suggested that a stormwater line runs under the existing site fence to the south of the morgue and then turns to run west along the boundary fence, under River Street and discharges into the River Macleay.

## **3.5 South Stormwater Drainage**

The southern drainage catchment contains the vegetated embankment to the south of the hospital development. All runoff is conveyed as overland flow towards the cemetery and the Tozer Street drainage system.

### **3.6 West Stormwater Drainage**

A small catchment along River Street drains directly onto River Street as overland flow. This flow then runs as overland flow within the road corridor of River Street to the low point between the hospital and cemetery where the flows run into a kerb inlet structure and discharge into the swale running through the cemetery towards Tozer Street.

## **4.0 Proposed Stormwater Drainage**

### **4.1 Rainfall Data**

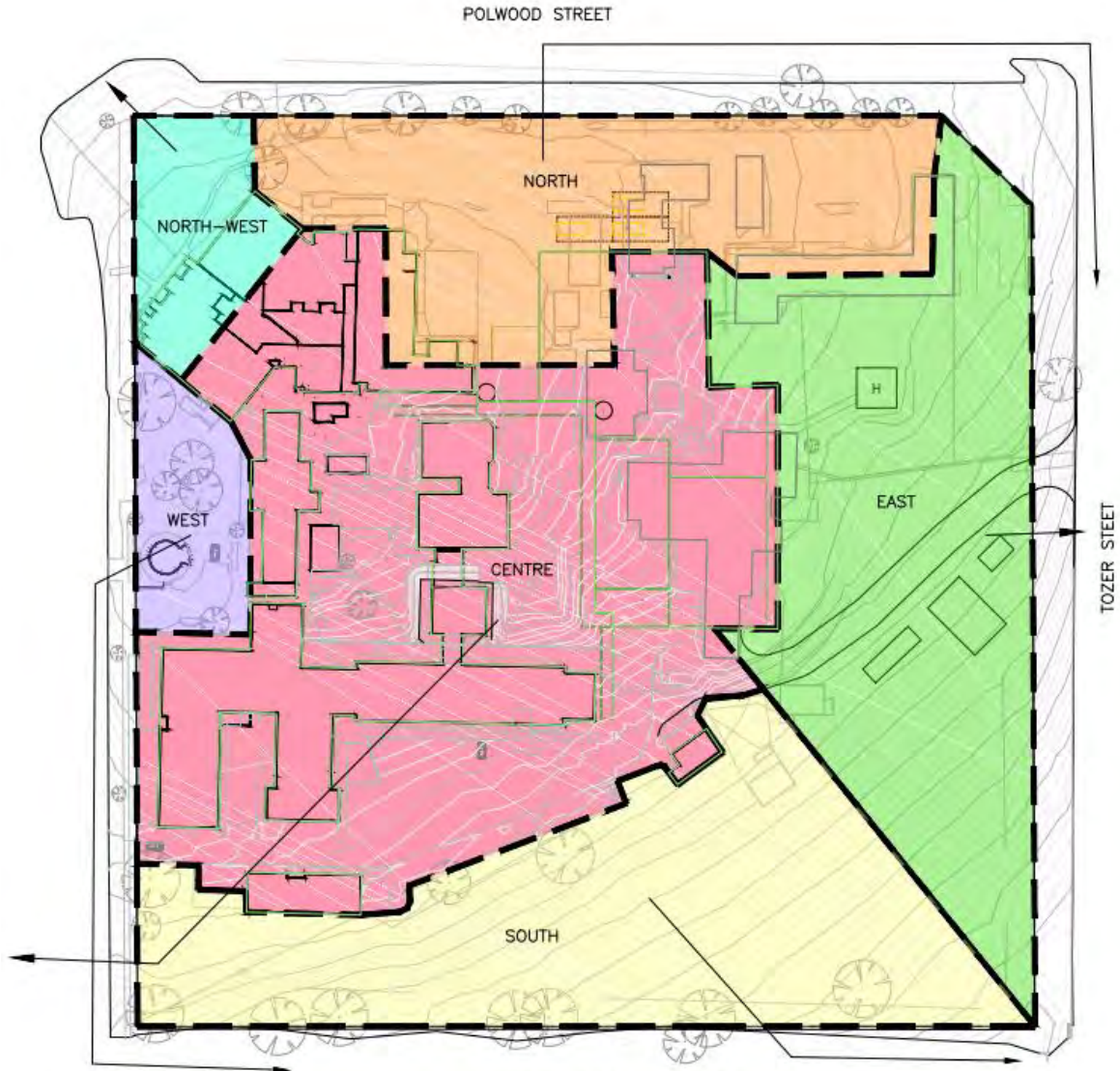
Kempsey Shire Council has adopted a standard rainfall chart for use within the council area. A copy of this chart is included in the Appendix to this report. This chart was prepared by the Bureau of Meteorology based on accumulated rainfall data for the area. This rainfall data has been used in the design of the stormwater drainage for this project.

### **4.2 Catchments & Runoff**

As discussed in the sections above, the rainfall catchment for the site is subdivided into six separate sub-catchments. The proposed development works will affect all but the west sub-catchment by either changes in surfacing, changes to the catchment size, changes to the proposed levels or a combination of the above.

The provision of new drainage infrastructure associated with the development works will convey surface water flows from the hospital building and external areas. New drainage infrastructure will be designed according to the anticipated flows discharging from each sub-catchment, but each sub-catchment's will continue to drain to its existing respective receiving drainage system.

The diagram below illustrates the post development situation and the gross areas for each of the sub-catchments.



POST-DEVELOPED CATCHMENT

| CATCHMENT  | AREA (m <sup>2</sup> ) | % OF TOTAL SITE AREA | OUTFALL       |
|------------|------------------------|----------------------|---------------|
| NORTH      | 6006                   | 14.7%                | TOZER ST      |
| EAST       | 8689                   | 21.2%                | TOZER ST      |
| SOUTH      | 8006                   | 19.6%                | TOZER ST      |
| WEST       | 1396                   | 3.4%                 | TOZER ST      |
| NORTH-WEST | 1504                   | 3.7%                 | RIVER MACLEAY |
| CENTRE     | 15294                  | 37.4%                | RIVER MACLEAY |
| TOTAL      | 40895                  |                      |               |

TOZER STREET TOTAL = 24097m<sup>3</sup>  
 RIVER MACLEAY TOTAL = 16798m<sup>3</sup>

## 4.3 Proposed Stormwater Drainage Assessment

The following sections describe the proposed alterations to each sub-catchment within the development site and the associated modifications to the drainage systems. Figures quoted for discharge rates are based on calculations presented in the tables below and that are based on Rationale Method estimates of the 1 in 100 year ARI rainfall event.

### 4.3.1 North Stormwater Drainage

Following construction of the new building there will be a slight reduction in the overall sub-catchment size from 0.64ha to 0.60ha. The majority of the north sub-catchment paved surfaces and levels will remain as existing following the redevelopment works. Limited sections of the car park will be resurfaced with no a negligible increase in impermeable areas and the existing drainage systems are proposed to continue to service runoff from this sub-catchment.

The only exception is the new ambulance delivery area which will be elevated to tie into the upper ground floor of the new hospital. Surface water drainage will discharge as overland flow and runoff from the ambulance area to the North into the Polwood Street as per the existing arrangement.

### 4.3.2 North West Stormwater Drainage

There is no permanent proposed development works within this sub-catchment that will affect the existing drainage regime. However, in the temporary case the existing oral health building will be relocated here as part of the decanting strategy. During this temporary situation, roof water will be discharged via a new drainage system directly to the existing drain rather than via overland flow (as existing) which will slightly increase the discharge rate from site.

Following completion of the new building however, the oral health building will be permanently removed from site and the temporary drainage removed. Thus at the end of the project there is no net change to this sub-catchment from pre to post.

### 4.3.3 East Stormwater Drainage

The east sub-catchment will experience significant regrading, changes to surfacing and alterations to its boundary as part of the redevelopment works. These changes are associated with installation of the service road and services compound as well as the new building.

In keeping with discussions with Kempsey Shire Council, the catchment size has been reduced from 9.9ha to 8.7ha to reduce the volume and rate at which water is discharged to the existing Tozer Street drainage system which is known to have capacity issues. However, as a consequence of the introduction of additional impermeable surfacing which increases from 0.18ha to 0.33ha, there will be an increase in the rate of offsite discharge.

Rationale Method calculations demonstrate that these two effects cancel each other out and the net peak offsite flow will remain unchanged.

#### 4.3.4 Central Stormwater Drainage

The central drainage sub-catchment will be significantly affected by the introduction of the new building. As part of the design there will be changes to ground levels and gradients and consequently an increase size of the catchment from 1.32ha to 1.53ha.

Similarly, the building itself will have a large impermeable roof which will contribute to an increase in the rate of surface water runoff. These two effects will contribute to a net increase in the rate of offsite discharge from 1.00m<sup>3</sup>/s to 1.17m<sup>3</sup>/s from this sub-catchment directly to the River Macleay. This approach is in keeping with Kempsey Shire Council's aspirations to decrease the flow to the Tozer street drainage system.

In order to ensure this flow can be conveyed to the river, a new replacement main Ø675mm drain pipe will be installed between the new building and the River Macleay. This pipe has been designed to convey the 1 in 100 year flow (major storm event) without surcharging and will address the shortfall in hydraulic capacity associated with the existing drain.

The new drainage pipe has also been sized to deal with an anticipated increase in flows that are associated with the proposed future stage 2 development. This is based on preliminary layouts which suggest a further increase in impermeable areas.

#### 4.3.5 South Stormwater Drainage

The area of the south sub-catchment will become slightly smaller as a consequence of the introduction of the services compound and associated dedicated drainage. However, the finished levels and gradients within the south sub-catchment will be affected by the works following a regrading exercise associated with the services compound fill platform. No new impermeable surfaces will be introduced into this sub-catchment and it remains entirely landscaped, draining in a southerly direction towards the existing graveyard via overland flow.

The net reduction in catchment area from 0.84ha to 0.80ha will result in a slight reduction in peak offsite flow rates.

#### 4.3.6 West Stormwater Drainage

The west sub-catchment is entirely unaffected by the development works and will continue to discharge water in the existing manner with no change to peak rates.

### Pre-Development Discharge Rates

| Catchment Name       | Sub-Catchment Area (Ha) | Time of Concentration (mins) | Effective 'C' Value                | 100 Year Design Flows (m <sup>3</sup> /s) |
|----------------------|-------------------------|------------------------------|------------------------------------|---|
| North                | 0.641                   | 6                            | $(0.4*1.2*0.09) + (1*0.91) = 0.95$ | 0.48                                      |
| North-West           | 0.150                   | 6                            | $(0.4*1.2*0.52) + (1*0.48) = 0.73$ | 0.08                                      |
| East                 | 0.988                   | 6                            | $(0.4*1.2*0.82) + (1*0.18) = 0.57$ | 0.44                                      |
| Centre               | 1.325                   | 6                            | $(0.4*1.2*0.10) + (1*0.90) = 0.95$ | 1.00                                      |
| South                | 0.844                   | 6                            | $(0.4*1.2*1.00) = 0.48$            | 0.32                                      |
| West                 | 0.140                   | 6                            | $(0.4*1.2*0.32) + (1*0.68) = 0.83$ | 0.09                                      |
| <b>Tozer Street</b>  | <b>2.614</b>            |                              |                                    | <b>1.33</b>                               |
| <b>Macleay River</b> | <b>1.475</b>            |                              |                                    | <b>1.08</b>                               |
| <b>Total</b>         | <b>4.089</b>            |                              |                                    | <b>2.41</b>                               |

### Post-Development Discharge Rates

| Catchment Name       | Sub-Catchment Area (Ha) | Time of Concentration (mins) | Effective 'C' Value                | 100 Year Design Flows (m <sup>3</sup> /s) |
|----------------------|-------------------------|------------------------------|------------------------------------|---|
| North                | 0.600                   | 6                            | $(0.4*1.2*0.09) + (1*0.91) = 0.95$ | 0.45                                      |
| North-West           | 0.150                   | 6                            | UNCHANGED                          | 0.08                                      |
| East                 | 0.869                   | 6                            | $(0.4*1.2*0.67) + (1*0.33) = 0.65$ | 0.44                                      |
| Centre               | 1.529                   | 6                            | $(0.4*1.2*0.07) + (1*0.93) = 0.96$ | 1.17                                      |
| South                | 0.800                   | 6                            | $(0.4*1.2*1.00) = 0.48$            | 0.30                                      |
| West                 | 0.140                   | 6                            | UNCHANGED                          | 0.09                                      |
| <b>Tozer Street</b>  | <b>2.398</b>            |                              |                                    | <b>1.28</b>                               |
| <b>Macleay River</b> | <b>1.691</b>            |                              |                                    | <b>1.25</b>                               |
| <b>Total</b>         | <b>4.089</b>            |                              |                                    | <b>2.53</b>                               |

## 4.4 On-Site Detention

The two receiving drainage systems are the River Macleay and Council drainage system below Tozer Street as described throughout the report. By comparing the overall sub-catchments peak discharge rates for both the pre and post development scenarios we note an overall reduction in peak flow to the Tozer street system and an increase in the peak flow to the River Macleay.

In accordance with Kempsey Shire Council's Development Design Specification and ongoing consultation with Council's development engineer throughout the design, no detention or attenuation of flows are required for discharge from site. For discharge to the Tozer Street drainage system this is because the proposed development will provide a betterment to the existing drainage regime.

For the sub-catchments discharging to the Macleay River, no detention is required because the new proposed stormwater pipe network is sized to cater for the Q100yr ARI flow without surcharging. The increased discharge to the River Macleay is deemed to have a negligible impact on peak flows within the river Macleay following significant rainfall given the size of the river catchment area when compared to the size of the hospital campus.

## **5.0 Surface Water Quality**

As part of the installation of the new drainage system, online surface water treatment devices will be installed to the central drainage sub-catchment. These devices will remove litter and debris, suspended sediments and hydrocarbons and is intended to improve the quality of discharge to the River Macleay.

## **6.0 Sediment & Erosion Control**

Erosion and sediment controls will be provided during the construction phase in accordance with Council guidelines. An Erosion and Sedimentation Control Plan has been prepared for the early works, and is included in the Appendix to this report. The plan includes measures such as sediment fences at the downstream edges of all disturbed areas, filters at all existing pits collecting stormwater runoff from disturbed areas, and a truck shaker tray at each point of access to the work area. A Sedimentation basin has been provided, sized in accordance with the guidelines in the “Blue Book” - Managing Urban Stormwater - Soils and Construction (NSW Department of Housing 1998).

Final details of Erosion and Sediment Control measures for the main works will be documented in the drawings to be prepared for the final certification documents. The drawings will take into account the site works staging including the preferred site access points, site shed locations and temporary stockpile locations. These details will be prepared in conjunction with the selected contractor, to ensure that the selected measures are practical and will be well maintained.

**Appendix A – Intensity Frequency Duration Chart**

## Intensity-Frequency-Duration Table

Location: 31.075S 152.825E Issued: 8/5/2013

Rainfall intensity in mm/h for various durations and Average Recurrence Interval

### Average Recurrence Interval

| Duration | 1 YEAR | 2 YEARS | 5 YEARS | 10 YEARS | 20 YEARS | 50 YEARS | 100 YEARS |
|----------|--------|---------|---------|----------|----------|----------|-----------|
| 5Mins    | 107    | 137     | 173     | 193      | 221      | 257      | 285       |
| 6Mins    | 100    | 128     | 162     | 181      | 207      | 241      | 267       |
| 10Mins   | 82.1   | 105     | 134     | 150      | 173      | 202      | 224       |
| 20Mins   | 59.7   | 77.0    | 99.3    | 112      | 130      | 153      | 170       |
| 30Mins   | 48.5   | 62.7    | 81.4    | 92.5     | 107      | 127      | 141       |
| 1Hr      | 33.1   | 42.9    | 56.2    | 64.1     | 74.6     | 88.5     | 99.2      |
| 2Hrs     | 22.1   | 28.7    | 37.7    | 43.2     | 50.3     | 59.8     | 67.1      |
| 3Hrs     | 17.3   | 22.5    | 29.7    | 34.0     | 39.6     | 47.1     | 52.9      |
| 6Hrs     | 11.5   | 14.9    | 19.6    | 22.5     | 26.2     | 31.2     | 35.0      |
| 12Hrs    | 7.56   | 9.83    | 12.9    | 14.8     | 17.2     | 20.5     | 23.0      |
| 24Hrs    | 4.93   | 6.41    | 8.42    | 9.63     | 11.2     | 13.3     | 14.9      |
| 48Hrs    | 3.13   | 4.06    | 5.31    | 6.06     | 7.04     | 8.34     | 9.35      |
| 72Hrs    | 2.34   | 3.03    | 3.95    | 4.50     | 5.22     | 6.18     | 6.91      |

(Raw data: 43.09, 9.88, 3.04, 88.22, 20.39, 6.11, skew=0.05, F2=4.36, F50=16.33)

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**Appendix B – Design Drawings**

**NOTES:**

- REFER TO CIVIL ENGINEERING DRAWINGS FOR DETAILS OF DRAINAGE, EARTHWORKS, RETAINING WALLS, KERBING, PAVEMENT AND SETTING OUT
- ALL TREE REMOVAL WORKS AND WORKS IN PROXIMITY TO TREE ROOT PROTECTION AREAS TO BE CARRIED OUT IN ACCORDANCE WITH THE ARBORIST'S RECOMMENDATIONS
- ALL SERVICES INSTALLATION TO BE IN ACCORDANCE WITH SERVICES ENGINEER'S DETAILS
- ALL EXISTING SERVICES INDICATED ARE REPRODUCED FROM TOPOGRAPHICAL SURVEY 130110\_04584DET07 PRODUCED BY MARK ROGERS ASSOCIATES. THE LOCATIONS OF ALL BELOW GROUND SERVICES MUST BE ESTABLISHED ON SITE PRIOR TO UNDERTAKING EXCAVATION
- PROPOSED BUILDING DEMOLITION WORKS ARE SUBJECT TO DECANTING AND TEMPORARY/PERMANENT SERVICES PROVISIONS, REFER TO SEQUENCING PLANS FOR FURTHER DETAILS

**KEY:**

- PHASE 1 BUILDING DEMOLITION
- PHASE 2 BUILDING RELOCATION/DEMOLITION
- PHASE 3 BUILDING DEMOLITION
- PROPOSED TREE REMOVAL
- PROPOSED NEW PAVEMENT CONSTRUCTION
- PROPOSED NEW DRAINAGE INSTALLATION
- PROPOSED RETAINING WALLS

**PHASE 1 WORKS**

**PHASE 2 WORKS**

**PHASE 3 WORKS**

**PROPOSED MECHANICAL, HYDRAULIC AND ELECTRICAL SERVICES**  
REPRODUCED FROM DRAWINGS BY OTHERS (REFER TO RELEVANT CONSULTANT DRAWINGS FOR FURTHER DETAIL)

- FIRE HYDRANT WATER FEED
- POTABLE WATER
- GAS
- OXYGEN
- COMMUNICATIONS
- ELECTRICAL
- SEWER

NOTE:  
GRUBBING OUT OF EXISTING SERVICES AND/OR INSTALLATION OF NEW SERVICES IN AREAS OF EXISTING HARD STANDING TO BE MADE GOOD BY BACKFILLING AND COMPACTING TRENCH WITH SUITABLE GRANULAR MATERIAL AND SURFACE FINISH REINSTATEMENT.

PHASE 2 WORKS:  
NEW PEDESTRIAN CROSSING AND ASSOCIATED FOOTWAYS, KERBING WORKS AND LINE MARKING TO BE CONSTRUCTED IMMEDIATELY FOLLOWING NEW SERVICES INSTALLATION TO MINIMISE DISRUPTION TO RIVER STREET

PHASE 2 WORKS:  
NEW DRAINAGE PIPE INSTALLATION CROSSING RIVER STREET, TO BE UNDERTAKEN CONCURRENTLY WITH INSTALLATION OF NEW ELECTRICAL/COMS CONDUITS

PHASE 2 WORKS:  
CONSTRUCTION OF NEW ON GRADE EXTERNAL CAR PARK

PHASE 2 WORKS:  
CONSTRUCTION OF NEW SURFACE WATER HEADWALL

PHASE 2 WORKS:  
TREE REMOVAL

PHASE 2 WORKS:  
CONSTRUCT NEW CAR PARKING BAYS

PHASE 2 WORKS:  
INSTALLATION OF NEW SURFACE WATER DRAIN

PHASE 2 WORKS:  
CIVILS WORKS FOR TEMPORARY RELOCATION OF BUILDING 13B

PHASE 2 WORKS:  
CIVILS WORKS FOR TEMPORARY RELOCATION OF BUILDING 13C

PHASE 2 WORKS:  
TREE REMOVAL

PHASE 2 WORKS:  
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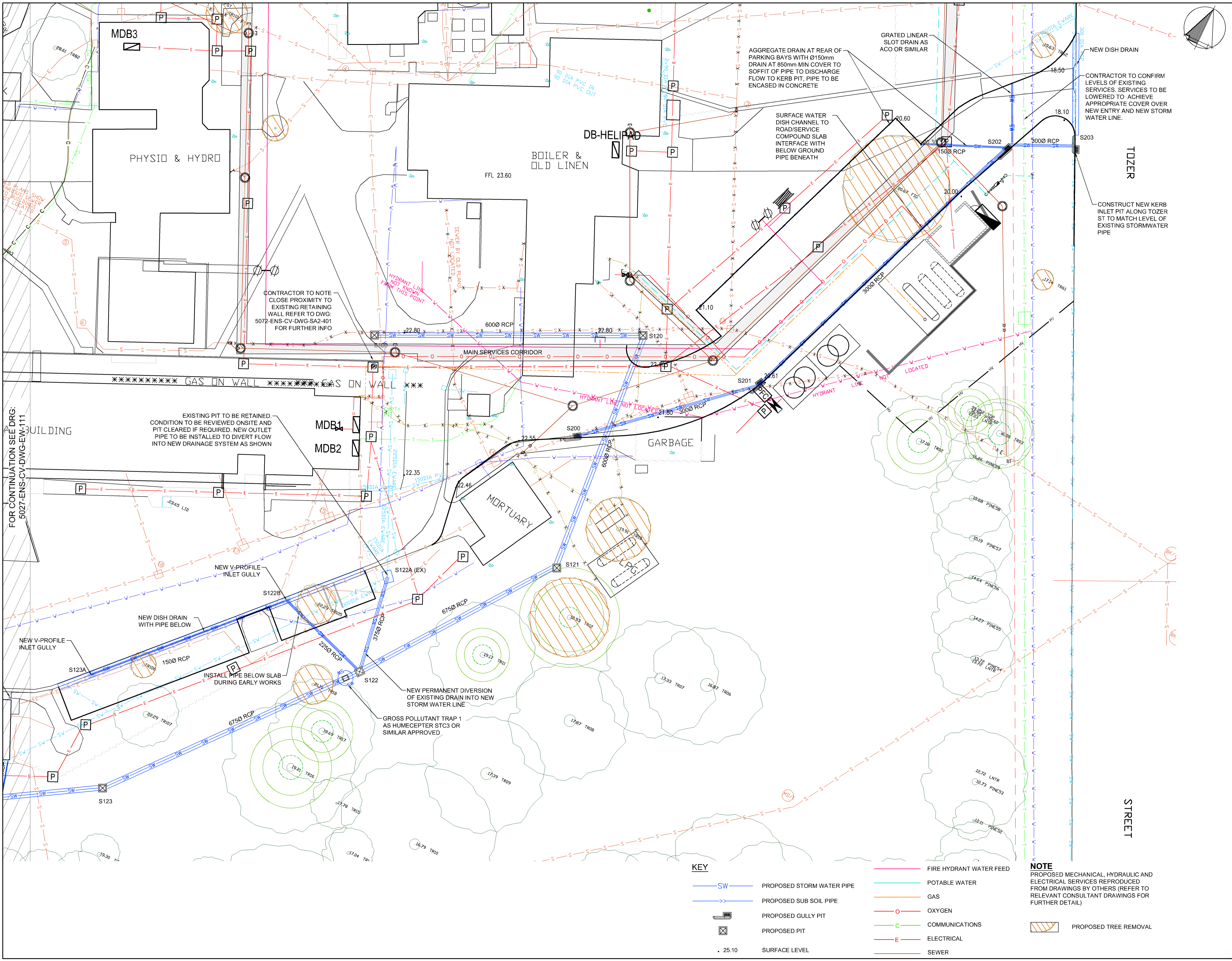
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NOTES:  
1. DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS CONTROL.  
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.  
3. ALL DIMENSIONS SHALL BE SHOWN ON THE DRAWING PRIOR TO PROCEEDING WITH THE WORK. ENSTRUCT SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES.  
4. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL RELEVANT CONTRACTS, SPECIFICATIONS, REPORTS AND DRAWINGS.  
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| ISSUE | DATE     | FOR         |
|-------|----------|-------------|
| 0     | 22/02/13 | PRELIMINARY |
| 1     | 28/02/13 | TENDER      |
| 2     | 20/03/13 | TENDER      |



FOR CONTINUATION SEE DRG:  
5027-ENS-CV-DWG-EW-111

CONTRACTOR TO NOTE CLOSE PROXIMITY TO EXISTING RETAINING WALL REFER TO DWG: 5072-ENS-CV-DWG-SA2-401 FOR FURTHER INFO

EXISTING PIT TO BE RETAINED. CONDITION TO BE REVIEWED ONSITE AND PIT CLEARED IF REQUIRED. NEW OUTLET PIPE TO BE INSTALLED TO DIVERT FLOW INTO NEW DRAINAGE SYSTEM AS SHOWN

CONTRACTOR TO CONFIRM LEVELS OF EXISTING SERVICES. SERVICES TO BE LOWERED TO ACHIEVE APPROPRIATE COVER OVER NEW ENTRY AND NEW STORM WATER LINE.

AGGREGATE DRAIN AT REAR OF PARKING BAYS WITH Ø150mm DRAIN AT 850mm MIN COVER TO SOFFIT OF PIPE TO DISCHARGE FLOW TO KERB PIT, PIPE TO BE ENCASED IN CONCRETE

SURFACE WATER DISH CHANNEL TO ROAD/SERVICE COMPOUND SLAB INTERFACE WITH BELOW GROUND PIPE BENEATH

GRATED LINEAR SLOT DRAIN AS ACO OR SIMILAR

NEW DISH DRAIN

**KEY**

|  |                           |  |                         |
|--|---------------------------|--|-------------------------|
|  | PROPOSED STORM WATER PIPE |  | FIRE HYDRANT WATER FEED |
|  | PROPOSED SUB SOIL PIPE    |  | POTABLE WATER           |
|  | PROPOSED GULLY PIT        |  | GAS                     |
|  | PROPOSED PIT              |  | COMMUNICATIONS          |
|  | SURFACE LEVEL             |  | ELECTRICAL              |
|  |                           |  | SEWER                   |

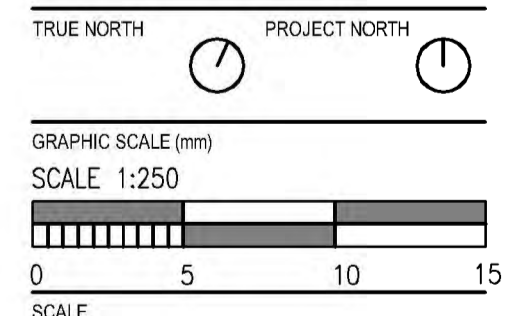
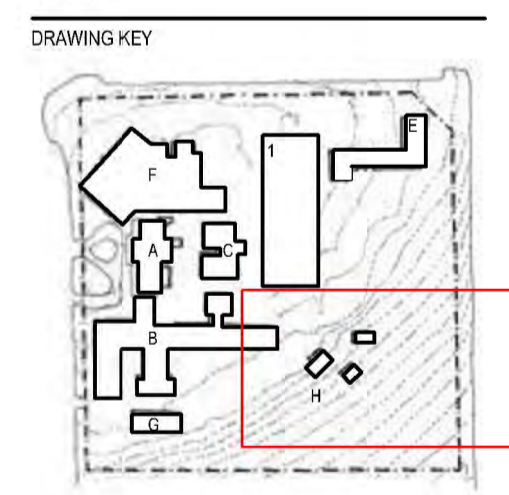
**NOTE**  
PROPOSED MECHANICAL, HYDRAULIC AND ELECTRICAL SERVICES REPRODUCED FROM DRAWINGS BY OTHERS (REFER TO RELEVANT CONSULTANT DRAWINGS FOR FURTHER DETAIL)

PROPOSED TREE REMOVAL

CLIENT  
 NSW Health Infrastructure

PROJECT MANAGER  
 JOHNSTAFF  
PROJECT  
KEMPSEY DISTRICT HOSPITAL

ENSTRUCT PROJECT NUMBER  
4463



FOR INFORMATION ONLY  
STATUS  
DRAWING NUMBER  
5027-ENS-CV-DWG-SA2-110  
ISSUE  
2